FINAL

Voluntary Cleanup Program

CONSTRUCTION CLOSEOUT REPORT
for
AREA I
(Former Republic (LTV) Steel Parcel)

STEELFIELDS SITE
BUFFALO, NY
(NYSDEC SITE #V00619-9)

March 2004 | 0062-008-404
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Prepared for:

STEELFIELDS LTD

Prepared by:

TurnKey Environmental Restoration, LLC

In association with:

Benchmark Environmental Engineering & Science, PLLC

STEELFIELDS, LTD.

CONSTRUCTION CLOSEOUT REPORT

AREA I

CERTIFICATION:

I certify that the Remedial Work Plan was implemented and that all construction activities for Area I were completed substantially in accordance with the Department-approved Voluntary Cleanup Work Plan except where deviations and/or corrective measures are duly noted and said construction activities were personally witnessed by me (or person(s) under my direct supervision).

STATE OF NEW YORK
PAUL H. WERTHMAN
LICENSED PROFESSIONAL ENGINEER

Paul H. Werthman, P.E.

Principal Engineer

STEELFIELDS, LTD.

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1.0 INTRODUCTION

1.1 Background

In October, 2002 Steelfields Ltd. purchased several vacant industrial properties in South Buffalo, New York (See Figure 1-1 and Figure 1-2) out of bankruptcy from the LTV Steel Company and Hanna Furnace Corporation (a wholly owned subsidiary of the National Steel Corporation). At the same time, Steelfields entered into a Voluntary Cleanup Agreement (VCA) with the New York State Department of Environmental Conservation (NYSDEC). The property, hereinafter referred to as either the Steelfields Site or the Former Steel and Coke Manufacturing Site, is subdivided into the following four parcels totaling approximately 213 acres, (see Figure 1-3), based on the operational and ownership history of each:

- Area I - Former Republic (LTV) Steel Plant Parcel
- Area II - Former Donner-Hanna Coke Plant Parcel
- Area III - Former Republic (LTV) Warehouse Parcel
- Area IV - Former Donner-Hanna Coke Yard Parcel

Two Site Assessment Reports were finalized in January 2000 (References 2 and 3), one for Area I and a second addressing Areas II, III, and IV, respectively to assess the environmental condition of the Site.

A Work Plan for Voluntary Cleanup Program Remedial Design/Remedial Action for the Former Steel and Coke Manufacturing Site (by TurnKey Environmental Restoration, LLC, September 2002) was approved by the NYSDEC on December 27, 2002.

1.2 Purpose and Scope

This Construction Closeout Report (CCR) documents remedial construction performed in Area I and related materials handling and treatment, and disposal activities. All other voluntary cleanup activities performed in 2003 and related to other Areas or operable units on the site are documented in a separate report.

Inspection reports were prepared by Construction Quality Assurance (CQA) personnel on a daily basis describing construction activities performed during the 2003 construction season including, but not limited to the following:

- Activities performed by the remediation contractor, Modern Construction, LLC and/or their subcontractor(s);
- Any problems encountered and/or corrective measures implemented, as necessary; and
- Collected soil samples (i.e., pre-qualification and verification sample collection) submitted to and analyzed by an approved analytical laboratory.

Daily inspection reports prepared by CQA personnel are presented in Appendix A of this report.

1.3 Report Organization

This report is organized by remedial task and subarea where the construction was performed and includes:

- Record drawings;
- Soil/fill analytical data verifying cleanup objectives were met;
- Community Air Monitoring and Documentation Air Monitoring data and reports documenting Work Plan requirements were met;
- Summaries of excavation quantities;
- Analytical data, source locations and quantities of off-site borrow soils brought on-site; and
- Construction quality assurance and other pertinent information collected during remedial construction.

2.0 CLEANUP OBJECTIVES

2.1 General

The Site is intended for sale and redevelopment for industrial or commercial use following remediation of on-site soils and groundwater in accordance with the NYSDEC-approved RD/RA Work Plan. Cleanup objectives for the site soil/fill include not only implementing remedial measures that are ultimately protective of human health and the environment, but also that mitigate potential short-term impact to site construction workers and the surrounding community during the remedial construction and redevelopment period.

A Soil/Fill Management Plan incorporated in the Work Plan addresses potentially contaminated soil/fill that may be excavated or handled subsequent to the Voluntary Cleanup during infrastructure construction or other redevelopment activities. The Soil/Fill Management Plan also addresses placement of final soil and/or vegetative cover prior to occupancy and use of redeveloped parcels.

Integral to the cleanup and redevelopment activities at the site will be the following objectives to protect the public health:

- Complete pavement, buildings and/or vegetative coverage prior to occupancy of a redeveloped parcel.

- Installation of fencing to prevent commercial workers and nearby residents from trespassing on undeveloped or unremediated areas of the site.

- Community air monitoring with engineering controls, as necessary, during periods of remedial construction and site redevelopment to prevent unacceptable fugitive releases of airborne particulates (i.e., dust). Community air monitoring will follow New York State Department of Health (NYSDOH) and NYSDEC approved procedures.

- Control of surface erosion and run-off during voluntary clean-up, infrastructure and redevelopment construction activities.

- Surface stabilization to mitigate potential wind or water-borne migration of surficial soil/fill constituents in disturbed areas of the property that are not undergoing immediate redevelopment (viz., areas outside redeveloped parcels where remedial construction or utility installation has take place).

2.2 Site –Specific Action Levels in Soil/Fill

In accordance with the approved RD/RA Work Plan, the following site-specific action levels (SSALs) were established for surficial and subsurface soil/fill on the Former Steel and Coke Manufacturing Site:

PARAMETER	MAXIMUM CONCENTRATION IN SOIL/FILL (mg/kg)
Individual VOC	1
Total VOCs	10
Total SVOCs	500
Arsenic	75
Barium	1,000
Cadmium	15
Chromium	1,000
Lead	1,000
Mercury	10
Selenium	61
Silver	10
Cyanide (Total Amenable)	1,600

Existing surficial and subsurface soil/fill on the site with constituent concentrations less than or equal to these SSALs were determined not to require excavation or cleanup. As such, on-site soil/fill with constituent concentrations below these SSALs have been deemed suitable for grading, backfilling excavations, raising grades or other on-site uses during remediation, predevelopment, and development phases of the project. Criteria for determining the acceptability of off-site borrow sources for final cover soils are delineated in the Soil/Fill Management Plan.

3.0 SUMMARY & DOCUMENTATION OF REMEDIAL ACTIVITIES

3.1 Overview of Remedial Actions Required

In accordance with the Remedial Work Plan for the Voluntary Cleanup Program RD/RA (revised Sept 2002) the following Remedial Tasks were required in Area I:

Task I-1: Petroleum/Napthalene/Tar-Impacted Soil/Fill Remediation: Soil/fill from the Subareas A, D, T3, K, L, and N14 exceeding site-specific action levels (SSALs) will be excavated and either: bio-remediated in Areas II or III; placed inside the Area II containment cell; or hauled off-site for disposal in a properly permitted landfill.

Task I-2: Underground Piping Remediation: Former fuel oil and tar transfer pipe lines shall be removed and drained of residual fluids for appropriate off-site treatment or disposal. All petroleum-impacted soil/fill exceeding SSALs encountered during pipe removal will be excavated and handled as per Task I-1.

Task I-3: Petroleum Storage Tank Removal: An underground storage tank filled with water at location T3 will be removed in accordance with 6NYCCR Part 613.9(b). The water will be pumped out and disposed of at a NYSDEC-approved disposal facility by a licensed hauler. Impacted soil from around the tank will also be addressed as per Task I-1.

Task I-4: Inorganic Impacted Soil/Fill Remediation: Soil/fill from Subareas Q5, Q14, Q18, and Q19 exceeding SSALs for inorganics will be excavated and placed inside the Area II containment cell or hauled off-site for disposal in a properly permitted landfill.

River Bank Stabilization: Those portions of Area I along the Buffalo River that are not protected by steel sheetpiling will be stabilized and protected from erosion.

3.2 General

Remediation of soil/fill in Area I can be generally categorized as:

- Petroleum-impacted

- Tar-impacted
- Inorganic-impacted

Petroleum-impacted soil/fill from past releases of fuel from underground storage tanks or pipelines were excavated and biologically treated on-site. After treatment to concentrations below SSALs, the treated soil/fill was used on-site as subsurface backfill. Tar-impacted and inorganic-impacted soil/fill exceeding SSALs were excavated and placed into the Area II containment cell. A more detailed description of the remedial work performed in Area I, by task and subarea, follows.

3.3 Underground Storage Tank Removal

An underground storage tank filled with water at location T3 was removed and recycled for scrap. The water in the tank was sampled and transferred to the Terminal Basin for discharge to the BSA sewerage system. Petroleum impacted soil/fill adjacent to the tank was excavated and transported to the Area III biopad for treatment via landfarming. Following bio treatment and verification sampling and analysis to demonstrate conformance with SSALs, the treated soil was used on-site for subsurface backfill.

3.4 Underground Piping Remediation

Former fuel oil and tar transfer pipelines were removed. Impacted soil/fill was excavated and transported to the Area III biopad for subsequent treatment or disposal. Petroleum-impacted soil was biotreated and after verification testing to demonstrate conformance with SSALs reused on-site for subsurface backfill. Tar-impacted soils were placed in the Area II containment cell.

3.5 Inorganic Impacted Soil/Fill Remediation

3.5.1 *Individual Subareas*

Subareas Q5, Q14, Q18, and Q19 were previously determined to contain inorganic impacted soil/fill. Figures 3-3 and 3-4 show the locations and lateral extent of excavated soil/fill in these Subareas. Table 3-1 summarizes the volume of impacted soil excavated.

3.5.2 *Excavation/Backfilling/Disposal/Groundwater Management*

Excavation of the Subarea Q impacted soil/fill began with Subarea Q5 on November 5, 2003 and was completed with Subarea Q19 on November 10, 2003. Each subarea was remediated by excavating the area identified on Figure 3-4. The upper 2-feet of unimpacted material within Subarea Q5 was removed and reused as backfill. The impacted material removed from subareas Q5, Q14, Q18, and Q19 was transported, placed and consolidated in the Area II containment cell. Verification testing was performed only in Subarea Q5 beyond A1-TP-Q5-13, since elevated chromium potentially existed beyond this point. Sufficient pre-excavation soil characterization data at other locations negated the need to perform additional verification testing. Results indicated that levels of chromium were below SSALs, and excavation was completed in accordance with the Work Plan. For results of this verification testing please refer to Table 5 of Appendix B. Backfilling of the Subarea Q excavations was completed on November 20, 2003. Backfill was transported from off-site borrow source material previously stockpiled in Area III, known as the "Truscon Soils". Refer to Appendix D for further information. Groundwater was encountered during excavation of subareas Q5, Q14, Q18, and Q19. Excavation and backfill proceeded with water in place.

3.6 Petroleum and Tar Impacted Soil/Fill Remediation

3.6.1 *General*

Remediation of surface and subsurface soil/fill impacted by petroleum and/or coke plant tar residuals was divided into five separate subareas. These subareas were labeled A, D, T3, K&L and N-14. The predicted impacted area, (as determined by the Site

Investigation) and approximate limits of each subarea are shown on Figures 3-1 and 3-2. Figures 3-5, 3-6, 3-7, 3-8, and 3-9 document final lateral and vertical limits of excavation for each respective subarea. Table 3-2 summarizes estimated and actual quantities of impacted soil removed from each subarea.

Generally, petroleum and/or tar-impacted soil/fill were visually identified as discrete layers. Excavations proceeded to native soil or until the excavation bottom was free of visible impacts, whichever was encountered sooner. Verification samples were then taken and analyzed in accordance with the RD/RA Work Plan.

3.6.2 *Subarea A*

3.6.2.1 *Excavation/Backfill*

Excavation of this subarea began on April 14, 2003, and backfill was completed on July 18, 2003. The location and lateral extent of excavation in Subarea A is shown on Figure 3-1. Figure 3-5 documents the actual volumes of both impacted soil/fill and overburden soil/fill excavated, which has been tabulated in Table 3-2. Impacted soil/fill in this subarea was comprised of primarily petroleum-contamination. The thickness of the contaminated material varied from 0.1 to over 6 feet throughout the lateral extent of Subarea A. Due to the proximity of the Buffalo River, all impacted soil, even impacted zones less than 0.5 feet in thickness, were removed to the extent practicable within 75 feet of the edge of water. Backfill was imported from an off-site borrow source known as the "Seneca Mall" borrow source. Refer to Appendix D for further information.

3.6.2.2 *Deviations and/or Corrective Measures*

During excavation, several situations were encountered that required field deviations from the approved Voluntary Cleanup Work Plan. Excavation adjacent to the sheetpile wall on the northern extent of Subarea A was complicated with the presence of a tie-back anchor wall. This concrete wall (referred to as the concrete "deadman") runs parallel to, and is off-set approximately 40' from the sheetpile. Anchor rods run perpendicularly between the sheet pile and deadman to provide structural support to the steel sheet pile. Excavation was altered according to the approach documented in a letter to the NYSDEC dated June 17, 2003 (included in Appendix C). Due to the need to maintain the structural integrity of the deadman and support the sheetpile wall, soils between the sheetpile tie-backs and sheetpile wall were excavated and sequentially backfilled such that only one or two tie-backs were exposed at any time. All impacted soil under the deadman was removed by an excavator to the extent feasible, without risk of collapse of the structure or the sheetpile wall. Impacted soil beneath and to the north of the deadman was excavated and sequentially backfilled to maintain structural stability of the sheetpile. Excavation was limited to removal of product, and to the impacted soil accessible. The excavation was visually inspected and approved by the NYSDEC on-site representative prior to backfilling.

3.6.2.3 *Groundwater Management*

Substantial groundwater with floating oil was encountered during excavation in Subarea A. A floating oil skimmer was placed in the excavation to collect floating oil product. Collected oil product was transferred to 85-gallon over-pack drums. These drums were collected on September 28, 2004 by NOCO Energy Corporation. A total of approximately 350 gallons of used #6 oil and water were collected from Area I (mostly Subarea A) and transported to NOCO's recovery plant located in Tonawanda, New York for recovery/disposal.

Floating oil continues to be observed in A1-MW-6 at the most recent monitoring event. As stated in the Long Term Ground Water Monitoring Report (revised June 2005) included in this document as electronic Attachment 1, the floating oil in this well will continue to be monitored and collected by use of the Petro-Trap on a monthly basis and reported on a semi-annual basis as part of the Long-Term Groundwater Monitoring Program until such time as floating oil is no longer observed or collected for 3 consecutive reporting events.

3.6.3 *Subarea D*

3.6.3.1 *Excavation/Backfill/Groundwater Management*

Excavation of this Subarea began on April 2, 2003, and backfill was completed on June 6, 2003. The location and lateral extent of excavation in Subarea D is shown on Figure 3-1. Figure 3-6 documents the actual volumes of both impacted soil/fill and overburden soil/fill excavated, which has been tabulated in Table 3-2. Subarea D soil/fill was impacted by volatile organic residuals (i.e. benzene, xylene, and toluene) from a former 1000-gallon gasoline tank that leaked during steel plant operations. Unimpacted soil/fill above the contaminated soil was stockpiled for reuse as fill. Backfill was imported from an off-site borrow source known as the "Seneca Mall" borrow source. Refer to Appendix D for further information. Groundwater was encountered during excavation of subarea D. Excavation and backfill proceeded with water in place.

3.6.3.2 *Deviations and/or Corrective Measures*

In accordance with the RD/RA Work Plan, excavation was adjusted as determined by field observations and confirmatory sampling, resulting in the removal of all visibly impacted soil/fill encountered in layers greater than 0.5 feet thick. Impacted soil/fill was excavated laterally to the extents shown in Figure 3-6, and to an average depth of approximately 21 feet. Verification sampling results for the excavation show conformance with site-specific action levels (SSALs) for the sidewalls, but indicate exceedance of SSALs for benzene and zylenes on the excavation bottom. As stated in section 3.3.4.1 of the RD/RA Work Plan, layers less than 0.5 feet thick are impractical to excavate at depth. It continues to state that these areas will be bioremediated in place by subsurface injection of oxygen-releasing compounds (ORC®). As documented in a letter to NYSDEC dated May 15, 2003 (included in Appendix C), ORC® treatment was used to complete the remediation in Subarea D. The ORC® was injected at 20 locations, spaced evenly across the excavation base, for a total application of 390 lbs of ORC®. Following the ORC® injection, the remainder of the excavation was backfilled.

3.6.4 *Subarea T3 – Excavation/Backfill*

Excavation of this subarea began on April 5, 2003, and backfill was completed on April 28, 2003. The location and lateral extent of excavation in Subarea T3 is shown on Figure 3-2. Figure 3-7 documents the actual volumes of both impacted soil/fill and overburden soil/fill excavated, which has been tabulated in Table 3-2. Subarea T3 contained an underground storage tank that was approximately 25ft long by 8 ft in diameter. During the site investigation, water and no product were observed in the tank. The tank was removed prior to soil/fill excavation. Excavation and backfill were performed in accordance with the approved RD/RA Work Plan. Backfill was imported from an off-site borrow source known as the "Seneca Mall" borrow source. Refer to Appendix D for further information.

3.6.5 *Subarea K & L*

3.6.5.1 *Excavation/Backfill/Groundwater Management*

Excavation of this subarea began on June 6, 2003, and backfill was completed on August 26, 2003. The location and lateral extent of excavation in Subarea K&L is shown on Figure 3-2. Figure 3-8 documents the actual volumes of both impacted soil/fill and overburden soil/fill excavated, which has been tabulated in Table 3-2. Subarea K&L consisted primarily of tar-impacted soil/fill. Impacted soil/fill within cemented slag overlaid native soil in a relatively thin layer and was excavated until impacted thickness was less than 0.5 feet. Additional remediation techniques (ORC treatment) were employed along the southern border of the excavation limits due to trace impacted soil thickness less than 0.5 feet as further detailed in Sections 3.5.5.2 below. A portion of the backfill was imported from an off-site borrow source known as the "Seneca Mall" borrow. Additional required backfill was transported from off-site borrow source material previously stockpiled in Area III, known as the "Truscon Soils". Refer to Appendix D for further information. Groundwater was encountered during excavation of subarea D. Excavation and backfill proceeded with water in place.

3.6.5.2 *Deviations and Corrective Measures*

On July 31, 2003 TurnKey Environmental Restoration, LLC sent correspondence to NYSDEC on behalf of Steelfields, Ltd. documenting proposed use of Oxygen Release Compound® (ORC®) to complete remediation of Subarea K & L. Verification samples analyzed had shown conformance with site specific action levels (SSALs) for the sidewalls and bottom of the excavation. All visibly impacted soil/fill had been removed yet there was visibly impacted groundwater seeping on top of the native soil along approximately 80 feet of the southern sidewall in the southeast corner of the excavation.

On September 26, 2003, 90 lbs of Oxygen Release Compound® (ORC®) was injected in 11 borings at approximately 6-8 foot intervals in accordance with the NYSDEC approved proposal dated July 31, 2003 (included in Appendix C).

3.6.6 *Subarea N14 – Excavation/Backfill/Groundwater Management*

Excavation began on July 25, 2003 and backfill was significantly completed on August 25, 2003. The location and lateral extent of excavation in Subarea N-14 is shown on Figure 3-2. Figure 3-9 documents the actual volumes of both the impacted soil/fill and overburden soil/fill excavated, which has been tabulated in Table 3-2. Unimpacted soil/fill (approximately 1.5 feet thick) above the level of impact was excavated and reused as backfill material. The excavation was completed to the extent of the property line, to be extended when access to the adjacent property was obtained. Backfill was transported from off-site borrow source material previously stockpiled in Area III, known as the "Truscon Soils". Refer to Appendix D for further information. Minimal groundwater was encountered during excavation of subarea D. Excavation and backfill proceeded with water in place.

On January 26th, 2005 TurnKey personnel conducted investigation activities for Subarea N-14 located immediately south of Area I of the Steelfields Site. The findings of this investigation were summarized in the Off-Site Soil/Fill Investigation: Area I – Subarea N-14 Report that was submitted to the NYSDEC on February 10th, 2005. Defined extents of impacted soil/fill were found to extend south beyond the Area I fence line less than 10 feet at a depth of approximately 4.5 feet below ground surface (fbgs). On July 25, 2005, excavation of the remaining impacted soil/fill (located off-site), was commenced with a CAT 345b excavator and 2 tandom dump trucks. The petroleum impacted soil/fill was excavated, loaded, and transported to the bio-pad for bio-remediation. The previous excavation completed to the Area I property line, was extend southward approximately 10-12 feet and to a depth of approx. 6-8 feet (or virgin soil). Refer to Figure 3-9 for further information. The extent of the excavation was governed by visual inspection and soil headspace readings indicating clean sidewalls and bottom, as well as previous agreement with NYSDEC to accept boring samples from the geo-probe investigation as verification samples. Backfill consisted of bio treated soils previously excavated from Area I and tested to meet SSALs.

3.6.7 *Disposal/Treatment*

All excavated petroleum-impacted soil/fill exhibiting visual evidence of contamination and/or found to exceed SSALs was transported on-site to the Area III bio-pad for bioremediation. This included all impacted soils from Subareas A, D, T-3 and N-14. As of December 2006, , 100% of all soil placed on the bio-pad had been treated successfully, removed from the bio-pad, and stockpiled for future use as soil/fill material. Quantities of soil/fill placed on the bio-pad can be found in Table 3-2.

Tar-impacted soil/fill found to exceed SSALs was transported on-site to the Area III bio-pad for storage where it was rolled and sealed until final deposition in the Area II Containment cell. This material was excavated entirely from the subarea of K&L. Actual volume of excavated material can be found in Table 3-2.

3.6.8 *Verification Sampling*

Verification sampling was performed on the sidewalls and bottom of the excavations of each subarea in Area I, after visibly impacted soil/fill was removed. Sample collection methodology was in accordance with the Quality Assurance Plan included in Appendix B of the Voluntary Cleanup Agreement Work Plan.

Verification samples were analyzed in accordance with USEPA Methods 8021 and 8270 for the VOCs and SVOCs, respectively. Lateral excavation continued until visually impacted soil/fill was less than 0.5 feet thick, the SSALs for VOCs and SVOCs were met, or NYSDEC agreed that no further excavation was required. All sampling locations were approved by, and a majority of the sampling was witnessed by the NYSDEC on-site representative.

Tabulated summaries of laboratory data have been compiled into Appendix B of this report, and can be cross-referenced with Figures 3-5 through 3-9 which indicate approximate locations of where each verification sample was taken.

Verification samples were taken of borrow soils in accordance with the VCA Work Plan, and results can be found in Appendix D of this report. Additional verification samples were taken during the process of treatment of the petroleum impacted soils on the Bio-pad. The tabulated summaries for these verification samples can be found in Appendix E of this report and cross-referenced with Figure 3-10 for sample locations.

3.6.9 *Site Restoration and River Bank Stabilization*

All areas in Area I excavated, were backfilled to grade with approved soil/fill. This material was graded and compacted using a CAT D6M bulldozer and a CAT smooth drum roller. Upon completion of each subarea, hydro-seed was applied to the surface, and monitored for adequate growth coverage to assist in dust and erosion control.

Portions of the river banks near Subarea A that required stabilization and/or erosion protection were defined in field with NYSDEC on-site personnel (see Figure 3-11). The toe of the slope of approximately 200 feet of the River bank to the northeast of sheet piling and southwest of the South Park Avenue lift-bridge was fitted with rip-rap, re-graded to approximately 3-on-1 grade, covered with topsoil, and re-seeded. The remaining river bank locations were re-graded to approximately 3-on-1, covered with topsoil, and re-seeded.

Silt curtains were used along the River edge to control sediment loss during grading and excavation activities. The silt curtains were removed after restoration was complete.

3.7 Community Air Monitoring & Documentation Air Monitoring Programs

3.7.1 *Community Air Monitoring*

The Community Air Monitoring Program was established in accordance with the appropriate NYSDEC and NYSDOH regulations and requirements, presented in Appendix I of the Voluntary Cleanup Agreement Work Plan, and revised, submitted and approved by the NYSDEC in August 2003. The primary purpose of this program was to provide real-time air monitoring and provide a measure of protection for the downwind community from potential airborne contaminant releases resulting from remedial work activities. A meteorological station was installed outside the construction trailers in Area II to monitor and document weather conditions. This station was used daily in association with construction activity through the 2003 calendar year.

Monthly documentation reports of this program were submitted to the NYSDEC and made available for public review at the Dudley Branch of the Erie County Library located on South Park Avenue, Lackawanna, New York. Appendix F of this report includes a listing of these reports, as well as the date on which they were submitted to the NYSDEC.

3.7.2 *Documentation Air Monitoring*

In accordance with the Community Air Monitoring Plan, and in an effort to quantify concentration of selected parameters, documentation air monitoring was performed for the following activities:

- At the start of a large-scale ground intrusive cleanup task
- At the start of a significantly different work task involving impacted soils handling
- If the real-time monitoring thresholds were exceeded for a predetermined amount of time, and
- As necessary to address specific off-site air quality concerns.

Eight separate Documentation Air Monitoring Events took place in 2003. Appendix F lists each event, the dates the event took place, and the date that the entitled report was submitted to NYSDEC. These reports have been previously submitted to NYSDEC and made available to the public and are therefore omitted from this report.

4.0 OPERATION, MAINTENANCE, & MONITORING PLAN

An Operation, Maintenance, & Monitoring (OM&M) Plan has been developed for the Steelfields Area I Parcel in accordance with the Voluntary Cleanup Agreement and for implementation upon completion of the Voluntary Cleanup Agreement. This plan has been officially included within the Site Management Plan (refer to Electronic Attachment 5). Portions of this report have been repeated within this document for completeness.

The Operation, Maintenance, & Monitoring Plan for Area I consists of implementation of the A1-MW-6 Operation, Maintenance, & Monitoring Program, the Long-Term Groundwater Monitoring (LTGWM) Plan (refer to Electronic Attachment 1), and the Annual Inspection and Certification of the property.

4.1 A1-MW-6 Operation, Maintenance & Monitoring Program

The presence of an immiscible layer detected within monitoring well A1-MW-6 has resulted in the development of an Area-specific OM&M Plan to address that issue. Although the history of the immiscible layer within monitoring well A1-MW-6 has already been submitted in the LTGWM 2004 Annual Report for Area I (revised January 2005), it has been repeated within this document for completeness. The subsequent long-term OM&M of the immiscible layer in monitoring well A1-MW-6 and the LTGWM Plan for Area I are discussed below.

4.1.1 *Immiscible Layer Background*

During well development and initial sampling activities of the September 2004 Area I LTGWM Event, field personnel performed visual immiscible layer surveillance of each well and observed no non-aqueous phase liquid (NAPL) in any of the on-site monitoring wells, except monitoring well A1-MW-6. Monitoring well A1-MW-6 is located approximately 45-feet from the Buffalo River adjacent to Subarea A (approximately 60 feet) as shown on Figure 1-3. A discussion pertaining to the immiscible layer detected in monitoring well A1-MW-6 follows.

4.1.2 *Boring Advancement*

During boring advancement of monitoring well A1-MW-6, soil/fill was characterized from grade to approximately 10 feet below ground surface (fbgs), immediately followed by a native, interbedded sand and clay soil unit from 10.0 to 22.0 fbgs, where the boring was terminated and the monitoring well installed. Groundwater was first encountered at 15.0 fbgs within a sandier portion of the native soil unit. Split spoon samples collected and described during advancement of boring A1-MW-6 are summarized below:

Depth (fbgs)	USCS Soil Description	Soil Unit
0.0 – 10.0	Soil/Fill	Fill
10.0 – 12.5	Sandy Lean Clay (CL)	Native
12.5 – 15.0	Clayey Sand (SC)	
15.0 – 17.5	Poorly Graded Sand w/ Clay (SP-SC)	
17.5 – 18.0	Lean Clay (CL)	
18.0 – 20.0	Poorly Graded Sand w/ Clay (SP-SC)	
20.0 – 22.0	Clayey Sand (SC)	

An immiscible layer of petroleum (i.e., light non-aqueous phase liquid, LNAPL) was observed within the saturated native soil matrix at approximately 15 feet below ground surface (fbgs) during boring advancement. Slightly elevated photoionization detector (PID) scans confirmed the presence of organic compounds (maximum reading of 53.4 ppm) in split-spoon soil samples collected from boring A1-MW-6 near the top of the saturated zone.

4.1.3 *Probable Source(s)*

The likely source(s) of residual immiscible product is the No. 6 fuel oil pipeline that was removed and/or the mill scale pit, both formerly located within and removed from Subarea A during 2003 construction activities. However, some residual product may have migrated laterally from the source area(s) through the thin, shallow sandy layer of the native soil prior to or during remediation.

4.1.4 *Groundwater Analytical Results*

Groundwater analytical results collected during the September 2004 LTGWM event from monitoring well A1-MW-6 contained non-detectable concentrations of volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPH) (see Table 5 and Section 6.0 of the LTGWM 2004 Annual Report).

4.1.5 *Conclusions*

Based upon the groundwater analytical results, field olfactory observations, and relatively low PID readings, it appears the LNAPL is highly "weathered" (i.e., the volatile fraction has degraded) and is not adversely impacting groundwater quality. The lateral extent of LNAPL impacts appears to be confined to the thin, shallow sand unit interbedded between clay immediately adjacent to monitoring well A1-MW-6. The Buffalo River elevation is generally the same as the groundwater elevation of monitoring well A1-MW-6 (573.25 versus 573.20 fmsl, respectively). This lack of hydraulic gradient, capillary forces, and/or the native soil stratigraphy appears to be limiting migration beyond this area of the site to the river. A lack of visual evidence in the form of a sheen on the Buffalo River surface at this location also supports this conclusion.

4.1.6 *Proposed Follow-Up Remedial Measures*

In the LTGWM 2004 Annual Report, TurnKey proposed to install the PetroTrap™ free product passive skimmer to mitigate the localized LNAPL in and adjacent to monitoring well A1-MW-6. The PetroTrap™ free product passive skimmer separates and recovers petroleum and light hydrocarbons from the groundwater. Incorporating hydrophobic filter technology with a storage canister, the device automatically collects floating product down to a sheen. Following recovery, the device can either be manually pulled from the well and the product evacuated through a discharge valve at the bottom of the canister, as in this application, or mechanically by using a peristaltic pump and small diameter tubing to evacuate the canister without removing the device from the well. The PetroTrap™ has a travel of 24 inches to compensate for water table fluctuation and well placement. The PetroTrap™ product specification sheet is included in Appendix G.

4.1.7 *Progress To Date*

On February 1, 2005 TurnKey personnel installed a PetroTrap™ free product passive skimmer to mitigate the localized immiscible layer in and adjacent to monitoring well A1-MW-6 in accordance with the LTGWM 2004 Annual Report for Area I (revised January 2005). At that time, the immiscible layer thickness measured 3.35 feet. Based upon this measurement, the monitoring and product removal frequency was increased to twice per week. During each subsequent visit, recovered product was removed from the skimmer and stored in a 5-gallon container in the Groundwater Pre-Treatment Building. Prior to placing the skimmer back into the well, the immiscible layer was measured with an interface probe to the nearest 0.01-foot and recorded. Subsequent monitoring events at monitoring well A1-MW-6 showed substantial removal of immiscible material with a corresponding decrease in layer thickness within the well. The attached Table 4-1 summarizes the recovered immiscible material quantities and layer thickness measurements for each monitoring event to date. As indicated on Figure 4-1, substantial immiscible layer removal progress has been made since the free product passive skimmer was installed.

In accordance with a NYSDEC request, on February 8, 2005, TurnKey personnel collected and submitted a sample of the immiscible layer to Severn Trent Laboratories, located in Amherst, New York for analysis of benzene, toluene, ethylbenzene, o-xylene, and m/p-xylenes. Although analytical results indicated the presence of toluene and total xylenes, groundwater analytical results collected during the September 2004 monitoring event from this monitoring well contained non-detectable concentrations of volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPH) indicating no significant impact of the floating product on local groundwater quality.

Based upon the progress to date, monitoring of A1-MW-6 has continued on a monthly basis and may be adjusted to longer durations based upon immiscible layer recovery quantities and thickness. Although there is little evidence the immiscible layer within monitoring well A1-MW-6 is significantly impacting groundwater quality, groundwater will continue to be monitored at this location during future LTGWM events of Area I. The additional groundwater analytical results and continued immiscible monitoring and removal is expected to indicate effective mitigation utilizing passive technology in this application.

4.1.8 *Immiscible Layer OM&M*

The OM&M of the PetroTrap™ free product passive skimmer will continue to be monitored on a monthly basis in accordance with the following procedure on relatively calm, non-windy days.

- Sampling personnel will obtain the following supplies prior to mobilization to well A1-MW-6:
  - Polyethylene tarp (minimum 5 feet by 20 feet)
  - Nitrile gloves
  - Poly-coated Tyvek
  - 5-gallon container with lid
  - Calibrated 1-gallon temporary container with lid
  - Well keys
  - Project Field Book
  - Oil absorbent pads
  - Paper towels
  - Oil/water interface probe
  - Shovel
- Mobilize to well A1-MW-6
- Cut small hole in center of polyethylene tarp and place over well. Lay out tarp and secure in place (typically using surrounding rocks/concrete at grade) making sure tarp is relatively tight against the well casing.
- Unlock well and place lock and J-plug at a secure location away from well
- Slowly remove the skimmer using the safety rope while coiling the vent tubing, taking care to prevent the tube from contacting un-tarped ground. Care should also be taken to prevent the coiled hose between the filter assembly and top centralizer from kinking.
- Once the skimmer is clear of the well, carefully hover the skimmer over the calibrated 1-gallon container and open the bottom ball valve, emptying the contents. Secure the lid, set the container aside, and allow sufficient time for captured groundwater, if any, and LNAPL to separate. Upon separation, record both quantities in the Project Field Book.
- Once the skimmer is emptied, close the bottom ball valve and carefully lay the skimmer, safety rope, and vent tubing on the polyethylene tarp.
- Take the oil/water interface probe and measure the depth of the immiscible layer and groundwater to the nearest 0.01-foot from the top of well riser and record the measurements in the Project Field Book.
- Slowly retract the interface probe from the well while wiping the tape with paper towels keeping residual product within well casing. Wipe down probe and set meter aside, clear of the well.

- If groundwater was recovered from the skimmer, the depth of the skimmer should be raised slightly in the well by untying the safety rope and re-tying the rope to the well at the new depth before lowering back into the well.
- Carefully pick up the skimmer assembly and slowly lower into the well using the safety rope making sure the coiled hose between the filter assembly and top centralizer has not kinked.
- Replace the J-plug, close the well, and replace the lock.
- Carefully wrap up the polyethylene tarp making sure not to spill any residual product on the ground. If residual product does contact the ground, immediately hand excavate the impact soils and place in garbage bag for disposal.
- Place all disposables (i.e., gloves, Tyvek, tarp etc.) in a standard garbage bag and seal.
- Take 1-gallon temporary container to the Groundwater Pre-Treatment Building and transfer the contents to the 5-gallon container. Place the 1-gallon container in the garbage bag after use.

Following sufficient operational experience and subject to NYSDEC approval, the frequency of monitoring and product removal may be reduced. The removed LNAPL will be stored in a properly labeled and sealed 5-gallon container with secondary containment inside the Groundwater Pre-Treatment Building located at the Steelfields Site. Once the container is full, arrangements will be made with local oil recycling firm for disposal as non-hazardous.

4.2 Long-Term Groundwater Monitoring (LTGWM) Plan

A LTGWM Plan is required at the Site to monitor the effectiveness of the source area removals, treatment, and controls implemented in accordance with the Voluntary Cleanup Agreement. Groundwater quality trends will be monitored along the perimeters of the Site and internally within Area I in accordance with the schedule presented in Table 4-2. Details of the groundwater-monitoring program are included in Appendix C of the RD/RA Work Plan (revised June 2005 (refer to Electronic Attachment 1)). To date, Area I groundwater has been monitored under the LTGWM program for three monitoring events (viz., September 2004, September 2005, and September 2006).

4.2.1 *Shallow Groundwater Isopotential mapping*

Shallow Groundwater Isopotential Mapping is completed for Area I with every annual monitoring report. Figure 4-2 represents the most recent mapping done in 2006. The comparison of this figure to that of pre-remedial isopotential map shown in Figure 4-3 (excerpt for the report prepared by Geomatrix Consultants, Inc. entitled "Groundwater Flow Simulations of Proposed Remedial Alternatives" dated December 4, 1998) substantiate and validate the original hypothesis that the Area II containment system was not and is not expected to have any significant impact on groundwater flows in Area I. General water elevations and flow paths are unchanged with the operation of the containment system. As noted, this isopotential mapping of Area I will be conducted annual to continue the documentation that this is the case.

4.3 Annual Inspection & Certification

The Area I property including wells and other physical components of the site shall be inspected annually by a qualified person representing the Owner or Property Manager/Representative. This qualified person shall at a minimum hold a four-year college degree in environmental sciences or engineering, and be supervised by a New York State Licensed Professional Engineer or Qualified Environmental Professional (QEP).

Annual inspection will require the completion of the Environmental Inspection Form (Electronic Attachment 5 – Attachment A1). The Corrective Actions Certification (Electronic Attachment 5 – Attachment A2) may be required if something is noted for attention during the initial inspection. If maintenance is required, the owner shall notify the NYSDEC and schedule repairs. The NYSDEC shall also be informed by the Property Owner/Manager when repairs have been completed. The Inspection forms shall be submitted to the NYSDEC within 60 days of completion, with a letter signed by a New York State Licensed Professional Engineer or QEP verifying that all institutional and engineering controls are in place and operating correctly and/or pending repair and maintenance. Additional and specific information regarding the Annual Inspection & Certification is contained in the Site Management Plan which has been included as Electronic Attachment 5 to this document.

5.0 PROJECT ASSOCIATED REFERENCES

1. South Buffalo Redevelopment Plan: Steel Manufacturing Site, Voluntary Cleanup Site Assessment Report, Malcolm Pirnie, September 1997.

2. Former Steel Manufacturing Site: Area I – Republic Steel Plant Parcel. Voluntary Cleanup Site Assessment Report, TurnKey Environmental Restoration, April 1999.

3. Former Steel Manufacturing Site: Area II – Donner-Hanna Coke Plant Parcel; Area III – Republic Steel Warehouse Parcel; Area IV – Donner-Hanna Coke Yard Parcel – Voluntary Cleanup Site Assessment Report, TurnKey Environmental Restoration, April 1999.

4. Former Steel Manufacturing Site: Area I – Republic Steel Plant Parcel, Voluntary Cleanup Site Assessment Report-Addendum 2, TurnKey Environmental Restoration, January 2000.

5. Former Steel Manufacturing Site: Area II – Donner-Hanna Coke Plant Parcel; Area III – Republic Steel Warehouse Parcel; Area IV – Donner-Hanna Coke Yard Parcel – Voluntary Cleanup Site Assessment Report-Addendum 1; TurnKey Environmental Restoration, January 2000.

6. Former Steel Manufacturing Site: Work Plan for Voluntary Cleanup Program Remedial Design/Remedial Action; TurnKey Environmental Restoration, September 2002.

TABLES

TABLE 3-1

SUBAREA Q SOIL/FILL EXCAVATION QUANTITIES

Construction Closeout Report - Area I
Steelfields, LTD.
Buffalo, New York

Location	Constituents of Concern	Excavation Area (SF)	Excavation Volume (CY)
Subarea Q5	Chromium	925	343
Subarea Q14	Arsenic	320	95
Subarea Q18	Lead	1,310	679
Subarea Q19	Lead	620	80

Notes:
1. CY = cubic yards
2. SF = square feet

TABLE 3-2

SOIL/FILL EXCAVATION VOLUMES FOR AREA I

Construction Closeout Report - Area I
Steelfields, LTD.
Buffalo, New York

Subarea Designation	Estimated Excavation Volumes (CY)	Actual Total Excavation Volume (CY)	Overburden Soil Volume (CY)	Impacted Soil Volume (CY)	Other (concrete) (CY)
Area A	11,878	22,900	13,114	9,298	488
Area D	4,764	5,701	2,773	2,928	0
N-14	2,498	2,358	394	1,964	0
T-3	6,738	4,213	1,213	3,000	0
K + L	20,463	31,073	8,922	22,151	0
TOTALS	**46,341**	**66,245**	**26,416**	**39,341**	**488**

Notes:
1. All values calculated from surveys provided by Niagara Boundary.
2. CY = cubic yards

TABLE 3-3

OFF-SITE BORROW MATERIAL QUANTITIES FOR AREA I

Construction Closeout Report - Area I
Steelfields, LTD.
Buffalo, New York

Source Name	Total Imported Volume (CY)	General Use
Truscon Soils (Area III Stockpile)	5,975	Soil / Fill
Seneca Mall Stockpile	33,822	Soil / Fill
Hertel Avenue	500	Soil / Fill
TOTALS	**40,297**	**Soil / Fill**

Notes:
1. All values calculated from surveys provided by Niagara Boundary.
2. CY = cubic yards

TABLE 4-1

SUMMARY OF LNAPL THICKNESS / REMOVAL IN A1-MW-6

Area I: Former Republic (LTV) Steel Plant Parcel
Steelfields, LTD.
Buffalo, New York

Date	Days Since Last Visit	LNAPL Measurement			Quantity Removed (oz.)	Height of Petro-Trap (fbTOR)	Comments
		Top (fbTOR)		Thickness (feet)			
09/21/04	--	18.10	18.40	0.30	NA	--	well development
09/23/04	2	18.10	18.40	0.30	NA	--	Fall 2004 groundwater monitoring event
02/01/05	131	17.50	20.85	3.35	NA	16.0	installed Petro Trap passive skimmer @ 16.00 fbTOR
02/08/05	7	17.94	19.89	1.95	16	16.0	first LNAPL removal from Petro Trap
02/11/05	3	17.89	19.75	1.86	20	16.0	ok
02/15/05	4	18.10	18.52	0.42	20	16.0	ok
02/18/05	3	17.59	17.91	0.32	12	16.0	ok
02/25/05	7	18.02	18.51	0.49	2	16.0	Petro Trap tubing was tangled
03/04/05	7	18.13	18.63	0.50	6	16.0	Petro Trap tubing was tangled
03/18/05	14	18.00	18.74	0.74	3.5	16.0	checked Petro Trap for leaks, none located
04/08/05	21	17.37	18.20	0.83	24	15.0	ok; raised Petro Trap approximately 1-foot
04/14/05	6	17.65	17.81	0.16	22	15.0	ok
04/28/05	14	16.23	16.25	0.02	25.6	15.0	ok
05/17/05	19	17.62	17.80	0.18	14	14.0	~14 oz. of water in Petro Trap; raised approx. 1-foot
06/21/05	35	17.68	17.71	0.03	14	14.0	ok
07/18/05	27	18.03	18.11	0.08	12	15.0	ok, lowered approx. 1-foot
09/09/05	53	18.34	18.42	0.08	8	15.0	ok
09/20/05	11	18.33	18.38	0.05	22	15.0	ok; Area I LTGWM Event
10/31/05	41	18.50	18.52	0.02	24	15.0	ok
11/23/05	23	18.95	18.96	0.01	22	15.0	ok
12/28/05	35	19.35	19.36	0.01	22	15.0	ok
01/30/06	33	18.43	18.44	0.01	24	15.0	ok
02/27/06	28	18.38	19.06	0.68	24	15.0	ok
03/28/06	29	18.44	19.31	0.87	24	15.0	ok
04/27/06	30	18.39	19.17	0.78	24	15.0	ok
05/18/06	21	18.41	19.05	0.64	8	15.0	ok; Area I LTGWM Event
06/30/06	43	17.82	18.35	0.53	8	15.0	ok
07/31/06	31	17.95	18.64	0.69	16	15.0	ok
12/01/06	123	19.41	21.65	2.24	16	15.0	ok; Area I LTGWM Event

Total Quantity Removed To Date: 433.1 oz.

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE 4-2

LONG-TERM GROUNDWATER MONITORING NETWORK AND SAMPLE FREQUENCY

Area I - Former Steel Plant Parcel
Steelfields LTD.
Buffalo, New York

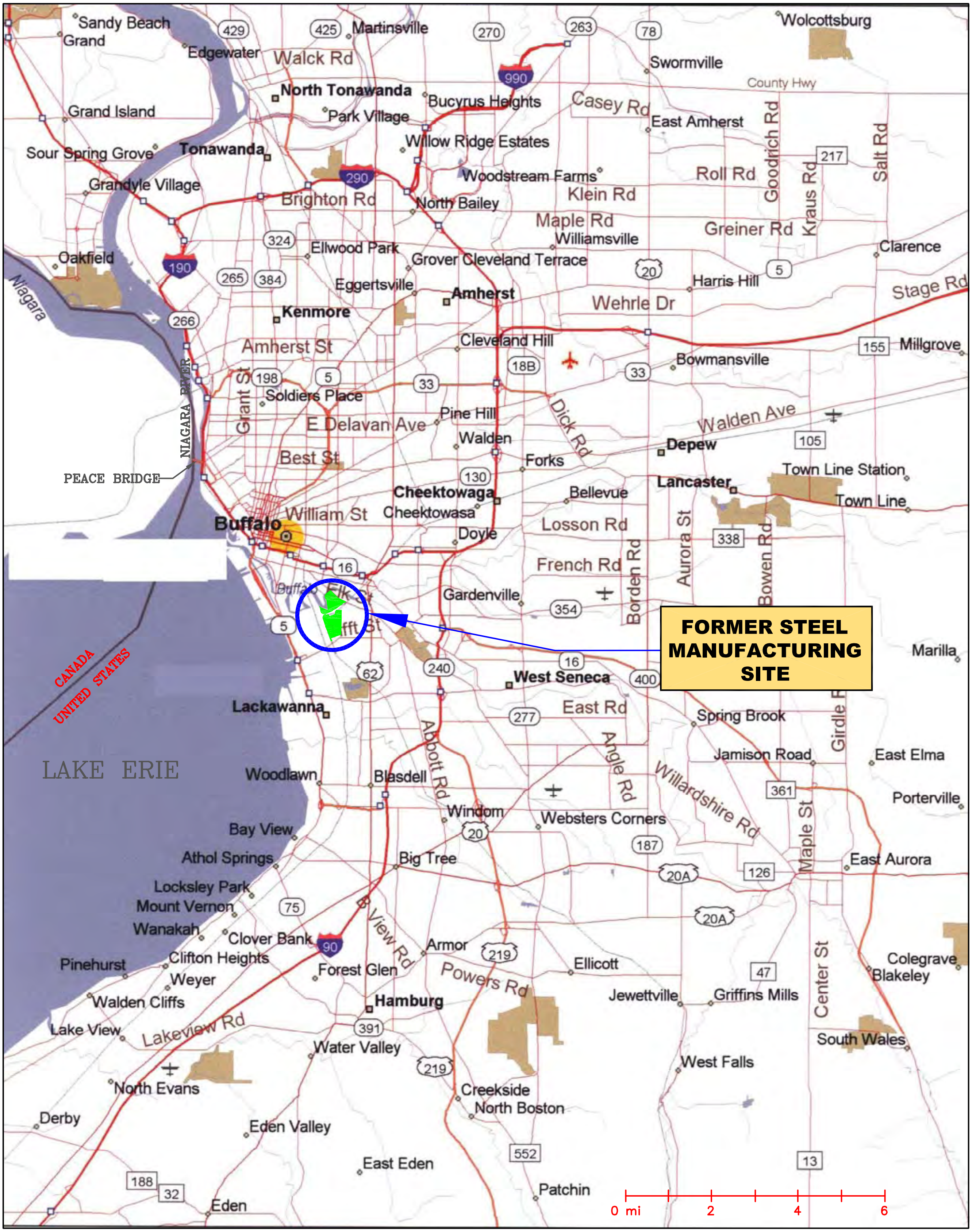
Well Designation	Monitoring Event [1]					
	2004	2005		2006		2007
	1 SA	1 SA	2SA	1 SA	2SA	Annually
	Fall [2]	Spring	Fall [3]	Spring	Fall	
Area 1 Monitoring Wells						
A1-MW-1	x		x		x	x
A1-MW-2	x		x		x	x
A1-MW-3	x		x		x	x
A1-MW-4	x		x	x	x	x
A1-MW-5	x		x	x	x	x
A1-MW-6	x		x	x	x	x
A1-MW-7	*water level only*					
A1-MW-8	x		x	x	x	x
A1-MW-9	x		x	x	x	x
A1-MW-M2	x		x		x	x
A1-P-4	x		x		x	x

Notes:
1. All well locations will be monitored annually following the 2006 annual event.
2. Monitored September 2004.
3. Monitored September 2005
4. " SA " identifies a semi-annual monitoring event.

FIGURES

PROJECT NO.: 0062-008-400

FIGURE 1-1



TurnKey Environmental Restoration, LLC

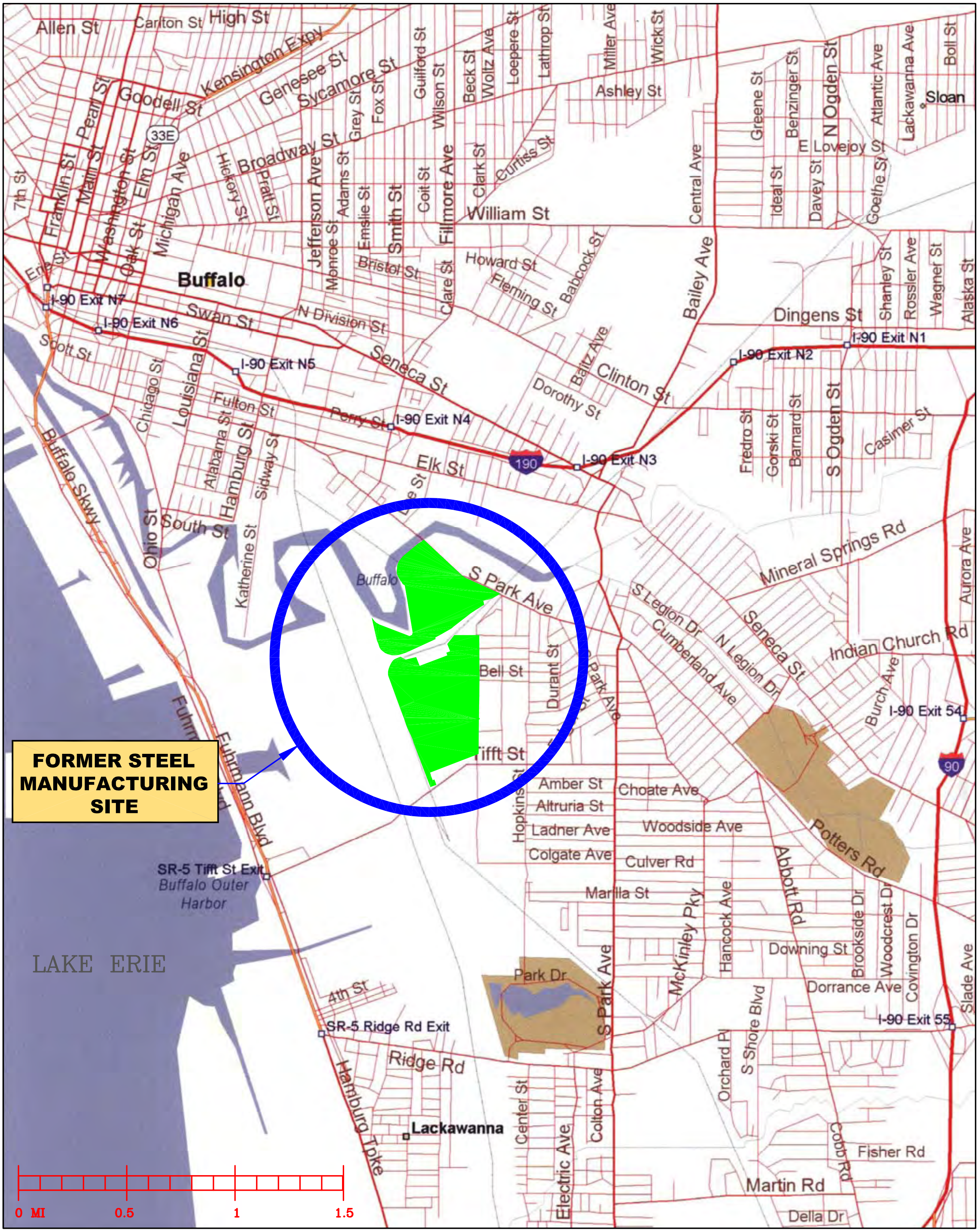
FORMER STEEL MANUFACTURING SITE
REGIONAL MAP

AREA 1 CLOSE-OUT REPORT
STEELFIELDS LTD
BUFFALO, NEW YORK

DATE: JANUARY 2004
DRAFTED BY: BCH/WJM
FILEPATH: f:\turnkey\cad\Steelfields\CMR2003\fig 1-1 - 2003.dwg

PROJECT NO.: 0062-008-400

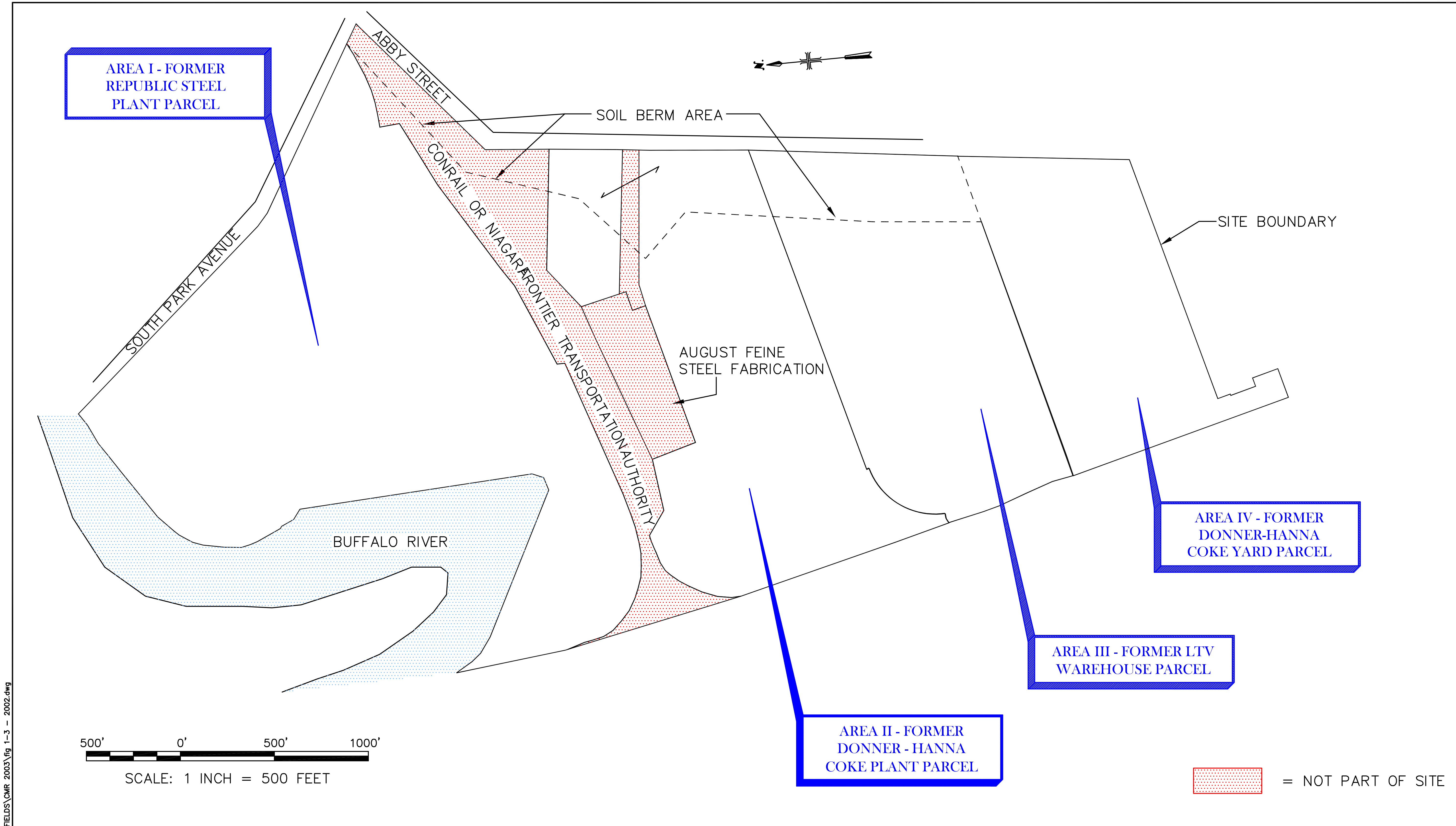
FIGURE 1-2



DATE: JANUARY 2004
DRAFTED BY: BCH/WJM
FILEPATH: f:\turnkey\cad\STEELFIELDS\CMR 2003\fig 1-2 - 2002.dwg

TurnKey Environmental Restoration, LLC

FORMER STEEL MANUFACTURING SITE
VICINITY MAP
AREA 1 CLOSE-OUT REPORT
STEELFIELDS LTD
BUFFALO, NEW YORK



DATE: JANUARY 2004
DRAFTED BY: BCH/WJM
FILEPATH: f:\turnkey\cad\STEELFIELDS\CMR 2003\fig 1-3 – 2002.dwg

TurnKey Environmental Restoration, LLC

FORMER STEEL MANUFACTURING SITE
SITE MAP
AREA I CLOSE–OUT REPORT
STEELFIELDS LTD

FIGURE 1-3

PROJECT NO.: 0062–008–400
PROJECT LOCATION: BUFFALO, NEW YORK

KEY PLAN

PLANT SITE AREA I

SCALE: 1" = 1000'

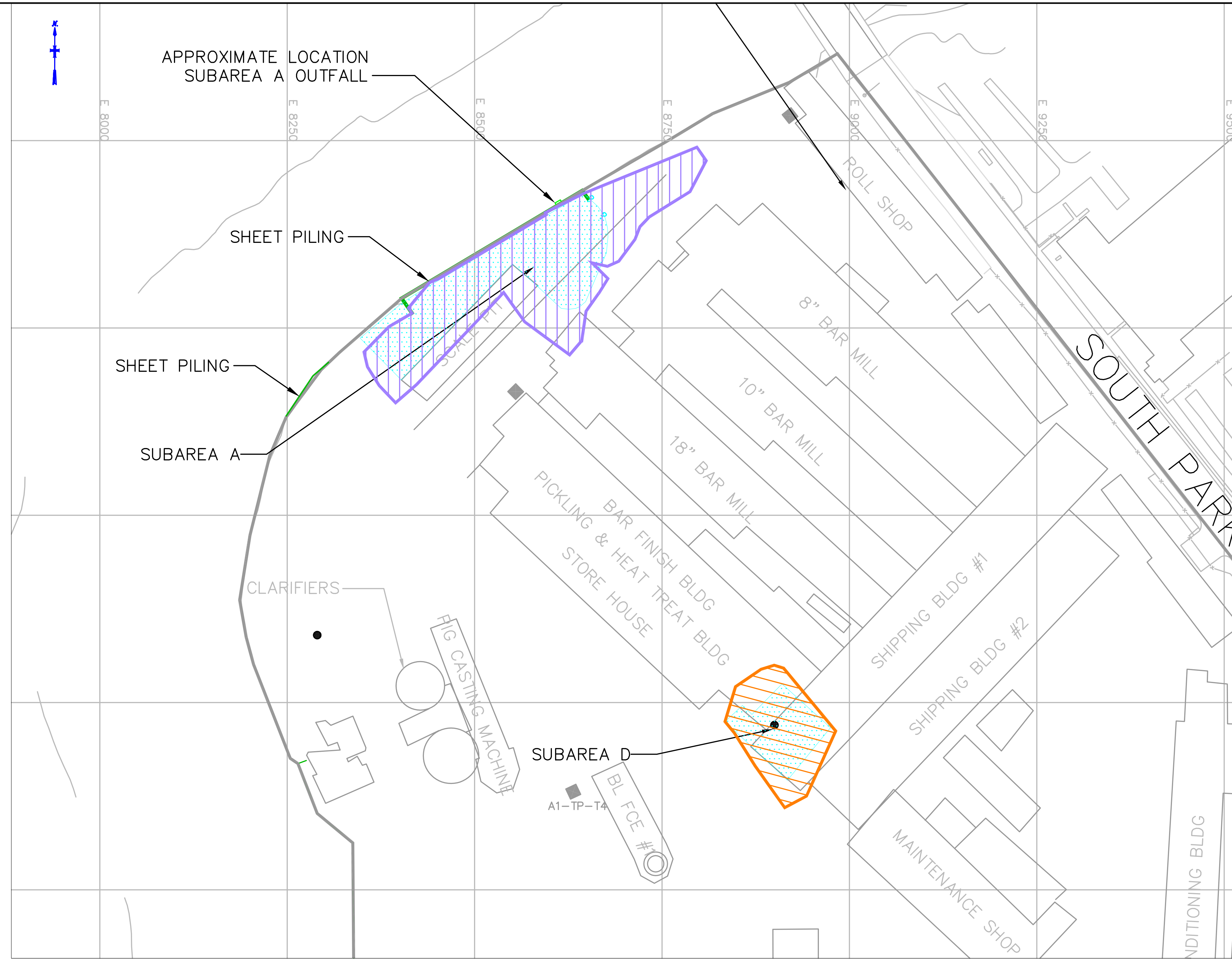
**PLANT SITE AREA I
PARTIAL PLAN**

LEGEND

- IMPACTED SOIL/FILL PER SITE INVESTIGATION REPORT
- APPROXIMATE EXCAVATION LIMITS FOR SUBAREA–A
- APPROXIMATE EXCAVATION LIMITS FOR SUBAREA–D

150' 0' 150' 300'

APPROX. SCALE: 1 INCH = 150 FEET



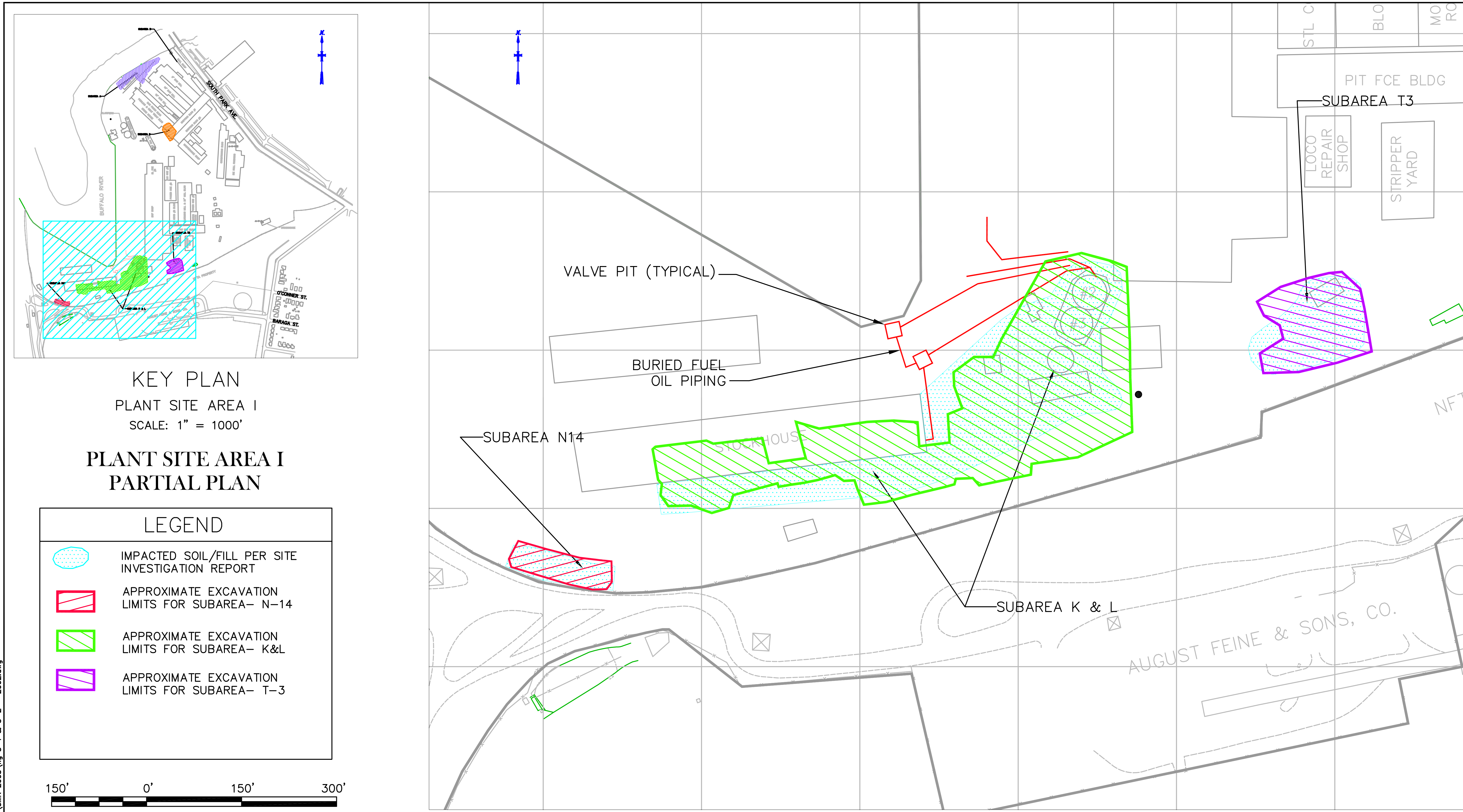
DATE: JANUARY 2004
DRAFTED BY: BCH/WJM
FILEPATH: f:\turnkey\cad\STEELFIELDS\CMR 2003\fig 3-1 & 3-2 – 2002.dwg

TurnKey Environmental Restoration, LLC

AREA I – SUBAREAS A & D
EXTENT OF PETROLEUM–IMPACTED SOIL/FILL
AREA 1 CLOSE–OUT REPORT
STEELFIELDS LTD

FIGURE 3-1

PROJECT NO.: 0062–008–400
PROJECT LOCATION: BUFFALO, NEW YORK



PLANT SITE AREA I
PARTIAL PLAN

LEGEND

- IMPACTED SOIL/FILL PER SITE INVESTIGATION REPORT
- APPROXIMATE EXCAVATION LIMITS FOR SUBAREA– N–14
- APPROXIMATE EXCAVATION LIMITS FOR SUBAREA– K&L
- APPROXIMATE EXCAVATION LIMITS FOR SUBAREA– T–3

150' 0' 150' 300'

APPROX. SCALE: 1 INCH = 150 FEET

DATE: JANUARY
DRAFTED BY: BCH/WJM
FILEPATH: f:\turnkey\cad\STEELFIELDS\CMR 2003\fig 3-1 & 3-2 – 2002.dwg

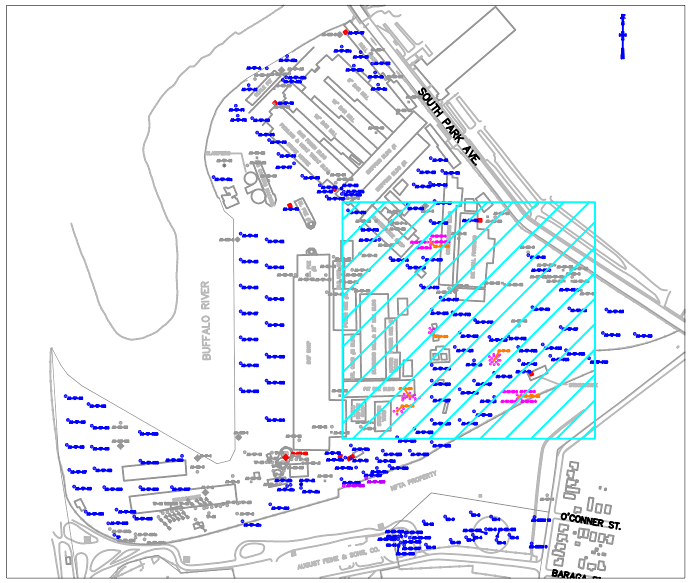
TurnKey Environmental Restoration, LLC

AREA I – SUBAREAS N–14, K & L, T–3
EXTENT OF IMPACTED SOIL/FILL

AREA 1 CLOSE–OUT REPORT
STEELFIELDS LTD

FIGURE 3-2

PROJECT NO.: 0062–008–400
PROJECT LOCATION: BUFFALO, NEW YORK



KEY PLAN

PLANT SITE AREA I

SCALE: 1" = 1000'

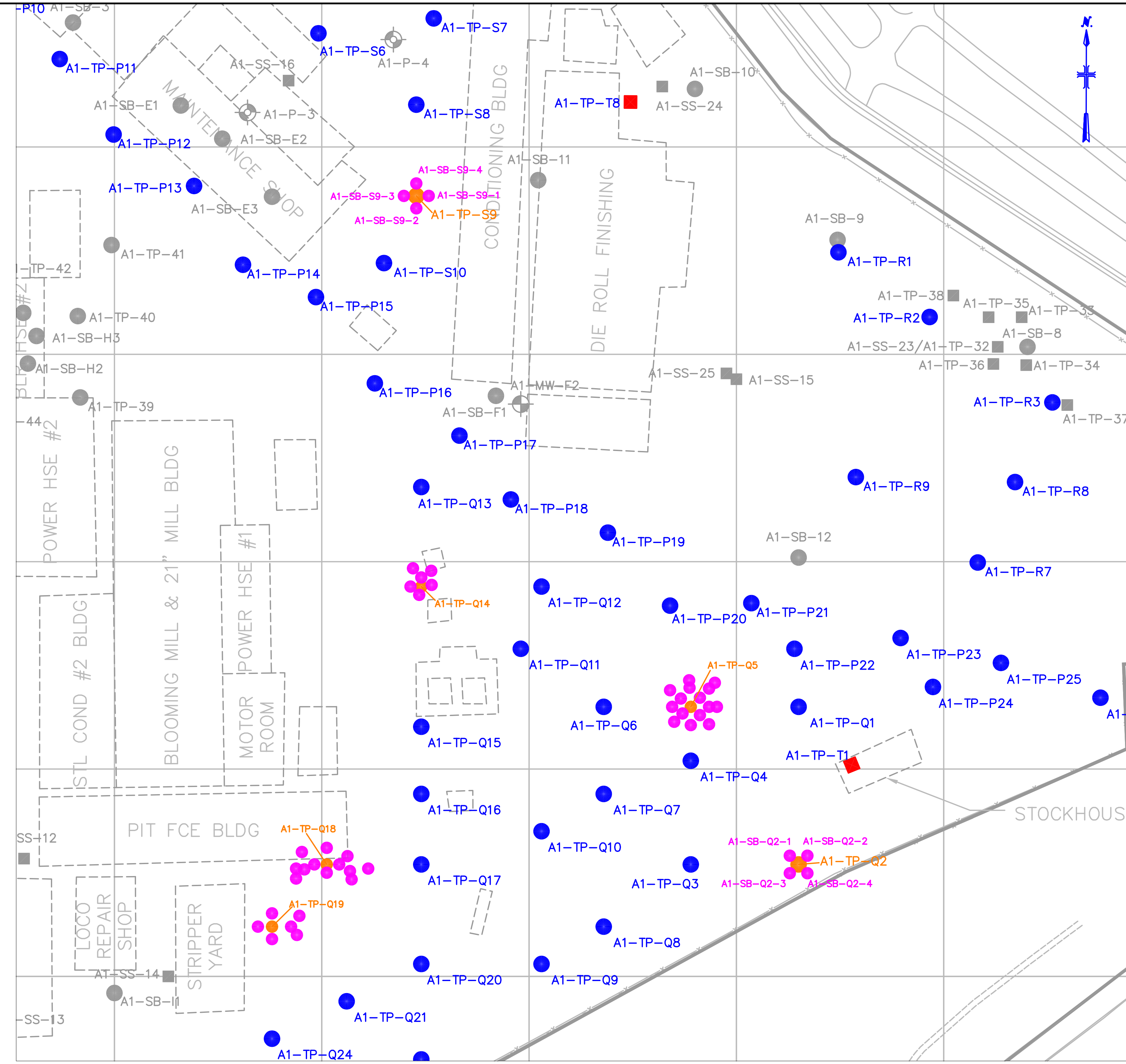
PARTIAL PLAN
AREA I

LEGEND

- NEW BORING LOCATION
- ORIGINAL SAMPLE LOCATION WITH ELEVATED INORGANICS
- FORMER TANK LOCATION
- JULY/AUGUST 1999 SAMPLE LOCATION
- PREVIOUS SAMPLE LOCATION
- EXISTING GROUNDWATER MONITORING WELL
- EXISTING PIEZOMETER

150' 0' 150' 300'

APPROX. SCALE: 1 INCH = 150 FEET



AREA I – SAMPLING LOCATIONS/LOCATIONS OF ELEVATED INORGANIC SUBAREAS

AREA 1 CLOSE-OUT REPORT

STEELFIELDS LTD

TurnKey Environmental Restoration, LLC

FIGURE 3-3

PROJECT NO.: 0062-008-400

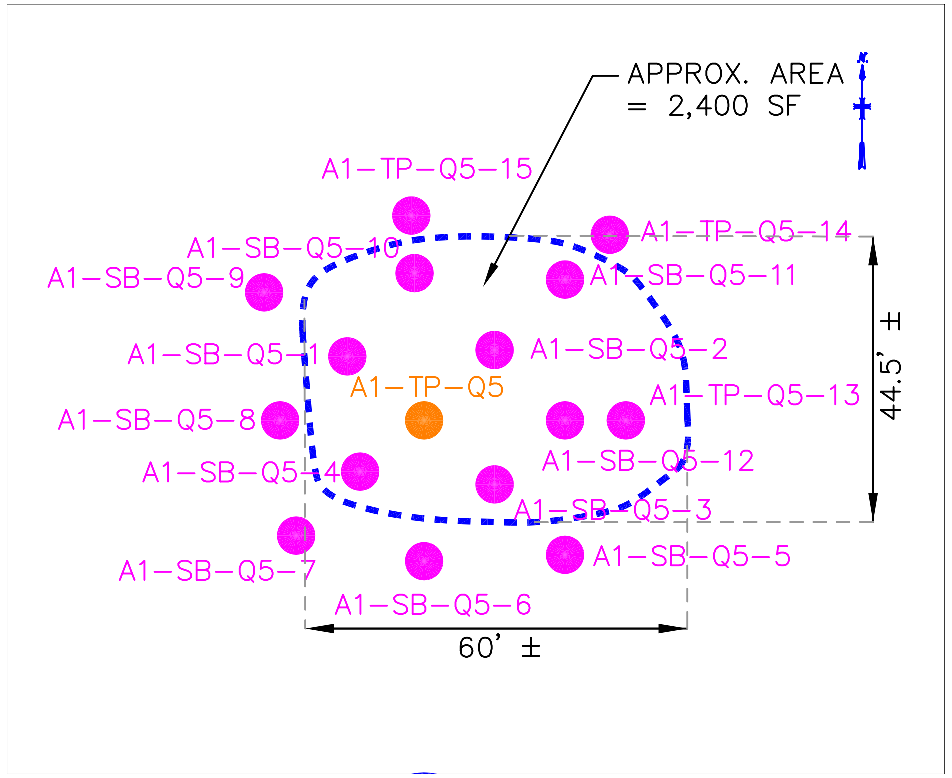
PROJECT LOCATION: BUFFALO, NEW YORK

DATE: JANUARY 2004

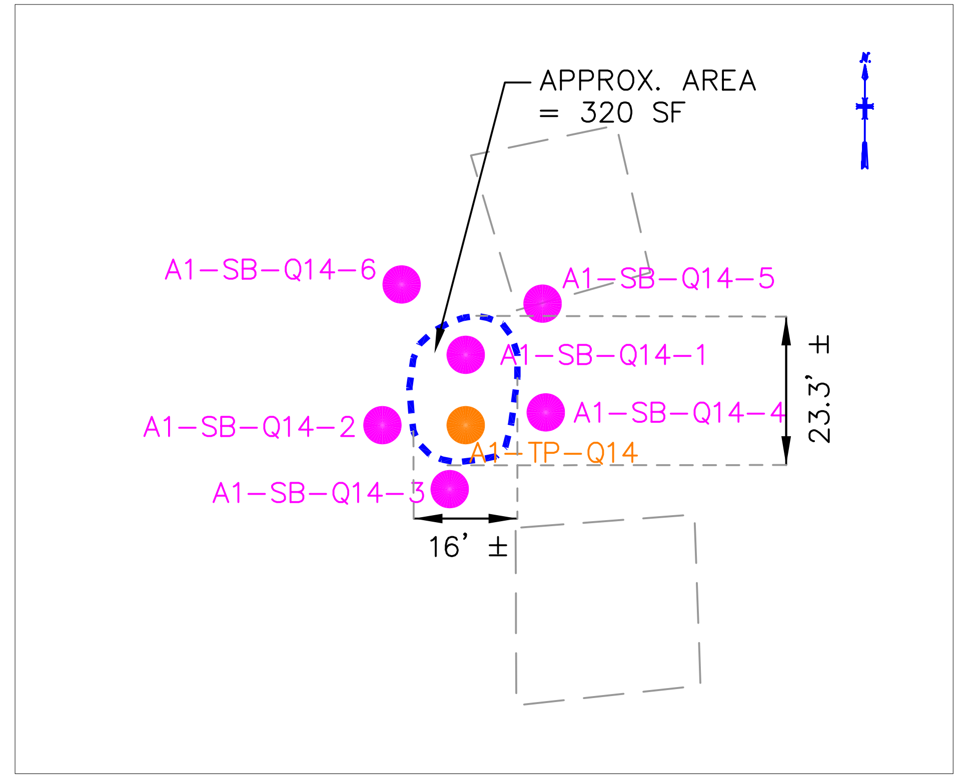
DRAFTED BY: BCH/WJM

FILEPATH: f:\turnkey\cad\STEELFIELDS\CMR 2003\fig 3-3 - 2002.dwg

DATE: SEPTEMBER 2004
DRAFTED BY: BCH/WJM
FILEPATH: g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 3-4; lateral extent of elevated inorganics in soil-fill.dwg



A1-TP-Q5 DETAILED PLAN

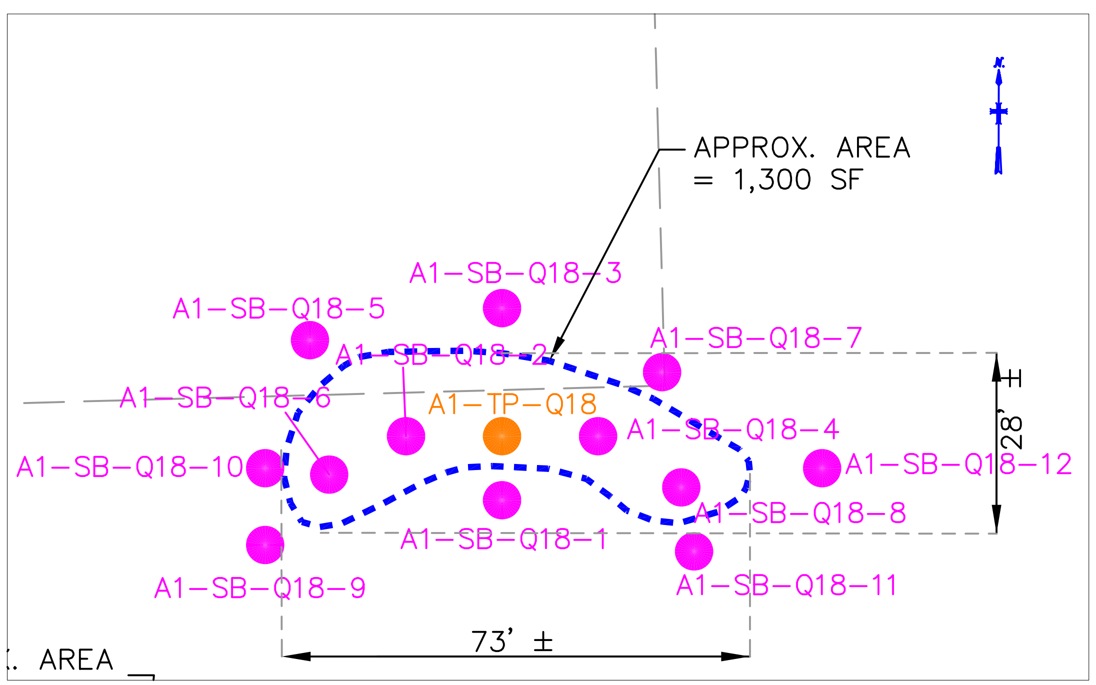


A1-TP-Q14 DETAILED PLAN

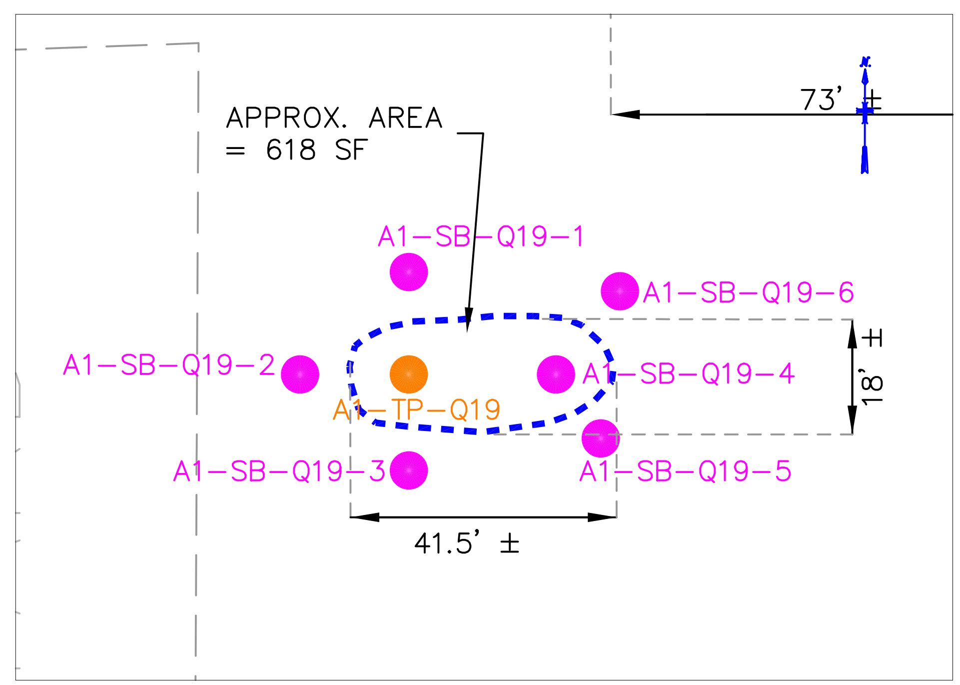
LEGEND

- NEW BORING LOCATION
- ORIGINAL SAMPLE LOCATION WITH ELEVATED INORGANICS
- LATERAL EXTENT OF ELEVATED INORGANICS

0' 30' 60'
APPROXIMATE SCALE



A1-TP-Q18 DETAILED PLAN



A1-TP-Q19 DETAILED PLAN

NOTE: SEE FIGURE 3-3 FOR LOCATION OF EACH SUBAREA WITHIN AREA I

TurnKey Environmental Restoration, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

JOB NO.: 0062-008-400

LATERAL EXTENT OF ELEVATED INORGANICS IN SOIL/FILL

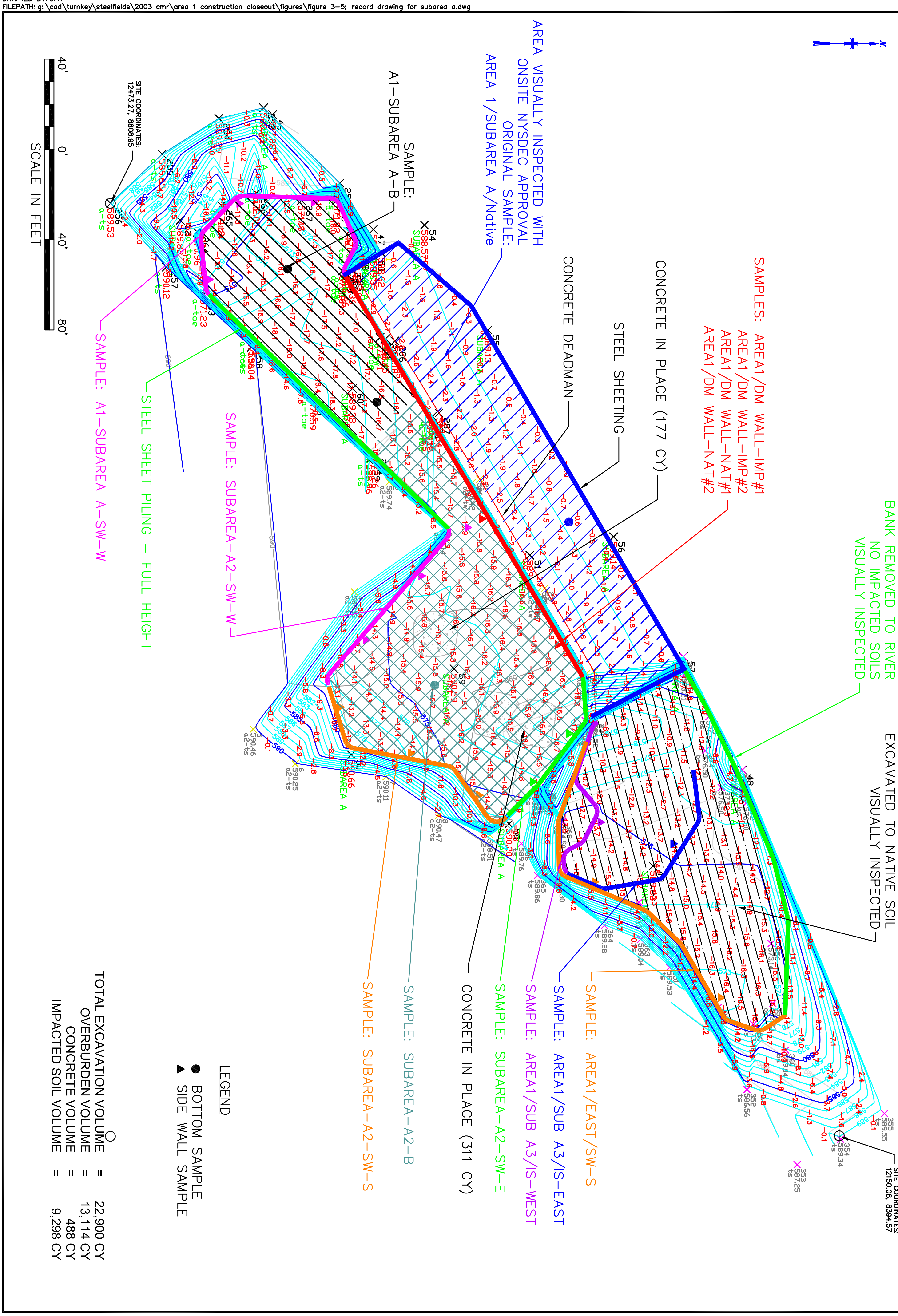
CONSTRUCTION CLOSEOUT REPORT

AREA I - FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR
STEELFIELDS, LTD.

FIGURE 3-4

DATE: SEPTEMBER 2004
DRAFTED BY: GPH
FILEPATH: g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 3-5; record drawing for subarea a.dwg



RECORD DRAWING FOR SUBAREA A

CONSTRUCTION CLOSEOUT REPORT

FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR
STEELFIELDS, LTD.

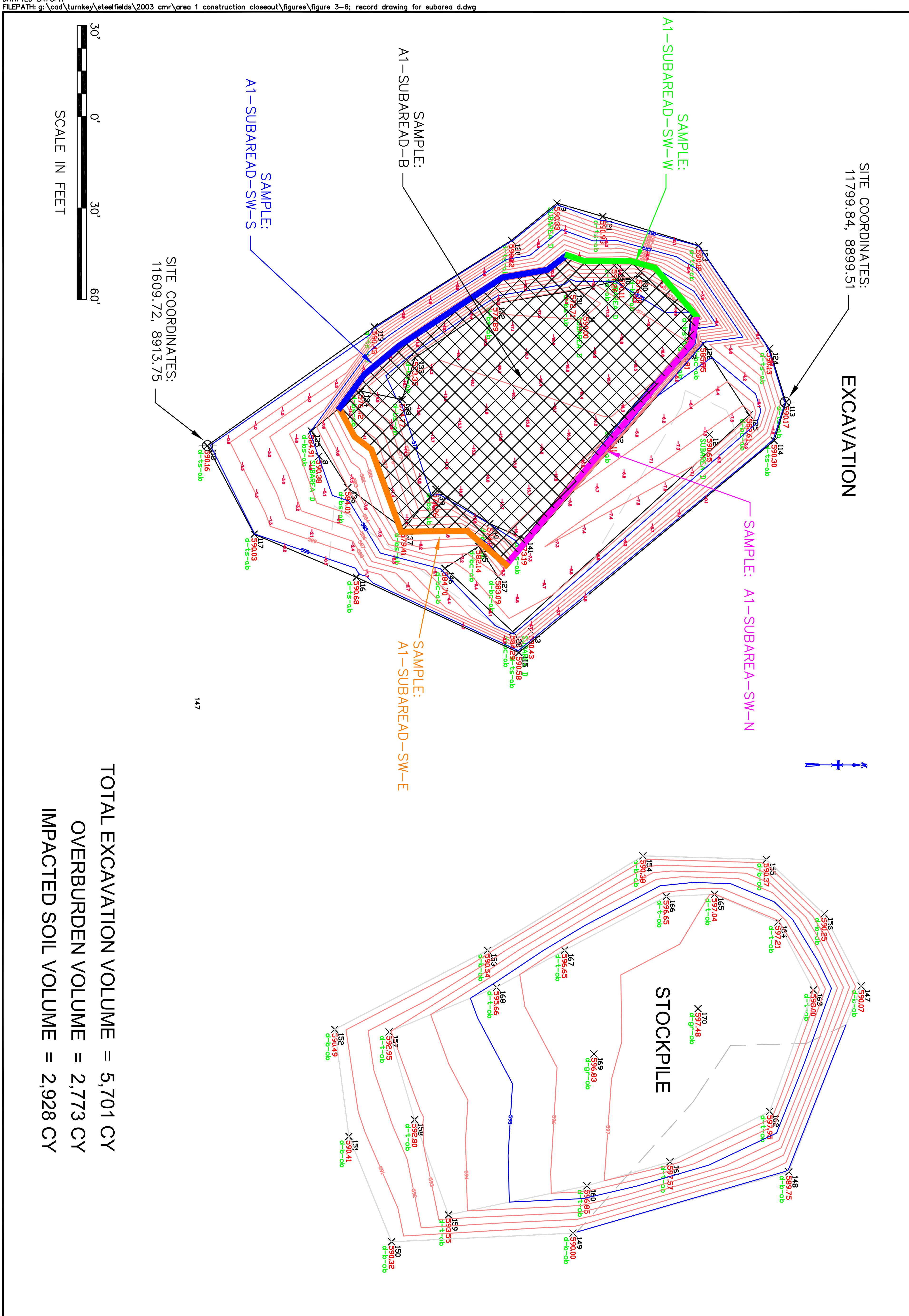
TurnKey Environmental Restoration, LLC

726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

JOB NO.: 0062-008-400

FIGURE 3-5

DATE: SEPTEMBER 2004
DRAFTED BY: GPH
FILEPATH: g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 3-6; record drawing for subarea d.dwg



RECORD DRAWING FOR SUBAREA D
CONSTRUCTION CLOSEOUT REPORT

FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

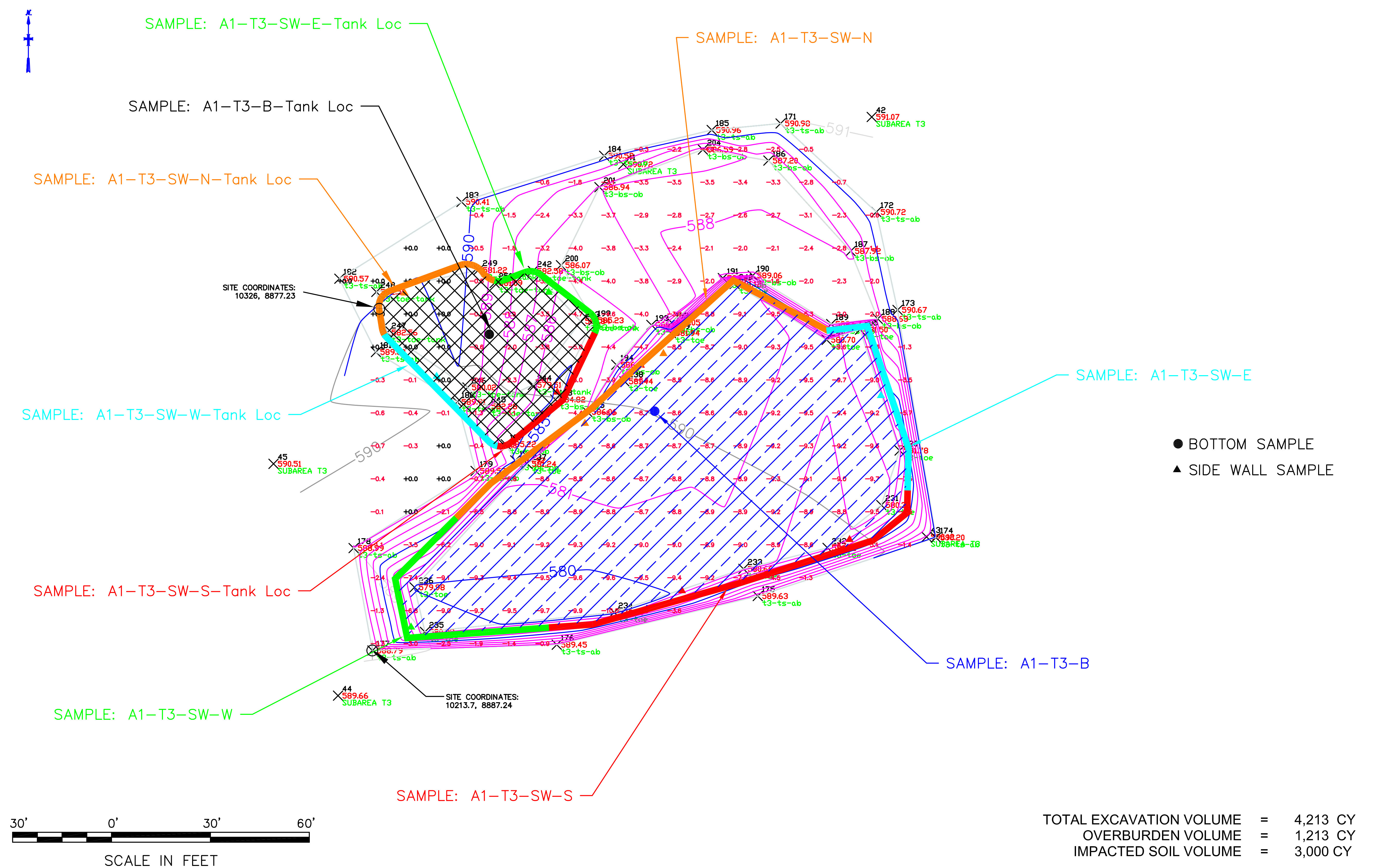
PREPARED FOR
STEELFIELDS, LTD.

TurnKey Environmental Restoration, LLC

726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

JOB NO.: 0062-008-400

FIGURE 3-6



TOTAL EXCAVATION VOLUME = 4,213 CY
OVERBURDEN VOLUME = 1,213 CY
IMPACTED SOIL VOLUME = 3,000 CY

DATE: SEPTEMBER 2004
DRAFTED BY: GPH
FILEPATH: g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 3-7; record drawing for subarea t3.dwg

RECORD DRAWING FOR SUBAREA T3

CONSTRUCTION CLOSEOUT REPORT

FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR
STEELFIELDS, LTD.

TurnKey Environmental Restoration, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

JOB NO.: 0062-008-400

FIGURE 3-7

DATE: SEPTEMBER 2004
DRAFTED BY: GPH
FILEPATH: g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 3-8; record drawing for subareas k&l.dwg

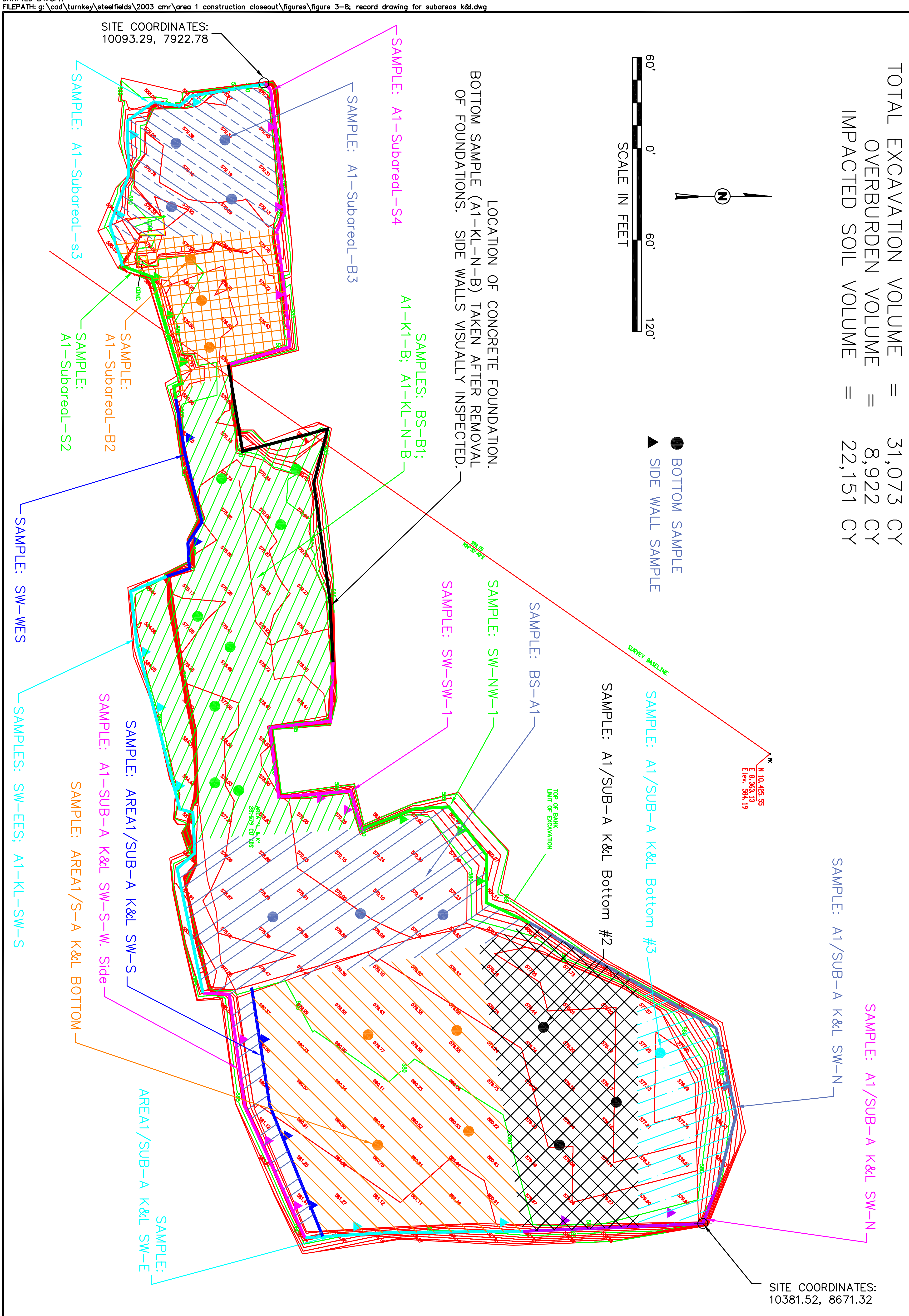


FIGURE 3-8

RECORD DRAWING FOR SUBAREAS K & L

CONSTRUCTION CLOSEOUT REPORT

FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

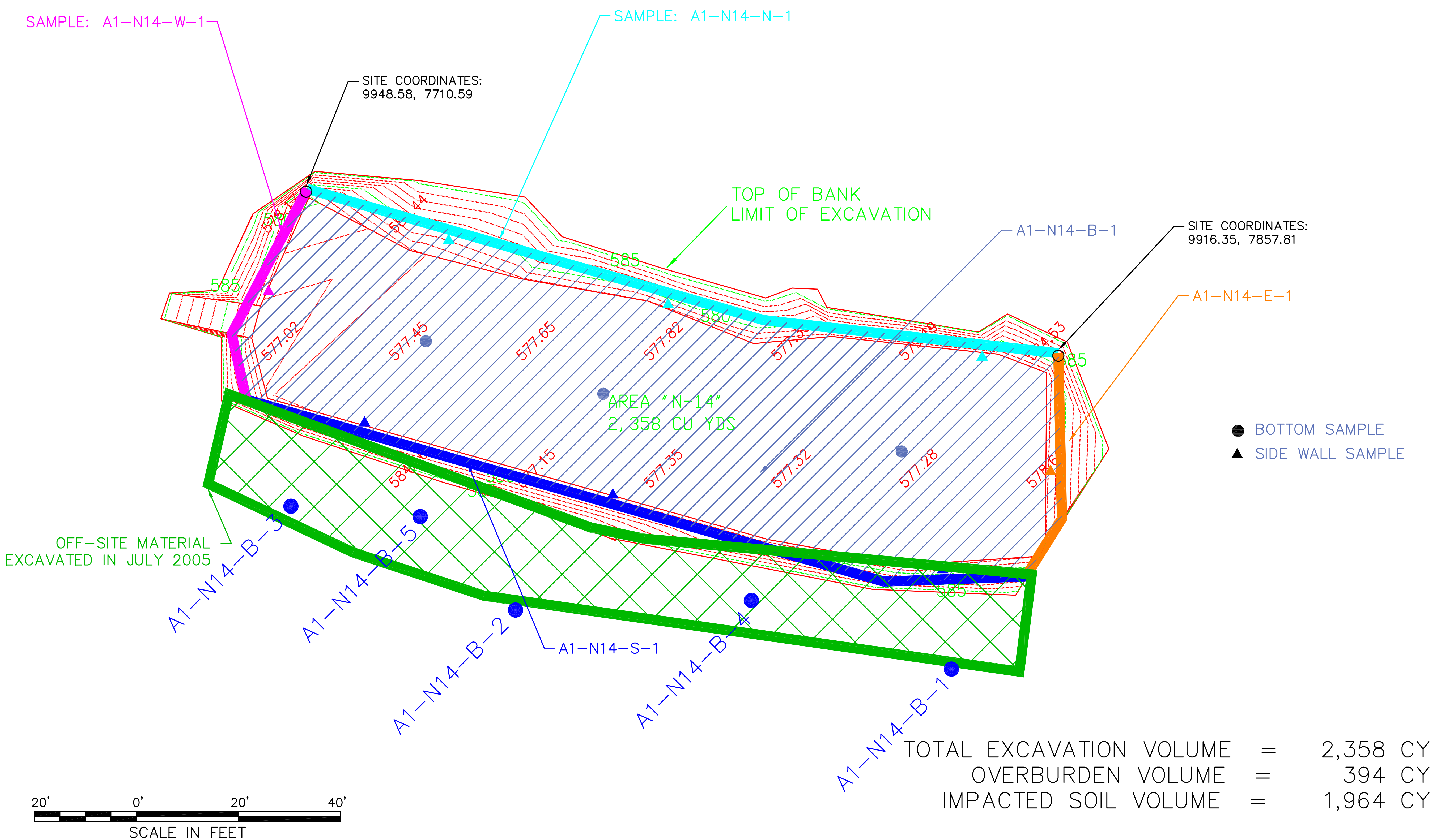
PREPARED FOR
STEELFIELDS, LTD.

TurnKey Environmental Restoration, LLC

726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

JOB NO.: 0062-008-400

DATE: SEPTEMBER 2004
DRAFTED BY: GPH
FILEPATH: g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 3-9; record drawing for subarea n-14.dwg



TOTAL EXCAVATION VOLUME = 2,358 CY
OVERBURDEN VOLUME = 394 CY
IMPACTED SOIL VOLUME = 1,964 CY

NOTE:
REFER TO CORRESPONDENCE "OFF-SITE SOIL/FILL INVESTIGATION: AREA I – SUBAREA N-14" DATED 02/10/05 FOR BORING RESULTS

TurnKey Environmental Restoration, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

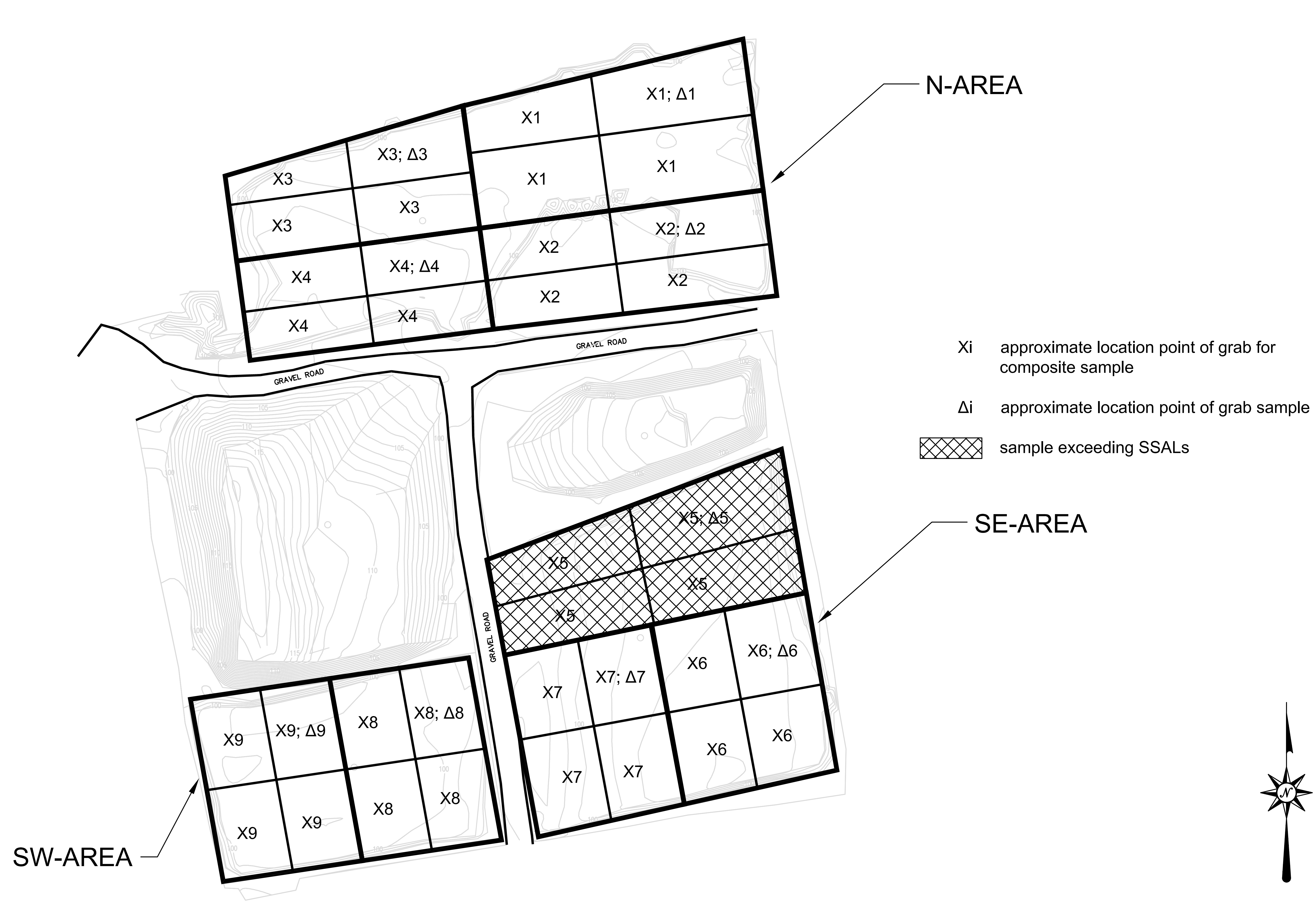
JOB NO.: 0062-008-400

RECORD DRAWING FOR SUBAREA N-14
CONSTRUCTION CLOSEOUT REPORT
FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR
STEELFIELDS, LTD.

FIGURE 3-9

DATE: SEPTEMBER 2004
DRAFTED BY: BCH/WJM
FILEPATH: g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 3-10; bio-pad verification sampling location map.dwg



BIO-PAD VERIFICATION SAMPLING LOCATION MAP

CONSTRUCTION CLOSEOUT REPORT

FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR
STEELFIELDS, LTD.

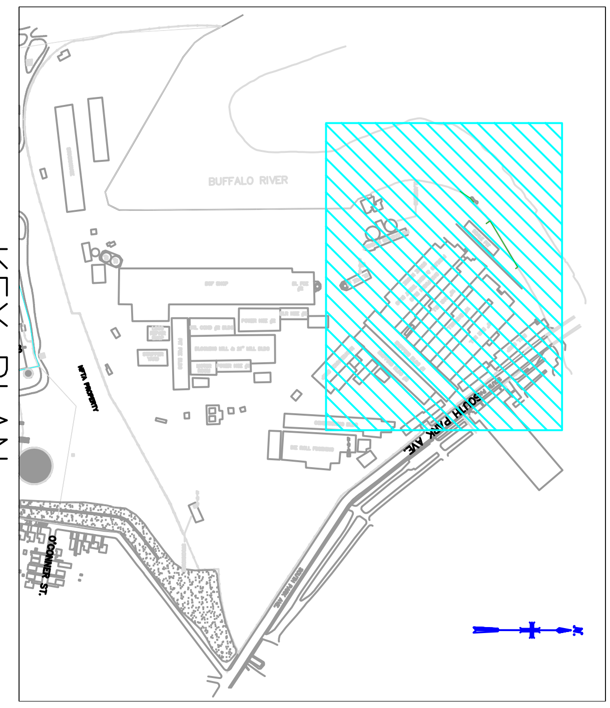
TurnKey Environmental Restoration, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

JOB NO.: 0062-008-400

FIGURE 3-10

DATE: OCTOBER 2005
DRAFTED BY: WJM
FILEPATH: g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 3-1; locations-extent of petroleum-impacted soil-fill subareas.dwg

KEY PLAN
PLANT SITE AREA I
SCALE: 1" = 1000'



PLANT SITE AREA I
PARTIAL PLAN

LEGEND

APPROXIMATE LOCATION OF RIP-RAP INSTALLATION, SLOPE RE-GRADING, TOPSOIL, AND SEEDING

APPROXIMATE LOCATION OF SLOPE RE-GRADING (3on1), TOPSOIL, AND SEEDING

150' 0' 150' 300'

APPROX. SCALE: 1 INCH = 150 FEET


PRIOR TO RESTORATION


AFTER RESTORATION

FIGURE 3-11

LOCATIONS/EXTENT OF BUFFALO RIVER SLOPE STABILIZATION

CONSTRUCTION CLOSEOUT REPORT

AREA I - FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR
STEELFIELDS, LTD.

TurnKey Environmental Restoration, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

JOB NO.: 0062-008-400

FIGURE 4-1

LNAPL THICKNESS WITHIN A1-MW-6 VERSUS TIME

Area I: Former Republic (LTV) Steel Plant Parcel
Steelfields, LTD.
Buffalo, New York

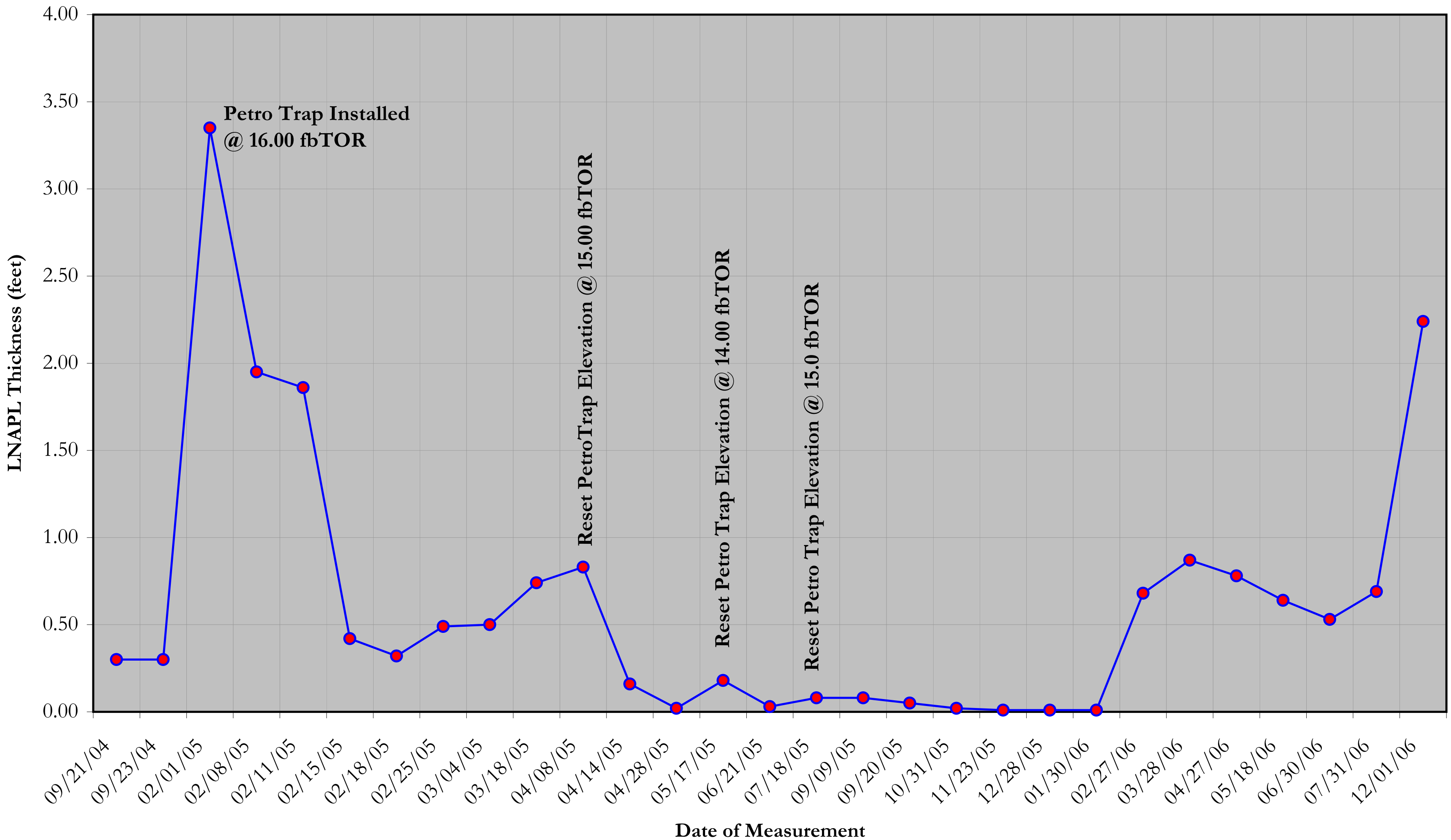
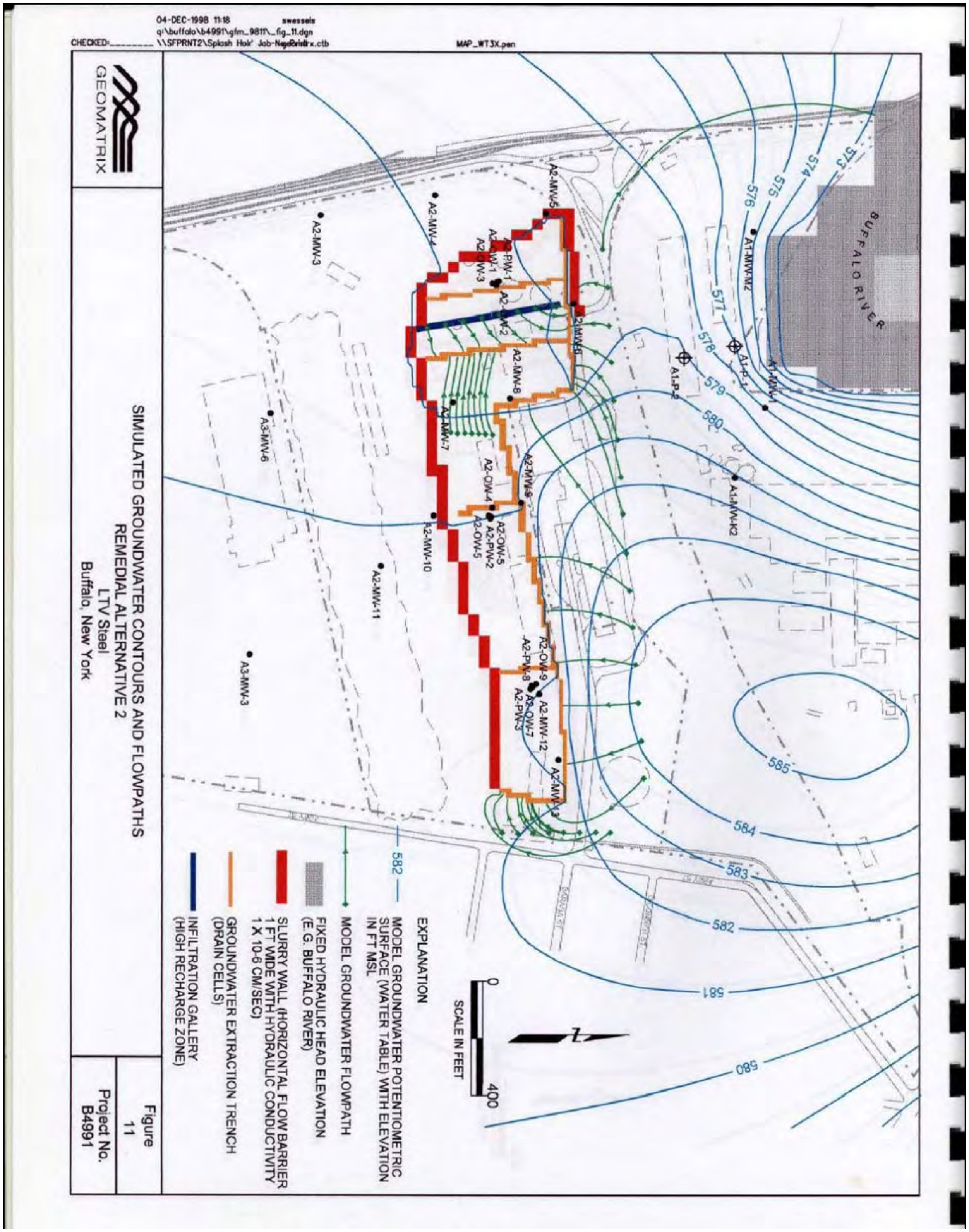


FIGURE 4-2



726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-010-100

DATE: APRIL 2007

DRAFTED BY: WJM

PRE-REMEDIAL SIMULATED GROUNDWATER CONTOURS

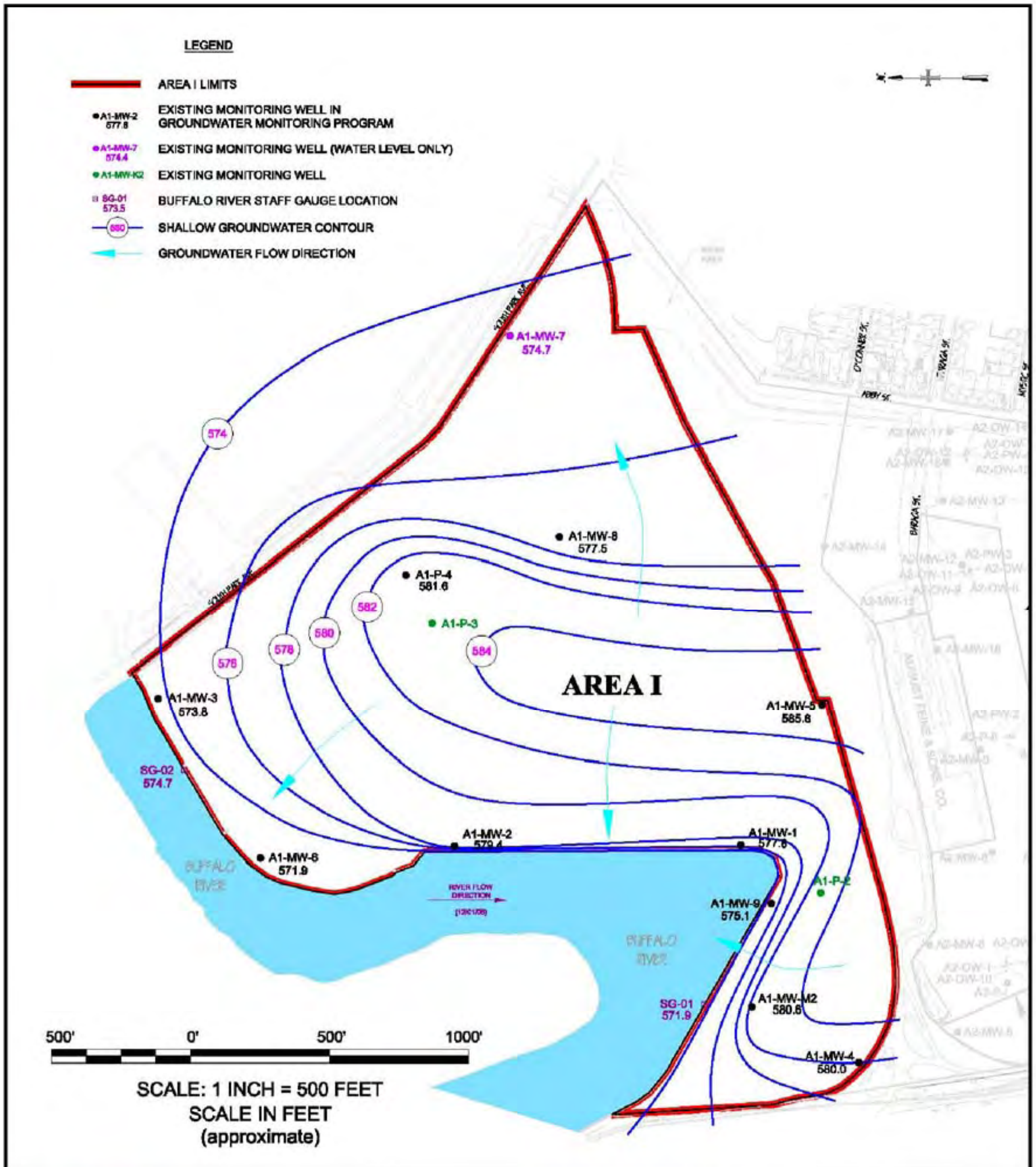
CONSTRUCTION CLOSEOUT REPORT

FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR
STEELFIELDS, LTD.

FIGURE 4-3

FIGURE 4



TURNKEY ENVIRONMENTAL RESTORATION, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-010-100

DATE: DECEMBER 2006

DRAFTED BY: BCH

SHALLOW GROUNDWATER ISOPOTENTIAL MAP

2006 ANNUAL MONITORING REPORT

AREA I - FORMER REPUBLIC (LTV) STEEL PLANT PARCEL
BUFFALO, NEW YORK

PREPARED FOR

STEELFIELDS, LTD.

TURNKEY ENVIRONMENTAL RESTORATION, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-010-100

DATE: APRIL 2007

DRAFTED BY: WJM

ISOPOTENTIAL MAP
2006 ANNUAL MONITORING REPORT

CONSTRUCTION CLOSEOUT REPORT

FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR

STEELFIELDS, LTD.

APPENDIX A

DAILY INSPECTION REPORTS
APRIL 30, 2003 THROUGH AUGUST 27, 2003

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	04-30-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Ptly. sun TEMP 50-63	START	7:00 am	END	15:30 pm

WORK PERFORMED

Area 2 – Gas Holder Area (adjacent to and west of construction trailers)

Contractor excavated and stockpiled at excavation, the aprox. 3 feet of overburden on top of the contaminated soil in the generally previously staked area this afternoon. An 6-8 inch layer of wet-black in color soil/fines was encountered with a few loads hauled to bio-remediation pad in area 3. The limits of excavation will be defined the next day.

Other work this day included preparing site access roads for on-site hauling. A cat 435 excavator was mobilized on site this morning.

Visitors: Jim Tuk (NYSDEC)

Meetings: A pre-construction meeting was held on site, Tuesday 04/29/03 with the NYSDEC.

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		3	Concrete Finisher						A350 Cat off-rd truck		1
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: see pre-construction minutes from meeting

CQA – no soil samples taken this day

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	05-01-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Rain early am, cloudy pm	TEMP	50-65	START	7:45 am	END	15:20 pm

WORK PERFORMED

Area 2 – Gas Holder Area (adjacent to and west of construction trailers)

Contractor completed excavation of suspected impacted soil and transported to the bio-pad for remediation. A 6" to 2' layer of wet-black in color soil/fines was encountered. The limits of the excavation where slightly extended beyond the original staked limits. This was done in part to expose the top of the gas holder foundation at the request of Jim Tuk of the NYSDEC. The gasholder was found to have a concrete slab over a ring foundation wall. The final limits of the excavation will be defined by survey on 5/2/03.

Soil samples where taken by Rick Dubis (Turnkey) from the four side walls and the bottom of the excavation. Details of the sampling are noted in the sampling report dated 5/1/03. Samples to be iced until retrieved by lab.

An additional off-road dump was delivered in afternoon.

Visitors: Jim Tuk (NYSDEC)

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		3	Concrete Finisher			Dump truck		1	A350 Cat off-rd truck		1
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA – soil samples taken this day from gas holder subarea excavation.

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	05-05-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Monday	JOB NO.	0062-008-400
WEATHER	Ptly. cloudy TEMP 50-65	START	7:00 am	END	15:30 pm

WORK PERFORMED

Onsite @ 7:20 am, met w/ Jerry Plewniak (Modern) Jerry stated that they will make repairs to the road leading to the biopad this morning. Tank excavation at T-3 will begin later this morning. 10:00am –Modern began excavating at T-3. Tank was located at 11:30 am. A sample of the water within the tank was collected for VOC's using a disposable dedicated bailer from the top of the tank. The sample was transferred under chain of custody to STL Laboratories. During excavation, approx 4-5' of overburden soils were removed. Visibly impacted soils was black , wet and had a fuel odor. Three loads of impacted soils were taken to the biopad. 12:30- 15:30 Modern began excavation at Area 1 /Sub area D. Overburden soils were removed and placed on a stockpile near the excavation. Modern and Turnkey offsite at 16:00.

Visitors: Jim Tuk/ G. Sutton (NYSDEC)

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Backhoe CAT 435	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	1	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA – Sample collected of water in tank at T-3 for VOC's.

Report by: ____

TURN KEY ENVIRONMENTAL RESTORATION, LLC

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LLC			DATE:	05-06-03
LOCATION	Steelfields Site – South Park Ave.	DAY	Tuesday	JOB NO.	0062-008-400
WEATHER	Ptly. sun TEMP 50-65	START	7:00 am	END	15:30 pm

WORK PERFORMED

Area 1 – Subarea D

Contractor excavated soil impacted material and hauled on-site to bio-remediation pad in area 3 with two off-road trucks and one tandum. The clean overburden material is stockpiled adjacent to this excavation for future backfilling material. As information, concrete walls/footers are located on the eastern side of the excavation and the depth of excavation is aprox. sixteen feet where water is also being encountered upon.

Area 1 – Subarea G

Contractor pumping out water in excavation into tanker truck and discharging into terminal basin in Area 2 on-site. Pictures taken of this excavation.

Visitors: Jim Tuk (NYSDEC)

Meetings: progress meeting #01

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Backhoe CAT 435	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	1	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA – no soil samples taken this day

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LLC			DATE:	05-07-03
LOCATION	Steelfields Site – South Park Ave.	DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Sunny	TEMP	70	START	7:00 am
				END	15:30 pm

WORK PERFORMED

Onsite at 7:20 am. Setup Gillian Air sampling pumps. Two downwind and one upwind. (See attachment). Pumps were setup for 8 hours to measure airborne particulates. Modern continue to remove overburden from A1/ Sub area D from 7:30 to 10:00am. Began removing impacted soils at 10:00 am and placing on the biopad. Gasoline odors detected within excavation. PID readings taken by Doug Weatherhog (DW Environmental) indicated high VOC's within the breathing zone of the excavation. Modern operators were upgraded to Level C PPE. PID readings >500 ppm detected within impacted soils.

A 2 ' thick verification sample was taken from the bottom of the excavation using a Cat 345 excavator. The sample was dug an additional 2' deeper in to the bottom excavation. The sample was brought to the surface. The upper 1 ft of the sample from the excavator bucket indicated high PID reading (> 500 ppm). The lower 1ft of the sample indicated PID readings of 5-20 ppm. Material appeared to be fine grey moist sand. A sample of the lower 1ft was collected as verification of the bottom excavation. The sample was collected for STARS VOC'S and SVOC's. A blind duplicate was also taken.

Vac truck onsite at 2:30 pm to remove water from tank at T-3. Water was discharged to the terminal basin. The tank was removed from the ground after all water was removed. Modern offsite at 3:30 pm.

Completed Day 2 of particulate monitoring at 3:30pm. Air sampling pumps were removed from each station. Offsite at 4:30 pm.

Visitors: G. Sutton (NYSDEC)

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Backhoe CAT 435	8	1
Operating Engineer	8	7	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:
CQA – Verification sampling of bottom excavation –A1/Subarea D.

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services						
CLIENT	Steelfields LLC					DATE:	05-08-03
LOCATION	Steelfields Site – South Park Ave.			DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Sunny	TEMP	70	START	7:00 am	END	15:30 pm

WORK PERFORMED

Onsite at 7:20 am. Setup Gillian Air sampling pumps. Two downwind and one upwind. Pumps were setup for 8 hours to measure airborne particulates.

Modern pumping water from A2-GH (Gas Holder) area excavation using a Vac truck. Water was discharged to the terminal basin.

John Deth (Benchmark) onsite at 7:30 am.

Modern continued to excavate impacted soils from A1/Sub Area D and haul to the biopad. A Cat 345 excavator was used with two off road and one tandem dump truck.

R. Dubisz and J. Plewniak sampled offsite borrow source material from 9:00 am to 11:00am. Samples were collected from a stockpile at the former Seneca Mall in West Seneca NY (see sketch). A total of 9 samples were collected which represent 6000cy. The size of the stockpile where the soils were collected was approx 12,000 cy.

Four samples were collected every 250 cy . Five samples were collected every 1000 cy. Samples were collected using a small rubber track excavator. The samples were being analyzed for STARS Voc's, TCL SVOC's, PCB's, Pest/Herbicides. Informed the lab to analyze the first sample, with results to TurnKey. If sample is within SSAL's, the remaining samples will be analyzed.

Modern began backfilling the A2/GH (gas holder area) with onsite overburden soils and approved offsite soils (from Hertal Ave water main construction 250 cy.) A Cat D6M dozer was used to place the material. The material was compacted using a Cat 513 smooth drum roller.

Removed Gillian air pumps from sampling at 3:00 pm.

Offsite at 15:30 pm.

Visitors: J. Tuk (NYSDEC)

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Backhoe CAT 435	8	1
Operating Engineer	8	7	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2

Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:
CQA – Sampled offsite borrow source.

Report by: _______________________________________

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	05-09-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Friday	JOB NO.	0062-008-400
WEATHER	Sunny TEMP 65	START	7:00 am	END	15:30 pm

WORK PERFORMED

Onsite at 7:00 am. Began Verification Sampling of A1/Sub Area D. A Cat 345 excavator was used to obtain samples of each sidewall. Samples were collected from the native clay soils below the fill/overburden soils. An MS/MSD was taken at SW-N, (sidewall North) and Total TCL VOC's was obtained from SW-S (sidewall South).

Informed Jerry Plewniak that no TurnKey Employees will be entering any of the excavations to collect samples.

J.Deth (Benchmark) on site at 11:30 pm. Surveyed Area D excavation and stockpiled overburden material from the excavation.

Off site at 3:30pm.

Visitors: J. Tuk (NYSDEC)

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Backhoe CAT 435	8	1
Operating Engineer	8	7	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA – Verification samples of sidewalls for Area-1/Subarea D.

Report by: ______________________________________

TURN KEY ENVIRONMENTAL RESTORATION, LLC

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LLC	DATE:	05-12-03		
LOCATION	Steelfields Site – South Park Ave.	DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Rain, windy TEMP 48 F	START	7:45 am	END	15:20 pm

WORK PERFORMED

Area 1 – Subarea T3

Contractor excavating suspected impacted soil, transporting and stockpiling at the bio-pad for remediation. A 6' to 8' layer of black in color soil/fines with slag was encountered. Contractor is currently working within the limits of the area as defined on the drawing Figure 3-2. Debris consisting of concrete, steel and RR ties was encountered and stockpiled at the perimeter of the excavation. No soil samples taken.

Visitors:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		3	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		1
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

7 pictures taken of subarea T3 excavation

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LLC		DATE:	05-13-03	
LOCATION	Steelfields Site – South Park Ave.	DAY	Tuesday	JOB NO.	0062-008-400
WEATHER	Cloudy TEMP 65	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern excavating impacted soils from A1-T-3 and placing on the biopad.

Received lab results for Area-1/ Subarea D sidewalls. Results were within SSALs for sidewalls. However, the bottom sample detected some VOC concentrations above SSAL's. Since the excavation was >20' and within native soils, the excavation will be backfilled. Any additional remediation within the excavation will be performed with a Geoprobe rig using ORC (Oxygen Releasing Compound).

Modern began backfilling Area 1/ Subarea D at 1:30 pm. A CAT D6 dozer was used to place overburden soils within the excavation. Informed Modern to backfill the excavation with granular material- No large concrete or RR Ties.

Offsite at 3:30 pm.

Visitors: G. Sutton J. Tuk (NYSDEC) J. McConnell J.Deth (TurnKey /Benchmark)

Meetings: Progress Meeting.

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Backhoe CAT 435	8	1
Operating Engineer	8	7	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA –

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LLC			DATE:	05-14-03
LOCATION	Steelfields Site – South Park Ave.	DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Pt Sunny TEMP 65	START	7:00 am	END	15:30 pm

WORK PERFORMED
Modern continue to excavate impacted soils from A1/T3 and placed on the biopad from 7:30 am to 1:00pm. Collected verification samples of excavation from 1:00pm –2:30 pm. The excavation was divided into two separate areas. The larger area was designated as A1/T-3. The smaller area was designated as A1/T-3- Tank Location. Verification samples were collected from the side walls and bottom of each excavation. The MS/MSD sample was taken from A1/T-3/SW-S, the blind duplicate was taken from A1/T-3/-B. The full list of VOC's was taken from A1/T-3-SW-N. (SEE SOIL EXCAVATION LOG) Modern began excavation of the Area –1 Subarea A at 2:30 pm. Began excavating over burden soils until 3:30pm. Offsite at 3:45 pm.
Visitors: J. Tuk (NYSDEC)

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Backhoe CAT 435	8	1
Operating Engineer	8	7	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:
CQA – Verification samples of side-walls at A1-T-3.

Report by: ______________________________________

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services						
CLIENT	Steelfields LLC			DATE:	05-15-03		
LOCATION	Steelfields Site – South Park Ave.			DAY	Thursday	JOB NO.	0062-008-400
WEATHER	AM Sun/ PM Rain	TEMP	60	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern continue to excavate at Area-1 /Sub area A (along sheet piling). A six-inch welded steel pipeline was uncovered approximately 2.5 ft below grade. Talked w/ Paul Werthman (Steelfields), he stated that it could be the abandoned No.6 fuel oil line which ran parallel with the sheet piling. If so, the line would have to be removed from the ground and disposed. Modern encountered various pieces of large concrete, conduit piping and process piping during excavation within this area.

STL laboratory onsite at 9:30 Am to pickup Verification samples.

Modern backfilling excavation at A1/Sub area D. Informed Modern to partially backfill the excavation enough to bridge over the water. This will reduce the amount of overburden drilling that will have to be done when the ORC remediation is performed. A Cat D6 dozer was used to backfill the excavation.

J. McConnell on site from at 2:00pm. Rick Dubisz offsite at 2:45pm.

Visitors: G. Sutton. J. Tuk (NYSDEC)

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Backhoe CAT 435	8	1
Operating Engineer	8	7	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA –

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	05-16-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Friday	JOB NO.	0062-008-400
WEATHER	Rain TEMP 55	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern removed additional impacted soils from an area of the excavation were accessibility with an excavator was difficult prior to partial backfilling. Approximately 4-5 truck loads of impacted soils were placed on the biopad. Following removal of the impacted soils, Modern decon the dump truck bodies and the bucket of the excavator. Began excavating overburden soils from Area 1/ Sub area A at 10:00 am. Material was stockpiled for future backfill material.

John Deth (Benchmark) onsite from 11:00 am to 1:00 pm.

NYSDEC received a complaint from a neighbor that a backhoe was driving down Abby St from the site.

R.Dubisz stated to Jim Tuk (NYSDEC) that a orange colored rubber tire backhoe was seen entering Abby St this morning and proceeded to the rail yards. The same machine was seen leaving the rail yards and proceeded down Abby St at 1:00 pm. Jim Tuk stated that he will inform the neighbor that the piece of equipment was not from the Steelfields Site.

Modern offsite at 3:30 pm.

Visitors: Jim Tuk (NYSDEC)

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Backhoe CAT 435	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	1	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services						
CLIENT	Steelfields LLC			DATE:	05-21-03		
LOCATION	Steelfields Site – South Park Ave.			DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Sunny	TEMP	70	START	7:00 am	END	15:30 pm

WORK PERFORMED

TurnKey installed oil boom along the retaining wall in the Buffalo River. Approx 400' of boom was installed.

Modern excavating over burden from Area 1 Subarea A. Excavation occurring north of the deadman for the retaining wall. (See Sketch) Approx 4 feet of overburden material was removed.

John McConnell on site @ 2:00 pm. Arrived with vendor (Peter Lane) who will provide an oil skimmer to rent.

TurnKey will provide the air compressor to run the oil skimmer.

Modern offsite at 3:30 pm.

Visitors: J.McConnell –TurnKey , G.Sutton, - NYSDEC

Meetings: Progress Meeting

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA –

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	05-22-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Sunny TEMP 60	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern removing impacted soils from Area 1/Subarea A along the south side of the dead man sheet piling anchor. A Cat 345 excavator was used to load 2 off road and 2 tandem dump trucks. The impacted soils were taken to the biopad in Area 3.

Turnkey installed oil skimmer at 1:00 pm in the subarea A excavation. Oil skimmer worked for twenty minutes before malfunctioning. The skimmer will be repaired on Friday.

Stated to J.Plewniak that additional overburden soils can be removed before the impacted soils are encountered. It was observed that non-impacted soils were being taken the biopad.

Modern also began backfilling the excavation at Area 1/T-3. Source of the backfill soils is overburden material from Area 1/ Subarea D & Subarea A.

Modern offsite at 3:30 pm.

Visitors: J.McConnell –TurnKey , G.Sutton, M. Doster - NYSDEC

Meetings: Progress Meeting

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LLC			DATE:	05-23-03
LOCATION	Steelfields Site – South Park Ave.	DAY	Friday	JOB NO.	0062-008-400
WEATHER	Pt/Sunny	TEMP	60	START	7:00 am
				END	15:30 pm

WORK PERFORMED

Modern removing impacted soils from Area 1/Subarea A along the south side of the dead man sheet piling anchor. A Cat 345 excavator was used to load 2 off road and 2 tandem dump trucks. The impacted soils were taken to the biopad in Area 3.

Oil skimmer repaired today and running along the west side of the excavation.

Modern also backfilling Area 2 Gasholder area excavation with approved offsite soils which was stockpiled onsite. (Hertel Ave water line soils) A Cat D6 was used to place the material.

TurnKey performed verification sampling on the west wall and bottom of the excavation in Area 1/ Subarea A.

(SEE SOIL EXCAVATION LOG).

Samples were collected for VOC's and SVOC's. A blind duplicate was collected from the west wall (Area-1/Subarea A-SW-W).

Modern offsite at 3:30 pm.

Visitors: J.McConnell –TurnKey , J. Tuk- NYSDEC, P.Werthman- Steelfields

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services						
CLIENT	Steelfields LLC			DATE:	05-27-03		
LOCATION	Steelfields Site – South Park Ave.			DAY	Tuesday	JOB NO.	0062-008-400
WEATHER	Cloudy	TEMP	65	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern excavating overburden material from Area 1/ Subarea A. Material was excavated with a Cat 345 excavator and loaded onto two tandem and two off road dump trucks. Material was used as backfill at Area 1/ T-3 excavation. A Cat D6 dozer was used to place material within the T-3 excavation.

R. Dubisz onsite until 9:30 am.

Progress meeting held today.

J.McConnell onsite at 1:00 pm..

Visitors: J.McConnell –TurnKey , J. Tuk- NYSDEC, P.Werthman- Steelfields

Meetings: Progress Meeting.

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA –

Report by: ____

TURN KEY ENVIRONMENTAL RESTORATION, LLC

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LLC			DATE:	05-28-03
LOCATION	Steelfields Site – South Park Ave.	DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Cloudy/Fog TEMP 60	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern excavating overburden material from Area 1/ Subarea A. Material was excavated with a Cat 345 excavator and loaded onto two tandem and two off road dump trucks. Material was used as backfill at Area 1/ T-3 excavation. A Cat D6 dozer was used to place material within the T-3 excavation.

R. Dubisz informed J. Plewniak not to back fill any concrete material near the top of the excavation (within 5 feet of ground surface).

Oil skimmer was removed from the Area 1/Subarea A today. Informed J.Plewniak to replace the oil boom within the excavation.

Received analytical results from Area 1/Subarea A- SW-W & Bottom. Sample results were non-detect. NYSDEC received samples results at 2:00 pm. Area was approved for backfill. G.Sutton stated that a sample should be collected from impacted soils under the concrete deadman wall to determine the concentration of the impacted layer.

Modern offsite at 3:30 pm.

Visitors: G. Sutton, J. Tuk- NYSDEC,

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	05-29-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Sunny	TEMP	65	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern excavating impacted soils in Area 1/Subarea A. A Cat 345 excavator was used to load two off road and two tandem dump trucks. The soils were taken to the biopad in Area 3.

John Deth & John McConnell onsite at 9:00 am, performed quantity survey of the SubArea A excavation. Survey was complete by 12:00 pm.

Modern began backfilling the bottom of the excavation with large concrete pieces, followed by onsite overburden material from Area 1/Subarea D. R.Dubisz informed J. Plewniak to place clay soils as backfill along a portion of the excavation west of the sheet piling retaining wall.

Modern offsite at 3:30 pm.

Visitors: J. Tuk- NYSDEC,

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA –

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LTD	DATE:	06-02-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Sunny TEMP 65 F	START	13:45 am	END	15:15 pm

WORK PERFORMED

Area 1 – Subarea A

Contractor working at the east end of Subarea A. Contractor excavating suspected impacted soil, transporting and stockpiling at the bio-pad for remediation. Contractor is currently working within the limits of the area as defined on drawing Figure 3-1 in the RD/RA Work Plan. Debris consisting of concrete was encountered and stockpiled at the perimeter of the excavation. Oil and ground water continues to be present in the excavation. Contractor continues to backfill the east of this subarea where the soil sampling and survey work has been completed.

Contractor transporting the overburden material stockpiled next to Subarea D to Subarea A for use as backfill within Subarea A.

Mr. Sutton indicated the excavation work is progressing at an acceptable level.

Visitors: Greg Sutton, NYSDEC

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

Pictures taken at subarea A

Report by: ______________________________________

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LTD	DATE:	06-03-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Partly sunny	TEMP	60 F	START	13:30	END	15:20

WORK PERFORMED

Area 1 – Subarea A

Contractor working at the east end of Subarea A. Contractor excavating suspected impacted soil, transporting and stockpiling at the bio-pad for remediation. Contractor is currently working within the limits of the area as defined on drawing Figure 3-1 in the RD/RA Work Plan. Oil and ground water continues to be present in the excavation. Contractor plan to skim off oil on 6/4/03. Contractor continues to backfill the east of this subarea where the soil sampling and survey work has been completed.

Contractor transporting the on site borrow material (from Hertel Ave) to Subarea A for use as backfill.

Visitors: Jim Tuk, Greg Sutton, NYSDEC

Meetings: Weekly Job meeting. 2pm

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

Pictures taken at subarea A

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LTD	DATE:	06-04-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Overcast, some rain in pm	TEMP	60 F	START	8:00	END	16:40

WORK PERFORMED

Area 1 – Subarea A

Contractor working at the east end of Subarea A. Contractor completed excavating suspected impacted soil, transporting and stockpiling at the bio-pad for remediation. Began excavation for the removal of the oil line which extends from Subarea A towards South Park. Contractor using oil skimmer to remove oil from surface of ground water in the excavation. Benchmark on site to survey east end of Subarea A. Sampling was performed at the east end of the excavation area by Rick Dubisz. Jim Tuk of NYSDEC on site to observe sampling.

Contractor transporting the on site borrow material (from Hertel Ave) to Subarea A, for use as backfill at the east end of this subarea. Backfilling east end of this area using dozer.

Zebra Environmental on site to perform ORC at Area 1, Subarea D. ORC injection was performed at 20 locations within this subarea. No problems where encountered with the injection of ORC into the sub soil. A total of 390 pounds of ORC (approx. 19 pounds per location) was injected to a varying depth of 15' to 19' below finish grade. A Survey was performed locating the ORC injection points.

Jim Tuk stopped in to view the ORC work.

Visitors: Jim Tuk (NYSDEC), Bryan Hann, John Deth, Rick Dubisz (Benchmark)

Contractor Subs: Zebra Environmental (ORC), 2 men & equipment

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

Pictures taken of ORC work.

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LTD	DATE:	06-09-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Partly sunny, windy TEMP 60 F	START	11:00	END	12:00

WORK PERFORMED

Area 1 – Subarea A

Contractor loading into truck(s) steel piping, sheeting, etc. removed from the excavation at Subarea A. Contractor has ceased excavation operations, awaiting a decision on the remaining impacted soil which is located below a large volume of concrete foundations. Paul Werthman to call Greg Sutton to review options. Contractor is also using oil skimmer to remove oil which has accumulated on the surface of the water.

Area 1 - Subareas K&L

Contractor began working on the excavation of overburden material in this area on 6/6/03. Transporting this material to Subarea A for backfill.

Visitors: Paul Werthman (Benchmark)

Contractor Subs:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

TURN KEY ENVIRONMENTAL RESTORATION, LLC

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services						
CLIENT	Steelfields LTD			DATE:	06-10-03		
LOCATION	Steelfields Site – South Park Ave.			DAY	Tuesday	JOB NO.	0062-008-400
WEATHER	Mostly sunny	TEMP	70 F	START	1:00	END	17:00

WORK PERFORMED

Area 1 – Subarea A

Contractor backfilling west end of excavation with the overburden material removed from Area 1, Subarea K&L. Contractor also removing overburden / non-impacted soils from the area between the deadman and the steel sheeting. Contractor continuing to use oil skimmer to remove oil which has accumulated on the surface of the water.

Area 1 - Subarea K&L

Contractor working on the excavation of overburden material in this area. Working from the east end and proceeding west. Transporting overburden material to Subarea A for backfill.

Visitors: Paul Werthman, Jim Tuk, Greg Sutton

Contractor Subs:

Meetings: Weekly job meeting @ 2pm

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: At approximately 11am the site was made aware of a water main break on Baraga St.. The City of Buffalo was notified and responded to the site at approx. noon.

Picture taken of watermain break excavation, water on street, Subarea K&L, Subarea A

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LTD	DATE:	06-11-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Overcast, some rain	TEMP	70 F	START	9:00	END	12:00

WORK PERFORMED

Area 1 – Subarea A

Contractor backfilling west end of excavation with the overburden material removed from Area 1, Subarea K&L. Contractor also removing overburden / non-impacted soils from the area between the deadman and the steel sheeting. Contractor continuing to use oil skimmer to remove oil which has accumulated on the surface of the water.

Benchmark sampled the soil at three locations below the concrete deadman. Two locations where at suspected clean soil, one location was at an area of suspected impacted soil at the east end of deadman. Also sampled soil located in subarea A, sample hole location A3. Two samples taken, one each from the east and west walls.

Area 1 - Subarea K&L

Contractor working on the excavation of overburden material in this area. Working from the east end and proceeding west. Transporting overburden material to Subarea A for backfill.

Visitors: Jim Tuk, Rick Dubisz (Benchmark)

Contractor Subs:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: Appears the city completed repairs of the water main break on Baraga St..

Pictures taken of sampling locations and sampling material in subarea A-3, Subarea K&L impacted soil

See soil sample logs for soil sample location drawings

Report by: ____________________

John McConnell

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LTD			DATE:	06-12-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Rain	TEMP	60 F	START	12:00	END	13:00

WORK PERFORMED

Area 1 – Subarea A

Contractor is receiving off site borrow soils from the West Seneca Mall site. Material is being placed at Subarea A for use as backfill. Trucks are entering the site from through the South Park gate entry. Continuing backfill of approved areas within Subarea A. 2nd excavator is exposing the 6" oil line heading towards South Park from Subarea A. line appears to have ended approx. 100' east of the Subarea A excavation. Contractor to move to the west side and begin tracing line heading towards Subarea K&L.

Area 1 - Subarea K&L

Contractor working on the excavation of impacted material in this area. Working from the east end and proceeding west. Transporting impacted soils to bio-pad.

Visitors:

Contractor Subs:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: Pictures taken at subarea K & L, and subarea A

Report by: ______________________________

John McConnell

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LTD			DATE:	06-16-03
LOCATION	Steelfields Site – South Park Ave.	DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Sunny TEMP 78 F	START	14:00	END	15:00

WORK PERFORMED

Area 1 – Subarea A

Contractor has completed backfilling west end and center portions of excavation. Received excavator with concrete buster. To begin on 6/17/03 removal of two concrete foundations at the east end of this subarea A so as to gain access to impacted soil beneath these foundations.

Area 1 - Subarea K&L

Contractor working on the excavation of impacted material in this area. Working from the east end and proceeding west. Transporting impacted soils to bio-pad.

Visitors: Jim Tuk (NYSDEC)

Contractor Subs:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: Pictures taken at subarea K & L, and subarea A

Report by: ______________________________

John McConnell

TURN KEY ENVIRONMENTAL RESTORATION, LLC

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LTD	DATE:	06-17-03		
LOCATION	Steelfields Site – South Park Ave.	DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Sunny TEMP 75 F	START	13:00	END	15:00

WORK PERFORMED

Area 1 – Subarea A

Contractor is using an excavator with concrete buster to breakup concrete foundations located at the east end of subarea A.

Area 1 - Subarea K&L

Contractor working on the excavation of impacted material in this area. Working from the east end and proceeding west. Transporting impacted soils to the bio-pad.

Bio-pad – Contractor using high-lift to stockpile impacted soils from Area 1, subarea K & L.

Contractor using water truck to apply water to haul and access roads.

Visitors: Jim Tuk, Greg Sutton, (NYSDEC), Paul Werthman

Contractor Subs:

Meetings: Weekly Job Meeting

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		1
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: Pictures taken at subarea K & L, and subarea A, Bio-pad

Report by: ____

John McConnell

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LTD	DATE:	06-18-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Sunny	TEMP	75 F	START	13:00	END	16:00

WORK PERFORMED

Area 1 – Subarea A

No work observed today.

Area 1 - Subarea K&L

Contractor working on the excavation of impacted material in this area. Working from the east end and proceeding west. Transporting impacted soils to the bio-pad.

Bio-pad – Contractor using high-lift to stockpile impacted soils from Area 1, subarea K & L.

Performed soil sampling within Area K&L. South wall, east wall and bottom. Refer to soil sampling log.

Contractor using water truck to apply water to haul and access roads.

Visitors: Rick Dubisz

Contractor Subs:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		1
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: Pictures taken at subarea K & L, and subarea A Soil samples taken

Report by: ______________________________________

John McConnell

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	06-20-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Pt Sunny TEMP 60	START	7:00 am	END	16:30 pm

WORK PERFORMED

Modern excavating impacted soils in Area 1/ Subarea A. Excavation occuring along the east side of the deadman anchor within the area of impacted soils above SSAL's. Also excavating soil from the area between the deadman anchor and the steel retaining wall. A excavator mounted ram is also being used break apart any foundations.

TurnKey collected two samples of soil material stockpiled on the biopad. The material was from Area 1 Subarea K&L. The samples were designated as "Area 1/Subarea K&L Stockpile Sample #1 & #2. The samples will be analyzed for TCLP Voc's. Sample were collected from three areas within the stockpile. A Cat loader was used to dig within the pile. The pile was approx 120' long by 40' wide. (See Sketch)

John Deth & Paul Werthman onsite. Located the corner of the former stockhouse building (south west corner). Also located manhole in Area II which may contain tar pipes from Area II to Area I. John Deth scheduled to be onsite next Tuesday –6/24 to survey Subarea K&L and Subarea A.

Applied Fabrics onsite today to pickup oil skimmer. Skimmer was removed from the site and taken to their shop for repairs. The skimmer should return on Monday.

Modern offsite at 3:30 pm.

Visitors: J. Tuk- NYSDEC,

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

DAILY OBSERVATION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LTD	DATE:	06-23-03		
LOCATION	Steelfields Site – South Park Ave.	DAY	Monday	JOB NO.	0062-008-400
WEATHER	Sunny TEMP 75 F	START	1:00	END	3:30

WORK PERFORMED

Area 1 – Subarea A

Working at east end of this area removing concrete foundations and impacted material below.

Area 1 - Subarea K&L - No work observed.

Contractor using water truck to apply water to haul and access roads.

Visitors: Jim Tuk, Greg Sutton (NYSDEC) Paul Werthman

Contractor Subs:

Meetings: Job meeting, 2pm

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		1
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: Pictures taken at subarea K & L, and subarea A.

Report by: ____

John McConnell

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LTD	DATE:	06-24-03		
LOCATION	Steelfields Site – South Park Ave.	DAY	Tuesday	JOB NO.	0062-008-400
WEATHER	Sunny TEMP 75 F	START	9:00	END	12:00

WORK PERFORMED

Area 1 – Subarea A

Working at east end of this area removing concrete foundations and impacted material below.

Benchmark performed survey of the excavation for this work area.

Area 1 - Subarea K&L No work observed.

Obtained soil samples from south wall, bagged & checked with PID. East 1/3 of wall had no readings. Center section and west end had readings of 20ppm and above. Identified to contractor area requiring additional soil removal. Benchmark performing survey layout for alignment of proposed slurry wall.

Contractor using water truck to apply water to haul and access roads.

Visitors: John Deth, Paul Werthman, Jr. (survey)

Contractor Subs:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		1
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: Pictures taken at subarea A.

Report by: ______________________________________

John McConnell

DAILY OBSERVATION REPORT

CONTRACTOR	Modern Environmental Services						
CLIENT	Steelfields LTD			DATE:	06-25-03		
LOCATION	Steelfields Site – South Park Ave.			DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Sunny	TEMP	75 F	START	9:00	END	12:00

WORK PERFORMED

Area 1 – Subarea A

Working at east end of this area performing miscellaneous cleanup of impacted material.

Turnkey obtained soil samples from the east end of this subaera excavation, 2 locations on the south wall. Refer to soil excavation log this day for sample locations.

Area 1 - Subarea K&L

Contractor working on the excavation of impacted material on the south wall where previous soil was sampled and results indicated values above the Work Plan values. Excavating material working from the west end and proceeding to the east. Transporting impacted soils to the bio-pad.

Contractor using water truck to apply water to haul and access roads.

Visitors: Jim Tuk, Greg Sutton (NYSDEC)

Contractor Subs:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		1
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: Pictures taken at subarea K & L, and subarea A.

Obtained soil verification samples from subarea A, East end, south wall

Report by: ______________________________

John McConnell

TURN KEY ENVIRONMENTAL RESTORATION, LLC

DAILY OBSERVATION REPORT

CONTRACTOR	Modern Environmental Services						
CLIENT	Steelfields LTD			DATE:	06-26-03		
LOCATION	Steelfields Site – South Park Ave.			DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Sunny	TEMP	75 F	START	11:00	END	12:00

WORK PERFORMED

Area 1 – Subarea A

Excavation working at the southeast end of this area, just opposite of the end of sheeting. Performing miscellaneous cleanup of impacted material. Backfilling the north east corner and building up the bank area along the Buffalo River with off site material trucked in from the West Seneca site.

Area 1 - Subarea K&L

No excavation work observed. Contractor is pumping ground water from excavation to an adjacent area of excavation with subarea K&L.

Contractor using water truck to apply water to haul and access roads.

Visitors:

Contractor Subs: trucking in fill material from West Seneca site.

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		1
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: Pictures taken at subarea K & L, and subarea A.

Report by: ______________________________

John McConnell

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	06-27-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Friday	JOB NO.	0062-008-400
WEATHER	Pt Sunny	TEMP	70	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern excavating impacted soils from Area K&L. Material was excavated using a Cat 345 excavator and placed in on the biopad.

Modern also backfilling Eastern portion of Area 1 Subarea A as approved by the NYSDEC. Modern backfilling the excavation with approved offsite soil material from the former Seneca Mall Site.

TurnKey personnel collected an additional sample from the Seneca Mall Stockpile for QC analysis. Sample collected represented approx 5000 cy. An excavator was used to dig 5 holes within the sample pile. A sample was collected from each hole to make one composite sample.

Sample was transferred to STL Labs at 11:00 am.

Modern offsite at 3:30 pm.

Visitors: J. Tuk- NYSDEC,

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA –

Report by: ______________________________

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	07-02-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Wednesday	JOB NO.	0062-008-400
WEATHER	Sunny	TEMP	80	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern excavating impacted soils from Area1/Subarea A between sheet piling and deadman anchor. NYSDEC onsite, observed that native soils were being removed along with the impacted slag layer. The native soils had a PID reading of 12-14 ppm. A slight petroleum odor was also detected. It was agreed by NYSDEC and TurnKey that a sample of the native soils will be collected and analyzed. The native soils will not be removed if below SSAL's. TurnKey collected one sample of the native soil for VOC and SVOC analysis. (SEE Excavation Log).

Sample was delivered to STL labs today.

Modern also excavating impacted soils from Area 1 /Subarea K&L and placed on the biopad.

Portions of the K&L excavation were also being backfilled with concrete debris and approved offsite soils.

Modern offsite at 3:30 pm.

Visitors: G.Sutton- NYSDEC,

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	1	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA –

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	07-07-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Monday	JOB NO.	0062-008-400
WEATHER	AM Rain/ Sunny PM TEMP 80	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern excavating impacted soils from Area 1/Subarea K&L. Excavation occurring along the eastern portion of K&L. A Cat 345 excavator was used to load off road and tandem dump trucks with impacted soils. Impacted soils were taken to the biopad in Area 2. Modern also backfilling portions of subarea K&L with offsite soils (Seneca Mall Stockpile). A Cat D6R dozer was used to place the material in lifts. Lifts were compacted using a Cat smooth drum roller.

John Deth onsite (Benchmark) to survey completed excavations of Subarea K&L.

Analytical results performed on 7/2/03 from native soils in Subarea A (Deadman wall & Sheetpiling) indicated that the material exceeded SSAL's will have to be removed.

Air Monitoring scheduled for today was cancelled due to morning rain showers.

Modern offsite at 3:30 pm.

Visitors:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	2	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA –

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	07-08-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Tuesday	JOB NO.	0062-008-400
WEATHER	Cloudy AM/ Sunny PM	TEMP	80	START	7:00 am	END	17:00 pm

WORK PERFORMED

Modern excavating impacted soils from Area 1/Subarea K&L. Excavation occurring along the eastern portion of K&L. A Cat 345 excavator was used to load off road and tandem dump trucks with impacted soils. Impacted soils were taken to the biopad in Area 3. Modern also backfilling portions of subarea K&L with offsite soils (Seneca Mall Stockpile). A Cat D6R dozer was used to place the material in lifts. Lifts were compacted using a Cat smooth drum roller.

Verification sampling performed today on Area 1/Subarea K&L/ SW-N and bottom sample # 2. Samples were collected using a Cat 225 excavator. Three samples were collected from the floor of the excavation to make one composite sample. (SEE EXCAVATION LOG). One sample was also taken from the North side wall.

A sample was also collected from the western side wall, however after further discussion with the NYSDEC it was agreed that the western side wall sample would not be analyzed due to the amount of impacted soils observed in the sample. The remaining samples were delivered to STL Labs. NYSDEC representative Jim Tuck was onsite to observe verification sampling.

Air monitoring stations were setup today during excavation activities performed at Subarea K&L and the Biopad. Air monitoring consisted of two downwind locations and one upwind location. (SEE DRAWING) Each station contained one SUMA canister to measure VOC's and one Gillian air Pump to measure air borne particulates. Monitoring stations were setup for an 8 hr sampling period. Both SUMA canisters and particulate cartridges were sent to STL labs.

Modern offsite at 3:30 pm.

Comment: NOTE: As you enter text this box will expand.

Visitors:

Meetings:

Comment: NOTE: As you enter text this box will expand.

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	2	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		

Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:
CQA –

Report by: ____

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LLC	DATE:	07-10-03

LOCATION	Steelfields Site – South Park Ave.			DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Sunny AM / Cloudy PM	TEMP	73	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern excavating impacted soils from Area 1/Subarea K&L. Excavation occurring along the eastern portion of K&L. A Cat 345 excavator was used to load off road and tandem dump trucks with impacted soils. Impacted soils were taken to the biopad in Area 3. Modern also backfilling portions of subarea K&L with offsite soils (Seneca Mall Stockpile). A Cat D6R dozer was used to place the material in lifts. Lifts were compacted using a Cat smooth drum roller.

Verification sampling performed today on Area 1/Subarea K&L/ SW-E #2 and bottom sample # 3. Samples were collected using a Cat 225 excavator. Two samples were collected from the floor of the excavation to make one composite sample. (SEE EXCAVATION LOG). Three samples were taken from the east side wall to make on composite sample.

NYSDEC representative Jim Tuck was onsite to observe verification sampling.

Modern offsite at 3:30 pm.

Visitors:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	*DESCRIPTION*	H	#	*DESCRIPTION*	H	#	*DESCRIPTION*	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	2	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

DAILY INSPECTION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LLC			DATE:	07-11-03
LOCATION	Steelfields Site – South Park Ave.	DAY	Friday	JOB NO.	0062-008-400
WEATHER	Pt Cloudy TEMP 70	START	7:00 am	END	15:30 pm

WORK PERFORMED

Modern excavating impacted soils from Area 1/Subarea K&L. Excavation occurring along the western portion of K&L. A Cat 345 excavator was used to load off road and tandem dump trucks with impacted soils. Impacted soils were taken to the biopad in Area 3. Modern also backfilling portions of subarea K&L with offsite soils (Seneca Mall Stockpile). A Cat D6R dozer was used to place the material in lifts. Lifts were compacted using a Cat smooth drum roller.

Collected samples today from offsite soils at the Seneca Mall Stockpile. Sample was collected to represent the next 5000cy of material brought onsite. Five composite samples were collected and combined to make one sample. An excavator was used to collect the samples from the stockpile. The sample was labeled as Sample #11 (5000 cy). STL labs picked up the sample from the Steelfields site Friday Morning.

Modern offsite at 3:30 pm.

Visitors:

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent	8	1	Ironworker			Generators			Bulldozer	8	2
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						SF Roller		
Laborer	8	2	Mechanic						Excavator CAT 345	8	1
Operating Engineer	8	4	Concrete Finisher			Tandum Truck	8	2	A350 Cat off-rd truck	8	2
Air Monitor (sub)	8	1				Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		1
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS:

CQA –

DAILY OBSERVATION REPORT

CONTRACTOR	Modern Environmental Services						
CLIENT	Steelfields LTD			DATE:	07-14-03		
LOCATION	Steelfields Site – South Park Ave.			DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Sunny, windy	TEMP	80 F	START	1:30	END	4:00

WORK PERFORMED

Area 1 - Subarea K&L

No work by contractor observed in this area.

Area 1 – Subarea A

Contractor excavating impacted material from area between concrete deadman and sheet piling at rivers edge. Excavating between tie-backs cell by cell. Jim Tuk from NYSDEC is on site providing visual inspection and directing extent of soil to be removed. Contractor is also backfilling area at east end of sheeting and area of open bank cut. Material is imported soil from West Seneca borrow site.

Contractor using water truck to apply water to haul and access roads.

Visitors: Jim Tuk

Contractor Subs: trucking in fill material from West Seneca site.

Meetings: Weekly job site meeting

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		1
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: pictures of subarea K&L and subarea A

Report by: ______________________

John McConnell

DAILY OBSERVATION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LTD	DATE:	07-17-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Sunny TEMP 80 F	START	1:30	END	4:00

WORK PERFORMED

Area 1 - Subarea K&L

Area 1 – Subarea A

Contractor excavating impacted material from area between concrete deadman and sheet piling at rivers edge. Excavating between tie-backs cell by cell. Jim Tuk from NYSDEC is on site providing visual inspection and directing extent of soil to be removed. Contractor is also backfilling area at east end of sheeting and area of open bank cut. Material is imported soil from West Seneca borrow site.

Contractor using water truck to apply water to haul and access roads.

Visitors: Jim Tuk

Contractor Subs: trucking in fill material from West Seneca site.

Meetings: Weekly job site meeting

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		1
Superintendent		1	Ironworker			Generators			Bulldozer		1
			Welder			Welding Equip.			SD Roller		1
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		1
Laborer		1	Mechanic						Backhoe CAT 435		1
Operating Engineer		5	Concrete Finisher			Dump truck		2	A350 Cat off-rd truck		2
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		1

Time & Material work: none

REMARKS: pictures of subarea K&L and subarea A

Report by: ______________________________
John McConnell

DAILY OBSERVATION REPORT

CONTRACTOR	Modern Environmental Services						
CLIENT	Steelfields LTD			DATE:	07-22-03		
LOCATION	Steelfields Site – South Park Ave.			DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Partly Sunny	TEMP	80 F	START	1:00	END	5:15

WORK PERFORMED

Area 1 - Subarea K&L

Contractor excavating overburden and impacted material from west end of this subarea, area south of what was the stockhouse as noted on the Work Plan drawings. Contractor is also backfilling the area to the east which has been sampled and approved by the DEC. Backfill material is imported soil from West Seneca Mall borrow site.

Contractor using water truck to apply water to haul and access roads. Cleaned South Park Ave at gate area using water truck.

Soil samples taken within subarea K&L.

Visitors: Greg Sutton (DEC)

Contractor Subs: trucking in fill material from West Seneca site.

Meetings: Weekly job site meeting

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		
Superintendent			Ironworker			Generators			Bulldozer		
			Welder			Welding Equip.			SD Roller		
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		
Laborer			Mechanic						Backhoe CAT 435		
Operating Engineer			Concrete Finisher			Dump truck			A350 Cat off-rd truck		
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		

Time & Material work: none

REMARKS: pictures of subarea K&L. Obtained soil samples from bottom and walls within subarea K&L

Report by: ____________________

John McConnell

DAILY OBSERVATION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LTD	DATE:	07-23-03		
LOCATION	Steelfields Site – South Park Ave.	DAY	Wed	JOB NO.	0062-008-400
WEATHER	Partly Sunny, rain in pm TEMP 70 F	START	10:00	END	12:30

WORK PERFORMED

Area 1 - Subarea K&L

Contractor excavating overburden and impacted material from west end of this subarea, area south of what was the stockhouse as noted on the Work Plan drawings. Contractor is also backfilling the area to the east which has been sampled and approved by the DEC. Backfill material is imported soil from West Seneca Mall borrow site.

Rain last night, watering of roads not required as of noon.

Soil samples taken at West Seneca Mall borrow site. 3 sets of samples taken from adjacent pile which should represent the next 15,000 CY. Sampling observed by Greg Sutton.

Visitors: Greg Sutton (DEC)

Contractor Subs: trucking in fill material from West Seneca site.

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		
Superintendent			Ironworker			Generators			Bulldozer		
			Welder			Welding Equip.			SD Roller		
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		
Laborer			Mechanic						Backhoe CAT 435		
Operating Engineer			Concrete Finisher			Dump truck			A350 Cat off-rd truck		
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		

Time & Material work: none

REMARKS: Obtained soil samples from West Seneca Mall borrow material.

Report by: ______________________

John McConnell

DAILY OBSERVATION REPORT

CONTRACTOR	Modern Environmental Services				
CLIENT	Steelfields LTD			DATE:	07-24-03

LOCATION	Steelfields Site – South Park Ave.		DAY	Thursday	JOB NO.	0062-008-400
WEATHER	Rain/overcast	TEMP 70 F	START		END	

WORK PERFORMED

Area 1 - Subarea K&L

Contractor excavating overburden and impacted material from west end of subarea K&L, area south of what was the stockhouse as noted on the Work Plan drawings. Also excavating material from within the limits of the stockhouse foundation. Removing foundations which have impacted soil beneath. Contractor is also backfilling the area to the east which has been sampled and approved by the DEC. Backfill material is imported soil from West Seneca Mall borrow site.

Visitors:

Contractor Subs: trucking in fill material from West Seneca site.

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		
Superintendent			Ironworker			Generators			Bulldozer		
			Welder			Welding Equip.			SD Roller		
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		
Laborer			Mechanic						Backhoe CAT 435		
Operating Engineer			Concrete Finisher			Dump truck			A350 Cat off-rd truck		
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		

Time & Material work: none

REMARKS: Pictures taken subarea K&L.

Report by: ______________________

John McConnell

DAILY OBSERVATION REPORT

CONTRACTOR	Modern Environmental Services		
CLIENT	Steelfields LTD	DATE:	08-06-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Wed	JOB NO.	0062-008-400
WEATHER	Rain/Partly sunny TEMP 80 F	START		END	

WORK PERFORMED

Area 1 - Subarea K&L

Contractor appears to have completed excavation of material from west end of subarea K&L. Contractor is also backfilling the area to the east which has been sampled and approved by the DEC. Backfill material is imported soil from West Seneca Mall borrow site. Performing cleanup of concrete, metal and other materials from subarea K&L.

Contractor also removing oil/tar line which runs along sheathing/buffalo river north of subarea K&L. During this process the line ruptured and a very small amount of product spilled down the sheeting and into the river. The product appeared to be rust scale with a slight oil film. Contractor immediately began to cleanup and contain the spill. Jim Tuk of the DEC was on site and advised contractor that cleanup and containment must be completed prior to the end of day. Turnkey also advised the contractor of the cleanup requirements. Turnkey personnel using a boat assisted the contractor in the installation of a asorbant boom at the area of the spill. The spill was contained and cleaned to the satisfaction of the DEC.

Visitors:

Contractor Subs: trucking in fill material from West Seneca site.

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		
Superintendent			Ironworker			Generators			Bulldozer		
			Welder			Welding Equip.			SD Roller		
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		
Laborer			Mechanic						Backhoe CAT 435		
Operating Engineer			Concrete Finisher			Dump truck			A350 Cat off-rd truck		
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		

Time & Material work: none

REMARKS:

Report by: ______________________________________

DAILY OBSERVATION REPORT

CONTRACTOR	Mulvey Construction		
CLIENT	Steelfields LTD	DATE:	08-26-03

LOCATION	Steelfields Site – South Park Ave.	DAY	Tue	JOB NO.	0062-008-400
WEATHER	Sunny, rain @ noon, TEMP 80 F	START		END	

WORK PERFORMED

Area I – Placing additional soil material in subarea K&L to bring up to final grade. Material from existing stockpile located between Areas 3 & 4.

Area II – Excavating a slurry wall exploratory trench to located and remove any old utilities. Removing steel line and cast iron piping, concrete, conduit and cables. Using excavator, excavator with concrete breaker, and 3rd excavator to remove debris from piles and backfill trench.

Area III- Working material on bio-pad

GWTP building -Davis FP completed install of underground piping except for 3" HDPE. General contractor sub setting up for the construction of concrete block walls. Seneca fence performing layout and installation of gate posts.

Visitors:

Contractor Subs: Davis, Mulvey, Seneca

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		
Superintendent			Ironworker			Generators			Bulldozer		
			Welder			Welding Equip.			SD Roller		
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		
Laborer			Mechanic						Backhoe CAT 435		
Operating Engineer			Concrete Finisher			Dump truck			A350 Cat off-rd truck		
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		

Time & Material work: Modern operator operating lift for Mulvey sub (4 hrs.)

REMARKS:

Report by: ______________________

John McConnell

DAILY OBSERVATION REPORT

CONTRACTOR	Mulvey Construction				
CLIENT	Steelfields LTD	DATE:	08-27-03		
LOCATION	Steelfields Site – South Park Ave.	DAY	Wed	JOB NO.	0062-008-400
WEATHER	Sunny	TEMP	80 F	START		END	

WORK PERFORMED

Area I – Placing additional soil material in subarea K&L to bring up to final grade. Material from existing stockpile located between Areas 3 & 4. Work completed.

Area II – Excavating a slurry wall exploratory trench to located and remove any old utilities. Removing steel line and cast iron piping, concrete, conduit and cables. Using excavator, excavator with concrete breaker, and 3rd excavator to remove debris from piles and backfill trench. Completed excav to a point 100' west of Klien bldg.

Area III- Working material on bio-pad

GWTP building -Davis FP filled piping for water test & inspection. General contractor sub constructing concrete block walls. Seneca fence performing layout and installation of gate post and line posts.

Visitors:

Contractor Subs: Davis, Mulvey, Seneca

Meetings:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Project Manager						Equipment			Rubber Tire Hoe/Ldr		
Superintendent			Ironworker			Generators			Bulldozer		
			Welder			Welding Equip.			SD Roller		
Laborer-Foreman			Carpenter						Excavator with Concrete breaker		
Laborer			Mechanic						Backhoe CAT 435		
Operating Engineer			Concrete Finisher			Dump truck			A350 Cat off-rd truck		
						Service Truck			Compactor		
Carpenter						Paving Equip. & Roller			Fuel Truck		
						Air Compressor			Water Truck		

Time & Material work: Modern operator operating lift for Mulvey sub (4 hrs.)

REMARKS:

Report by: ______________________________
John McConnell

APPENDIX B

TABLES OF SOIL/FILL VERIFICATION RESULTS

APPENDIX B

Tables of Soil/Fill Verification Results

Table	***Subarea***	**# *of Pages***
Table 1 A	Subarea A - 1	3
Table 1 B	Subarea A - 2	3
Table 1 C	Subarea A - 3	3
Table 2	Subarea D	5
Table 3 A	Subarea T-3	3
Table 3 B	Subarea T-3	3
Table 3 C	Subarea T-3	3
Table 4 A	Subarea K & L	3
Table 4 B	Subarea K & L	3
Table 4 C	Subarea K & L	3
Table 4 D	Subarea K & L	3
Table 4 E	Subarea K & L	3
Table 5	Subarea Q-5	1
Table 6	Subarea N-14	4

Supporting Data also included under this cover

Note:

The tables identified above summarize analytical results for verification sampling performed in Area 1. For locations at which these samples have been taken, refer to Figures 3-5 through 3-10 incorporated in the main text of this document.

TABLE 1A

AREA 1 - SUBAREA A
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA1/DM WALL-IMP #1	AREA1/DM WALL-IMP #2	AREA1/DM WALL-NAT #1	AREA1/DM WALL-NAT #2	AREA1/SUB A3/IS-EAST	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	1.6	0.56	--	0.049	0.059	**1**
n-Propylbenzene	0.97	0.92	--	ND	0.025	**1**
n-Butylbenzene	11	4.4	--	ND	0.6	**1**
p-Xylene	0.12	0.024	--	0.012	0.012	**1**
m-Xylene	7.2	0.9	--	0.078	0.22	**1**
1,3,5-Trimethylbenzene	5.4	0.78	--	ND	0.25	**1**
Toluene	1	ND	--	ND	0.04	**1**
Xylenes, Total	10	0.9	--	0.078	0.35	**1**
sec-Butylbenzene	1.8	1.9	--	0.44	0.23 J	**1**
Methyl tert butyl ether	ND	ND	--	ND	ND	**1**
Benzene	ND	ND	--	ND	ND	**1**
o-Xylene	3.2	ND	--	ND	0.13	**1**
1,2,4-Trimethylbenzene	15	2.4	--	0.21	0.7	**1**
tert-Butylbenzene	ND	ND	--	ND	ND	**1**
Isopropylbenzene	0.99	0.63	--	0.046	0.044	**1**
p-Cymene	ND	0.7	--	ND	0.012 UJ	**1**
TOTAL VOCs (mg/kg)	**58.28**	**14.114**	**0**	**0.913**	**2.672**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	ND	--	--	**1**
Styrene	--	--	ND	--	--	**1**
cis-1,3-Dichloropropene	--	--	ND	--	--	**1**
trans-1,3-Dichloropropene	--	--	ND	--	--	**1**
n-Propylbenzene	--	--	ND	--	--	**1**
n-Butylbenzene	--	--	ND	--	--	**1**
1,4-Dichlrobenzene	--	--	ND	--	--	**1**
1,2-Dibromoethane	--	--	ND	--	--	**1**
1,2-Dichloroethane	--	--	ND	--	--	**1**
4-Methyl-2-Pentanone	--	--	ND	--	--	**1**
1,3,5-Trimethylbenzene	--	--	ND	--	--	**1**
Methylcyclohexane	--	--	ND	--	--	**1**
Toluene	--	--	ND	--	--	**1**
Chlorobenzene	--	--	ND	--	--	**1**
Cyclohexane	--	--	ND	--	--	**1**
1,2,4-Trichlorobenzene	--	--	ND	--	--	**1**
Dibromochloromethane	--	--	ND	--	--	**1**
Tetrachloroethene	--	--	ND	--	--	**1**
Xylenes, Total	--	--	ND	--	--	**1**
sec-Butylbenzene	--	--	ND	--	--	**1**
cis-1,2-Dichloroethene	--	--	ND	--	--	**1**
trans-1,2-Dichloroethene	--	--	ND	--	--	**1**
Methyl tert butyl ether	--	--	ND	--	--	**1**
1,3-Dichlrobenzene	--	--	ND	--	--	**1**
Carbon Tetrachloride	--	--	ND	--	--	**1**
2-Hexanone	--	--	ND	--	--	**1**
Acetone	--	--	0.17	--	--	**1**

TABLE 1A

AREA 1 - SUBAREA A
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA1/DM WALL-IMP #1	AREA1/DM WALL-IMP #2	AREA1/DM WALL-NAT #1	AREA1/DM WALL-NAT #2	AREA1/SUB A3/IS-EAST	
Chloroform	--	--	ND	--	--	**1**
Benzene	--	--	ND	--	--	**1**
1,1,1-Trichloroethane	--	--	ND	--	--	**1**
Bromomethane	--	--	ND	--	--	**1**
Chloromethane	--	--	ND	--	--	**1**
Chloroethane	--	--	ND	--	--	**1**
Vinyl chloride	--	--	ND	--	--	**1**
Methylene chloride	--	--	0.019 U	--	--	**1**
Carbon Disulfide	--	--	ND	--	--	**1**
Bromoform	--	--	ND	--	--	**1**
Bromodichloromethane	--	--	ND	--	--	**1**
1,1-Dichloroethane	--	--	ND	--	--	**1**
1,1-Dichloroethene	--	--	ND	--	--	**1**
Trichlorofluoromethane	--	--	ND	--	--	**1**
Dichlorodifluoromethane	--	--	ND	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	ND	--	--	**1**
1,2-Dichlropropane	--	--	ND	--	--	**1**
2-Butanone	--	--	0.037	--	--	**1**
1,1,2-Trichloroethane	--	--	ND	--	--	**1**
Trichloroethene	--	--	ND	--	--	**1**
Methyl acetate	--	--	ND	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	ND	--	--	**1**
1,2-Dichlrobenzene	--	--	ND	--	--	**1**
1,2,4-Trimethylbenzene	--	--	ND	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	ND	--	--	**1**
tert-Butylbenzene	--	--	ND	--	--	**1**
Isopropylbenzene	--	--	ND	--	--	**1**
p-Cymene	--	--	ND	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0.226**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	ND	ND	ND	ND	ND	**--**
Benzyl alcohol	ND	ND	ND	ND	ND	**--**
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	**--**
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	**--**
4-Chloroaniline	ND	ND	ND	ND	ND	**--**
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	**--**
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	**--**
Di-n-octyl phthalate	ND	ND	ND	ND	ND	**--**
Hexachlorobenzene	ND	ND	ND	ND	ND	**--**
Anthracene	ND	ND	ND	ND	ND	**--**
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	**--**
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	**--**
Pyrene	ND	ND	ND	ND	ND	**--**
Dimethyl phthalate	ND	ND	ND	ND	ND	**--**

TABLE 1A

AREA 1 - SUBAREA A
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA1/DM WALL-IMP #1	AREA1/DM WALL-IMP #2	AREA1/DM WALL-NAT #1	AREA1/DM WALL-NAT #2	AREA1/SUB A3/IS-EAST	
Dibenzofuran	ND	ND	ND	ND	ND	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	--
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	--
Fluoranthene	ND	ND	ND	ND	ND	--
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	--
Acenaphthylene	ND	ND	ND	ND	ND	--
Chrysene	ND	ND	ND	ND	ND	--
Benzo(a)pyrene	ND	ND	ND	ND	ND	--
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	ND	ND	ND	ND	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Benzoic acid	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	21 UJ	40 UJ	0.43 UJ	39 UJ	ND	--
Isophorone	ND	ND	ND	ND	ND	--
Acenaphthene	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Phenanthrene	16 J	32 J	ND	ND	12 J	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	--
Fluorene	ND	ND	ND	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	19 UJ	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Naphthalene	ND	ND	ND	ND	ND	--
2-Methylnaphthalene	22	ND	ND	ND	20	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**59**	**72**	**0.43**	**39**	**51**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 1 B

AREA 1 - SUBAREA A
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA1/SUB A3/IS-WEST	AREA-1/EAST/ SW-S (resample)	SUBAREA-A2-B	SUBAREA-A2-SW-E	SUBAREA-A2-SW-S	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	1.5	0.17 J	ND	ND	ND	**1**
n-Propylbenzene	1	0.37 J	ND	ND	ND	**1**
n-Butylbenzene	11 J	2.2 J	ND	ND	ND	**1**
p-Xylene	0.12	0.012 1UJ	ND	ND	ND	**1**
m-Xylene	6.3	0.68	ND	ND	ND	**1**
1,3,5-Trimethylbenzene	5.4	0.7 J	ND	ND	ND	**1**
Toluene	1.5	0.036	ND	ND	0.039	**1**
Xylenes, Total	9.6	0.82 J	ND	ND	ND	**1**
sec-Butylbenzene	2.3	0.012 UJ	ND	ND	ND	**1**
Methyl tert butyl ether	ND	0.012 UJ	ND	ND	ND	**1**
Benzene	0.16	0.012 UJ	ND	ND	ND	**1**
o-Xylene	3.3	0.14	ND	ND	ND	**1**
1,2,4-Trimethylbenzene	17	2.2 J	ND	ND	ND	**1**
tert-Butylbenzene	ND	0.012 UJ	ND	ND	ND	**1**
Isopropylbenzene	0.18	0.33 J	ND	ND	ND	**1**
p-Cymene	1	0.012 UJ	ND	ND	ND	**1**
TOTAL VOCs (mg/kg)	**60.36**	**7.718**	**0**	**0**	**0.039**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	--	--	--	**1**
Styrene	--	--	--	--	--	**1**
cis-1,3-Dichloropropene	--	--	--	--	--	**1**
trans-1,3-Dichloropropene	--	--	--	--	--	**1**
n-Propylbenzene	--	--	--	--	--	**1**
n-Butylbenzene	--	--	--	--	--	**1**
1,4-Dichlrobenzene	--	--	--	--	--	**1**
1,2-Dibromoethane	--	--	--	--	--	**1**
1,2-Dichloroethane	--	--	--	--	--	**1**
4-Methyl-2-Pentanone	--	--	--	--	--	**1**
1,3,5-Trimethylbenzene	--	--	--	--	--	**1**
Methylcyclohexane	--	--	--	--	--	**1**
Toluene	--	--	--	--	--	**1**
Chlorobenzene	--	--	--	--	--	**1**
Cyclohexane	--	--	--	--	--	**1**
1,2,4-Trichlorobenzene	--	--	--	--	--	**1**
Dibromochloromethane	--	--	--	--	--	**1**
Tetrachloroethene	--	--	--	--	--	**1**
Xylenes, Total	--	--	--	--	--	**1**
sec-Butylbenzene	--	--	--	--	--	**1**
cis-1,2-Dichloroethene	--	--	--	--	--	**1**
trans-1,2-Dichloroethene	--	--	--	--	--	**1**
Methyl tert butyl ether	--	--	--	--	--	**1**
1,3-Dichlrobenzene	--	--	--	--	--	**1**
Carbon Tetrachloride	--	--	--	--	--	**1**
2-Hexanone	--	--	--	--	--	**1**
Acetone	--	--	--	--	--	**1**

TABLE 1 B

AREA 1 - SUBAREA A
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA1/SUB A3/IS-WEST	AREA-1/EAST/ SW-S (resample)	SUBAREA-A2-B	SUBAREA-A2-SW-E	SUBAREA-A2-SW-S	
Chloroform	--	--	--	--	--	**1**
Benzene	--	--	--	--	--	**1**
1,1,1-Trichloroethane	--	--	--	--	--	**1**
Bromomethane	--	--	--	--	--	**1**
Chloromethane	--	--	--	--	--	**1**
Chloroethane	--	--	--	--	--	**1**
Vinyl chloride	--	--	--	--	--	**1**
Methylene chloride	--	--	--	--	--	**1**
Carbon Disulfide	--	--	--	--	--	**1**
Bromoform	--	--	--	--	--	**1**
Bromodichloromethane	--	--	--	--	--	**1**
1,1-Dichloroethane	--	--	--	--	--	**1**
1,1-Dichloroethene	--	--	--	--	--	**1**
Trichlorofluoromethane	--	--	--	--	--	**1**
Dichlorodifluoromethane	--	--	--	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--	--	**1**
1,2-Dichlropropane	--	--	--	--	--	**1**
2-Butanone	--	--	--	--	--	**1**
1,1,2-Trichloroethane	--	--	--	--	--	**1**
Trichloroethene	--	--	--	--	--	**1**
Methyl acetate	--	--	--	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	--	--	--	**1**
1,2-Dichlrobenzene	--	--	--	--	--	**1**
1,2,4-Trimethylbenzene	--	--	--	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	--	--	--	**1**
tert-Butylbenzene	--	--	--	--	--	**1**
Isopropylbenzene	--	--	--	--	--	**1**
p-Cymene	--	--	--	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	ND	ND	ND	ND	ND	**--**
Benzyl alcohol	ND	ND	ND	ND	ND	**--**
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	**--**
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	**--**
4-Chloroaniline	ND	ND	ND	ND	ND	**--**
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	**--**
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	**--**
Di-n-octyl phthalate	ND	ND	ND	ND	ND	**--**
Hexachlorobenzene	ND	ND	ND	ND	ND	**--**
Anthracene	ND	ND	ND	ND	ND	**--**
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	**--**
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	**--**
Pyrene	21	ND	ND	ND	ND	**--**
Dimethyl phthalate	ND	ND	ND	ND	ND	**--**

TABLE 1 B

AREA 1 - SUBAREA A
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA1/SUB A3/IS-WEST	AREA-1/EAST/ SW-S (resample)	SUBAREA-A2-B	SUBAREA-A2-SW-E	SUBAREA-A2-SW-S	
Dibenzofuran	ND	ND	ND	ND	ND	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	--
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	--
Fluoranthene	ND	1.7 J	ND	ND	ND	--
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	--
Acenaphthylene	ND	ND	ND	ND	ND	--
Chrysene	ND	ND	ND	ND	ND	--
Benzo(a)pyrene	ND	ND	ND	ND	ND	--
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	ND	ND	ND	ND	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Benzoic acid	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	40 UJ	ND	0.4 UJ	0.41 UJ	0.42 UJ	--
Isophorone	ND	ND	ND	ND	ND	--
Acenaphthene	18 J	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Phenanthrene	87	4.1	ND	ND	ND	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	--
Fluorene	30	ND	ND	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Naphthalene	ND	ND	ND	ND	ND	--
2-Methylnaphthalene	200	1.8 J	ND	ND	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**396**	**7.6**	**0.4**	**0.41**	**0.42**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 1 C

AREA 1 - SUBAREA A
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA 1/SUBAREA A/NATIVE	SUBAREA-A2-SW-W	A1-SUBAREA A-B	A1-SUBAREA A-SW-W		
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	1.3	ND	ND	ND		**1**
n-Propylbenzene	1.4	ND	ND	ND		**1**
n-Butylbenzene	7.2	ND	ND	ND		**1**
p-Xylene	0.049	ND	ND	ND		**1**
m-Xylene	2	ND	ND	ND		**1**
1,3,5-Trimethylbenzene	2.3	ND	ND	ND		**1**
Toluene	ND	ND	ND	ND		**1**
Xylenes, Total	2	ND	ND	ND		**1**
sec-Butylbenzene	4.8	ND	ND	ND		**1**
Methyl tert butyl ether	ND	ND	ND	ND		**1**
Benzene	ND	ND	ND	ND		**1**
o-Xylene	ND	ND	ND	ND		**1**
1,2,4-Trimethylbenzene	8	ND	ND	ND		**1**
tert-Butylbenzene	ND	ND	ND	ND		**1**
Isopropylbenzene	1.2	ND	ND	ND		**1**
p-Cymene	2	ND	ND	ND		**1**
TOTAL VOCs (mg/kg)	**32.249**	**0**	**0**	**0**	**0**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	--	--	--	**1**
Styrene	--	--	--	--	--	**1**
cis-1,3-Dichloropropene	--	--	--	--	--	**1**
trans-1,3-Dichloropropene	--	--	--	--	--	**1**
n-Propylbenzene	--	--	--	--	--	**1**
n-Butylbenzene	--	--	--	--	--	**1**
1,4-Dichlrobenzene	--	--	--	--	--	**1**
1,2-Dibromoethane	--	--	--	--	--	**1**
1,2-Dichloroethane	--	--	--	--	--	**1**
4-Methyl-2-Pentanone	--	--	--	--	--	**1**
1,3,5-Trimethylbenzene	--	--	--	--	--	**1**
Methylcyclohexane	--	--	--	--	--	**1**
Toluene	--	--	--	--	--	**1**
Chlorobenzene	--	--	--	--	--	**1**
Cyclohexane	--	--	--	--	--	**1**
1,2,4-Trichlorobenzene	--	--	--	--	--	**1**
Dibromochloromethane	--	--	--	--	--	**1**
Tetrachloroethene	--	--	--	--	--	**1**
Xylenes, Total	--	--	--	--	--	**1**
sec-Butylbenzene	--	--	--	--	--	**1**
cis-1,2-Dichloroethene	--	--	--	--	--	**1**
trans-1,2-Dichloroethene	--	--	--	--	--	**1**
Methyl tert butyl ether	--	--	--	--	--	**1**
1,3-Dichlrobenzene	--	--	--	--	--	**1**
Carbon Tetrachloride	--	--	--	--	--	**1**
2-Hexanone	--	--	--	--	--	**1**
Acetone	--	--	--	--	--	**1**

TABLE 1 C

AREA 1 - SUBAREA A
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA 1/SUBAREA A/NATIVE	SUBAREA-A2-SW-W	A1-SUBAREA A-B	A1-SUBAREA A-SW-W		
Chloroform	--	--	--	--	--	**1**
Benzene	--	--	--	--	--	**1**
1,1,1-Trichloroethane	--	--	--	--	--	**1**
Bromomethane	--	--	--	--	--	**1**
Chloromethane	--	--	--	--	--	**1**
Chloroethane	--	--	--	--	--	**1**
Vinyl chloride	--	--	--	--	--	**1**
Methylene chloride	--	--	--	--	--	**1**
Carbon Disulfide	--	--	--	--	--	**1**
Bromoform	--	--	--	--	--	**1**
Bromodichloromethane	--	--	--	--	--	**1**
1,1-Dichloroethane	--	--	--	--	--	**1**
1,1-Dichloroethene	--	--	--	--	--	**1**
Trichlorofluoromethane	--	--	--	--	--	**1**
Dichlorodifluoromethane	--	--	--	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--	--	**1**
1,2-Dichlropropane	--	--	--	--	--	**1**
2-Butanone	--	--	--	--	--	**1**
1,1,2-Trichloroethane	--	--	--	--	--	**1**
Trichloroethene	--	--	--	--	--	**1**
Methyl acetate	--	--	--	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	--	--	--	**1**
1,2-Dichlrobenzene	--	--	--	--	--	**1**
1,2,4-Trimethylbenzene	--	--	--	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	--	--	--	**1**
tert-Butylbenzene	--	--	--	--	--	**1**
Isopropylbenzene	--	--	--	--	--	**1**
p-Cymene	--	--	--	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	ND	ND	ND	ND		**--**
Benzyl alcohol	ND	ND	ND	ND		**--**
4-Bromophenyl phenyl ether	ND	ND	ND	ND		**--**
1,4-Dichlrobenzene	ND	ND	ND	ND		**--**
4-Chloroaniline	ND	ND	ND	ND		**--**
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND		**--**
Bis(2-chloroethyl) ether	ND	ND	ND	ND		**--**
Bis(2-chloroethoxy) methane	ND	ND	ND	ND		**--**
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND		**--**
Di-n-octyl phthalate	ND	ND	ND	ND		**--**
Hexachlorobenzene	ND	ND	ND	ND		**--**
Anthracene	ND	ND	ND	ND		**--**
1,2,4-Trichlorobenzene	ND	ND	ND	ND		**--**
2,4-Dinitrotoluene	ND	ND	ND	ND		**--**
Pyrene	ND	ND	ND	ND		**--**
Dimethyl phthalate	ND	ND	ND	ND		**--**

TABLE 1 C

AREA 1 - SUBAREA A
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA 1/SUBAREA A/NATIVE	SUBAREA-A2-SW-W	A1-SUBAREA A-B	A1-SUBAREA A-SW-W		
Dibenzofuran	ND	ND	ND	ND		--
Benzo(g,h,i)perylene	ND	ND	ND	ND		--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND		--
Benzo(b)fluoranthene	ND	ND	ND	ND		--
Fluoranthene	ND	ND	ND	ND		--
Benzo(k)fluoranthene	ND	ND	ND	ND		--
Acenaphthylene	ND	ND	ND	ND		--
Chrysene	ND	ND	ND	ND		--
Benzo(a)pyrene	ND	ND	ND	ND		--
Dibenzo(a,h)anthracene	ND	ND	ND	ND		--
1,3-Dichlrobenzene	ND	ND	ND	ND		--
Benzo(a)anthracene	ND	ND	ND	ND		--
2,6-Dinitrotoluene	ND	ND	ND	ND		--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND		--
Benzoic acid	ND	ND	ND	ND		--
Hexachloroethane	ND	ND	ND	ND		--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND		--
Hexachlorocyclopentadiene	ND	0.41 UJ	ND	ND		--
Isophorone	ND	ND	ND	ND		--
Acenaphthene	ND	ND	ND	ND		--
Diethyl phthalate	ND	ND	ND	ND		--
Di-n-butyl phthalate	ND	ND	ND	ND		--
Phenanthrene	ND	ND	ND	ND		--
Butyl benzyl phthalate	ND	ND	ND	ND		--
N-Nitrosodiphenylamine	ND	ND	ND	ND		--
Fluorene	ND	ND	ND	ND		--
Hexachlorobutadiene	ND	ND	ND	ND		--
2-Nitroaniline	ND	ND	ND	ND		--
Naphthalene	ND	ND	ND	ND		--
2-Methylnaphthalene	ND	ND	ND	ND		--
2-Chloronaphthalene	ND	ND	ND	ND		--
3,3'-Dichlorobenzidine	ND	ND	ND	ND		--
1,2-Dichlorobenzene	ND	ND	ND	ND		--
Nitrobenzene	ND	ND	ND	ND		--
3-Nitroaniline	ND	ND	ND	ND		--
TOTAL SVOCs (mg/kg)	**0**	**0.41**	**0**	**0**	**0**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 2

AREA 1 - SUBAREA D
VERFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-SUBAREAD-B	A1-SUBAREAD-SW-N	A1-SUBAREAD-SW-S	A1-SUBAREAD-SW-E	A1-SUBAREAD-SW-W	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	0.34	ND	--	ND	ND	**1**
n-Propylbenzene	0.04	ND	--	ND	ND	**1**
n-Butylbenzene	25	ND	--	0.034	ND	**1**
p-Xylene	25	ND	--	ND	ND	**1**
m-Xylene	7.2	ND	--	ND	ND	**1**
1,3,5-Trimethylbenzene	0.05	ND	--	ND	ND	**1**
Toluene	0.15	ND	--	ND	ND	**1**
Xylenes, Total	7.3	ND	--	ND	ND	**1**
sec-Butylbenzene	25	ND	--	ND	ND	**1**
Methyl tert butyl ether	0.078	ND	--	ND	ND	**1**
Benzene	5.4	ND	--	ND	ND	**1**
o-Xylene	0.17	ND	--	ND	ND	**1**
1,2,4-Trimethylbenzene	0.7	ND	--	0.014	ND	**1**
tert-Butylbenzene	25	ND	--	ND	ND	**1**
Isopropylbenzene	0.1	ND	--	ND	ND	**1**
p-Cymene	25	ND	--	ND	ND	**1**
TOTAL VOCs (mg/kg)	**146.528**	**0**	**0**	**0.048**	**0**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	ND	--	--	**1**
Styrene	--	--	ND	--	--	**1**
cis-1,3-Dichloropropene	--	--	ND	--	--	**1**
trans-1,3-Dichloropropene	--	--	ND	--	--	**1**
n-Propylbenzene	--	--	ND	--	--	**1**
n-Butylbenzene	--	--	ND	--	--	**1**
1,4-Dichlrobenzene	--	--	ND	--	--	**1**
1,2-Dibromoethane	--	--	ND	--	--	**1**
1,2-Dichloroethane	--	--	ND	--	--	**1**
4-Methyl-2-Pentanone	--	--	ND	--	--	**1**
1,3,5-Trimethylbenzene	--	--	ND	--	--	**1**
Methylcyclohexane	--	--	ND	--	--	**1**
Toluene	--	--	ND	--	--	**1**
Chlorobenzene	--	--	ND	--	--	**1**
Cyclohexane	--	--	ND	--	--	**1**
1,2,4-Trichlorobenzene	--	--	ND	--	--	**1**
Dibromochloromethane	--	--	ND	--	--	**1**
Tetrachloroethene	--	--	ND	--	--	**1**
Xylenes, Total	--	--	ND	--	--	**1**
sec-Butylbenzene	--	--	ND	--	--	**1**
cis-1,2-Dichloroethene	--	--	ND	--	--	**1**
trans-1,2-Dichloroethene	--	--	ND	--	--	**1**
Methyl tert butyl ether	--	--	ND	--	--	**1**
1,3-Dichlrobenzene	--	--	ND	--	--	**1**
Carbon Tetrachloride	--	--	ND	--	--	**1**
2-Hexanone	--	--	ND	--	--	**1**
Acetone	--	--	0.008 J	--	--	**1**

TABLE 2

AREA 1 - SUBAREA D
VERFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-SUBAREAD-B	A1-SUBAREAD-SW-N	A1-SUBAREAD-SW-S	A1-SUBAREAD-SW-E	A1-SUBAREAD-SW-W	
Chloroform	--	--	ND	--	--	**1**
Benzene	--	--	ND	--	--	**1**
1,1,1-Trichloroethane	--	--	ND	--	--	**1**
Bromomethane	--	--	ND	--	--	**1**
Chloromethane	--	--	ND	--	--	**1**
Chloroethane	--	--	ND	--	--	**1**
Vinyl chloride	--	--	ND	--	--	**1**
Methylene chloride	--	--	0.019 U	--	--	**1**
Carbon Disulfide	--	--	ND	--	--	**1**
Bromoform	--	--	ND	--	--	**1**
Bromodichloromethane	--	--	ND	--	--	**1**
1,1-Dichloroethane	--	--	ND	--	--	**1**
1,1-Dichloroethene	--	--	ND	--	--	**1**
Trichlorofluoromethane	--	--	ND	--	--	**1**
Dichlorodifluoromethane	--	--	ND	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	ND	--	--	**1**
1,2-Dichlropropane	--	--	ND	--	--	**1**
2-Butanone	--	--	ND	--	--	**1**
1,1,2-Trichloroethane	--	--	ND	--	--	**1**
Trichloroethene	--	--	ND	--	--	**1**
Methyl acetate	--	--	ND	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	ND	--	--	**1**
1,2-Dichlrobenzene	--	--	ND	--	--	**1**
1,2,4-Trimethylbenzene	--	--	ND	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	ND	--	--	**1**
tert-Butylbenzene	--	--	ND	--	--	**1**
Isopropylbenzene	--	--	ND	--	--	**1**
p-Cymene	--	--	ND	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0.027**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	--	--	--	--	--	**--**
Benzyl alcohol	--	--	--	--	--	**--**
4-Bromophenyl phenyl ether	--	--	--	--	--	**--**
1,4-Dichlrobenzene	--	--	--	--	--	**--**
4-Chloroaniline	--	--	--	--	--	**--**
2,2'-Oxybis (1-Chloropropane)	--	--	--	--	--	**--**
Bis(2-chloroethyl) ether	--	--	--	--	--	**--**
Bis(2-chloroethoxy) methane	--	--	--	--	--	**--**
Bis(2-ethylhexyl) phthalate	--	--	--	--	--	**--**
Di-n-octyl phthalate	--	--	--	--	--	**--**
Hexachlorobenzene	--	--	--	--	--	**--**
Anthracene	--	--	--	--	--	**--**
1,2,4-Trichlorobenzene	--	--	--	--	--	**--**
2,4-Dinitrotoluene	--	--	--	--	--	**--**
Pyrene	--	--	--	--	--	**--**
Dimethyl phthalate	--	--	--	--	--	**--**

TABLE 2

AREA 1 - SUBAREA D
VERFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-SUBAREAD-B	A1-SUBAREAD-SW-N	A1-SUBAREAD-SW-S	A1-SUBAREAD-SW-E	A1-SUBAREAD-SW-W	
Dibenzofuran	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--
Benzo(a)pyrene	--	--	--	--	--	--
Dibenzo(a,h)anthracene	--	--	--	--	--	--
1,3-Dichlrobenzene	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--
2,6-Dinitrotoluene	--	--	--	--	--	--
N-Nitroso-Di-n-propylamine	--	--	--	--	--	--
Benzoic acid	--	--	--	--	--	--
Hexachloroethane	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	--	--	--	--	--	--
Hexachlorocyclopentadiene	--	--	--	--	--	--
Isophorone	--	--	--	--	--	--
Acenaphthene	--	--	--	--	--	--
Diethyl phthalate	--	--	--	--	--	--
Di-n-butyl phthalate	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--
Butyl benzyl phthalate	--	--	--	--	--	--
N-Nitrosodiphenylamine	--	--	--	--	--	--
Fluorene	--	--	--	--	--	--
Hexachlorobutadiene	--	--	--	--	--	--
2-Nitroaniline	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--
2-Chloronaphthalene	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	--	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	--	--
Nitrobenzene	--	--	--	--	--	--
3-Nitroaniline	--	--	--	--	--	--
TOTAL SVOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**500**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	ND	ND	ND	ND	ND	--
Benzaldehyde	ND	ND	ND	ND	ND	--
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	--
Caprolactam	ND	ND	ND	ND	ND	--
4-Chloroaniline	ND	ND	ND	ND	ND	--
2,2'-Oxybis(1-Chloropropane)	ND	ND	ND	ND	ND	--
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	--
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	--
Bis(2-ethylhexyl) phthalate	0.3	0.25 J	0.65	0.7	0.2 J	--

TABLE 2

AREA 1 - SUBAREA D
VERFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-SUBAREAD-B	A1-SUBAREAD-SW-N	A1-SUBAREAD-SW-S	A1-SUBAREAD-SW-E	A1-SUBAREAD-SW-W	
Di-n-octyl phthalate	ND	ND	ND	0.019 J	ND	--
Hexachlorobenzene	ND	ND	ND	ND	ND	--
Anthracene	ND	ND	ND	0.033 J	ND	--
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	--
Pyrene	ND	ND	0.013 J	0.2 J	ND	--
Dimethyl phthalate	ND	ND	ND	ND	ND	--
Dibenzofuran	ND	ND	ND	ND	ND	--
Benzo(ghi)perylene	ND	ND	ND	0.076 J	ND	--
Atrazine	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	0.078 J	ND	--
Benzo(b)fluoranthene	ND	ND	ND	0.12 J	ND	--
Fluoranthene	ND	ND	0.017 J	0.24 J	ND	--
Benzo(k)fluoranthene	ND	ND	ND	0.11 J	ND	--
Acenaphthylene	ND	ND	ND	ND	ND	--
Chrysene	ND	ND	ND	0.12 J	ND	--
Benzo(a)pyrene	0.073	0.097 J	ND	0.13 J	ND	--
Dibenzo(a,h)anthracene	ND	ND	ND	0.028 J	ND	--
Benzo(a)anthracene	ND	ND	ND	0.13 J	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	--
Isophorone	ND	ND	ND	ND	ND	--
Acenaphthene	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Phenanthrene	ND	ND	0.027 J	0.12 J	ND	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
N-nitrosodiphenylamine	ND	ND	ND	ND	ND	--
Fluorene	ND	ND	ND	ND	ND	--
Carbazole	ND	ND	ND	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Naphthalene	0.023	ND	ND	ND	ND	--
2-Methylnaphthalene	ND	ND	ND	0.012 J	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
Acetophenone	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**0.396**	**0.347**	**0.707**	**2.116**	**0.2**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.

TABLE 2

AREA 1 - SUBAREA D
VERFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-SUBAREAD-B	A1-SUBAREAD-SW-N	A1-SUBAREAD-SW-S	A1-SUBAREAD-SW-E	A1-SUBAREAD-SW-W	

4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 3 A

AREA 1 - SUBAREA T-3
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-T3-B-Tank Loc	A1-T3-SW-E-Tank Loc	A1-T3-SW-N-Tank Loc	A1-T3-SW-S-Tank Loc	A1-T3-SW-W-Tank Loc	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	ND	ND	ND	ND	ND	**1**
n-Propylbenzene	ND	ND	ND	ND	ND	**1**
n-Butylbenzene	ND	ND	ND	ND	ND	**1**
p-Xylene	ND	ND	ND	ND	ND	**1**
m-Xylene	ND	ND	ND	ND	ND	**1**
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	**1**
Toluene	ND	ND	ND	ND	ND	**1**
Xylenes, Total	ND	ND	ND	ND	ND	**1**
sec-Butylbenzene	ND	ND	ND	ND	ND	**1**
Methyl tert butyl ether	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.015 UJ	**1**
Benzene	ND	ND	ND	ND	ND	**1**
o-Xylene	ND	ND	ND	ND	ND	**1**
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	**1**
tert-Butylbenzene	ND	ND	ND	ND	ND	**1**
Isopropylbenzene	ND	ND	ND	ND	ND	**1**
p-Cymene	ND	ND	ND	ND	ND	**1**
TOTAL VOCs (mg/kg)	**0.013**	**0.013**	**0.013**	**0.013**	**0.015**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	--	--	--	**1**
Styrene	--	--	--	--	--	**1**
cis-1,3-Dichloropropene	--	--	--	--	--	**1**
trans-1,3-Dichloropropene	--	--	--	--	--	**1**
n-Propylbenzene	--	--	--	--	--	**1**
n-Butylbenzene	--	--	--	--	--	**1**
1,4-Dichlrobenzene	--	--	--	--	--	**1**
1,2-Dibromoethane	--	--	--	--	--	**1**
1,2-Dichloroethane	--	--	--	--	--	**1**
4-Methyl-2-Pentanone	--	--	--	--	--	**1**
1,3,5-Trimethylbenzene	--	--	--	--	--	**1**
Methylcyclohexane	--	--	--	--	--	**1**
Toluene	--	--	--	--	--	**1**
Chlorobenzene	--	--	--	--	--	**1**
Cyclohexane	--	--	--	--	--	**1**
1,2,4-Trichlorobenzene	--	--	--	--	--	**1**
Dibromochloromethane	--	--	--	--	--	**1**
Tetrachloroethene	--	--	--	--	--	**1**
Xylenes, Total	--	--	--	--	--	**1**
sec-Butylbenzene	--	--	--	--	--	**1**
cis-1,2-Dichloroethene	--	--	--	--	--	**1**
trans-1,2-Dichloroethene	--	--	--	--	--	**1**
Methyl tert butyl ether	--	--	--	--	--	**1**
1,3-Dichlrobenzene	--	--	--	--	--	**1**
Carbon Tetrachloride	--	--	--	--	--	**1**
2-Hexanone	--	--	--	--	--	**1**
Acetone	--	--	--	--	--	**1**

TABLE 3 A

AREA 1 - SUBAREA T-3
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-T3-B- Tank Loc	A1-T3-SW-E- Tank Loc	A1-T3-SW-N- Tank Loc	A1-T3-SW-S- Tank Loc	A1-T3-SW-W- Tank Loc	
Chloroform	--	--	--	--	--	**1**
Benzene	--	--	--	--	--	**1**
1,1,1-Trichloroethane	--	--	--	--	--	**1**
Bromomethane	--	--	--	--	--	**1**
Chloromethane	--	--	--	--	--	**1**
Chloroethane	--	--	--	--	--	**1**
Vinyl chloride	--	--	--	--	--	**1**
Methylene chloride	--	--	--	--	--	**1**
Carbon Disulfide	--	--	--	--	--	**1**
Bromoform	--	--	--	--	--	**1**
Bromodichloromethane	--	--	--	--	--	**1**
1,1-Dichloroethane	--	--	--	--	--	**1**
1,1-Dichloroethene	--	--	--	--	--	**1**
Trichlorofluoromethane	--	--	--	--	--	**1**
Dichlorodifluoromethane	--	--	--	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--	--	**1**
1,2-Dichlropropane	--	--	--	--	--	**1**
2-Butanone	--	--	--	--	--	**1**
1,1,2-Trichloroethane	--	--	--	--	--	**1**
Trichloroethene	--	--	--	--	--	**1**
Methyl acetate	--	--	--	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	--	--	--	**1**
1,2-Dichlrobenzene	--	--	--	--	--	**1**
1,2,4-Trimethylbenzene	--	--	--	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	--	--	--	**1**
tert-Butylbenzene	--	--	--	--	--	**1**
Isopropylbenzene	--	--	--	--	--	**1**
p-Cymene	--	--	--	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	ND	ND	ND	ND	ND	**--**
Benzyl alcohol	ND	ND	ND	ND	ND	**--**
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	**--**
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	**--**
4-Chloroaniline	ND	ND	ND	ND	ND	**--**
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	**--**
Bis(2-ethylhexyl) phthalate	1.7	0.83	1.1	1	ND	**--**
Di-n-octyl phthalate	ND	ND	ND	ND	ND	**--**
Hexachlorobenzene	ND	ND	ND	ND	ND	**--**
Anthracene	ND	ND	ND	ND	ND	**--**
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	**--**
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	**--**
Pyrene	ND	ND	ND	ND	ND	**--**
Dimethyl phthalate	ND	ND	ND	ND	ND	**--**

TABLE 3 A

AREA 1 - SUBAREA T-3
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-T3-B- Tank Loc	A1-T3-SW-E- Tank Loc	A1-T3-SW-N- Tank Loc	A1-T3-SW-S- Tank Loc	A1-T3-SW-W- Tank Loc	
Dibenzofuran	ND	ND	ND	ND	ND	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	--
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	--
Fluoranthene	ND	ND	ND	ND	ND	--
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	--
Acenaphthylene	ND	ND	ND	ND	ND	--
Chrysene	ND	ND	ND	ND	ND	--
Benzo(a)pyrene	ND	ND	ND	ND	ND	--
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	ND	ND	ND	ND	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Benzoic acid	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	--
Isophorone	ND	ND	ND	ND	ND	--
Acenaphthene	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Phenanthrene	ND	ND	ND	ND	ND	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	--
Fluorene	ND	ND	ND	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Naphthalene	ND	ND	ND	ND	ND	--
2-Methylnaphthalene	ND	ND	ND	ND	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**1.7**	**0.83**	**1.1**	**1**	**0**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 3 B

AREA 1 - SUBAREA T-3
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-T3-B	A1-T3-SW-E	A1-T3-SW-S	A1-T3-SW-N	A1-T3-SW-W	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	ND	ND	ND	--	ND	**1**
n-Propylbenzene	ND	ND	ND	--	ND	**1**
n-Butylbenzene	ND	ND	ND	--	ND	**1**
p-Xylene	ND	ND	ND	--	ND	**1**
m-Xylene	ND	ND	ND	--	ND	**1**
1,3,5-Trimethylbenzene	ND	ND	ND	--	ND	**1**
Toluene	ND	ND	ND	--	ND	**1**
Xylenes, Total	ND	ND	ND	--	ND	**1**
sec-Butylbenzene	ND	ND	ND	--	ND	**1**
Methyl tert butyl ether	0.013 UJ	0.015 UJ	0.013 UJ	--	0.015 UJ	**1**
Benzene	ND	ND	ND	--	ND	**1**
o-Xylene	ND	ND	ND	--	ND	**1**
1,2,4-Trimethylbenzene	ND	ND	ND	--	ND	**1**
tert-Butylbenzene	ND	ND	ND	--	ND	**1**
Isopropylbenzene	ND	ND	ND	--	ND	**1**
p-Cymene	ND	ND	ND	--	ND	**1**
TOTAL VOCs (mg/kg)	**0.013**	**0.015**	**0.013**	**0**	**0.015**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	--	ND	--	**1**
Styrene	--	--	--	ND	--	**1**
cis-1,3-Dichloropropene	--	--	--	ND	--	**1**
trans-1,3-Dichloropropene	--	--	--	ND	--	**1**
n-Propylbenzene	--	--	--	ND	--	**1**
n-Butylbenzene	--	--	--	ND	--	**1**
1,4-Dichlrobenzene	--	--	--	ND	--	**1**
1,2-Dibromoethane	--	--	--	ND	--	**1**
1,2-Dichloroethane	--	--	--	ND	--	**1**
4-Methyl-2-Pentanone	--	--	--	ND	--	**1**
1,3,5-Trimethylbenzene	--	--	--	ND	--	**1**
Methylcyclohexane	--	--	--	ND	--	**1**
Toluene	--	--	--	ND	--	**1**
Chlorobenzene	--	--	--	ND	--	**1**
Cyclohexane	--	--	--	ND	--	**1**
1,2,4-Trichlorobenzene	--	--	--	ND	--	**1**
Dibromochloromethane	--	--	--	ND	--	**1**
Tetrachloroethene	--	--	--	ND	--	**1**
Xylenes, Total	--	--	--	ND	--	**1**
sec-Butylbenzene	--	--	--	ND	--	**1**
cis-1,2-Dichloroethene	--	--	--	ND	--	**1**
trans-1,2-Dichloroethene	--	--	--	ND	--	**1**
Methyl tert butyl ether	--	--	--	ND	--	**1**
1,3-Dichlrobenzene	--	--	--	ND	--	**1**
Carbon Tetrachloride	--	--	--	ND	--	**1**
2-Hexanone	--	--	--	ND	--	**1**
Acetone	--	--	--	0.12	--	**1**

TABLE 3 B

AREA 1 - SUBAREA T-3
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-T3-B	A1-T3-SW-E	A1-T3-SW-S	A1-T3-SW-N	A1-T3-SW-W	
Chloroform	--	--	--	ND	--	**1**
Benzene	--	--	--	ND	--	**1**
1,1,1-Trichloroethane	--	--	--	ND	--	**1**
Bromomethane	--	--	--	ND	--	**1**
Chloromethane	--	--	--	ND	--	**1**
Chloroethane	--	--	--	ND	--	**1**
Vinyl chloride	--	--	--	ND	--	**1**
Methylene chloride	--	--	--	0.015 U	--	**1**
Carbon Disulfide	--	--	--	ND	--	**1**
Bromoform	--	--	--	ND	--	**1**
Bromodichloromethane	--	--	--	ND	--	**1**
1,1-Dichloroethane	--	--	--	ND	--	**1**
1,1-Dichloroethene	--	--	--	ND	--	**1**
Trichlorofluoromethane	--	--	--	ND	--	**1**
Dichlorodifluoromethane	--	--	--	ND	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	ND	--	**1**
1,2-Dichlropropane	--	--	--	ND	--	**1**
2-Butanone	--	--	--	0.012	--	**1**
1,1,2-Trichloroethane	--	--	--	ND	--	**1**
Trichloroethene	--	--	--	ND	--	**1**
Methyl acetate	--	--	--	ND	--	**1**
1,1,2,2-Tetrachloroethane	--	--	--	ND	--	**1**
1,2-Dichlrobenzene	--	--	--	ND	--	**1**
1,2,4-Trimethylbenzene	--	--	--	ND	--	**1**
1,2-Dibromo-3-chloropropane	--	--	--	ND	--	**1**
tert-Butylbenzene	--	--	--	ND	--	**1**
Isopropylbenzene	--	--	--	ND	--	**1**
p-Cymene	--	--	--	ND	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0.147**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	ND	ND	ND	ND	ND	**--**
Benzyl alcohol	ND	ND	ND	ND	ND	**--**
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	**--**
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	**--**
4-Chloroaniline	ND	ND	ND	ND	ND	**--**
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	**--**
Bis(2-ethylhexyl) phthalate	2.7	0.83	1.7	4.2	0.52	**--**
Di-n-octyl phthalate	ND	ND	ND	ND	ND	**--**
Hexachlorobenzene	ND	ND	ND	ND	ND	**--**
Anthracene	ND	ND	ND	ND	ND	**--**
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	**--**
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	**--**
Pyrene	ND	ND	ND	ND	ND	**--**
Dimethyl phthalate	ND	ND	ND	ND	ND	**--**

TABLE 3 B

AREA 1 - SUBAREA T-3
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-T3-B	A1-T3-SW-E	A1-T3-SW-S	A1-T3-SW-N	A1-T3-SW-W	
Dibenzofuran	ND	ND	ND	ND	ND	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	--
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	--
Fluoranthene	ND	ND	ND	ND	ND	--
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	--
Acenaphthylene	ND	ND	ND	ND	ND	--
Chrysene	ND	ND	ND	ND	ND	--
Benzo(a)pyrene	ND	ND	ND	ND	ND	--
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	ND	ND	ND	ND	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Benzoic acid	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	--
Isophorone	ND	ND	ND	ND	ND	--
Acenaphthene	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Phenanthrene	ND	ND	ND	ND	ND	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	--
Fluorene	ND	ND	ND	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Naphthalene	ND	ND	ND	ND	ND	--
2-Methylnaphthalene	ND	ND	ND	ND	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**2.7**	**0.83**	**1.7**	**4.2**	**0.52**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 3 C

AREA 1 - SUBAREA T-3
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-T3 TANKWATER					
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	ND					1
n-Propylbenzene	ND					1
n-Butylbenzene	0.0085					1
p-Xylene	0.0004					1
m-Xylene	0.0052					1
1,3,5-Trimethylbenzene	0.0033					1
Toluene	0.0069					1
Xylenes, Total	0.0078					1
sec-Butylbenzene	0.0035					1
Methyl tert butyl ether	ND					1
Benzene	ND					1
o-Xylene	0.0026					1
1,2,4-Trimethylbenzene	0.012					1
tert-Butylbenzene	0.0063					1
Isopropylbenzene	ND					1
p-Cymene	0.006					1
TOTAL VOCs (mg/kg)	**0.0625**	**0**	**0**	**0**	**0**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	--	--	--	1
Styrene	--	--	--	--	--	1
cis-1,3-Dichloropropene	--	--	--	--	--	1
trans-1,3-Dichloropropene	--	--	--	--	--	1
n-Propylbenzene	--	--	--	--	--	1
n-Butylbenzene	--	--	--	--	--	1
1,4-Dichlrobenzene	--	--	--	--	--	1
1,2-Dibromoethane	--	--	--	--	--	1
1,2-Dichloroethane	--	--	--	--	--	1
4-Methyl-2-Pentanone	--	--	--	--	--	1
1,3,5-Trimethylbenzene	--	--	--	--	--	1
Methylcyclohexane	--	--	--	--	--	1
Toluene	--	--	--	--	--	1
Chlorobenzene	--	--	--	--	--	1
Cyclohexane	--	--	--	--	--	1
1,2,4-Trichlorobenzene	--	--	--	--	--	1
Dibromochloromethane	--	--	--	--	--	1
Tetrachloroethene	--	--	--	--	--	1
Xylenes, Total	--	--	--	--	--	1
sec-Butylbenzene	--	--	--	--	--	1
cis-1,2-Dichloroethene	--	--	--	--	--	1
trans-1,2-Dichloroethene	--	--	--	--	--	1
Methyl tert butyl ether	--	--	--	--	--	1
1,3-Dichlrobenzene	--	--	--	--	--	1
Carbon Tetrachloride	--	--	--	--	--	1
2-Hexanone	--	--	--	--	--	1
Acetone	--	--	--	--	--	1

TABLE 3 C

AREA 1 - SUBAREA T-3
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-T3 TANKWATER					
Chloroform	--	--	--	--	--	**1**
Benzene	--	--	--	--	--	**1**
1,1,1-Trichloroethane	--	--	--	--	--	**1**
Bromomethane	--	--	--	--	--	**1**
Chloromethane	--	--	--	--	--	**1**
Chloroethane	--	--	--	--	--	**1**
Vinyl chloride	--	--	--	--	--	**1**
Methylene chloride	--	--	--	--	--	**1**
Carbon Disulfide	--	--	--	--	--	**1**
Bromoform	--	--	--	--	--	**1**
Bromodichloromethane	--	--	--	--	--	**1**
1,1-Dichloroethane	--	--	--	--	--	**1**
1,1-Dichloroethene	--	--	--	--	--	**1**
Trichlorofluoromethane	--	--	--	--	--	**1**
Dichlorodifluoromethane	--	--	--	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--	--	**1**
1,2-Dichlropropane	--	--	--	--	--	**1**
2-Butanone	--	--	--	--	--	**1**
1,1,2-Trichloroethane	--	--	--	--	--	**1**
Trichloroethene	--	--	--	--	--	**1**
Methyl acetate	--	--	--	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	--	--	--	**1**
1,2-Dichlrobenzene	--	--	--	--	--	**1**
1,2,4-Trimethylbenzene	--	--	--	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	--	--	--	**1**
tert-Butylbenzene	--	--	--	--	--	**1**
Isopropylbenzene	--	--	--	--	--	**1**
p-Cymene	--	--	--	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	--					**--**
Benzyl alcohol	--					**--**
4-Bromophenyl phenyl ether	--					**--**
1,4-Dichlrobenzene	--					**--**
4-Chloroaniline	--					**--**
2,2'-Oxybis (1-Chloropropane)	--					**--**
Bis(2-chloroethyl) ether	--					**--**
Bis(2-chloroethoxy) methane	--					**--**
Bis(2-ethylhexyl) phthalate	--					**--**
Di-n-octyl phthalate	--					**--**
Hexachlorobenzene	--					**--**
Anthracene	--					**--**
1,2,4-Trichlorobenzene	--					**--**
2,4-Dinitrotoluene	--					**--**
Pyrene	--					**--**
Dimethyl phthalate	--					**--**

TABLE 3 C

AREA 1 - SUBAREA T-3
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-T3 TANKWATER					
Dibenzofuran	--					--
Benzo(g,h,i)perylene	--					--
Indeno(1,2,3-cd)pyrene	--					--
Benzo(b)fluoranthene	--					--
Fluoranthene	--					--
Benzo(k)fluoranthene	--					--
Acenaphthylene	--					--
Chrysene	--					--
Benzo(a)pyrene	--					--
Dibenzo(a,h)anthracene	--					--
1,3-Dichlrobenzene	--					--
Benzo(a)anthracene	--					--
2,6-Dinitrotoluene	--					--
N-Nitroso-Di-n-propylamine	--					--
Benzoic acid	--					--
Hexachloroethane	--					--
4-Chlorophenyl phenyl ether	--					--
Hexachlorocyclopentadiene	--					--
Isophorone	--					--
Acenaphthene	--					--
Diethyl phthalate	--					--
Di-n-butyl phthalate	--					--
Phenanthrene	--					--
Butyl benzyl phthalate	--					--
N-Nitrosodiphenylamine	--					--
Fluorene	--					--
Hexachlorobutadiene	--					--
2-Nitroaniline	--					--
Naphthalene	--					--
2-Methylnaphthalene	--					--
2-Chloronaphthalene	--					--
3,3'-Dichlorobenzidine	--					--
1,2-Dichlorobenzene	--					--
Nitrobenzene	--					--
3-Nitroaniline	--					--
TOTAL SVOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 4 A

AREA 1 - SUBAREA K & L
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA1/S-A K&L/BOTTOM	AREA1/SUB-A K&L/SW-E	AREA1/SUB-A K&L/SW-S	A1-SubareaL-S2	A1-SubareaL-B3	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	0.061 J	0.027	0.32 J	ND	0.042	**1**
n-Propylbenzene	0.013 UJ	ND	0.064 J	ND	ND	**1**
n-Butylbenzene	0.013 UJ	ND	0.67 J	ND	ND	**1**
p-Xylene	0.013 1UJ	0.015	0.027	ND	0.014	**1**
m-Xylene	0.04 1J	0.054	0.88 1J	ND	0.21	**1**
1,3,5-Trimethylbenzene	ND	0.026	0.58 J	ND	0.096	**1**
Toluene	0.013 UJ	0.049	0.13 J	ND	ND	**1**
Xylenes, Total	0.04 J	0.086	1.4 J	ND	0.37	**1**
sec-Butylbenzene	0.013 UJ	ND	0.029 J	ND	ND	**1**
Methyl tert butyl ether	0.013 UJ	0.015 UJ	0.027 UJ	ND	ND	**1**
Benzene	0.032 J	0.025	ND	ND	ND	**1**
o-Xylene	0.013 UJ	0.032	0.51 J	ND	0.16	**1**
1,2,4-Trimethylbenzene	0.11 J	0.066	1.7 J	ND	0.19	**1**
tert-Butylbenzene	0.013 UJ	ND	ND	ND	ND	**1**
Isopropylbenzene	0.013 UJ	0.041	0.088 J	ND	ND	**1**
p-Cymene	0.013 UJ	ND	0.22 J	ND	ND	**1**
TOTAL VOCs (mg/kg)	**0.413**	**0.436**	**6.645**	**0**	**1.082**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	--	--	--	**1**
Styrene	--	--	--	--	--	**1**
cis-1,3-Dichloropropene	--	--	--	--	--	**1**
trans-1,3-Dichloropropene	--	--	--	--	--	**1**
n-Propylbenzene	--	--	--	--	--	**1**
n-Butylbenzene	--	--	--	--	--	**1**
1,4-Dichlrobenzene	--	--	--	--	--	**1**
1,2-Dibromoethane	--	--	--	--	--	**1**
1,2-Dichloroethane	--	--	--	--	--	**1**
4-Methyl-2-Pentanone	--	--	--	--	--	**1**
1,3,5-Trimethylbenzene	--	--	--	--	--	**1**
Methylcyclohexane	--	--	--	--	--	**1**
Toluene	--	--	--	--	--	**1**
Chlorobenzene	--	--	--	--	--	**1**
Cyclohexane	--	--	--	--	--	**1**
1,2,4-Trichlorobenzene	--	--	--	--	--	**1**
Dibromochloromethane	--	--	--	--	--	**1**
Tetrachloroethene	--	--	--	--	--	**1**
Xylenes, Total	--	--	--	--	--	**1**
sec-Butylbenzene	--	--	--	--	--	**1**
cis-1,2-Dichloroethene	--	--	--	--	--	**1**
trans-1,2-Dichloroethene	--	--	--	--	--	**1**
Methyl tert butyl ether	--	--	--	--	--	**1**
1,3-Dichlrobenzene	--	--	--	--	--	**1**
Carbon Tetrachloride	--	--	--	--	--	**1**
2-Hexanone	--	--	--	--	--	**1**
Acetone	--	--	--	--	--	**1**

TABLE 4 A

AREA 1 - SUBAREA K & L
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA1/S-A K&L/BOTTOM	AREA1/SUB-A K&L/SW-E	AREA1/SUB-A K&L/SW-S	A1-SubareaL-S2	A1-SubareaL-B3	
Chloroform	--	--	--	--	--	1
Benzene	--	--	--	--	--	1
1,1,1-Trichloroethane	--	--	--	--	--	1
Bromomethane	--	--	--	--	--	1
Chloromethane	--	--	--	--	--	1
Chloroethane	--	--	--	--	--	1
Vinyl chloride	--	--	--	--	--	1
Methylene chloride	--	--	--	--	--	1
Carbon Disulfide	--	--	--	--	--	1
Bromoform	--	--	--	--	--	1
Bromodichloromethane	--	--	--	--	--	1
1,1-Dichloroethane	--	--	--	--	--	1
1,1-Dichloroethene	--	--	--	--	--	1
Trichlorofluoromethane	--	--	--	--	--	1
Dichlorodifluoromethane	--	--	--	--	--	1
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--	--	1
1,2-Dichlropropane	--	--	--	--	--	1
2-Butanone	--	--	--	--	--	1
1,1,2-Trichloroethane	--	--	--	--	--	1
Trichloroethene	--	--	--	--	--	1
Methyl acetate	--	--	--	--	--	1
1,1,2,2-Tetrachloroethane	--	--	--	--	--	1
1,2-Dichlrobenzene	--	--	--	--	--	1
1,2,4-Trimethylbenzene	--	--	--	--	--	1
1,2-Dibromo-3-chloropropane	--	--	--	--	--	1
tert-Butylbenzene	--	--	--	--	--	1
Isopropylbenzene	--	--	--	--	--	1
p-Cymene	--	--	--	--	--	1
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	ND	ND	ND	ND	2.1 UJ	--
Benzyl alcohol	ND	ND	ND	ND	ND	--
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	--
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	--
4-Chloroaniline	ND	ND	ND	ND	ND	--
2,2'-Oxybis (1-Chloropropane)	2.2 UJ	2.2 UJ	4.2 UJ	ND	ND	--
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	--
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	--
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	--
Di-n-octyl phthalate	ND	ND	ND	ND	ND	--
Hexachlorobenzene	ND	ND	ND	ND	ND	--
Anthracene	5.4 J	5.4	13	ND	0.27 J	--
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	--
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	--
Pyrene	8.3 J	7.6	17	2 J	0.65	--
Dimethyl phthalate	ND	ND	ND	ND	ND	--

TABLE 4 A

AREA 1 - SUBAREA K & L
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	AREA1/S-A K&L/BOTTOM	AREA1/SUB-A K&L/SW-E	AREA1/SUB-A K&L/SW-S	A1-SubareaL-S2	A1-SubareaL-B3	
Dibenzofuran	5.8 J	4.8	11	ND	0.19	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	2.2 UJ	ND	ND	ND	0.16 J	--
Benzo(b)fluoranthene	1.5 J	2.1 J	3.1 J	ND	ND	--
Fluoranthene	11 J	10	23	2.3	1	--
Benzo(k)fluoranthene	1.5 J	2.2	3.5 J	ND	ND	--
Acenaphthylene	2.2 UJ	ND	ND	ND	ND	--
Chrysene	2.2 J	2.7	5.4	1.1 J	0.27 J	--
Benzo(a)pyrene	1.4 J	2 J	3.4 J	1.2 J	0.29 J	--
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	2.7 J	3.4	6.5	1.2 J	0.36 J	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Benzoic acid	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	ND	ND	ND	ND	0.44 UJ	--
Isophorone	ND	ND	ND	ND	ND	--
Acenaphthene	6.9 J	5.1	15	ND	0.26	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Phenanthrene	21 J	18	42	1.4 J	1.1	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	--
Fluorene	8.7 J	7.7	18	ND	0.3 J	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Naphthalene	20 J	23	50	ND	1.6	--
2-Methylnaphthalene	ND	4.8	10	ND	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	2.1 UJ	--
TOTAL SVOCs (mg/kg)	**103**	**101**	**225.1**	**9.2**	**11.09**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 4B

AREA 1 - SUBAREA K & L
VERICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1/SUB-A K&L BOTTOM #2	A1/SUB-A K&L SW-N	A1/SUB-A K&L BOTTOM #3	A1/SUB-A K&L SW-E#2	A1/SUB-A K&L SW-S-W. SIDE	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	ND	--	ND	ND	ND	**1**
n-Propylbenzene	ND	--	ND	ND	ND	**1**
n-Butylbenzene	ND	--	0.1	ND	0.025	**1**
p-Xylene	ND	--	0.013	ND	0.013	**1**
m-Xylene	ND	--	0.025	ND	0.015	**1**
1,3,5-Trimethylbenzene	ND	--	0.03	ND	ND	**1**
Toluene	ND	--	0.033	0.037	ND	**1**
Xylenes, Total	ND	--	0.025 J	ND	0.015	**1**
sec-Butylbenzene	ND	--	ND	ND	ND	**1**
Methyl tert butyl ether	ND	--	ND	ND	ND	**1**
Benzene	ND	--	ND	ND	ND	**1**
o-Xylene	ND	--	ND	ND	ND	**1**
1,2,4-Trimethylbenzene	ND	--	0.12	ND	0.018	**1**
tert-Butylbenzene	ND	--	ND	ND	ND	**1**
Isopropylbenzene	ND	--	ND	ND	ND	**1**
p-Cymene	ND	--	ND	ND	ND	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0.346**	**0.037**	**0.086**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	ND	--	--	--	**1**
Styrene	--	ND	--	--	--	**1**
cis-1,3-Dichloropropene	--	ND	--	--	--	**1**
trans-1,3-Dichloropropene	--	ND	--	--	--	**1**
n-Propylbenzene	--	ND	--	--	--	**1**
n-Butylbenzene	--	ND	--	--	--	**1**
1,4-Dichlrobenzene	--	ND	--	--	--	**1**
1,2-Dibromoethane	--	ND	--	--	--	**1**
1,2-Dichloroethane	--	ND	--	--	--	**1**
4-Methyl-2-Pentanone	--	ND	--	--	--	**1**
1,3,5-Trimethylbenzene	--	ND	--	--	--	**1**
Methylcyclohexane	--	ND	--	--	--	**1**
Toluene	--	ND	--	--	--	**1**
Chlorobenzene	--	ND	--	--	--	**1**
Cyclohexane	--	ND	--	--	--	**1**
1,2,4-Trichlorobenzene	--	ND	--	--	--	**1**
Dibromochloromethane	--	ND	--	--	--	**1**
Tetrachloroethene	--	ND	--	--	--	**1**
Xylenes, Total	--	ND	--	--	--	**1**
sec-Butylbenzene	--	ND	--	--	--	**1**
cis-1,2-Dichloroethene	--	ND	--	--	--	**1**
trans-1,2-Dichloroethene	--	ND	--	--	--	**1**
Methyl tert butyl ether	--	ND	--	--	--	**1**
1,3-Dichlrobenzene	--	ND	--	--	--	**1**
Carbon Tetrachloride	--	ND	--	--	--	**1**
2-Hexanone	--	ND	--	--	--	**1**
Acetone	--	0.03	--	--	--	**1**

TABLE 4B

AREA 1 - SUBAREA K & L
VERICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1/SUB-A K&L BOTTOM #2	A1/SUB-A K&L SW-N	A1/SUB-A K&L BOTTOM #3	A1/SUB-A K&L SW-E#2	A1/SUB-A K&L SW-S-W. SIDE	
Chloroform	--	ND	--	--	--	**1**
Benzene	--	ND	--	--	--	**1**
1,1,1-Trichloroethane	--	ND	--	--	--	**1**
Bromomethane	--	ND	--	--	--	**1**
Chloromethane	--	ND	--	--	--	**1**
Chloroethane	--	ND	--	--	--	**1**
Vinyl chloride	--	ND	--	--	--	**1**
Methylene chloride	--	ND	--	--	--	**1**
Carbon Disulfide	--	ND	--	--	--	**1**
Bromoform	--	ND	--	--	--	**1**
Bromodichloromethane	--	ND	--	--	--	**1**
1,1-Dichloroethane	--	ND	--	--	--	**1**
1,1-Dichloroethene	--	ND	--	--	--	**1**
Trichlorofluoromethane	--	ND	--	--	--	**1**
Dichlorodifluoromethane	--	ND	--	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	ND	--	--	--	**1**
1,2-Dichlropropane	--	ND	--	--	--	**1**
2-Butanone	--	ND	--	--	--	**1**
1,1,2-Trichloroethane	--	ND	--	--	--	**1**
Trichloroethene	--	ND	--	--	--	**1**
Methyl acetate	--	ND	--	--	--	**1**
1,1,2,2-Tetrachloroethane	--	ND	--	--	--	**1**
1,2-Dichlrobenzene	--	ND	--	--	--	**1**
1,2,4-Trimethylbenzene	--	ND	--	--	--	**1**
1,2-Dibromo-3-chloropropane	--	ND	--	--	--	**1**
tert-Butylbenzene	--	ND	--	--	--	**1**
Isopropylbenzene	--	ND	--	--	--	**1**
p-Cymene	--	ND	--	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0.03**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	ND	ND	ND	ND	ND	**--**
Benzyl alcohol	ND	ND	ND	ND	ND	**--**
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	**--**
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	**--**
4-Chloroaniline	ND	ND	ND	ND	ND	**--**
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	**--**
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	**--**
Di-n-octyl phthalate	ND	ND	ND	ND	ND	**--**
Hexachlorobenzene	ND	ND	ND	ND	ND	**--**
Anthracene	ND	ND	ND	0.28 J	ND	**--**
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	**--**
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	**--**
Pyrene	ND	ND	ND	1.5	0.44	**--**
Dimethyl phthalate	ND	ND	ND	ND	ND	**--**

TABLE 4B

AREA 1 - SUBAREA K & L
VERICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1/SUB-A K&L BOTTOM #2	A1/SUB-A K&L SW-N	A1/SUB-A K&L BOTTOM #3	A1/SUB-A K&L SW-E#2	A1/SUB-A K&L SW-S-W. SIDE	
Dibenzofuran	ND	ND	ND	0.33 J	ND	--
Benzo(g,h,i)perylene	ND	ND	ND	0.36 J	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	0.26 J	ND	--
Benzo(b)fluoranthene	ND	ND	ND	0.37 J	ND	--
Fluoranthene	ND	ND	ND	1.2	0.57	--
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	--
Acenaphthylene	ND	ND	ND	ND	ND	--
Chrysene	ND	ND	ND	0.47	ND	--
Benzo(a)pyrene	ND	ND	ND	0.48	ND	--
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	ND	ND	ND	0.48	0.22 J	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Benzoic acid	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	--
Isophorone	ND	ND	ND	ND	ND	--
Acenaphthene	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Phenanthrene	ND	ND	ND	2.2	0.66	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	--
Fluorene	ND	ND	ND	0.6	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Naphthalene	ND	ND	ND	2	0.31 J	--
2-Methylnaphthalene	ND	ND	ND	0.39 J	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**0**	**0**	**0**	**10.92**	**2.2**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 4 C

AREA 1 - SUBAREA K & L
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	BS-A1	BS-B1	SW-EES	SW-NW-1	SW-SW-1	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	ND	ND	ND	ND	ND	**1**
n-Propylbenzene	ND	ND	ND	0.019	ND	**1**
n-Butylbenzene	0.014 UJ	0.014 UJ	0.014 UJ	0.12 J	0.014 UJ	**1**
p-Xylene	0.014	0.014	0.014	0.015	ND	**1**
m-Xylene	0.015	0.025	0.034	0.016	ND	**1**
1,3,5-Trimethylbenzene	ND	ND	0.016	ND	ND	**1**
Toluene	ND	ND	ND	ND	ND	**1**
Xylenes, Total	ND	0.045	0.057	0.034	ND	**1**
sec-Butylbenzene	ND	ND	ND	0.016	ND	**1**
Methyl tert butyl ether	ND	ND	ND	ND	ND	**1**
Benzene	ND	ND	0.034	0.037	ND	**1**
o-Xylene	ND	0.02	0.024	0.018	ND	**1**
1,2,4-Trimethylbenzene	0.018 J	0.024 J	0.022 J	0.045 J	0.014 UJ	**1**
tert-Butylbenzene	ND	ND	ND	ND	ND	**1**
Isopropylbenzene	ND	ND	ND	0.015	ND	**1**
p-Cymene	0.014 UJ	0.014 UJ	0.014 UJ	0.015 UJ	0.014 UJ	**1**
TOTAL VOCs (mg/kg)	**0.075**	**0.156**	**0.229**	**0.35**	**0.042**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	--	--	--	**1**
Styrene	--	--	--	--	--	**1**
cis-1,3-Dichloropropene	--	--	--	--	--	**1**
trans-1,3-Dichloropropene	--	--	--	--	--	**1**
n-Propylbenzene	--	--	--	--	--	**1**
n-Butylbenzene	--	--	--	--	--	**1**
1,4-Dichlrobenzene	--	--	--	--	--	**1**
1,2-Dibromoethane	--	--	--	--	--	**1**
1,2-Dichloroethane	--	--	--	--	--	**1**
4-Methyl-2-Pentanone	--	--	--	--	--	**1**
1,3,5-Trimethylbenzene	--	--	--	--	--	**1**
Methylcyclohexane	--	--	--	--	--	**1**
Toluene	--	--	--	--	--	**1**
Chlorobenzene	--	--	--	--	--	**1**
Cyclohexane	--	--	--	--	--	**1**
1,2,4-Trichlorobenzene	--	--	--	--	--	**1**
Dibromochloromethane	--	--	--	--	--	**1**
Tetrachloroethene	--	--	--	--	--	**1**
Xylenes, Total	--	--	--	--	--	**1**
sec-Butylbenzene	--	--	--	--	--	**1**
cis-1,2-Dichloroethene	--	--	--	--	--	**1**
trans-1,2-Dichloroethene	--	--	--	--	--	**1**
Methyl tert butyl ether	--	--	--	--	--	**1**
1,3-Dichlrobenzene	--	--	--	--	--	**1**
Carbon Tetrachloride	--	--	--	--	--	**1**
2-Hexanone	--	--	--	--	--	**1**
Acetone	--	--	--	--	--	**1**

TABLE 4 C

AREA 1 - SUBAREA K & L
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	BS-A1	BS-B1	SW-EES	SW-NW-1	SW-SW-1	
Chloroform	--	--	--	--	--	**1**
Benzene	--	--	--	--	--	**1**
1,1,1-Trichloroethane	--	--	--	--	--	**1**
Bromomethane	--	--	--	--	--	**1**
Chloromethane	--	--	--	--	--	**1**
Chloroethane	--	--	--	--	--	**1**
Vinyl chloride	--	--	--	--	--	**1**
Methylene chloride	--	--	--	--	--	**1**
Carbon Disulfide	--	--	--	--	--	**1**
Bromoform	--	--	--	--	--	**1**
Bromodichloromethane	--	--	--	--	--	**1**
1,1-Dichloroethane	--	--	--	--	--	**1**
1,1-Dichloroethene	--	--	--	--	--	**1**
Trichlorofluoromethane	--	--	--	--	--	**1**
Dichlorodifluoromethane	--	--	--	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--	--	**1**
1,2-Dichlropropane	--	--	--	--	--	**1**
2-Butanone	--	--	--	--	--	**1**
1,1,2-Trichloroethane	--	--	--	--	--	**1**
Trichloroethene	--	--	--	--	--	**1**
Methyl acetate	--	--	--	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	--	--	--	**1**
1,2-Dichlrobenzene	--	--	--	--	--	**1**
1,2,4-Trimethylbenzene	--	--	--	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	--	--	--	**1**
tert-Butylbenzene	--	--	--	--	--	**1**
Isopropylbenzene	--	--	--	--	--	**1**
p-Cymene	--	--	--	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	ND	11 UJ	11 UJ	11 UJ	2.3 UJ	**--**
Benzyl alcohol	ND	ND	ND	ND	ND	**--**
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	**--**
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	**--**
4-Chloroaniline	ND	ND	ND	ND	ND	**--**
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	**--**
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	**--**
Di-n-octyl phthalate	ND	ND	ND	ND	ND	**--**
Hexachlorobenzene	ND	ND	ND	ND	ND	**--**
Anthracene	ND	13	2	ND	ND	**--**
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	**--**
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	**--**
Pyrene	0.23	24	5.1	ND	ND	**--**
Dimethyl phthalate	ND	ND	ND	ND	ND	**--**

TABLE 4 C

AREA 1 - SUBAREA K & L
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	BS-A1	BS-B1	SW-EES	SW-NW-1	SW-SW-1	
Dibenzofuran	ND	8.8 DJ	1.9	ND	ND	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	0.9	ND	ND	--
Benzo(b)fluoranthene	ND	8.4 DJ	ND	ND	ND	--
Fluoranthene	0.28	37	7.8	ND	ND	--
Benzo(k)fluoranthene	ND	ND	1.4	ND	ND	--
Acenaphthylene	ND	ND	2.4	ND	ND	--
Chrysene	ND	10 DJ	1.8	ND	ND	--
Benzo(a)pyrene	ND	8.9 DJ	1.7	ND	ND	--
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	ND	12	2.5	ND	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Benzoic acid	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	ND	2.3 UJ	2.3 UJ	2.4 UJ	0.47 UJ	--
Isophorone	ND	ND	ND	ND	ND	--
Acenaphthene	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Phenanthrene	ND	50	11	ND	ND	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	--
Fluorene	ND	15	2.9	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Naphthalene	ND	32	10	ND	ND	--
2-Methylnaphthalene	ND	7.2 DJ	1.6	ND	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	11 UJ	11 UJ	11 UJ	2.3 UJ	--
TOTAL SVOCs (mg/kg)	**0.51**	**250.6**	**77.3**	**24.4**	**5.07**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. D = sample was diluted; diluted result is reported in this table.
3. E = The reported value is estimated due to interference.
4. J = Estimated value.
5. ND = parameter not detected above laboratory detection limit.
6. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
7. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 4 D

AREA 1 - SUBAREA K & L
VERIFCATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	SW-WES	A1-KL-B	A1-KL-N-B	A1-KL-SW-S	A1-SubareaL-B2	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	ND	0.055	ND	0.022	0.019	**1**
n-Propylbenzene	0.015 UJ	ND	ND	ND	ND	**1**
n-Butylbenzene	0.015 UJ	ND	ND	ND	ND	**1**
p-Xylene	ND	0.013	0.013	0.013	0.014	**1**
m-Xylene	ND	0.062	0.024	0.059	0.12	**1**
1,3,5-Trimethylbenzene	ND	0.019	0.014	0.025	0.11	**1**
Toluene	ND	0.047	0.029	0.044	ND	**1**
Xylenes, Total	ND	0.089	0.046	0.11	0.2	**1**
sec-Butylbenzene	ND	ND	ND	ND	ND	**1**
Methyl tert butyl ether	ND	ND	ND	ND	ND	**1**
Benzene	ND	0.052	0.029	0.053	ND	**1**
o-Xylene	ND	0.027	0.022	0.052	0.09	**1**
1,2,4-Trimethylbenzene	0.015 UJ	0.033	0.026	0.06	0.22	**1**
tert-Butylbenzene	ND	ND	ND	ND	ND	**1**
Isopropylbenzene	ND	ND	ND	ND	ND	**1**
p-Cymene	ND	ND	ND	ND	ND	**1**
TOTAL VOCs (mg/kg)	**0.045**	**0.397**	**0.203**	**0.438**	**0.773**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	--	--	--	**1**
Styrene	--	--	--	--	--	**1**
cis-1,3-Dichloropropene	--	--	--	--	--	**1**
trans-1,3-Dichloropropene	--	--	--	--	--	**1**
n-Propylbenzene	--	--	--	--	--	**1**
n-Butylbenzene	--	--	--	--	--	**1**
1,4-Dichlrobenzene	--	--	--	--	--	**1**
1,2-Dibromoethane	--	--	--	--	--	**1**
1,2-Dichloroethane	--	--	--	--	--	**1**
4-Methyl-2-Pentanone	--	--	--	--	--	**1**
1,3,5-Trimethylbenzene	--	--	--	--	--	**1**
Methylcyclohexane	--	--	--	--	--	**1**
Toluene	--	--	--	--	--	**1**
Chlorobenzene	--	--	--	--	--	**1**
Cyclohexane	--	--	--	--	--	**1**
1,2,4-Trichlorobenzene	--	--	--	--	--	**1**
Dibromochloromethane	--	--	--	--	--	**1**
Tetrachloroethene	--	--	--	--	--	**1**
Xylenes, Total	--	--	--	--	--	**1**
sec-Butylbenzene	--	--	--	--	--	**1**
cis-1,2-Dichloroethene	--	--	--	--	--	**1**
trans-1,2-Dichloroethene	--	--	--	--	--	**1**
Methyl tert butyl ether	--	--	--	--	--	**1**
1,3-Dichlrobenzene	--	--	--	--	--	**1**
Carbon Tetrachloride	--	--	--	--	--	**1**
2-Hexanone	--	--	--	--	--	**1**
Acetone	--	--	--	--	--	**1**

TABLE 4 D

AREA 1 - SUBAREA K & L
VERIFCATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	SW-WES	A1-KL-B	A1-KL-N-B	A1-KL-SW-S	A1-SubareaL-B2	
Chloroform	--	--	--	--	--	**1**
Benzene	--	--	--	--	--	**1**
1,1,1-Trichloroethane	--	--	--	--	--	**1**
Bromomethane	--	--	--	--	--	**1**
Chloromethane	--	--	--	--	--	**1**
Chloroethane	--	--	--	--	--	**1**
Vinyl chloride	--	--	--	--	--	**1**
Methylene chloride	--	--	--	--	--	**1**
Carbon Disulfide	--	--	--	--	--	**1**
Bromoform	--	--	--	--	--	**1**
Bromodichloromethane	--	--	--	--	--	**1**
1,1-Dichloroethane	--	--	--	--	--	**1**
1,1-Dichloroethene	--	--	--	--	--	**1**
Trichlorofluoromethane	--	--	--	--	--	**1**
Dichlorodifluoromethane	--	--	--	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--	--	**1**
1,2-Dichlropropane	--	--	--	--	--	**1**
2-Butanone	--	--	--	--	--	**1**
1,1,2-Trichloroethane	--	--	--	--	--	**1**
Trichloroethene	--	--	--	--	--	**1**
Methyl acetate	--	--	--	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	--	--	--	**1**
1,2-Dichlrobenzene	--	--	--	--	--	**1**
1,2,4-Trimethylbenzene	--	--	--	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	--	--	--	**1**
tert-Butylbenzene	--	--	--	--	--	**1**
Isopropylbenzene	--	--	--	--	--	**1**
p-Cymene	--	--	--	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	2.5 UJ	ND	ND	ND	ND	**--**
Benzyl alcohol	ND	ND	ND	ND	ND	**--**
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	**--**
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	**--**
4-Chloroaniline	ND	ND	ND	ND	ND	**--**
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	**--**
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	**--**
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	**--**
Di-n-octyl phthalate	ND	ND	ND	ND	ND	**--**
Hexachlorobenzene	ND	ND	ND	ND	ND	**--**
Anthracene	ND	0.84	ND	1.2	ND	**--**
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	**--**
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	**--**
Pyrene	ND	1.6	0.6	3.7	0.29 J	**--**
Dimethyl phthalate	ND	ND	ND	ND	ND	**--**

TABLE 4 D

AREA 1 - SUBAREA K & L
VERIFCATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	SW-WES	A1-KL-B	A1-KL-N-B	A1-KL-SW-S	A1-SubareaL-B2	
Dibenzofuran	ND	0.72	ND	ND	ND	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	--
Benzo(b)fluoranthene	ND	0.34	ND	ND	ND	--
Fluoranthene	ND	2.2	0.77	4.7	ND	--
Benzo(k)fluoranthene	ND	0.44	ND	ND	ND	--
Acenaphthylene	ND	ND	ND	ND	ND	--
Chrysene	ND	0.61	0.25	1.5	ND	--
Benzo(a)pyrene	ND	0.42	0.23	ND	ND	--
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	ND	0.76	0.32	1.8	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Benzoic acid	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	0.52 UJ	ND	ND	ND	ND	--
Isophorone	ND	ND	ND	ND	ND	--
Acenaphthene	ND	0.92	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Phenanthrene	ND	3.7	1	6	0.44	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	--
Fluorene	ND	1.1	0.27	1.4	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Naphthalene	ND	1.6	2.5	3.7	8.2	--
2-Methylnaphthalene	ND	0.44	ND	ND	0.43 J	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
3-Nitroaniline	2.5 UJ	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**5.52**	**15.69**	**5.94**	**24**	**9.36**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. D = sample was diluted; diluted result is reported in this table.
3. E = The reported value is estimated due to interference.
4. J = Estimated value.
5. ND = parameter not detected above laboratory detection limit.
6. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
7. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 4 E

AREA 1 - SUBAREA K & L
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-SubareaL-S3	A1-SubareaL-S4				
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	0.09	ND				**1**
n-Propylbenzene	ND	ND				**1**
n-Butylbenzene	ND	ND				**1**
p-Xylene	0.013	ND				**1**
m-Xylene	0.2	ND				**1**
1,3,5-Trimethylbenzene	0.082	ND				**1**
Toluene	0.059	ND				**1**
Xylenes, Total	0.3	ND				**1**
sec-Butylbenzene	ND	ND				**1**
Methyl tert butyl ether	ND	ND				**1**
Benzene	0.029	ND				**1**
o-Xylene	0.1	ND				**1**
1,2,4-Trimethylbenzene	0.19	ND				**1**
tert-Butylbenzene	ND	ND				**1**
Isopropylbenzene	ND	ND				**1**
p-Cymene	ND	ND				**1**
TOTAL VOCs (mg/kg)	**1.063**	**0**	**0**	**0**	**0**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	--	--	--	**1**
Styrene	--	--	--	--	--	**1**
cis-1,3-Dichloropropene	--	--	--	--	--	**1**
trans-1,3-Dichloropropene	--	--	--	--	--	**1**
n-Propylbenzene	--	--	--	--	--	**1**
n-Butylbenzene	--	--	--	--	--	**1**
1,4-Dichlrobenzene	--	--	--	--	--	**1**
1,2-Dibromoethane	--	--	--	--	--	**1**
1,2-Dichloroethane	--	--	--	--	--	**1**
4-Methyl-2-Pentanone	--	--	--	--	--	**1**
1,3,5-Trimethylbenzene	--	--	--	--	--	**1**
Methylcyclohexane	--	--	--	--	--	**1**
Toluene	--	--	--	--	--	**1**
Chlorobenzene	--	--	--	--	--	**1**
Cyclohexane	--	--	--	--	--	**1**
1,2,4-Trichlorobenzene	--	--	--	--	--	**1**
Dibromochloromethane	--	--	--	--	--	**1**
Tetrachloroethene	--	--	--	--	--	**1**
Xylenes, Total	--	--	--	--	--	**1**
sec-Butylbenzene	--	--	--	--	--	**1**
cis-1,2-Dichloroethene	--	--	--	--	--	**1**
trans-1,2-Dichloroethene	--	--	--	--	--	**1**
Methyl tert butyl ether	--	--	--	--	--	**1**
1,3-Dichlrobenzene	--	--	--	--	--	**1**
Carbon Tetrachloride	--	--	--	--	--	**1**
2-Hexanone	--	--	--	--	--	**1**
Acetone	--	--	--	--	--	**1**

TABLE 4 E

AREA 1 - SUBAREA K & L
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-SubareaL-S3	A1-SubareaL-S4				
Chloroform	--	--	--	--	--	**1**
Benzene	--	--	--	--	--	**1**
1,1,1-Trichloroethane	--	--	--	--	--	**1**
Bromomethane	--	--	--	--	--	**1**
Chloromethane	--	--	--	--	--	**1**
Chloroethane	--	--	--	--	--	**1**
Vinyl chloride	--	--	--	--	--	**1**
Methylene chloride	--	--	--	--	--	**1**
Carbon Disulfide	--	--	--	--	--	**1**
Bromoform	--	--	--	--	--	**1**
Bromodichloromethane	--	--	--	--	--	**1**
1,1-Dichloroethane	--	--	--	--	--	**1**
1,1-Dichloroethene	--	--	--	--	--	**1**
Trichlorofluoromethane	--	--	--	--	--	**1**
Dichlorodifluoromethane	--	--	--	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--	--	**1**
1,2-Dichlropropane	--	--	--	--	--	**1**
2-Butanone	--	--	--	--	--	**1**
1,1,2-Trichloroethane	--	--	--	--	--	**1**
Trichloroethene	--	--	--	--	--	**1**
Methyl acetate	--	--	--	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	--	--	--	**1**
1,2-Dichlrobenzene	--	--	--	--	--	**1**
1,2,4-Trimethylbenzene	--	--	--	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	--	--	--	**1**
tert-Butylbenzene	--	--	--	--	--	**1**
Isopropylbenzene	--	--	--	--	--	**1**
p-Cymene	--	--	--	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg						
4-Nitroaniline	2.1 UJ	2.3 UJ				**--**
Benzyl alcohol	ND	ND				**--**
4-Bromophenyl phenyl ether	ND	ND				**--**
1,4-Dichlrobenzene	ND	ND				**--**
4-Chloroaniline	ND	ND				**--**
2,2'-Oxybis (1-Chloropropane)	ND	ND				**--**
Bis(2-chloroethyl) ether	ND	ND				**--**
Bis(2-chloroethoxy) methane	ND	ND				**--**
Bis(2-ethylhexyl) phthalate	ND	ND				**--**
Di-n-octyl phthalate	ND	ND				**--**
Hexachlorobenzene	ND	ND				**--**
Anthracene	0.62	ND				**--**
1,2,4-Trichlorobenzene	ND	ND				**--**
2,4-Dinitrotoluene	ND	ND				**--**
Pyrene	1.4	ND				**--**
Dimethyl phthalate	ND	ND				**--**

TABLE 4 E

AREA 1 - SUBAREA K & L
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-SubareaL-S3	A1-SubareaL-S4				
Dibenzofuran	0.64	ND				--
Benzo(g,h,i)perylene	0.26 J	ND				--
Indeno(1,2,3-cd)pyrene	0.26 J	ND				--
Benzo(b)fluoranthene	0.5	ND				--
Fluoranthene	2.1	ND				--
Benzo(k)fluoranthene	0.38 J	ND				--
Acenaphthylene	0.47	ND				--
Chrysene	0.49	ND				--
Benzo(a)pyrene	0.54	ND				--
Dibenzo(a,h)anthracene	ND	ND				--
1,3-Dichlrobenzene	ND	ND				--
Benzo(a)anthracene	0.69	ND				--
2,6-Dinitrotoluene	ND	ND				--
N-Nitroso-Di-n-propylamine	ND	ND				--
Benzoic acid	ND	ND				--
Hexachloroethane	ND	ND				--
4-Chlorophenyl phenyl ether	ND	ND				--
Hexachlorocyclopentadiene	0.44 UJ	0.47 UJ				--
Isophorone	ND	ND				--
Acenaphthene	0.45	ND				--
Diethyl phthalate	ND	ND				--
Di-n-butyl phthalate	ND	ND				--
Phenanthrene	2.8	ND				--
Butyl benzyl phthalate	ND	ND				--
N-Nitrosodiphenylamine	ND	ND				--
Fluorene	0.96	ND				--
Hexachlorobutadiene	ND	ND				--
2-Nitroaniline	ND	ND				--
Naphthalene	2.8	ND				--
2-Methylnaphthalene	0.51	ND				--
2-Chloronaphthalene	ND	ND				--
3,3'-Dichlorobenzidine	ND	ND				--
1,2-Dichlorobenzene	ND	ND				--
Nitrobenzene	ND	ND				--
3-Nitroaniline	2.1 UJ	2.3 UJ				--
TOTAL SVOCs (mg/kg)	**20.51**	**5.07**	**0**	**0**	**0**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. D = sample was diluted; diluted result is reported in this table.
3. E = The reported value is estimated due to interference.
4. J = Estimated value.
5. ND = parameter not detected above laboratory detection limit.
6. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
7. " -- " = not analyzed for this parameter or no inidiviual SSAL

TABLE 5

AREA 1 - SUBAREA Q-5
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Date of Collection		SSALs
	A1-Q5-EAST-SW 11/05/03	A1-Q5-EAST-SW 11/07/03	
Total Metals (Method 6010) - mg/kg			
Chromium, Total	952	979 E	**1000**

Notes:
1. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.

TABLE 6

AREA 1 - SUBAREA N-14
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-N14-B-1	A1-N14-E-1	A1-N14-N-1	A1-N14-S-1	A1-N14-W-1	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg						
Ethylbenzene	--	--	--	--	--	**1**
n-Propylbenzene	--	--	--	--	--	**1**
n-Butylbenzene	--	--	--	--	--	**1**
p-Xylene	--	--	--	--	--	**1**
m-Xylene	--	--	--	--	--	**1**
1,3,5-Trimethylbenzene	--	--	--	--	--	**1**
Toluene	--	--	--	--	--	**1**
Xylenes, Total	--	--	--	--	--	**1**
sec-Butylbenzene	--	--	--	--	--	**1**
Methyl tert butyl ether	--	--	--	--	--	**1**
Benzene	--	--	--	--	--	**1**
o-Xylene	--	--	--	--	--	**1**
1,2,4-Trimethylbenzene	--	--	--	--	--	**1**
tert-Butylbenzene	--	--	--	--	--	**1**
Isopropylbenzene	--	--	--	--	--	**1**
p-Cymene	--	--	--	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**10**
STARS Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	0.03	0.006	0.005	0.04	ND	**1**
n-Propylbenzene	ND	ND	ND	ND	ND	**1**
n-Butylbenzene	ND	ND	ND	ND	ND	**1**
1,3,5-Trimethylbenzene	0.094	0.008	0.032	0.1	ND	**1**
Toluene	0.07	0.002	0.009	0.049	ND	**1**
Xylenes, Total	0.41	0.036	0.11	0.49	ND	**1**
sec-Butylbenzene	0.009	0.002	0.002	0.01	ND	**1**
Methyl tert butyl ether	ND	ND	ND	ND	ND	**1**
Benzene	0.054	0.003	0.006	0.019	ND	**1**
o-Xylene	0.12	0.018	0.042	0.16	ND	**1**
1,2,4-Trimethylbenzene	0.17	0.028	0.064	0.2	ND	**1**
tert-Butylbenzene	ND	ND	ND	ND	ND	**1**
Isopropylbenzene	0.006	0.002	ND	0.005	ND	**1**
p-Cymene	0.002	ND	ND	0.002	ND	**1**
m,p-Xylenes	0.3	0.018	0.07	0.34	ND	**1**
TOTAL VOCs (mg/kg)	**1.265**	**0.123**	**0.34**	**1.415**	**0**	**10**
TCL Volatile Organic Compounds (VOCs - Method 8260) - mg/kg						
Ethylbenzene	--	--	--	--	--	**1**
Styrene	--	--	--	--	--	**1**
cis-1,3-Dichloropropene	--	--	--	--	--	**1**
trans-1,3-Dichloropropene	--	--	--	--	--	**1**
n-Propylbenzene	--	--	--	--	--	**1**
n-Butylbenzene	--	--	--	--	--	**1**
1,4-Dichlrobenzene	--	--	--	--	--	**1**
1,2-Dibromoethane	--	--	--	--	--	**1**
1,2-Dichloroethane	--	--	--	--	--	**1**
4-Methyl-2-Pentanone	--	--	--	--	--	**1**

TABLE 6

AREA 1 - SUBAREA N-14
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-N14-B-1	A1-N14-E-1	A1-N14-N-1	A1-N14-S-1	A1-N14-W-1	
1,3,5-Trimethylbenzene	--	--	--	--	--	**1**
Methylcyclohexane	--	--	--	--	--	**1**
Toluene	--	--	--	--	--	**1**
Chlorobenzene	--	--	--	--	--	**1**
Cyclohexane	--	--	--	--	--	**1**
1,2,4-Trichlorobenzene	--	--	--	--	--	**1**
Dibromochloromethane	--	--	--	--	--	**1**
Tetrachloroethene	--	--	--	--	--	**1**
Xylenes, Total	--	--	--	--	--	**1**
sec-Butylbenzene	--	--	--	--	--	**1**
cis-1,2-Dichloroethene	--	--	--	--	--	**1**
trans-1,2-Dichloroethene	--	--	--	--	--	**1**
Methyl tert butyl ether	--	--	--	--	--	**1**
1,3-Dichlrobenzene	--	--	--	--	--	**1**
Carbon Tetrachloride	--	--	--	--	--	**1**
2-Hexanone	--	--	--	--	--	**1**
Acetone	--	--	--	--	--	**1**
Chloroform	--	--	--	--	--	**1**
Benzene	--	--	--	--	--	**1**
1,1,1-Trichloroethane	--	--	--	--	--	**1**
Bromomethane	--	--	--	--	--	**1**
Chloromethane	--	--	--	--	--	**1**
Chloroethane	--	--	--	--	--	**1**
Vinyl chloride	--	--	--	--	--	**1**
Methylene chloride	--	--	--	--	--	**1**
Carbon Disulfide	--	--	--	--	--	**1**
Bromoform	--	--	--	--	--	**1**
Bromodichloromethane	--	--	--	--	--	**1**
1,1-Dichloroethane	--	--	--	--	--	**1**
1,1-Dichloroethene	--	--	--	--	--	**1**
Trichlorofluoromethane	--	--	--	--	--	**1**
Dichlorodifluoromethane	--	--	--	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--	--	**1**
1,2-Dichlropropane	--	--	--	--	--	**1**
2-Butanone	--	--	--	--	--	**1**
1,1,2-Trichloroethane	--	--	--	--	--	**1**
Trichloroethene	--	--	--	--	--	**1**
Methyl acetate	--	--	--	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	--	--	--	**1**
1,2-Dichlrobenzene	--	--	--	--	--	**1**
1,2,4-Trimethylbenzene	--	--	--	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	--	--	--	**1**
tert-Butylbenzene	--	--	--	--	--	**1**
Isopropylbenzene	--	--	--	--	--	**1**
p-Cymene	--	--	--	--	--	**1**
TOTAL VOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**10**

TABLE 6

AREA 1 - SUBAREA N-14
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-N14-B-1	A1-N14-E-1	A1-N14-N-1	A1-N14-S-1	A1-N14-W-1	
STARS Semi-Volatile Organic Compounds (SVOCs) - mg/kg						
4-Nitroaniline	ND	ND	ND	ND	ND	--
Benzyl alcohol	ND	ND	ND	ND	ND	--
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	--
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	--
4-Chloroaniline	ND	ND	ND	ND	ND	--
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	--
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	--
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	--
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	--
Di-n-octyl phthalate	ND	ND	ND	ND	ND	--
Hexachlorobenzene	ND	ND	ND	ND	ND	--
Anthracene	8.1	1.4	19	110 J	21	--
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	--
2,4-Dinitrotoluene	ND	ND	ND	ND	3.7 UJ	--
Pyrene	13	3.9	38	210	48	--
Dimethyl phthalate	ND	ND	ND	ND	ND	--
Dibenzofuran	4.7	1.4	12	100 J	6.2	--
Benzo(g,h,i)perylene	ND	ND	4.9	ND	8	--
Indeno(1,2,3-cd)pyrene	1	ND	5.9	ND	9.9	--
Benzo(b)fluoranthene	2.6	ND	15	87 J	28	--
Fluoranthene	18	4.9	47	300	60	--
Benzo(k)fluoranthene	2.3	ND	9.1	110 J	16	--
Acenaphthylene	2	ND	3.9	ND	5.8	--
Chrysene	4.2	1.4	16	ND	26	--
Benzo(a)pyrene	2.8	1.3	14	ND	24	--
Dibenzo(a,h)anthracene	ND	ND	2.6	ND	4.3	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	4.8	1.5	18	79 J	29	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Benzoic acid	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	2.2 UJ	2.1 UJ	3.5 UJ	ND	3.7 UJ	--
Isophorone	ND	ND	ND	ND	ND	--
Acenaphthene	6.5	2.2	17	160 J	9.4 J	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Phenanthrene	20	5.2	53	410	49	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	--
Fluorene	7.6	2.1	19	150 J	12	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Naphthalene	35	15	55	1200	10	--

TABLE 6

AREA 1 - SUBAREA N-14
VERIFICATION SOIL/FILL ANALYTICAL RESULTS
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					SSALs
	A1-N14-B-1	A1-N14-E-1	A1-N14-N-1	A1-N14-S-1	A1-N14-W-1	
2-Methylnaphthalene	6.3	1.9	9.6	180 J	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**141.1**	**44.3**	**362.5**	**3096**	**374**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. D = sample was diluted; diluted result is reported in this table.
3. E = The reported value is estimated due to interference.
4. J = Estimated value.
5. ND = parameter not detected above laboratory detection limit.
6. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
7. " -- " = not analyzed for this parameter or no inidiviual SSAL

AREA I – Tank T-3

TABLE 1

AQUEOUS ANALYTICAL RESULTS

Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					
	A1-T3 TANKWATER					SSALs
STARS Volatile Organic Compounds (VOCs) - mg/L						
Benzene	ND					1
n-Butylbenzene	0.0085					1
sec-Butylbenzene	0.0035					1
tert-Butylbenzene	0.0063					1
Ethylbenzene	ND					1
Isopropylbenzene	ND					1
Methyl tert butyl ether	ND					1
p-Cymene	0.006					1
n-Propylbenzene	ND					1
Toluene	0.0069					1
1,2,4-Trimethylbenzene	0.012					1
1,3,5-Trimethylbenzene	0.0033					1
o-Xylene	0.0026					1
m-Xylene	0.0052					1
p-Xylene	ND					1
Xylenes, Total	0.0078					1
TOTAL VOCs (mg/kg)	**0.0621**	**0**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs) - mg/kg						
Acenaphthene	--					--
Anthracene	--					--
Benzaldehyde	--					--
Benzo(a)anthracene	--					--
Bis(-2-Chloroethyl) Ether	--					--
Benzo(b)fluoranthene	--					--
Benzo(k)fluoranthene	--					--
Benzo(g,h,i)perylene	--					--
Benzo(a)pyrene	--					--
Chrysene	--					--
Dibenzo(a,h)anthracene	--					--
Fluoranthene	--					--
Fluorene	--					--
Indeno(1,2,3-cd)pyrene	--					--
Phenanthrene	--					--
Pyrene	--					--
Naphthalene	--					--
2,2'-Oxybis (1-Chloropropane)	--					--
Acetophenone	--					--
N-Nitroso-Di-n-propylamine	--					--
Hexachloroethane	--					--
Nitrobenzene	--					--
Isophorone	--					--
Bis(2-chloroethoxy) methane	--					--
4-Chloroaniline	--					--
Hexachlorobutadiene	--					--

TABLE 1

AQUEOUS ANALYTICAL RESULTS

Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					
	A1-T3 TANKWATER					SSALs
Caprolactam	--					--
2-Methylnaphthalene	--					--
Hexachlorocyclopentadiene	--					--
2-Chloronaphthalene	--					--
2-Nitroaniline	--					--
Dimethyl phthalate	--					--
Acenaphthylene	--					--
2,6-Dinitrotoluene	--					--
3-Nitroaniline	--					--
Dibenzofuran	--					--
2,4-Dinitrotoluene	--					--
Diethyl phthalate	--					--
4-Chlorophenyl phenyl ether	--					--
4-Nitroaniline	--					--
N-Nitrosodiphenylamine	--					--
4-Bromophenyl phenyl ether	--					--
Hexachlorobenzene	--					--
Atrazine	--					--
Carbazole	--					--
Di-n-butyl phthalate	--					--
Butyl benzyl phthalate	--					--
3,3'-Dichlorobenzidine	--					--
Bis(2-ethylhexyl) phthalate	--					--
Di-n-octyl phthalate	--					--
TOTAL SVOCs (mg/kg)	**0**	**0**	**0**	**0**	**0**	**500**

Notes:
1. B Analyte was detected in the associated blank as well as in the sample.
2. E The reported value is estimated due to interference.
3. J Estimated value.
4. ND parameter not detected above laboratory detection limit.
5. SSALs Site Specific Action Levels as per the RD/RA Work Plan.
6. "--" not analyzed for this parameter or no inidiviual SSAL.

Date: 05/06/2003
Time: 14:21:58

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS - AQUEOUS-ASP00 8021 - STARS LIST

Rept: AN0326

Client ID Job No Lab ID Sample Date		AREA-1 T-3 TANKWATER A03-4221 A3422101 05/05/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/L	ND	0.40	NA		NA		NA	
n-Butylbenzene	UG/L	8.5	0.40	NA		NA		NA	
sec-Butylbenzene	UG/L	3.5	0.40	NA		NA		NA	
tert-Butylbenzene	UG/L	6.3	0.40	NA		NA		NA	
Ethylbenzene	UG/L	ND	1.2	NA		NA		NA	
Isopropylbenzene	UG/L	ND	0.40	NA		NA		NA	
Methyl tert butyl ether	UG/L	ND	0.13	NA		NA		NA	
p-Cymene	UG/L	6.0	2.0	NA		NA		NA	
n-Propylbenzene	UG/L	ND	0.40	NA		NA		NA	
Toluene	UG/L	6.9	0.40	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/L	12	0.40	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/L	3.3	2.0	NA		NA		NA	
o-Xylene	UG/L	2.6	0.40	NA		NA		NA	
m-Xylene	UG/L	5.2 1	0.40	NA		NA		NA	
p-Xylene	UG/L	ND 1	0.40	NA		NA		NA	
Total Xylenes	UG/L	7.8	0.40	NA		NA		NA	
SURROGATE(S)									
Fluorobenzene	%	105	70-125	NA		NA		NA	
a,a,a-Trifluorotoluene	%	122	66-131	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 05/06/2003
Time: 14:21:58

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS - AQUEOUS-ASPDO 8021 - STARS LIST

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		TRIP BLANK 5-5-03 A03-4221 A3422102 05/05/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/L	ND	0.20	NA		NA		NA	
n-Butylbenzene	UG/L	ND	0.20	NA		NA		NA	
sec-Butylbenzene	UG/L	ND	0.20	NA		NA		NA	
tert-Butylbenzene	UG/L	ND	0.20	NA		NA		NA	
Ethylbenzene	UG/L	ND	0.62	NA		NA		NA	
Isopropylbenzene	UG/L	ND	0.20	NA		NA		NA	
Methyl tert butyl ether	UG/L	ND	0.066	NA		NA		NA	
p-Cymene	UG/L	ND	1.0	NA		NA		NA	
n-Propylbenzene	UG/L	ND	0.20	NA		NA		NA	
Toluene	UG/L	ND	0.20	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/L	ND	0.20	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/L	ND	1.0	NA		NA		NA	
o-Xylene	UG/L	ND	0.20	NA		NA		NA	
m-Xylene	UG/L	ND	0.20	NA		NA		NA	
p-Xylene	UG/L	ND	0.20	NA		NA		NA	
Total Xylenes	UG/L	ND	0.20	NA		NA		NA	
SURROGATE(S)									
Fluorobenzene	%	104	70-125	NA		NA		NA	
a,a,a-Trifluorotoluene	%	113	66-131	NA		NA		NA	

NA = Not Applicable ND = Not Detected

AREA I

T-3 TANK EXCAVATION RESULTS

TABLE 1

CONFIRMATION SOIL ANALYTICAL RESULTS

Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth										
	A1-T3-B-Tank Loc	A1-T3-SW-E-Tank Loc	A1-T3-SW-N Tank Loc	A1-T3-SW-S-Tank Loc	A1-T3-SW-W Tank Loc	A1-T3-B	A1-T3-SW-E	A1-T3-SW-S	A1-T3-SW-N	A1-T3-SW-W	SSALs
TCL Volatile Organic Compounds (VOCs) - mg/kg											
STARS Volatile Organic Compounds (VOCs) - mg/kg (shaded compounds)											
Acetone	--	--	0.12	--	--	--	--	--	--	--	1
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
Bromodichloromethane	--	--	ND	--	--	--	--	--	--	--	1
Bromoform	--	--	ND	--	--	--	--	--	--	--	1
Bromomethane	--	--	ND	--	--	--	--	--	--	--	1
2-Butanone	--	--	0.012 J	--	--	--	--	--	--	--	1
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
Carbon Disulfide	--	--	ND	--	--	--	--	--	--	--	1
Carbon Tetrachloride	--	--	ND	--	--	--	--	--	--	--	1
Chloromethane	--	--	ND	--	--	--	--	--	--	--	1
Chlorobenzene	--	--	ND	--	--	--	--	--	--	--	1
Chloroethane	--	--	ND	--	--	--	--	--	--	--	1
Cyclohexane	--	--	ND	--	--	--	--	--	--	--	1
Chloroform	--	--	ND	--	--	--	--	--	--	--	1
1,2-Dibromo-3-chloropropane	--	--	ND	--	--	--	--	--	--	--	1
Dibromochloromethane	--	--	ND	--	--	--	--	--	--	--	1
Dichlorodifluoromethane	--	--	ND	--	--	--	--	--	--	--	1
1,2-Dibromoethane	--	--	ND	--	--	--	--	--	--	--	1
1,2-Dichlrobenzene	--	--	ND	--	--	--	--	--	--	--	1
1,3-Dichlrobenzene	--	--	ND	--	--	--	--	--	--	--	1
1,4-Dichlrobenzene	--	--	ND	--	--	--	--	--	--	--	1
1,1-Dichloroethane	--	--	ND	--	--	--	--	--	--	--	1
1,2-Dichloroethane	--	--	ND	--	--	--	--	--	--	--	1
1,1-Dichloroethene	--	--	ND	--	--	--	--	--	--	--	1
cis-1,2-Dichloroethene	--	--	ND	--	--	--	--	--	--	--	1
trans-1,2-Dichloroethene	--	--	ND	--	--	--	--	--	--	--	1
1,2-Dichlropropane	--	--	ND	--	--	--	--	--	--	--	1
cis-1,3-Dichloropropene	--	--	ND	--	--	--	--	--	--	--	1
trans-1,3-Dichloropropene	--	--	ND	--	--	--	--	--	--	--	1
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
2-Hexanone	--	--	ND	--	--	--	--	--	--	--	1
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
Methyl acetate	--	--	ND	--	--	--	--	--	--	--	1
Methylene chloride	--	--	0.015 B	--	--	--	--	--	--	--	1
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
4-Methyl-2-Pentanone	--	--	ND	--	--	--	--	--	--	--	1
Methylcyclohexane	--	--	ND	--	--	--	--	--	--	--	1
p-Cymene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
Styrene	--	--	ND	--	--	--	--	--	--	--	1
1,1,2,2-Tetrachloroethane	--	--	ND	--	--	--	--	--	--	--	1
Tetrachloroethene	--	--	ND	--	--	--	--	--	--	--	1
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
1,2,4-Trichlorobenzene	--	--	ND	--	--	--	--	--	--	--	1
1,1,1-Trichlorobenzene	--	--	ND	--	--	--	--	--	--	--	1
1,1,2-Trichlorobenzene	--	--	ND	--	--	--	--	--	--	--	1
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	ND	--	--	--	--	--	--	--	1
Trichloroethene	--	--	ND	--	--	--	--	--	--	--	1
Trichlorofluoromethane	--	--	ND	--	--	--	--	--	--	--	1
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
Vinyl chloride	--	--	ND	--	--	--	--	--	--	--	1
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
m-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1

TABLE 1

CONFIRMATION SOIL ANALYTICAL RESULTS

Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth										
	A1-T3-B-Tank Loc	A1-T3-SW-E-Tank Loc	A1-T3-SW-N Tank Loc	A1-T3-SW-S-Tank Loc	A1-T3-SW-W Tank Loc	A1-T3-B	A1-T3-SW-E	A1-T3-SW-S	A1-T3-SW-N	A1-T3-SW-W	SSALs
p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
Xylenes, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
TOTAL VOCs (mg/kg)	**0**	**0**	**0.147**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs) - mg/kg											
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Benzaldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Bis(-2-Chloroethyl) Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Caprolactam	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Atrazine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Carbazole	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Bis(2-ethylhexyl) phthalate	1.7	0.8	1.1	1.0	ND	2.7	0.8	1.7	4.2	0.52	--
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**1.7**	**0.83**	**1.1**	**1**	**0**	**2.7**	**0.83**	**1.7**	**4.2**	**0.52**	**500**

Notes:
1. B Analyte was detected in the associated blank as well as in the sample.
2. E The reported value is estimated due to interference.

TABLE 1

CONFIRMATION SOIL ANALYTICAL RESULTS

Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth										
	A1-T3-B-Tank Loc	A1-T3-SW-E-Tank Loc	A1-T3-SW-N Tank Loc	A1-T3-SW-S-Tank Loc	A1-T3-SW-W Tank Loc	A1-T3-B	A1-T3-SW-E	A1-T3-SW-S	A1-T3-SW-N	A1-T3-SW-W	SSALs

3. J Estimated value.
4. ND parameter not detected above laboratory detection limit.
5. SSALs Site Specific Action Levels as per the RD/RA Work Plan.
6. " -- " not analyzed for this parameter or no individual SSAL.

Date: 05/19/2003
Time: 16:19:06

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8260 - TCL VOLATILE ORGANICS+STARS-S

Rept: AN0326

Client ID Job No Sample Date	Lab ID	A1/T-3/SW-N A03-4683 05/14/2003	A3468301						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acetone	UG/KG	120	32	NA		NA		NA	
Benzene	UG/KG	ND	6	NA		NA		NA	
Bromodichloromethane	UG/KG	ND	6	NA		NA		NA	
Bromoform	UG/KG	ND	6	NA		NA		NA	
Bromomethane	UG/KG	ND	6	NA		NA		NA	
2-Butanone	UG/KG	12 J	32	NA		NA		NA	
Carbon Disulfide	UG/KG	ND	6	NA		NA		NA	
Carbon Tetrachloride	UG/KG	ND	6	NA		NA		NA	
Chlorobenzene	UG/KG	ND	6	NA		NA		NA	
Chloroethane	UG/KG	ND	6	NA		NA		NA	
Chloroform	UG/KG	ND	6	NA		NA		NA	
Chloromethane	UG/KG	ND	6	NA		NA		NA	
Cyclohexane	UG/KG	ND	6	NA		NA		NA	
Dibromochloromethane	UG/KG	ND	6	NA		NA		NA	
1,2-Dibromo-3-chloropropane	UG/KG	ND	6	NA		NA		NA	
1,1-Dichloroethane	UG/KG	ND	6	NA		NA		NA	
1,2-Dichloroethane	UG/KG	ND	6	NA		NA		NA	
Dichlorodifluoromethane	UG/KG	ND	6	NA		NA		NA	
1,1-Dichloroethene	UG/KG	ND	6	NA		NA		NA	
1,2-Dibromoethane	UG/KG	ND	6	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	6	NA		NA		NA	
1,2-Dichloropropane	UG/KG	ND	6	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	6	NA		NA		NA	
cis-1,3-Dichloropropene	UG/KG	ND	6	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	6	NA		NA		NA	
trans-1,3-Dichloropropene	UG/KG	ND	6	NA		NA		NA	
Ethylbenzene	UG/KG	ND	6	NA		NA		NA	
2-Hexanone	UG/KG	ND	32	NA		NA		NA	
Methylene chloride	UG/KG	15 B	6	NA		NA		NA	
cis-1,2-Dichloroethene	UG/KG	ND	6	NA		NA		NA	
trans-1,2-Dichloroethene	UG/KG	ND	6	NA		NA		NA	
4-Methyl-2-pentanone	UG/KG	ND	32	NA		NA		NA	
Styrene	UG/KG	ND	6	NA		NA		NA	
1,1,2,2-Tetrachloroethane	UG/KG	ND	6	NA		NA		NA	
Tetrachloroethene	UG/KG	ND	6	NA		NA		NA	
Toluene	UG/KG	ND	6	NA		NA		NA	
1,1,1-Trichloroethane	UG/KG	ND	6	NA		NA		NA	
1,1,2-Trichloroethane	UG/KG	ND	6	NA		NA		NA	
Isopropylbenzene	UG/KG	ND	6	NA		NA		NA	
Trichloroethene	UG/KG	ND	6	NA		NA		NA	
[illegible]	UG/KG	ND	6	NA		NA		NA	
Vinyl chloride	UG/KG	ND	13	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	6	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 05/19/2003
Time: 16:19:06

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8260 - TCL VOLATILE ORGANICS+STARS-S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	A1/T-3/SW-N A03-4683 05/14/2003	A3468301						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Total Xylenes	UG/KG	ND	19	NA		NA		NA	
Methylcyclohexane	UG/KG	ND	6	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	6	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	6	NA		NA		NA	
1,1,2-Trichloro-1,2,2-trifluor	UG/KG	ND	6	NA		NA		NA	
Trichlorofluoromethane	UG/KG	ND	6	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	6	NA		NA		NA	
n-Butylbenzene	UG/KG	ND	6	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	6	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	6	NA		NA		NA	
n-Propylbenzene	UG/KG	ND	6	NA		NA		NA	
p-Cymene	UG/KG	ND	6	NA		NA		NA	
IS/SURROGATE(S)									
Chlorobenzene-D5	%	92	50-200	NA		NA		NA	
1,4-Difluorobenzene	%	90	50-200	NA		NA		NA	
1,4-Dichlorobenzene-D4	%	91	50-200	NA		NA		NA	
Toluene-D8	%	77	71-125	NA		NA		NA	
p-Bromofluorobenzene	%	74	68-124	NA		NA		NA	
1,2-Dichloroethane-D4	%	72	61-136	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 05/19/2003
Time: 16:30:43

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		A1-T-3-B-TANK LOC A03-4683 A3468311 05/14/2003		A1-T-3-SW-E-TANK LOC A03-4683 A3468309 05/14/2003		A1-T-3-SW-N-TANK LOC A03-4683 A3468307 05/14/2003		A1-T-3-SW-S-TANK LOC A03-4683 A3468308 05/14/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	13	ND	13	ND	13	ND	13
n-Butylbenzene	UG/KG	ND	13	ND	13	ND	13	ND	13
sec-Butylbenzene	UG/KG	ND	13	ND	13	ND	13	ND	13
tert-Butylbenzene	UG/KG	ND	13	ND	13	ND	13	ND	13
Ethylbenzene	UG/KG	ND	13	ND	13	ND	13	ND	13
Isopropylbenzene	UG/KG	ND	13	ND	13	ND	13	ND	13
p-Cymene	UG/KG	ND	13	ND	13	ND	13	ND	13
n-Propylbenzene	UG/KG	ND	13	ND	13	ND	13	ND	13
Toluene	UG/KG	ND	13	ND	13	ND	13	ND	13
o-Xylene	UG/KG	ND	13	ND	13	ND	13	ND	13
m-Xylene	UG/KG	ND	13	ND	13	ND	13	ND	13
p-Xylene	UG/KG	ND	13	ND	13	ND	13	ND	13
Total Xylenes	UG/KG	ND	40	ND	40	ND	40	ND	40
Methyl tert butyl ether	UG/KG	ND	13	ND	13	ND	13	ND	13
1,2,4-Trimethylbenzene	UG/KG	ND	13	ND	13	ND	13	ND	13
1,3,5-Trimethylbenzene	UG/KG	ND	13	ND	13	ND	13	ND	13
SURROGATE(S)									
Fluorobenzene	%	105	60-130	105	60-130	105	60-130	104	60-130
a,a,a-Trifluorotoluene	%	100	76-127	102	76-127	100	76-127	99	76-127

NA = Not Applicable   ND = Not Detected

Date: 05/19/2003
Time: 16:30:43

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		A1-T-3-SW-W-TANK LOC A03-4683 A3468310 05/14/2003		A1/T-3/-B A03-4683 A3468305 05/14/2003		A1/T-3/-BLIND DUP A03-4683 A3468306 05/14/2003		A1/T-3/SW-E A03-4683 A3468303 05/14/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	15	ND	13	ND	13	ND	15
n-Butylbenzene	UG/KG	ND	15	ND	13	ND	13	ND	15
sec-Butylbenzene	UG/KG	ND	15	ND	13	ND	13	ND	15
tert-Butylbenzene	UG/KG	ND	15	ND	13	ND	13	ND	15
Ethylbenzene	UG/KG	ND	15	ND	13	ND	13	ND	15
Isopropylbenzene	UG/KG	ND	15	ND	13	ND	13	ND	15
p-Cymene	UG/KG	ND	15	ND	13	ND	13	ND	15
n-Propylbenzene	UG/KG	ND	15	ND	13	ND	13	ND	15
Toluene	UG/KG	ND	15	ND	13	ND	13	ND	15
o-Xylene	UG/KG	ND	15	ND	13	ND	13	ND	15
m-Xylene	UG/KG	ND	15	ND	13	ND	13	ND	15
p-Xylene	UG/KG	ND	15	ND	13	ND	13	ND	15
Total Xylenes	UG/KG	ND	46	ND	40	ND	40	ND	44
Methyl tert butyl ether	UG/KG	ND	15	ND	13	ND	13	ND	15
1,2,4-Trimethylbenzene	UG/KG	ND	15	ND	13	ND	13	ND	15
1,3,5-Trimethylbenzene	UG/KG	ND	15	ND	13	ND	13	ND	15
SURROGATE(S)									
Fluorobenzene	%	105	60-130	104	60-130	104	60-130	104	60-130
a,a,a-Trifluorotoluene	%	102	76-127	100	76-127	99	76-127	101	76-127

NA = Not Applicable ND = Not Detected

Date: 05/19/2003
Time: 16:30:43

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S

Rept: AN0326

Client ID / Job No / Sample Date / Lab ID		A1/T-3/SW-S A03-4683 05/14/2003 A3468302		A1/T-3/SW-W A03-4683 05/14/2003 A3468304					
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	13	ND	15	NA		NA	
n-Butylbenzene	UG/KG	ND	13	ND	15	NA		NA	
sec-Butylbenzene	UG/KG	ND	13	ND	15	NA		NA	
tert-Butylbenzene	UG/KG	ND	13	ND	15	NA		NA	
Ethylbenzene	UG/KG	ND	13	ND	15	NA		NA	
Isopropylbenzene	UG/KG	ND	13	ND	15	NA		NA	
p-Cymene	UG/KG	ND	13	ND	15	NA		NA	
n-Propylbenzene	UG/KG	ND	13	ND	15	NA		NA	
Toluene	UG/KG	ND	13	ND	15	NA		NA	
o-Xylene	UG/KG	ND	13	ND	15	NA		NA	
m-Xylene	UG/KG	ND	13	ND	15	NA		NA	
p-Xylene	UG/KG	ND	13	ND	15	NA		NA	
Total Xylenes	UG/KG	ND	40	ND	44	NA		NA	
Methyl tert butyl ether	UG/KG	ND	13	ND	15	NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	13	ND	15	NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	13	ND	15	NA		NA	
SURROGATE(S)									
Fluorobenzene	%	104	60-130	103	60-130	NA		NA	
a,a,a-Trifluorotoluene	%	100	76-127	100	76-127	NA		NA	

NA = Not Applicable ND = Not Detected

Date: 05/19/2003
Time: 16:18:34

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date / Lab ID		A1-T-3-B-TANK LOC A03-4683 A3468311 05/14/2003		A1-T-3-SW-E-TANK LOC A03-4683 A3468309 05/14/2003		A1-T-3-SW-N-TANK LOC A03-4683 A3468307 05/14/2003		A1-T-3-SW-S-TANK LOC A03-4683 A3468308 05/14/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	430	ND	460	ND	450	ND	450
Acenaphthylene	UG/KG	ND	430	ND	460	ND	450	ND	450
Anthracene	UG/KG	ND	430	ND	460	ND	450	ND	450
Benzo(a)anthracene	UG/KG	ND	430	ND	460	ND	450	ND	450
Benzo(b)fluoranthene	UG/KG	ND	430	ND	460	ND	450	ND	450
Benzo(k)fluoranthene	UG/KG	ND	430	ND	460	ND	450	ND	450
Benzo(ghi)perylene	UG/KG	ND	430	ND	460	ND	450	ND	450
Benzo(a)pyrene	UG/KG	ND	430	ND	460	ND	450	ND	450
Benzoic acid	UG/KG	ND	2100	ND	2200	ND	450	ND	450
Benzyl alcohol	UG/KG	ND	430	ND	460	ND	2200	ND	2200
Bis(2-chloroethoxy) methane	UG/KG	ND	430	ND	460	ND	450	ND	450
Bis(2-chloroethyl) ether	UG/KG	ND	430	ND	460	ND	450	ND	450
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	430	ND	460	ND	450	ND	450
Bis(2-ethylhexyl) phthalate	UG/KG	1700	430	830	460	1100	450	1000	450
4-Bromophenyl phenyl ether	UG/KG	ND	430	ND	460	ND	450	ND	450
Butyl benzyl phthalate	UG/KG	ND	430	ND	460	ND	450	ND	450
4-Chloroaniline	UG/KG	ND	430	ND	460	ND	450	ND	450
2-Chloronaphthalene	UG/KG	ND	430	ND	460	ND	450	ND	450
4-Chlorophenyl phenyl ether	UG/KG	ND	430	ND	460	ND	450	ND	450
Chrysene	UG/KG	ND	430	ND	460	ND	450	ND	450
Dibenzo(a,h)anthracene	UG/KG	ND	430	ND	460	ND	450	ND	450
Dibenzofuran	UG/KG	ND	430	ND	460	ND	450	ND	450
Di-n-butyl phthalate	UG/KG	ND	430	ND	460	ND	450	ND	450
1,2-Dichlorobenzene	UG/KG	ND	430	ND	460	ND	450	ND	450
1,3-Dichlorobenzene	UG/KG	ND	430	ND	460	ND	450	ND	450
1,4-Dichlorobenzene	UG/KG	ND	430	ND	460	ND	450	ND	450
3,3'-Dichlorobenzidine	UG/KG	ND	850	ND	920	ND	450	ND	450
Diethyl phthalate	UG/KG	ND	430	ND	460	ND	900	ND	900
Dimethyl phthalate	UG/KG	ND	430	ND	460	ND	450	ND	450
2,4-Dinitrotoluene	UG/KG	ND	430	ND	460	ND	450	ND	450
2,6-Dinitrotoluene	UG/KG	ND	430	ND	460	ND	450	ND	450
Di-n-octyl phthalate	UG/KG	ND	430	ND	460	ND	450	ND	450
Fluoranthene	UG/KG	ND	430	ND	460	ND	450	ND	450
Fluorene	UG/KG	ND	430	ND	460	ND	450	ND	450
Hexachlorobenzene	UG/KG	ND	430	ND	460	ND	450	ND	450
Hexachlorobutadiene	UG/KG	ND	430	ND	460	ND	450	ND	450
Hexachlorocyclopentadiene	UG/KG	ND	430	ND	460	ND	450	ND	450
Hexachloroethane	UG/KG	ND	430	ND	460	ND	450	ND	450
Indeno(1,2,3-cd)pyrene	UG/KG	ND	430	ND	460	ND	450	ND	450
Isophorone	UG/KG	ND	430	ND	460	ND	450	ND	450
2-Methylnaphthalene	UG/KG	ND	430	ND	460	[illegible]	[illegible]	[illegible]	[illegible]
Naphthalene	UG/KG	ND	430	ND	460	ND	450	ND	450
2-Nitroaniline	UG/KG	ND	2100	ND	2200	ND	2200	ND	2200

NA = Not Applicable ND = Not Detected

Date: 05/19/2003
Time: 16:18:34

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		A1-T-3-B-TANK LOC A03-4683 A3468311 05/14/2003		A1-T-3-SW-E-TANK LOC A03-4683 A3468309 05/14/2003		A1-T-3-SW-N-TANK LOC A03-4683 A3468307 05/14/2003		A1-T-3-SW-S-TANK LOC A03-4683 A3468308 05/14/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2100	ND	2200	ND	2200	ND	2200
4-Nitroaniline	UG/KG	ND	2100	ND	2200	ND	2200	ND	2200
Nitrobenzene	UG/KG	ND	430	ND	460	ND	450	ND	450
N-nitrosodiphenylamine	UG/KG	ND	430	ND	460	ND	450	ND	450
N-Nitroso-Di-n-propylamine	UG/KG	ND	430	ND	460	ND	450	ND	450
Phenanthrene	UG/KG	ND	430	ND	460	ND	450	ND	450
Pyrene	UG/KG	ND	430	ND	460	ND	450	ND	450
1,2,4-Trichlorobenzene	UG/KG	ND	430	ND	460	ND	450	ND	450
----IS/SURROGATE(S)----									
1,4-Dichlorobenzene-D4	%	97	50-200	118	50-200	105	50-200	96	50-200
Naphthalene-D8	%	101	50-200	123	50-200	109	50-200	100	50-200
Acenaphthene-D10	%	98	50-200	120	50-200	109	50-200	99	50-200
Phenanthrene-D10	%	97	50-200	119	50-200	106	50-200	98	50-200
Chrysene-D12	%	95	50-200	118	50-200	104	50-200	98	50-200
Perylene-D12	%	104	50-200	129	50-200	113	50-200	104	50-200
Nitrobenzene-D5	%	71	34-120	63	34-120	71	34-120	71	34-120
2-Fluorobiphenyl	%	87	43-125	72	43-125	88	43-125	86	43-125
p-Terphenyl-d14	%	95	38-141	81	38-141	93	38-141	92	38-141
Phenol-D5	%	71	34-120	60	34-120	68	34-120	69	34-120
2-Fluorophenol	%	64	25-125	52	25-125	58	25-125	60	25-125
2,4,6-Tribromophenol	%	89	36-139	77	36-139	90	36-139	85	36-139

NA = Not Applicable ND = Not Detected

Date: 05/19/2003
Time: 16:18:34

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		A1-T-3-SW-W-TANK LOC, A03-4683, 05/14/2003 — A3468310		A1/T-3/-B, A03-4683, 05/14/2003 — A3468305		A1/T-3/-BLIND DUP, A03-4683, 05/14/2003 — A3468306		A1/T-3/SW-E, A03-4683, 05/14/2003 — A3468303	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	480	ND	440	ND	430	ND	480
Acenaphthylene	UG/KG	ND	480	ND	440	ND	430	ND	480
Anthracene	UG/KG	ND	480	ND	440	ND	430	ND	480
Benzo(a)anthracene	UG/KG	ND	480	ND	440	ND	430	ND	480
Benzo(b)fluoranthene	UG/KG	ND	480	ND	440	ND	430	ND	480
Benzo(k)fluoranthene	UG/KG	ND	480	ND	440	ND	430	ND	480
Benzo(ghi)perylene	UG/KG	ND	480	ND	440	ND	430	ND	480
Benzo(a)pyrene	UG/KG	ND	480	ND	440	ND	430	ND	480
Benzoic acid	UG/KG	ND	2300	ND	2100	ND	2100	ND	480
Benzyl alcohol	UG/KG	ND	480	ND	440	ND	430	ND	2300
Bis(2-chloroethoxy) methane	UG/KG	ND	480	ND	440	ND	430	ND	480
Bis(2-chloroethyl) ether	UG/KG	ND	480	ND	440	ND	430	ND	480
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	480	ND	440	ND	430	ND	480
Bis(2-ethylhexyl) phthalate	UG/KG	ND	480	2700	440	2200	430	830	480
4-Bromophenyl phenyl ether	UG/KG	ND	480	ND	440	ND	430	ND	480
Butyl benzyl phthalate	UG/KG	ND	480	ND	440	ND	430	ND	480
4-Chloroaniline	UG/KG	ND	480	ND	440	ND	430	ND	480
2-Chloronaphthalene	UG/KG	ND	480	ND	440	ND	430	ND	480
4-Chlorophenyl phenyl ether	UG/KG	ND	480	ND	440	ND	430	ND	480
Chrysene	UG/KG	ND	480	ND	440	ND	430	ND	480
Dibenzo(a,h)anthracene	UG/KG	ND	480	ND	440	ND	430	ND	480
Dibenzofuran	UG/KG	ND	480	ND	440	ND	430	ND	480
Di-n-butyl phthalate	UG/KG	ND	480	ND	440	ND	430	ND	480
1,2-Dichlorobenzene	UG/KG	ND	480	ND	440	ND	430	ND	480
1,3-Dichlorobenzene	UG/KG	ND	480	ND	440	ND	430	ND	480
1,4-Dichlorobenzene	UG/KG	ND	480	ND	440	ND	430	ND	480
3,3'-Dichlorobenzidine	UG/KG	ND	970	ND	880	ND	850	ND	960
Diethyl phthalate	UG/KG	ND	480	ND	440	ND	430	ND	480
Dimethyl phthalate	UG/KG	ND	480	ND	440	ND	430	ND	480
2,4-Dinitrotoluene	UG/KG	ND	480	ND	440	ND	430	ND	480
2,6-Dinitrotoluene	UG/KG	ND	480	ND	440	ND	430	ND	480
Di-n-octyl phthalate	UG/KG	ND	480	ND	440	ND	430	ND	480
Fluoranthene	UG/KG	ND	480	ND	440	ND	430	ND	480
Fluorene	UG/KG	ND	480	ND	440	ND	430	ND	480
Hexachlorobenzene	UG/KG	ND	480	ND	440	ND	430	ND	480
Hexachlorobutadiene	UG/KG	ND	480	ND	440	ND	430	ND	480
Hexachlorocyclopentadiene	UG/KG	ND	480	ND	440	ND	430	ND	480
Hexachloroethane	UG/KG	ND	480	ND	440	ND	430	ND	480
Indeno(1,2,3-cd)pyrene	UG/KG	ND	480	ND	440	ND	430	ND	480
Isophorone	UG/KG	ND	480	ND	440	ND	430	ND	480
2-Methylnaphthalene	UG/KG	ND	480	ND	440	ND	430	ND	480
Naphthalene	UG/KG	ND	480	ND	440	ND	430	ND	480
2-Nitroaniline	UG/KG	ND	2300	ND	2100	ND	2100	ND	2300

NA = Not Applicable ND = Not Detected

Date: 05/19/2003
Time: 16:18:34

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	A1-T-3-SW-W-TANK LOC A03-4683 05/14/2003 A3468310		A1/T-3/-B A03-4683 05/14/2003 A3468305		A1/T-3/-BLIND DUP A03-4683 05/14/2003 A3468306		A1/T-3/SW-E A03-4683 05/14/2003 A3468303	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2300	ND	2100	ND	2100	ND	2300
4-Nitroaniline	UG/KG	ND	2300	ND	2100	ND	2100	ND	2300
Nitrobenzene	UG/KG	ND	480	ND	440	ND	430	ND	480
N-nitrosodiphenylamine	UG/KG	ND	480	ND	440	ND	430	ND	480
N-Nitroso-Di-n-propylamine	UG/KG	ND	480	ND	440	ND	430	ND	480
Phenanthrene	UG/KG	ND	480	ND	440	ND	430	ND	480
Pyrene	UG/KG	ND	480	ND	440	ND	430	ND	480
1,2,4-Trichlorobenzene	UG/KG	ND	480	ND	440	ND	430	ND	480
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	105	50-200	128	50-200	125	50-200	118	50-200
Naphthalene-D8	%	109	50-200	130	50-200	125	50-200	118	50-200
Acenaphthene-D10	%	107	50-200	123	50-200	119	50-200	113	50-200
Phenanthrene-D10	%	105	50-200	122	50-200	117	50-200	110	50-200
Chrysene-D12	%	101	50-200	119	50-200	115	50-200	106	50-200
Perylene-D12	%	112	50-200	122	50-200	117	50-200	110	50-200
Nitrobenzene-D5	%	71	34-120	65	34-120	68	34-120	61	34-120
2-Fluorobiphenyl	%	81	43-125	77	43-125	85	43-125	80	43-125
p-Terphenyl-d14	%	94	38-141	85	38-141	88	38-141	92	38-141
Phenol-D5	%	68	34-120	63	34-120	65	34-120	59	34-120
2-Fluorophenol	%	60	25-125	56	25-125	58	25-125	49	25-125
2,4,6-Tribromophenol	%	84	36-139	83	36-139	86	36-139	90	36-139

NA = Not Applicable ND = Not Detected

Date: 05/19/2003
Time: 16:18:34

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	A1/T-3/SW-N A03-4683 05/14/2003	A3468301	A1/T-3/SW-S A03-4683 05/14/2003	A3468302	A1/T-3/SW-W A03-4683 05/14/2003	A3468304		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	420	ND	420	ND	470	NA	
Acenaphthylene	UG/KG	ND	420	ND	420	ND	470	NA	
Anthracene	UG/KG	ND	420	ND	420	ND	470	NA	
Benzo(a)anthracene	UG/KG	ND	420	ND	420	ND	470	NA	
Benzo(b)fluoranthene	UG/KG	ND	420	ND	420	ND	470	NA	
Benzo(k)fluoranthene	UG/KG	ND	420	ND	420	ND	470	NA	
Benzo(ghi)perylene	UG/KG	ND	420	ND	420	ND	470	NA	
Benzo(a)pyrene	UG/KG	ND	420	ND	420	ND	470	NA	
Benzoic acid	UG/KG	ND	2000	ND	2000	ND	2300	NA	
Benzyl alcohol	UG/KG	ND	420	ND	420	ND	470	NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	420	ND	420	ND	470	NA	
Bis(2-chloroethyl) ether	UG/KG	ND	420	ND	420	ND	470	NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	420	ND	420	ND	470	NA	
Bis(2-ethylhexyl) phthalate	UG/KG	4200	420	1700	420	520	470	NA	
4-Bromophenyl phenyl ether	UG/KG	ND	420	ND	420	ND	470	NA	
Butyl benzyl phthalate	UG/KG	ND	420	ND	420	ND	470	NA	
4-Chloroaniline	UG/KG	ND	420	ND	420	ND	470	NA	
2-Chloronaphthalene	UG/KG	ND	420	ND	420	ND	470	NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	420	ND	420	ND	470	NA	
Chrysene	UG/KG	ND	420	ND	420	ND	470	NA	
Dibenzo(a,h)anthracene	UG/KG	ND	420	ND	420	ND	470	NA	
Dibenzofuran	UG/KG	ND	420	ND	420	ND	470	NA	
Di-n-butyl phthalate	UG/KG	ND	420	ND	420	ND	470	NA	
1,2-Dichlorobenzene	UG/KG	ND	420	ND	420	ND	470	NA	
1,3-Dichlorobenzene	UG/KG	ND	420	ND	420	ND	470	NA	
1,4-Dichlorobenzene	UG/KG	ND	420	ND	420	ND	470	NA	
3,3'-Dichlorobenzidine	UG/KG	ND	840	ND	840	ND	940	NA	
Diethyl phthalate	UG/KG	ND	420	ND	420	ND	470	NA	
Dimethyl phthalate	UG/KG	ND	420	ND	420	ND	470	NA	
2,4-Dinitrotoluene	UG/KG	ND	420	ND	420	ND	470	NA	
2,6-Dinitrotoluene	UG/KG	ND	420	ND	420	ND	470	NA	
Di-n-octyl phthalate	UG/KG	ND	420	ND	420	ND	470	NA	
Fluoranthene	UG/KG	ND	420	ND	420	ND	470	NA	
Fluorene	UG/KG	ND	420	ND	420	ND	470	NA	
Hexachlorobenzene	UG/KG	ND	420	ND	420	ND	470	NA	
Hexachlorobutadiene	UG/KG	ND	420	ND	420	ND	470	NA	
Hexachlorocyclopentadiene	UG/KG	ND	420	ND	420	ND	470	NA	
Hexachloroethane	UG/KG	ND	420	ND	420	ND	470	NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	420	ND	420	ND	470	NA	
Isophorone	UG/KG	ND	420	ND	420	ND	470	NA	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Naphthalene	UG/KG	ND	420	ND	420	ND	470	NA	
2-Nitroaniline	UG/KG	ND	2000	ND	2000	ND	2300	NA	

NA = Not Applicable ND = Not Detected

Date: 05/19/2003
Time: 16:18:34

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		A1/T-3/SW-N A03-4683 05/14/2003	A3468301	A1/T-3/SW-S A03-4683 05/14/2003	A3468302	A1/T-3/SW-W A03-4683 05/14/2003	A3468304		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2000	ND	2000	ND	2300	NA	
4-Nitroaniline	UG/KG	ND	2000	ND	2000	ND	2300	NA	
Nitrobenzene	UG/KG	ND	420	ND	420	ND	470	NA	
N-nitrosodiphenylamine	UG/KG	ND	420	ND	420	ND	470	NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	420	ND	420	ND	470	NA	
Phenanthrene	UG/KG	ND	420	ND	420	ND	470	NA	
Pyrene	UG/KG	ND	420	ND	420	ND	470	NA	
1,2,4-Trichlorobenzene	UG/KG	ND	420	ND	420	ND	470	NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	108	50-200	110	50-200	116	50-200	NA	
Naphthalene-D8	%	111	50-200	109	50-200	116	50-200	NA	
Acenaphthene-D10	%	107	50-200	104	50-200	111	50-200	NA	
Phenanthrene-D10	%	105	50-200	101	50-200	108	50-200	NA	
Chrysene-D12	%	103	50-200	99	50-200	106	50-200	NA	
Perylene-D12	%	107	50-200	101	50-200	110	50-200	NA	
Nitrobenzene-D5	%	60	34-120	63	34-120	65	34-120	NA	
2-Fluorobiphenyl	%	78	43-125	76	43-125	81	43-125	NA	
p-Terphenyl-d14	%	93	38-141	86	38-141	88	38-141	NA	
Phenol-D5	%	58	34-120	60	34-120	62	34-120	NA	
2-Fluorophenol	%	48	25-125	52	25-125	53	25-125	NA	
2,4,6-Tribromophenol	%	90	36-139	82	36-139	89	36-139	NA	

NA = Not Applicable   ND = Not Detected

AREA I
SUBAREA D

TABLE 1

CONFIRMATION SOIL ANALYTICAL RESULTS

Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					
	A1-SUBAREAD-B	A1-SUBAREAD-SW-N	A1-SUBAREAD-SW-S	A1-SUBAREAD-SW-E	A1-SUBAREAD-SW-W	SSALs
TCL Volatile Organic Compounds (VOCs) - mg/kg						
STARS Volatile Organic Compounds (VOCs) - mg/kg (shaded compounds)						
Acetone	--	--	0.008 J	--	--	**1**
Benzene	5.4	ND	ND	ND	ND	**1**
Bromodichloromethane	--	--	ND	--	--	**1**
Bromoform	--	--	ND	--	--	**1**
Bromomethane	--	--	ND	--	--	**1**
2-Butanone	--	--	ND	--	--	**1**
n-Butylbenzene	ND	ND	ND	0.034	ND	**1**
sec-Butylbenzene	ND	ND	ND	ND	ND	**1**
tert-Butylbenzene	ND	ND	ND	ND	ND	**1**
Carbon Disulfide	--	--	ND	--	--	**1**
Carbon Tetrachloride	--	--	ND	--	--	**1**
Chloromethane	--	--	ND	--	--	**1**
Chlorobenzene	--	--	ND	--	--	**1**
Chloroethane	--	--	ND	--		**1**
Cyclohexane	--	--	ND	--	--	**1**
Chloroform	--	--	ND	--	--	**1**
1,2-Dibromo-3-chloropropane	--	--	ND	--	--	**1**
Dibromochloromethane	--	--	ND	--	--	**1**
Dichlorodifluoromethane	--	--	ND	--	--	**1**
1,2-Dibromoethane	--	--	ND	--	--	**1**
1,2-Dichlrobenzene	--	--	ND	--	--	**1**
1,3-Dichlrobenzene	--	--	ND	--	--	**1**
1,4-Dichlrobenzene	--	--	ND	--	--	**1**
1,1-Dichloroethane	--	--	ND	--	--	**1**
1,2-Dichloroethane	--	--	ND	--	--	**1**
1,1-Dichloroethene	--	--	ND	--	--	**1**
cis-1,2-Dichloroethene	--	--	ND	--	--	**1**
trans-1,2-Dichloroethene	--	--	ND	--	--	**1**
1,2-Dichlropropane	--	--	ND	--	--	**1**
cis-1,3-Dichloropropene	--	--	ND	--	--	**1**
trans-1,3-Dichloropropene	--	--	ND	--	--	**1**
Ethylbenzene	0.34	ND	ND	ND	ND	**1**
2-Hexanone	--	--	ND	--	--	**1**
Isopropylbenzene	0.1	ND	ND	ND	ND	**1**
Methyl acetate	--	--	ND	--	--	**1**
Methylene chloride	--	--	0.019 B	--	--	**1**
Methyl tert butyl ether	0.078	ND	ND	ND	ND	**1**
4-Methyl-2-Pentanone	--	--	ND	--	--	**1**
Methylcyclohexane		--	ND	--	--	**1**
p-Cymene	ND	ND	ND	ND	ND	**1**
n-Propylbenzene	0.04	ND	ND	ND	ND	**1**
Styrene	--	--	ND	--	--	**1**
1,1,2,2-Tetrachloroethane	--	--	ND	--	--	**1**

A1-SUBAREAD TABLE 1

TABLE 1

CONFIRMATION SOIL ANALYTICAL RESULTS

Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					
	A1-SUBAREAD-B	A1-SUBAREAD-SW-N	A1-SUBAREAD-SW-S	A1-SUBAREAD-SW-E	A1-SUBAREAD-SW-W	SSALs
Tetrachloroethene	--	--	ND	-	-	**1**
Toluene	0.15	ND	ND	ND	ND	**1**
1,2,4-Trichlorobenzene	--	-	ND	--	--	**1**
1,1,1-Trichlorobenzene	-	--	ND	--	--	**1**
1,1,2-Trichlorobenzene	-	--	ND	--	--	**1**
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	ND	--	-	**1**
Trichloroethene	--	--	ND	--	--	**1**
Trichlorofluoromethane	--	--	ND	--	--	**1**
1,2,4-Trimethylbenzene	0.7	ND	ND	0.014	ND	**1**
1,3,5-Trimethylbenzene	0.05	ND	ND	ND	ND	**1**
Vinyl chloride	--	--	ND	--	--	**1**
o-Xylene	0.17	ND	-	ND	ND	**1**
m-Xylene	7.2	ND	--	ND	ND	**1**
p-Xylene	ND	ND	--	ND	ND	**1**
Xylenes, Total	7.3	ND	ND	ND	ND	**1**
TOTAL VOCs (mg/kg)	**14.158**	**0**	**0.027**	**0.048**	**0**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs) - mg/kg						
Acenaphthene	ND	ND	ND	ND	ND	--
Anthracene	ND	ND	ND	0.033 J	ND	--
Benzaldehyde	ND	ND	ND	ND	ND	--
Benzo(a)anthracene	ND	ND	ND	0.13 J	ND	--
Bis(-2-Chloroethyl) Ether	ND	ND	ND	ND	ND	--
Benzo(b)fluoranthene	ND	ND	ND	0.12 J	ND	--
Benzo(k)fluoranthene	ND	ND	ND	0.11 J	ND	--
Benzo(g,h,i)perylene	ND	ND	ND	0.076 J	ND	--
Benzo(a)pyrene	0.073 J	0.097 J	ND	0.13 J	ND	--
Chrysene	ND	ND	ND	0.12 J	ND	--
Dibenzo(a,h)anthracene	ND	ND	ND	0.028 J	ND	--
Fluoranthene	ND	ND	0.017 J	0.24 J	ND	--
Fluorene	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	0.078 J	ND	--
Phenanthrene	ND	ND	0.027 J	0.12 J	ND	--
Pyrene	ND	ND	0.013 J	0.2 J	ND	--
Naphthalene	0.023 J	ND	ND	ND	ND	--
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	--
Acetophenone	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	--
Isophorone	ND	ND	ND	ND	ND	--
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	--
4-Chloroaniline	ND	ND	ND	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	--
Caprolactam	ND	ND	ND	ND	ND	--
2-Methylnaphthalene	ND	ND	ND	0.012 J	ND	--

TABLE 1

CONFIRMATION SOIL ANALYTICAL RESULTS

Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth					
	A1-SUBAREAD-B	A1-SUBAREAD-SW-N	A1-SUBAREAD-SW-S	A1-SUBAREAD-SW-E	A1-SUBAREAD-SW-W	SSALs
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	--
Dimethyl phthalate	ND	ND	ND	ND	ND	--
Acenaphthylene	ND	ND	ND	ND	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	--
Dibenzofuran	ND	ND	ND	ND	ND	--
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	--
4-Nitroaniline	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	--
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	--
Hexachlorobenzene	ND	ND	ND	ND	ND	--
Atrazine	ND	ND	ND	ND	ND	--
Carbazole	ND	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	--
Bis(2-ethylhexyl) phthalate	0.3 J	0.25 J	0.65	0.7	0.2 J	--
Di-n-octyl phthalate	ND	ND	ND	0.019 J	ND	--
TOTAL SVOCs (mg/kg)	**0.396**	**0.347**	**0.707**	**2.116**	**0.2**	**500**

Notes:
1. B Analyte was detected in the associated blank as well as in the sample.
2. E The reported value is estimated due to interference.
3. J Estimated value.
4. ND parameter not detected above laboratory detection limit.
5. SSALs Site Specific Action Levels as per the RD/RA Work Plan.
6. "--" not analyzed for this parameter or no inidivdual SSAL

AREA I
SubArea D
Verification Samples
(Bottom Sample
fail, sidewalls ok)

SEVERN TRENT STL

Fax message

To: T. Forbes
Company: Benchmark
Fax: 856-0583
Subject: Results

From: B. Fischer
Date: 5/12/03
Pages: 4

This facsimile transmission contains analytical data for STL Buffalo Report #(s): A3-4382 ______ ______ ______. It is understood and agreed by the customer that all data and information stated in this report may be preliminary, may not have been reviewed for completeness or accuracy and could be subject to change based upon a final review. Severn Trent Laboratories, Inc. makes no expressed or implied warranties of any kind, including, but not limited to merchantability and fitness for a particular purpose, and customer agrees that Severn Trent Laboratories, Inc. shall not be liable for any of the customer's losses or damages caused by use of the data.

Date: 05/12/2003
Time: 15:47:05

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS - SOIL-ASPOD 8021 - STARS LIST

Rept: AN1246

Client ID / Job No / Lab ID / Sample Date		A-1/SUB AREA D-B A03-4382 A3438201 05/07/2003		A-1/SUB AREA-D-BLDUP A03-4382 A3438202 05/07/2003					
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	5400	5.0	10000	9.8	NA		NA	
n-Butylbenzene	UG/KG	ND	5.0	ND	9.8	NA		NA	
sec-Butylbenzene	UG/KG	ND	5.0	ND	9.8	NA		NA	
tert-Butylbenzene	UG/KG	ND	5.0	ND	9.8	NA		NA	
Ethylbenzene	UG/KG	340	16	740	30	NA		NA	
Isopropylbenzene	UG/KG	100	5.0	160	9.8	NA		NA	
Methyl tert butyl ether	UG/KG	78	1.7	120	3.3	NA		NA	
p-Cymene	UG/KG	ND	5.0	ND	9.8	NA		NA	
n-Propylbenzene	UG/KG	40	5.0	130	9.8	NA		NA	
Toluene	UG/KG	150	5.0	300	9.8	NA		NA	
1,2,4-Trimethylbenzene	UG/KG	700	5.0	1100	9.8	NA		NA	
1,3,5-Trimethylbenzene	UG/KG	50	5.0	69	9.8	NA		NA	
o-Xylene	UG/KG	170	5.0	320	9.8	NA		NA	
m-Xylene	UG/KG	7200 1	5.0	12000 1	9.8	NA		NA	
p-Xylene	UG/KG	ND 1	5.0	ND 1	9.8	NA		NA	
Total Xylenes	UG/KG	7300	5.0	13000	9.8	NA		NA	
SURROGATE(S)									
Fluorobenzene	%	108	70-125	108	70-125	NA		NA	
a,a,a-Trifluorotoluene	%	115	74-126	115	74-126	NA		NA	

NA = Not Applicable ND = Not Detected

Date: 05/12/2003
Time: 15:57:29

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS - SOIL - ASP00 8270 - BN ONLY

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		A-1/SUB AREA D-B A03-4382 A3438201 05/07/2003		A-1/SUB AREA-D-BLDUP A03-4382 A3438202 05/07/2003					
Analyte	**Units**	**Sample Value**	**Reporting Limit**	**Sample Value**	**Reporting Limit**	**Sample Value**	**Reporting Limit**	**Sample Value**	**Reporting Limit**
Acenaphthene	UG/KG	ND	420	ND	420	NA		NA	
Anthracene	UG/KG	ND	420	ND	420	NA		NA	
Benzaldehyde	UG/KG	ND	420	ND	420	NA		NA	
Benzo(a)anthracene	UG/KG	ND	420	ND	420	NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	420	ND	420	NA		NA	
Benzo(b)fluoranthene	UG/KG	ND	420	ND	420	NA		NA	
Benzo(k)fluoranthene	UG/KG	ND	420	ND	420	NA		NA	
Benzo(ghi)perylene	UG/KG	ND	420	ND	420	NA		NA	
Benzo(a)pyrene	UG/KG	73 J	420	130 J	420	NA		NA	
Chrysene	UG/KG	ND	420	ND	420	NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	420	ND	420	NA		NA	
Fluoranthene	UG/KG	ND	420	ND	420	NA		NA	
Fluorene	UG/KG	ND	420	ND	420	NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	420	ND	420	NA		NA	
Phenanthrene	UG/KG	ND	420	ND	420	NA		NA	
Pyrene	UG/KG	ND	420	ND	420	NA		NA	
Naphthalene	UG/KG	23 J	420	85 J	420	NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	420	ND	420	NA		NA	
Acetophenone	UG/KG	ND	420	ND	420	NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	420	ND	420	NA		NA	
Hexachloroethane	UG/KG	ND	420	ND	420	NA		NA	
Nitrobenzene	UG/KG	ND	420	ND	420	NA		NA	
Isophorone	UG/KG	ND	420	ND	420	NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	420	ND	420	NA		NA	
4-Chloroaniline	UG/KG	ND	420	ND	420	NA		NA	
Hexachlorobutadiene	UG/KG	ND	420	ND	420	NA		NA	
Caprolactam	UG/KG	ND	420	ND	420	NA		NA	
2-Methylnaphthalene	UG/KG	ND	420	ND	420	NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	420	ND	420	NA		NA	
2-Chloronaphthalene	UG/KG	ND	420	ND	420	NA		NA	
2-Nitroaniline	UG/KG	ND	1000	ND	1000	NA		NA	
Dimethyl phthalate	UG/KG	ND	420	ND	420	NA		NA	
Acenaphthylene	UG/KG	ND	420	ND	420	NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	420	ND	420	NA		NA	
3-Nitroaniline	UG/KG	ND	1000	ND	1000	NA		NA	
Dibenzofuran	UG/KG	ND	420	ND	420	NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	420	ND	420	NA		NA	
Diethyl phthalate	UG/KG	ND	420	ND	420	NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	420	ND	420	NA		NA	
4-Nitroaniline	UG/KG	ND	1000	ND	1000	NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	420	ND	420	NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	420	ND	420	NA		NA	
Hexachlorobenzene	UG/KG	ND	420	ND	420	NA		NA	

NA = Not Applicable ND = Not Detected

Date: 05/12/2003
Time: 15:57:29

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS - SOIL - ASP00 8270 - BN ONLY

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	A-1/SUB AREA D-B A03-4382 A3438201 05/07/2003		A-1/SUB AREA-D-BLDUP A03-4382 A3438202 05/07/2003					
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Atrazine	UG/KG	ND	420	ND	420	NA		NA	
Carbazole	UG/KG	ND	420	ND	420	NA		NA	
Di-n-butyl phthalate	UG/KG	ND	420	ND	420	NA		NA	
Butyl benzyl phthalate	UG/KG	ND	420	ND	420	NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	420	ND	420	NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	300 J	420	240 J	420	NA		NA	
Di-n-octyl phthalate	UG/KG	ND	420	ND	420	NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	82	50-200	91	50-200	NA		NA	
Naphthalene-D8	%	81	50-200	88	50-200	NA		NA	
Acenaphthene-D10	%	83	50-200	87	50-200	NA		NA	
Phenanthrene-D10	%	87	50-200	97	50-200	NA		NA	
Chrysene-D12	%	88	50-200	101	50-200	NA		NA	
Perylene-D12	%	91	50-200	108	50-200	NA		NA	
Nitrobenzene-D5	%	58	23-120	69	23-120	NA		NA	
2-Fluorobiphenyl	%	70	30-115	79	30-115	NA		NA	
p-Terphenyl-d14	%	91	18-137	87	18-137	NA		NA	
Phenol-D5	%	58	24-113	68	24-113	NA		NA	
2-Fluorophenol	%	48	25-121	59	25-121	NA		NA	
2,4,6-Tribromophenol	%	78	19-122	84	19-122	NA		NA	
2-Chlorophenol-d4	%	54	20-130	64	20-130	NA		NA	
1,2-Dichlorobenzene-d4	%	56	20-130	65	20-130	NA		NA	

NA = Not Applicable ND = Not Detected

Date: 05/13/2003
Time: 09:24:33

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS - SOIL-ASP00 8021 - STARS LIST

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		A1/SUBAREAD/SW-E A03-4466 A3446603 05/09/2003		A1/SUBAREAD/SW-N A03-4466 A3446601 05/09/2003		A1/SUBAREAD/SW-W A03-4466 A3446604 05/09/2003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
n-Butylbenzene	UG/KG	34	2.5	ND	2.6	ND	2.7	NA	
sec-Butylbenzene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
tert-Butylbenzene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
Ethylbenzene	UG/KG	ND	7.6	ND	7.9	ND	8.3	NA	
Isopropylbenzene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
Methyl tert butyl ether	UG/KG	ND	0.82	ND	0.85	ND	0.90	NA	
p-Cymene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
n-Propylbenzene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
Toluene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
1,2,4-Trimethylbenzene	UG/KG	14	2.5	ND	2.6	ND	2.7	NA	
1,3,5-Trimethylbenzene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
o-Xylene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
m-Xylene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
p-Xylene	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
Total Xylenes	UG/KG	ND	2.5	ND	2.6	ND	2.7	NA	
SURROGATE(S)									
Fluorobenzene	%	102	70-125	103	70-125	101	70-125	NA	
a,a,a-Trifluorotoluene	%	114	74-126	115	74-126	113	74-126	NA	

NA = Not Applicable ND = Not Detected

Date: 05/13/2003
Time: 09:24:33

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS - SOIL - ASP00 8270 - BN ONLY

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	A1/SUBAREAD/SW-E A03-4466 05/09/2003	A3446603	A1/SUBAREAD/SW-N A03-4466 05/09/2003	A3446601	A1/SUBAREAD/SW-S A03-4466 05/09/2003	A3446602	A1/SUBAREAD/SW-W A03-4466 05/09/2003	A3446604
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	420	ND	430	ND	410	ND	410
Anthracene	UG/KG	33 J	420	ND	430	ND	410	ND	410
Benzaldehyde	UG/KG	ND	420	ND	430	ND	410	ND	410
Benzo(a)anthracene	UG/KG	130 J	420	ND	430	ND	410	ND	410
Bis(2-chloroethyl) ether	UG/KG	ND	420	ND	430	ND	410	ND	410
Benzo(b)fluoranthene	UG/KG	120 J	420	ND	430	ND	410	ND	410
Benzo(k)fluoranthene	UG/KG	110 J	420	ND	430	ND	410	ND	410
Benzo(ghi)perylene	UG/KG	76 J	420	ND	430	ND	410	ND	410
Benzo(a)pyrene	UG/KG	130 J	420	97 J	430	ND	410	ND	410
Chrysene	UG/KG	120 J	420	ND	430	ND	410	ND	410
Dibenzo(a,h)anthracene	UG/KG	28 J	420	ND	430	ND	410	ND	410
Fluoranthene	UG/KG	240 J	420	ND	430	17 J	410	ND	410
Fluorene	UG/KG	ND	420	ND	430	ND	410	ND	410
Indeno(1,2,3-cd)pyrene	UG/KG	78 J	420	ND	430	ND	410	ND	410
Phenanthrene	UG/KG	120 J	420	ND	430	27 J	410	ND	410
Pyrene	UG/KG	200 J	420	ND	430	13 J	410	ND	410
Naphthalene	UG/KG	ND	420	ND	430	ND	410	ND	410
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	420	ND	430	ND	410	ND	410
Acetophenone	UG/KG	ND	420	ND	430	ND	410	ND	410
N-Nitroso-Di-n-propylamine	UG/KG	ND	420	ND	430	ND	410	ND	410
Hexachloroethane	UG/KG	ND	420	ND	430	ND	410	ND	410
Nitrobenzene	UG/KG	ND	420	ND	430	ND	410	ND	410
Isophorone	UG/KG	ND	420	ND	430	ND	410	ND	410
Bis(2-chloroethoxy) methane	UG/KG	ND	420	ND	430	ND	410	ND	410
4-Chloroaniline	UG/KG	ND	420	ND	430	ND	410	ND	410
Hexachlorobutadiene	UG/KG	ND	420	ND	430	ND	410	ND	410
Caprolactam	UG/KG	ND	420	ND	430	ND	410	ND	410
2-Methylnaphthalene	UG/KG	12 J	420	ND	430	ND	410	ND	410
Hexachlorocyclopentadiene	UG/KG	ND	420	ND	430	ND	410	ND	410
2-Chloronaphthalene	UG/KG	ND	420	ND	430	ND	410	ND	410
2-Nitroaniline	UG/KG	ND	1000	ND	1000	ND	1000	ND	990
Dimethyl phthalate	UG/KG	ND	420	ND	430	ND	410	ND	410
Acenaphthylene	UG/KG	ND	420	ND	430	ND	410	ND	410
2,6-Dinitrotoluene	UG/KG	ND	420	ND	430	ND	410	ND	410
3-Nitroaniline	UG/KG	ND	1000	ND	1000	ND	1000	ND	990
Dibenzofuran	UG/KG	ND	420	ND	430	ND	410	ND	410
2,4-Dinitrotoluene	UG/KG	ND	420	ND	430	ND	410	ND	410
Diethyl phthalate	UG/KG	ND	420	ND	430	ND	410	ND	410
4-Chlorophenyl phenyl ether	UG/KG	ND	420	ND	430	ND	410	ND	410
4-Nitroaniline	UG/KG	ND	1000	ND	1000	ND	1000	ND	990
N-nitrosodiphenylamine	UG/KG	ND	420	ND	430	ND	410	ND	410
4-Bromophenyl phenyl ether	UG/KG	ND	420	ND	430	ND	410	ND	410
Hexachlorobenzene	UG/KG	ND	420	ND	430	ND	410	ND	410

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 05/13/2003
Time: 09:24:33

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS - SOIL - ASP00 8270 - BN ONLY

Rept: AN0326

Client ID / Job No / Sample Date / Lab ID		A1/SUBAREAD/SW-E A03-4466 05/09/2003	A3446603	A1/SUBAREAD/SW-N A03-4466 05/09/2003	A3446601	A1/SUBAREAD/SW-S A03-4466 05/09/2003	A3446602	A1/SUBAREAD/SW-W A03-4466 05/09/2003	A3446604
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Atrazine	UG/KG	ND	420	ND	430	ND	410	ND	410
Carbazole	UG/KG	ND	420	ND	430	ND	410	ND	410
Di-n-butyl phthalate	UG/KG	ND	420	ND	430	ND	410	ND	410
Butyl benzyl phthalate	UG/KG	ND	420	ND	430	ND	410	ND	410
3,3'-Dichlorobenzidine	UG/KG	ND	420	ND	430	ND	410	ND	410
Bis(2-ethylhexyl) phthalate	UG/KG	700	420	250 J	430	650	410	200 J	410
Di-n-octyl phthalate	UG/KG	19 J	420	ND	430	ND	410	ND	410
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	92	50-200	77	50-200	94	50-200	89	50-200
Naphthalene-D8	%	86	50-200	72	50-200	89	50-200	82	50-200
Acenaphthene-D10	%	86	50-200	70	50-200	87	50-200	80	50-200
Phenanthrene-D10	%	103	50-200	83	50-200	98	50-200	88	50-200
Chrysene-D12	%	97	50-200	78	50-200	94	50-200	84	50-200
Perylene-D12	%	96	50-200	71	50-200	88	50-200	78	50-200
Nitrobenzene-D5	%	84	23-120	58	23-120	84	23-120	89	23-120
2-Fluorobiphenyl	%	93	30-115	72	30-115	93	30-115	98	30-115
p-Terphenyl-d14	%	87	18-137	84	18-137	88	18-137	92	18-137
Phenol-D5	%	77	24-113	55	24-113	78	24-113	82	24-113
2-Fluorophenol	%	72	25-121	49	25-121	72	25-121	78	25-121
2,4,6-Tribromophenol	%	91	19-122	80	19-122	93	19-122	97	19-122
2-Chlorophenol-d4	%	79	20-130	55	20-130	80	20-130	85	20-130
1,2-Dichlorobenzene-d4	%	77	20-130	54	20-130	75	20-130	82	20-130

NA = Not Applicable ND = Not Detected

Date: 05/13/2003
Time: 12:36:26

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS-SOIL-ASP00 8260-TCL VOLATILES + STARS

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	A1/SUBAREAD/SW-S A03-4466 05/09/2003	A3446602						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acetone	UG/KG	8 J	12	NA		NA		NA	
Benzene	UG/KG	ND	12	NA		NA		NA	
Bromodichloromethane	UG/KG	ND	12	NA		NA		NA	
Bromoform	UG/KG	ND	12	NA		NA		NA	
Bromomethane	UG/KG	ND	12	NA		NA		NA	
2-Butanone	UG/KG	ND	12	NA		NA		NA	
Carbon Disulfide	UG/KG	ND	12	NA		NA		NA	
Carbon Tetrachloride	UG/KG	ND	12	NA		NA		NA	
Chloromethane	UG/KG	ND	12	NA		NA		NA	
Chlorobenzene	UG/KG	ND	12	NA		NA		NA	
Chloroethane	UG/KG	ND	12	NA		NA		NA	
Cyclohexane	UG/KG	ND	12	NA		NA		NA	
Chloroform	UG/KG	ND	12	NA		NA		NA	
1,2-Dibromo-3-chloropropane	UG/KG	ND	12	NA		NA		NA	
Dibromochloromethane	UG/KG	ND	12	NA		NA		NA	
Dichlorodifluoromethane	UG/KG	ND	12	NA		NA		NA	
1,2-Dibromoethane	UG/KG	ND	12	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	12	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	12	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	12	NA		NA		NA	
1,1-Dichloroethane	UG/KG	ND	12	NA		NA		NA	
1,2-Dichloroethane	UG/KG	ND	12	NA		NA		NA	
1,1-Dichloroethene	UG/KG	ND	12	NA		NA		NA	
cis-1,2-Dichloroethene	UG/KG	ND	12	NA		NA		NA	
trans-1,2-Dichloroethene	UG/KG	ND	12	NA		NA		NA	
1,2-Dichloropropane	UG/KG	ND	12	NA		NA		NA	
cis-1,3-Dichloropropene	UG/KG	ND	12	NA		NA		NA	
trans-1,3-Dichloropropene	UG/KG	ND	12	NA		NA		NA	
Ethylbenzene	UG/KG	ND	12	NA		NA		NA	
2-Hexanone	UG/KG	ND	12	NA		NA		NA	
Isopropylbenzene	UG/KG	ND	12	NA		NA		NA	
Methyl acetate	UG/KG	ND	12	NA		NA		NA	
Methylene chloride	UG/KG	19 B	12	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	12	NA		NA		NA	
4-Methyl-2-pentanone	UG/KG	ND	12	NA		NA		NA	
Methylcyclohexane	UG/KG	ND	12	NA		NA		NA	
Styrene	UG/KG	ND	12	NA		NA		NA	
1,1,2,2-Tetrachloroethane	UG/KG	ND	12	NA		NA		NA	
Tetrachloroethene	UG/KG	ND	12	NA		NA		NA	
Toluene	UG/KG	ND	12	NA		NA		NA	
1.2.4-Trichlorobenzene	UG/KG	ND	12	NA		NA		NA	
1,1,1-Trichloroethane	UG/KG	ND	12	NA		NA		NA	
1,1,2-Trichloroethane	UG/KG	ND	12	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 05/13/2003
Time: 12:36:26

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS-SOIL-ASP00 8260-TCL VOLATILES + STARS

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		A1/SUBAREAD/SW-S A03-4466 A3446602 05/09/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
1,1,2-Trichloro-1,2,2-trifluor	UG/KG	ND	12	NA		NA		NA	
Trichloroethene	UG/KG	ND	12	NA		NA		NA	
Trichlorofluoromethane	UG/KG	ND	12	NA		NA		NA	
Vinyl chloride	UG/KG	ND	12	NA		NA		NA	
Total Xylenes	UG/KG	ND	12	NA		NA		NA	
n-Propylbenzene	UG/KG	ND	12	NA		NA		NA	
p-Cymene	UG/KG	ND	12	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	12	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	12	NA		NA		NA	
n-Butylbenzene	UG/KG	ND	12	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	12	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	12	NA		NA		NA	
IS/SURROGATE(S)									
Bromochloromethane	%	86	50-200	NA		NA		NA	
1,4-Difluorobenzene	%	82	50-200	NA		NA		NA	
Chlorobenzene-D5	%	84	50-200	NA		NA		NA	
p-Bromofluorobenzene	%	107	59-113	NA		NA		NA	
1,2-Dichloroethane-D4	%	108	70-121	NA		NA		NA	
Toluene-D8	%	104	84-138	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 05/13/2003
Time: 12:36:26

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS - ASP00 - METHOD 8260 + STARS - W

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	TRIP BLANK A03-4466 05/09/2003	A3446605						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Chloromethane	UG/L	ND	5	NA		NA		NA	
Bromomethane	UG/L	ND	5	NA		NA		NA	
Vinyl chloride	UG/L	ND	5	NA		NA		NA	
Chloroethane	UG/L	ND	5	NA		NA		NA	
Methylene chloride	UG/L	ND	10	NA		NA		NA	
Acetone	UG/L	ND	25	NA		NA		NA	
Carbon Disulfide	UG/L	ND	5	NA		NA		NA	
1,1-Dichloroethene	UG/L	ND	5	NA		NA		NA	
1,1-Dichloroethane	UG/L	ND	5	NA		NA		NA	
Chloroform	UG/L	ND	5	NA		NA		NA	
1,2-Dichloroethane	UG/L	ND	5	NA		NA		NA	
2-Butanone	UG/L	ND	25	NA		NA		NA	
1,1,1-Trichloroethane	UG/L	ND	5	NA		NA		NA	
Carbon Tetrachloride	UG/L	ND	5	NA		NA		NA	
Bromodichloromethane	UG/L	ND	5	NA		NA		NA	
1,2-Dichloropropane	UG/L	ND	5	NA		NA		NA	
cis-1,3-Dichloropropene	UG/L	ND	5	NA		NA		NA	
Trichloroethene	UG/L	ND	5	NA		NA		NA	
Dibromochloromethane	UG/L	ND	5	NA		NA		NA	
1,1,2-Trichloroethane	UG/L	ND	5	NA		NA		NA	
Benzene	UG/L	ND	5	NA		NA		NA	
trans-1,3-Dichloropropene	UG/L	ND	5	NA		NA		NA	
Bromoform	UG/L	ND	5	NA		NA		NA	
4-Methyl-2-pentanone	UG/L	ND	25	NA		NA		NA	
2-Hexanone	UG/L	ND	25	NA		NA		NA	
Tetrachloroethene	UG/L	ND	5	NA		NA		NA	
Toluene	UG/L	ND	5	NA		NA		NA	
1,1,2,2-Tetrachloroethane	UG/L	ND	5	NA		NA		NA	
Chlorobenzene	UG/L	ND	5	NA		NA		NA	
Ethylbenzene	UG/L	ND	5	NA		NA		NA	
Styrene	UG/L	ND	5	NA		NA		NA	
Total Xylenes	UG/L	ND	5	NA		NA		NA	
Dichlorodifluoromethane	UG/L	ND	5	NA		NA		NA	
Trichlorofluoromethane	UG/L	ND	5	NA		NA		NA	
1,1,2-Trichloro-1,2,2-trifluor	UG/L	ND	10	NA		NA		NA	
trans-1,2-Dichloroethene	UG/L	ND	5	NA		NA		NA	
Methyl tert butyl ether	UG/L	ND	10	NA		NA		NA	
cis-1,2-Dichloroethene	UG/L	ND	5	NA		NA		NA	
Cyclohexane	UG/L	ND	10	NA		NA		NA	
Methylcyclohexane	UG/L	ND	10	NA		NA		NA	
1,2-Dibromoethane	UG/L	ND	5	NA		NA		NA	
Isopropylbenzene	UG/L	ND	5	NA		NA		NA	
1,3-Dichlorobenzene	UG/L	ND	5	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 05/13/2003
Time: 12:36:26

Benchmark Environmental - Stars Testing
Benchmark - Steelfields site
STEELFIELDS - ASP00 - METHOD 8260 + STARS - W

Rept: AH0326

Client ID / Job No / Sample Date	Lab ID	TRIP BLANK A03-4466 05/09/2003	A3446605						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
1,4-Dichlorobenzene	UG/L	ND	5	NA		NA		NA	
1,2-Dichlorobenzene	UG/L	ND	5	NA		NA		NA	
1,2-Dibromo-3-chloropropane	UG/L	ND	5	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/L	ND	5	NA		NA		NA	
Methyl acetate	UG/L	ND	10	NA		NA		NA	
n-Propylbenzene	UG/L	ND	5	NA		NA		NA	
p-Cymene	UG/L	ND	5	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/L	ND	5	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/L	ND	5	NA		NA		NA	
n-Butylbenzene	UG/L	ND	5	NA		NA		NA	
sec-Butylbenzene	UG/L	ND	5	NA		NA		NA	
tert-Butylbenzene	UG/L	ND	5	NA		NA		NA	
IS/SURROGATE(S)									
Bromochloromethane	%	88	50-200	NA		NA		NA	
1,4-Difluorobenzene	%	84	50-200	NA		NA		NA	
Chlorobenzene-D5	%	86	50-200	NA		NA		NA	
Toluene-D8	%	99	88-110	NA		NA		NA	
p-Bromofluorobenzene	%	102	86-115	NA		NA		NA	
1,2-Dichloroethane-D4	%	103	76-114	NA		NA		NA	

NA = Not Applicable ND = Not Detected

AREA 1

SUBAREA A

FIRST OPEN AREAS

SEVERN TRENT STL

Fax message

To: T. Forbes

From: B. Fischer

Company: Benchmark

Date: 6-9-03

Fax: 856-0583

Pages: 4

Subject: Results

This facsimile transmission contains analytical data for STL Buffalo Report #(s): A03-5379 ______ ______ ______. It is understood and agreed by the customer that all data and information stated in this report may be preliminary, may not have been reviewed for completeness or accuracy and could be subject to change based upon a final review. Severn Trent Laboratories, Inc. makes no expressed or implied warranties of any kind, including, but not limited to merchantability and fitness for a particular purpose, and customer agrees that Severn Trent Laboratories, Inc. shall not be liable for any of the customer's losses or damages caused by use of the data.

Severn Trent Laboratories Inc.
STL Buffalo 10 Hazelwood Drive Amherst, New York 14228
Tel 716 691 2600 Fax 716 691 7991 Toll Free 877 STL BFLO • www.stl-inc.com

Date: 06/09/2003
Time: 13:26:03

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	SUB AREA-A2-B A03-5379 06/04/2003	A3537901	SUB AREA-A2-SW-E A03-5379 06/04/2003	A3537903	SUB AREA-A2-SW-S A03-5379 06/04/2003	A3537904	SUB AREA-A2-SW-W A03-5379 06/04/2003	A3537902
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	12	ND	12	ND	12	ND	12
n-Butylbenzene	UG/KG	ND	12	ND	12	ND	12	ND	12
sec-Butylbenzene	UG/KG	ND	12	ND	12	ND	12	ND	12
tert-Butylbenzene	UG/KG	ND	12	ND	12	ND	12	ND	12
Ethylbenzene	UG/KG	ND	12	ND	12	ND	12	ND	12
Isopropylbenzene	UG/KG	ND	12	ND	12	ND	12	ND	12
p-Cymene	UG/KG	ND	12	ND	12	ND	12	ND	12
n-Propylbenzene	UG/KG	ND	12	ND	12	ND	12	ND	12
Toluene	UG/KG	ND	12	ND	12	39	12	ND	12
o-Xylene	UG/KG	ND	12	ND	12	ND	12	ND	12
m-Xylene	UG/KG	ND	12	ND	12	ND	12	ND	12
p-Xylene	UG/KG	ND	12	ND	12	ND	12	ND	12
Total Xylenes	UG/KG	ND	38	ND	36	ND	36	ND	37
Methyl tert butyl ether	UG/KG	ND	12	ND	12	ND	12	ND	12
1,2,4-Trimethylbenzene	UG/KG	ND	12	ND	12	ND	12	ND	12
1,3,5-Trimethylbenzene	UG/KG	ND	12	ND	12	ND	12	ND	12
SURROGATE(S)									
Fluorobenzene	%	112	60-130	110	60-130	111	60-130	110	60-130
a,a,a-Trifluorotoluene	%	111	76-127	110	76-127	110	76-127	110	76-127

STL Buffalo

NA = Not Applicable ND = Not Detected

Date: 06/09/2003
Time: 13:26:03

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	SUB AREA-A2-B A03-5379 06/04/2003	A3537901	SUB AREA-A2-SW-E A03-5379 06/04/2003	A3537903	SUB AREA-A2-SW-S A03-5379 06/04/2003	A3537904	SUB AREA-A2-SW-W A03-5379 06/04/2003	A3537902
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	400	ND	410	ND	420	ND	480
Acenaphthylene	UG/KG	ND	400	ND	410	ND	420	ND	480
Anthracene	UG/KG	ND	400	ND	410	ND	420	ND	480
Benzo(a)anthracene	UG/KG	ND	400	ND	410	ND	420	ND	480
Benzo(b)fluoranthene	UG/KG	ND	400	ND	410	ND	420	ND	480
Benzo(k)fluoranthene	UG/KG	ND	400	ND	410	ND	420	ND	480
Benzo(ghi)perylene	UG/KG	ND	400	ND	410	ND	420	ND	480
Benzo(a)pyrene	UG/KG	ND	400	ND	410	ND	420	ND	480
Benzoic acid	UG/KG	ND	2000	ND	2000	ND	2000	ND	2300
Benzyl alcohol	UG/KG	ND	400	ND	410	ND	420	ND	480
Bis(2-chloroethoxy) methane	UG/KG	ND	400	ND	410	ND	420	ND	480
Bis(2-chloroethyl) ether	UG/KG	ND	400	ND	410	ND	420	ND	480
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	400	ND	410	ND	420	ND	480
Bis(2-ethylhexyl) phthalate	UG/KG	ND	400	ND	410	ND	420	ND	480
4-Bromophenyl phenyl ether	UG/KG	ND	400	ND	410	ND	420	ND	480
Butyl benzyl phthalate	UG/KG	ND	400	ND	410	ND	420	ND	480
4-Chloroaniline	UG/KG	ND	400	ND	410	ND	420	ND	480
2-Chloronaphthalene	UG/KG	ND	400	ND	410	ND	420	ND	480
4-Chlorophenyl phenyl ether	UG/KG	ND	400	ND	410	ND	420	ND	480
Chrysene	UG/KG	ND	400	ND	410	ND	420	ND	480
Dibenzo(a,h)anthracene	UG/KG	ND	400	ND	410	ND	420	ND	480
Dibenzofuran	UG/KG	ND	400	ND	410	ND	420	ND	480
Di-n-butyl phthalate	UG/KG	ND	400	ND	410	ND	420	ND	480
1,2-Dichlorobenzene	UG/KG	ND	400	ND	410	ND	420	ND	480
1,3-Dichlorobenzene	UG/KG	ND	400	ND	410	ND	420	ND	480
1,4-Dichlorobenzene	UG/KG	ND	400	ND	410	ND	420	ND	480
3,3'-Dichlorobenzidine	UG/KG	ND	800	ND	810	ND	830	ND	950
Diethyl phthalate	UG/KG	ND	400	ND	410	ND	420	ND	480
Dimethyl phthalate	UG/KG	ND	400	ND	410	ND	420	ND	480
2,4-Dinitrotoluene	UG/KG	ND	400	ND	410	ND	420	ND	480
2,6-Dinitrotoluene	UG/KG	ND	400	ND	410	ND	420	ND	480
Di-n-octyl phthalate	UG/KG	ND	400	ND	410	ND	420	ND	480
Fluoranthene	UG/KG	ND	400	ND	410	ND	420	ND	480
Fluorene	UG/KG	ND	400	ND	410	ND	420	ND	480
Hexachlorobenzene	UG/KG	ND	400	ND	410	ND	420	ND	480
Hexachlorobutadiene	UG/KG	ND	400	ND	410	ND	420	ND	480
Hexachlorocyclopentadiene	UG/KG	ND	400	ND	410	ND	420	ND	480
Hexachloroethane	UG/KG	ND	400	ND	410	ND	420	ND	480
Indeno(1,2,3-cd)pyrene	UG/KG	ND	400	ND	410	ND	420	ND	480
Isophorone	UG/KG	ND	400	ND	410	ND	420	ND	480
2-Methylnaphthalene	UG/KG	ND	400	ND	410	ND	420	ND	[illegible]
Naphthalene	UG/KG	ND	400	ND	410	ND	420	ND	480
2-Nitroaniline	UG/KG	ND	2000	ND	2000	ND	2000	ND	2300

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 06/09/2003
Time: 13:26:03

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		SUB AREA-A2-B A03-5379 A3537901 06/04/2003		SUB AREA-A2-SW-E A03-5379 A3537903 06/04/2003		SUB AREA-A2-SW-S A03-5379 A3537904 06/04/2003		SUB AREA-A2-SW-W A03-5379 A3537902 06/04/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2000	ND	2000	ND	2000	ND	2300
4-Nitroaniline	UG/KG	ND	2000	ND	2000	ND	2000	ND	2300
Nitrobenzene	UG/KG	ND	400	ND	410	ND	420	ND	480
N-nitrosodiphenylamine	UG/KG	ND	400	ND	410	ND	420	ND	480
N-Nitroso-Di-n-propylamine	UG/KG	ND	400	ND	410	ND	420	ND	480
Phenanthrene	UG/KG	ND	400	ND	410	ND	420	ND	480
Pyrene	UG/KG	ND	400	ND	410	ND	420	ND	480
1,2,4-Trichlorobenzene	UG/KG	ND	400	ND	410	ND	420	ND	480
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	91	50-200	109	50-200	120	50-200	115	50-200
Naphthalene-D8	%	101	50-200	115	50-200	127	50-200	121	50-200
Acenaphthene-D10	%	95	50-200	110	50-200	119	50-200	113	50-200
Phenanthrene-D10	%	96	50-200	110	50-200	120	50-200	109	50-200
Chrysene-D12	%	98	50-200	109	50-200	117	50-200	109	50-200
Perylene-D12	%	93	50-200	97	50-200	103	50-200	93	50-200
Nitrobenzene-D5	%	88	34-120	88	34-120	86	34-120	91	34-120
2-Fluorobiphenyl	%	101	43-125	104	43-125	101	43-125	108	43-125
p-Terphenyl-d14	%	91	38-141	88	38-141	90	38-141	89	38-141
Phenol-D5	%	93	34-120	91	34-120	87	34-120	90	34-120
2-Fluorophenol	%	86	25-125	84	25-125	80	25-125	82	25-125
2,4,6-Tribromophenol	%	95	36-139	97	36-139	100	36-139	109	36-139

NA = Not Applicable ND = Not Detected

SEVERN TRENT STL

Fax message

To: T. FORBES

From: B. FISCHER

Company: Benchmark

Date: 5-28-03

Fax: 856-0583

Pages: 4

Subject: STEELFIELDS RESULTS

This facsimile transmission contains analytical data for STL Buffalo Report #(s): A03-5041 ______ ______ ______. It is understood and agreed by the customer that all data and information stated in this report may be preliminary, may not have been reviewed for completeness or accuracy and could be subject to change based upon a final review. Severn Trent Laboratories, Inc. makes no expressed or implied warranties of any kind, including, but not limited to merchantability and fitness for a particular purpose, and customer agrees that Severn Trent Laboratories, Inc. shall not be liable for any of the customer's losses or damages caused by use of the data.

Severn Trent Laboratories Inc.
STL Buffalo 10 Hazelwood Drive Amherst, New York 14228
Tel 716 691 2600 Fax 716 691 7991 Toll Free 877 STL BFLO • www.stl-inc.com

Date: 05/28/2003
Time: 11:58:48

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1 SUBAREA A B A03-5041 A3504102 05/23/2003		AREA1 SUBAREA A SW-W A03-5041 A3504101 05/23/2003		BLIND DUPLICATE A03-5041 A3504103 05/23/2003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	12	ND	11	ND	12	NA	
n-Butylbenzene	UG/KG	ND	12	ND	11	ND	12	NA	
sec-Butylbenzene	UG/KG	ND	12	ND	11	ND	12	NA	
tert-Butylbenzene	UG/KG	ND	12	ND	11	ND	12	NA	
Ethylbenzene	UG/KG	ND	12	ND	11	ND	12	NA	
Isopropylbenzene	UG/KG	ND	12	ND	11	ND	12	NA	
p-Cymene	UG/KG	ND	12	ND	11	ND	12	NA	
n-Propylbenzene	UG/KG	ND	12	ND	11	ND	12	NA	
Toluene	UG/KG	ND	12	ND	11	ND	12	NA	
o-Xylene	UG/KG	ND	12	ND	11	ND	12	NA	
m-Xylene	UG/KG	ND	12	ND	11	ND	12	NA	
p-Xylene	UG/KG	ND	12	ND	11	ND	12	NA	
Total Xylenes	UG/KG	ND	37	ND	34	ND	35	NA	
Methyl tert butyl ether	UG/KG	ND	12	ND	11	ND	12	NA	
1,2,4-Trimethylbenzene	UG/KG	ND	12	ND	11	ND	12	NA	
1,3,5-Trimethylbenzene	UG/KG	ND	12	ND	11	ND	12	NA	
SURROGATE(S)									
Fluorobenzene	%	107	60-130	109	60-130	109	60-130	NA	
a,a,a-Trifluorotoluene	%	105	76-127	107	76-127	107	76-127	NA	

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 05/28/2003
Time: 11:58:48

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1 SUBAREA A B A03-5041 A3504102 05/23/2003		AREA1 SUBAREA A SW-W A03-5041 A3504101 05/23/2003		BLIND DUPLICATE A03-5041 A3504103 05/23/2003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	420	ND	480	ND	500	NA	
Acenaphthylene	UG/KG	ND	420	ND	480	ND	500	NA	
Anthracene	UG/KG	ND	420	ND	480	ND	500	NA	
Benzo(a)anthracene	UG/KG	ND	420	ND	480	ND	500	NA	
Benzo(b)fluoranthene	UG/KG	ND	420	ND	480	ND	500	NA	
Benzo(k)fluoranthene	UG/KG	ND	420	ND	480	ND	500	NA	
Benzo(ghi)perylene	UG/KG	ND	420	ND	480	ND	500	NA	
Benzo(a)pyrene	UG/KG	ND	420	ND	480	ND	500	NA	
Benzoic acid	UG/KG	ND	2000	ND	2400	ND	2400	NA	
Benzyl alcohol	UG/KG	ND	420	ND	480	ND	500	NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	420	ND	480	ND	500	NA	
Bis(2-chloroethyl) ether	UG/KG	ND	420	ND	480	ND	500	NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	420	ND	480	ND	500	NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	420	ND	480	ND	500	NA	
4-Bromophenyl phenyl ether	UG/KG	ND	420	ND	480	ND	500	NA	
Butyl benzyl phthalate	UG/KG	ND	420	ND	480	ND	500	NA	
4-Chloroaniline	UG/KG	ND	420	ND	480	ND	500	NA	
2-Chloronaphthalene	UG/KG	ND	420	ND	480	ND	500	NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	420	ND	480	ND	500	NA	
Chrysene	UG/KG	ND	420	ND	480	ND	500	NA	
Dibenzo(a,h)anthracene	UG/KG	ND	420	ND	480	ND	500	NA	
Dibenzofuran	UG/KG	ND	420	ND	480	ND	500	NA	
Di-n-butyl phthalate	UG/KG	ND	420	ND	480	ND	500	NA	
1,2-Dichlorobenzene	UG/KG	ND	420	ND	480	ND	500	NA	
1,3-Dichlorobenzene	UG/KG	ND	420	ND	480	ND	500	NA	
1,4-Dichlorobenzene	UG/KG	ND	420	ND	480	ND	500	NA	
3,3'-Dichlorobenzidine	UG/KG	ND	840	ND	970	ND	1000	NA	
Diethyl phthalate	UG/KG	ND	420	ND	480	ND	500	NA	
Dimethyl phthalate	UG/KG	ND	420	ND	480	ND	500	NA	
2,4-Dinitrotoluene	UG/KG	ND	420	ND	480	ND	500	NA	
2,6-Dinitrotoluene	UG/KG	ND	420	ND	480	ND	500	NA	
Di-n-octyl phthalate	UG/KG	ND	420	ND	480	ND	500	NA	
Fluoranthene	UG/KG	ND	420	ND	480	ND	500	NA	
Fluorene	UG/KG	ND	420	ND	480	ND	500	NA	
Hexachlorobenzene	UG/KG	ND	420	ND	480	ND	500	NA	
Hexachlorobutadiene	UG/KG	ND	420	ND	480	ND	500	NA	
Hexachlorocyclopentadiene	UG/KG	ND	420	ND	480	ND	500	NA	
Hexachloroethane	UG/KG	ND	420	ND	480	ND	500	NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	420	ND	480	ND	500	NA	
Isophorone	UG/KG	ND	420	ND	480	ND	500	NA	
2-Methylnaphthalene	UG/KG	ND	420	ND	480	ND	500	NA	
Naphthalene	UG/KG	ND	420	ND	480	ND	500	NA	
2-Nitroaniline	UG/KG	ND	2000	ND	2400	ND	2400	NA	

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 05/28/2003
Time: 11:58:48

Steelfields LLC
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1 SUBAREA A B A03-5041 A3504102 05/23/2003		AREA1 SUBAREA A SW-W A03-5041 A3504101 05/23/2003		BLIND DUPLICATE A03-5041 A3504103 05/23/2003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2000	ND	2400	ND	2400	NA	
4-Nitroaniline	UG/KG	ND	2000	ND	2400	ND	2400	NA	
Nitrobenzene	UG/KG	ND	420	ND	480	ND	500	NA	
N-nitrosodiphenylamine	UG/KG	ND	420	ND	480	ND	500	NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	420	ND	480	ND	500	NA	
Phenanthrene	UG/KG	ND	420	ND	480	ND	500	NA	
Pyrene	UG/KG	ND	420	ND	480	ND	500	NA	
1,2,4-Trichlorobenzene	UG/KG	ND	420	ND	480	ND	500	NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	59	50-200	66	50-200	64	50-200	NA	
Naphthalene-D8	%	61	50-200	69	50-200	68	50-200	NA	
Acenaphthene-D10	%	60	50-200	70	50-200	67	50-200	NA	
Phenanthrene-D10	%	64	50-200	73	50-200	72	50-200	NA	
Chrysene-D12	%	64	50-200	71	50-200	72	50-200	NA	
Perylene-D12	%	66	50-200	73	50-200	76	50-200	NA	
Nitrobenzene-D5	%	130 *	34-120	118	34-120	120	34-120	NA	
2-Fluorobiphenyl	%	138 *	43-125	128 *	43-125	131 *	43-125	NA	
p-Terphenyl-d14	%	139	38-141	140	38-141	146 *	38-141	NA	
Phenol-D5	%	64	34-120	58	34-120	60	34-120	NA	
2-Fluorophenol	%	62	25-125	54	25-125	55	25-125	NA	
2,4,6-Tribromophenol	%	58	36-139	58	36-139	61	36-139	NA	

NA = Not Applicable ND = Not Detected

AREA 1

SUBAREA A

RESAMPLED AREA ON EAST SIDE OF EXCAVATION BENEATH FORMER CONCRETE SLAB/FOUNDATION

Date: 06/27/2003
Time: 11:30:34

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	AREA-1/EAST/SW-S A03-6100 06/25/2003	A3610001						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	12	NA		NA		NA	
n-Butylbenzene	UG/KG	2200	12	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	12	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	12	NA		NA		NA	
Ethylbenzene	UG/KG	170	12	NA		NA		NA	
Isopropylbenzene	UG/KG	330	12	NA		NA		NA	
p-Cymene	UG/KG	ND	12	NA		NA		NA	
n-Propylbenzene	UG/KG	370	12	NA		NA		NA	
Toluene	UG/KG	36	12	NA		NA		NA	
o-Xylene	UG/KG	140	12	NA		NA		NA	
m-Xylene	UG/KG	680 1	12	NA		NA		NA	
p-Xylene	UG/KG	ND 1	12	NA		NA		NA	
Total Xylenes	UG/KG	820	38	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	12	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	2200	12	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	700	12	NA		NA		NA	
SURROGATE(S)									
Fluorobenzene	%	108	60-130	NA		NA		NA	
a,a,a-Trifluorotoluene	%	124	76-127	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 06/27/2003
Time: 11:30:34

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID Job No Lab ID Sample Date		AREA-1/EAST/SW-S A03-6100 A3610001 06/25/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	4100	NA		NA		NA	
Acenaphthylene	UG/KG	ND	4100	NA		NA		NA	
Anthracene	UG/KG	ND	4100	NA		NA		NA	
Benzo(a)anthracene	UG/KG	ND	4100	NA		NA		NA	
Benzo(b)fluoranthene	UG/KG	ND	4100	NA		NA		NA	
Benzo(k)fluoranthene	UG/KG	ND	4100	NA		NA		NA	
Benzo(ghi)perylene	UG/KG	ND	4100	NA		NA		NA	
Benzo(a)pyrene	UG/KG	ND	4100	NA		NA		NA	
Benzoic acid	UG/KG	ND	20000	NA		NA		NA	
Benzyl alcohol	UG/KG	ND	4100	NA		NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	4100	NA		NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	4100	NA		NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	4100	NA		NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	4100	NA		NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	4100	NA		NA		NA	
Butyl benzyl phthalate	UG/KG	ND	4100	NA		NA		NA	
4-Chloroaniline	UG/KG	ND	4100	NA		NA		NA	
2-Chloronaphthalene	UG/KG	ND	4100	NA		NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	4100	NA		NA		NA	
Chrysene	UG/KG	ND	4100	NA		NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	4100	NA		NA		NA	
Dibenzofuran	UG/KG	ND	4100	NA		NA		NA	
Di-n-butyl phthalate	UG/KG	ND	4100	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	4100	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	4100	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	4100	NA		NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	8200	NA		NA		NA	
Diethyl phthalate	UG/KG	ND	4100	NA		NA		NA	
Dimethyl phthalate	UG/KG	ND	4100	NA		NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	4100	NA		NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	4100	NA		NA		NA	
Di-n-octyl phthalate	UG/KG	ND	4100	NA		NA		NA	
Fluoranthene	UG/KG	ND	4100	NA		NA		NA	
Fluorene	UG/KG	ND	4100	NA		NA		NA	
Hexachlorobenzene	UG/KG	ND	4100	NA		NA		NA	
Hexachlorobutadiene	UG/KG	ND	4100	NA		NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	4100	NA		NA		NA	
Hexachloroethane	UG/KG	ND	4100	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	4100	NA		NA		NA	
Isophorone	UG/KG	ND	4100	NA		NA		NA	
2-Methylnaphthalene	UG/KG	ND	4100	NA		NA		NA	
Naphthalene	UG/KG	ND	4100	NA		NA		NA	
2-Nitroaniline	UG/KG	ND	20000	NA		NA		NA	

Date: 06/27/2003
Time: 11:30:34

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA-1/EAST/SW-S A03-6100 A3610001 06/25/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	20000	NA		NA		NA	
4-Nitroaniline	UG/KG	ND	20000	NA		NA		NA	
Nitrobenzene	UG/KG	ND	4100	NA		NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	4100	NA		NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	4100	NA		NA		NA	
Phenanthrene	UG/KG	4100	4100	NA		NA		NA	
Pyrene	UG/KG	ND	4100	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	4100	NA		NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	74	50-200	NA		NA		NA	
Naphthalene-D8	%	74	50-200	NA		NA		NA	
Acenaphthene-D10	%	89	50-200	NA		NA		NA	
Phenanthrene-D10	%	104	50-200	NA		NA		NA	
Chrysene-D12	%	104	50-200	NA		NA		NA	
Perylene-D12	%	131	50-200	NA		NA		NA	
Nitrobenzene-D5	%	30 *	34-120	NA		NA		NA	
2-Fluorobiphenyl	%	54	43-125	NA		NA		NA	
p-Terphenyl-d14	%	70	38-141	NA		NA		NA	
Phenol-D5	%	35	34-120	NA		NA		NA	
2-Fluorophenol	%	31	25-125	NA		NA		NA	
2,4,6-Tribromophenol	%	43	36-139	NA		NA		NA	

AREA 1

SUBAREA A

DEADMAN/SHEETPILE AREA

Date: 06/13/2003
Time: 16:39:24

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/DM WALL-IMP #2 A03-5567 A3556706 06/11/2003		AREA1/DM WALL-IMP#1 A03-5567 A3556704 06/11/2003		AREA1/DM WALL-NAT #2 A03-5567 A3556707 06/11/2003		AREA1/SUB A3/IS-EAST A03-5567 A3556702 06/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	24	ND	120	ND	12	ND	12
n-Butylbenzene	UG/KG	4400	24	11000	120	ND	12	600	12
sec-Butylbenzene	UG/KG	1900	24	1800	120	440	12	230	12
tert-Butylbenzene	UG/KG	ND	24	ND	120	ND	12	ND	12
Ethylbenzene	UG/KG	560	24	1600	120	49	12	59	12
Isopropylbenzene	UG/KG	630	24	990	120	46	12	44	12
p-Cymene	UG/KG	700	24	ND	120	ND	12	ND	12
n-Propylbenzene	UG/KG	920	24	970	120	ND	12	25	12
Toluene	UG/KG	ND	24	1000	120	ND	12	40	12
o-Xylene	UG/KG	ND	24	3200	120	ND	12	130	12
m-Xylene	UG/KG	900 1	24	7200 1	120	78 1	12	220 1	12
p-Xylene	UG/KG	ND 1	24	ND 1	120	ND 1	12	ND 1	12
Total Xylenes	UG/KG	900	72	10000	380	78	35	350	36
Methyl tert butyl ether	UG/KG	ND	24	ND	120	ND	12	ND	12
1,2,4-Trimethylbenzene	UG/KG	2400	24	15000	120	210	12	700	12
1,3,5-Trimethylbenzene	UG/KG	780	24	5400	120	ND	12	250	12
SURROGATE(S)									
Fluorobenzene	%	104	60-130	102	60-130	96	60-130	104	60-130
a,a,a-Trifluorotoluene	%	108	76-127	112	76-127	100	76-127	108	76-127

NA = Not Applicable ND = Not Detected

Date: 06/13/2003
Time: 16:39:24

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/SUB A3/IS-WEST A03-5567 A3556701 06/11/2003		BLIND DUP-6-11-03 A03-5567 A3556703 06/11/2003					
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	160	120	ND	12	NA		NA	
n-Butylbenzene	UG/KG	11000	120	1100	12	NA		NA	
sec-Butylbenzene	UG/KG	2300	120	ND	12	NA		NA	
tert-Butylbenzene	UG/KG	ND	120	ND	12	NA		NA	
Ethylbenzene	UG/KG	1500	120	90	12	NA		NA	
Isopropylbenzene	UG/KG	180	120	47	12	NA		NA	
p-Cymene	UG/KG	1000	120	110	12	NA		NA	
n-Propylbenzene	UG/KG	1000	120	31	12	NA		NA	
Toluene	UG/KG	1500	120	60	12	NA		NA	
o-Xylene	UG/KG	3300	120	220	12	NA		NA	
m-Xylene	UG/KG	6300 1	120	390 1	12	NA		NA	
p-Xylene	UG/KG	ND 1	120	ND 1	12	NA		NA	
Total Xylenes	UG/KG	9600	360	610	37	NA		NA	
Methyl tert butyl ether	UG/KG	ND	120	ND	12	NA		NA	
1,2,4-Trimethylbenzene	UG/KG	17000	120	1000	12	NA		NA	
1,3,5-Trimethylbenzene	UG/KG	5400	120	440	12	NA		NA	
SURROGATE(S)									
Fluorobenzene	%	107	60-130	105	60-130	NA		NA	
a,a,a-Trifluorotoluene	%	112	76-127	110	76-127	NA		NA	

NA = Not Applicable ND = Not Detected

Date: 06/13/2003
Time: 16:39:24

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8260 - TCL VOLATILE ORGANICS+STARS-S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/DM WALL-NAT #1 A03-5567 A3556705 06/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acetone	UG/KG	170	33	NA		NA		NA	
Benzene	UG/KG	ND	6	NA		NA		NA	
Bromodichloromethane	UG/KG	ND	6	NA		NA		NA	
Bromoform	UG/KG	ND	6	NA		NA		NA	
Bromomethane	UG/KG	ND	6	NA		NA		NA	
2-Butanone	UG/KG	37	33	NA		NA		NA	
Carbon Disulfide	UG/KG	ND	6	NA		NA		NA	
Carbon Tetrachloride	UG/KG	ND	6	NA		NA		NA	
Chlorobenzene	UG/KG	ND	6	NA		NA		NA	
Chloroethane	UG/KG	ND	6	NA		NA		NA	
Chloroform	UG/KG	ND	6	NA		NA		NA	
Chloromethane	UG/KG	ND	6	NA		NA		NA	
Cyclohexane	UG/KG	ND	6	NA		NA		NA	
Dibromochloromethane	UG/KG	ND	6	NA		NA		NA	
1,2-Dibromo-3-chloropropane	UG/KG	ND	6	NA		NA		NA	
1,1-Dichloroethane	UG/KG	ND	6	NA		NA		NA	
1,2-Dichloroethane	UG/KG	ND	6	NA		NA		NA	
Dichlorodifluoromethane	UG/KG	ND	6	NA		NA		NA	
1,1-Dichloroethene	UG/KG	ND	6	NA		NA		NA	
1,2-Dibromoethane	UG/KG	ND	6	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	6	NA		NA		NA	
1,2-Dichloropropane	UG/KG	ND	6	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	6	NA		NA		NA	
cis-1,3-Dichloropropene	UG/KG	ND	6	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	6	NA		NA		NA	
trans-1,3-Dichloropropene	UG/KG	ND	6	NA		NA		NA	
Ethylbenzene	UG/KG	ND	6	NA		NA		NA	
2-Hexanone	UG/KG	ND	33	NA		NA		NA	
Methylene chloride	UG/KG	19 B	6	NA		NA		NA	
cis-1,2-Dichloroethene	UG/KG	ND	6	NA		NA		NA	
trans-1,2-Dichloroethene	UG/KG	ND	6	NA		NA		NA	
4-Methyl-2-pentanone	UG/KG	ND	33	NA		NA		NA	
Styrene	UG/KG	ND	6	NA		NA		NA	
1,1,2,2-Tetrachloroethane	UG/KG	ND	6	NA		NA		NA	
Tetrachloroethene	UG/KG	ND	6	NA		NA		NA	
Toluene	UG/KG	ND	6	NA		NA		NA	
1,1,1-Trichloroethane	UG/KG	ND	6	NA		NA		NA	
1,1,2-Trichloroethane	UG/KG	ND	6	NA		NA		NA	
Isopropylbenzene	UG/KG	ND	6	NA		NA		NA	
Trichloroethene	UG/KG	ND	6	NA		NA		NA	
Methyl acetate	UG/KG	ND	6	NA		NA		NA	
Vinyl chloride	UG/KG	ND	13	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	6	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 06/13/2003
Time: 16:39:24

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8260 - TCL VOLATILE ORGANICS+STARS-S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/DM WALL-NAT #1 / A03-5567 / A3556705 / 06/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Total Xylenes	UG/KG	ND	20	NA		NA		NA	
Methylcyclohexane	UG/KG	ND	6	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	6	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	6	NA		NA		NA	
1,1,2-Trichloro-1,2,2-trifluor	UG/KG	ND	6	NA		NA		NA	
Trichlorofluoromethane	UG/KG	ND	6	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	6	NA		NA		NA	
n-Butylbenzene	UG/KG	ND	6	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	6	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	6	NA		NA		NA	
n-Propylbenzene	UG/KG	ND	6	NA		NA		NA	
p-Cymene	UG/KG	ND	6	NA		NA		NA	
IS/SURROGATE(S)									
Chlorobenzene-D5	%	92	50-200	NA		NA		NA	
1,4-Difluorobenzene	%	92	50-200	NA		NA		NA	
1,4-Dichlorobenzene-D4	%	90	50-200	NA		NA		NA	
Toluene-D8	%	107	71-125	NA		NA		NA	
p-Bromofluorobenzene	%	103	68-124	NA		NA		NA	
1,2-Dichloroethane-D4	%	102	61-136	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 06/13/2003
Time: 16:39:24

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/DM WALL-IMP #2 A03-5567 A3556706 06/11/2003		AREA1/DM WALL-IMP#1 A03-5567 A3556704 06/11/2003		AREA1/DM WALL-NAT #1 A03-5567 A3556705 06/11/2003		AREA1/DM WALL-NAT #2 A03-5567 A3556707 06/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Acenaphthylene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Anthracene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Benzo(a)anthracene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Benzo(b)fluoranthene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Benzo(k)fluoranthene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Benzo(ghi)perylene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Benzo(a)pyrene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Benzoic acid	UG/KG	ND	190000	ND	100000	ND	2100	ND	190000
Benzyl alcohol	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Bis(2-chloroethoxy) methane	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Bis(2-chloroethyl) ether	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Bis(2-ethylhexyl) phthalate	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
4-Bromophenyl phenyl ether	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Butyl benzyl phthalate	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
4-Chloroaniline	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
2-Chloronaphthalene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
4-Chlorophenyl phenyl ether	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Chrysene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Dibenzo(a,h)anthracene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Dibenzofuran	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Di-n-butyl phthalate	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
1,2-Dichlorobenzene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
1,3-Dichlorobenzene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
1,4-Dichlorobenzene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
3,3'-Dichlorobenzidine	UG/KG	ND	80000	ND	41000	ND	860	ND	77000
Diethyl phthalate	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Dimethyl phthalate	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
2,4-Dinitrotoluene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
2,6-Dinitrotoluene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Di-n-octyl phthalate	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Fluoranthene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Fluorene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Hexachlorobenzene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Hexachlorobutadiene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Hexachlorocyclopentadiene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Hexachloroethane	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Indeno(1,2,3-cd)pyrene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Isophorone	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
2-Methylnaphthalene	UG/KG	ND	40000	22000	21000	ND	430	ND	39000
Naphthalene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
2-Nitroaniline	UG/KG	ND	190000	ND	100000	ND	2100	ND	190000

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 06/13/2003
Time: 16:39:24

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	AREA1/DM WALL-IMP #2 A03-5567 A3556706 06/11/2003		AREA1/DM WALL-IMP#1 A03-5567 A3556704 06/11/2003		AREA1/DM WALL-NAT #1 A03-5567 A3556705 06/11/2003		AREA1/DM WALL-NAT #2 A03-5567 A3556707 06/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	190000	ND	100000	ND	2100	ND	190000
4-Nitroaniline	UG/KG	ND	190000	ND	100000	ND	2100	ND	190000
Nitrobenzene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
N-nitrosodiphenylamine	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
N-Nitroso-Di-n-propylamine	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
Phenanthrene	UG/KG	32000 J	40000	16000 J	21000	ND	430	ND	39000
Pyrene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
1,2,4-Trichlorobenzene	UG/KG	ND	40000	ND	21000	ND	430	ND	39000
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	104	50-200	86	50-200	97	50-200	109	50-200
Naphthalene-D8	%	98	50-200	81	50-200	87	50-200	96	50-200
Acenaphthene-D10	%	100	50-200	88	50-200	87	50-200	100	50-200
Phenanthrene-D10	%	111	50-200	97	50-200	92	50-200	106	50-200
Chrysene-D12	%	134	50-200	117	50-200	107	50-200	141	50-200
Perylene-D12	%	173	50-200	146	50-200	137	50-200	176	50-200
Nitrobenzene-D5	%	0 D	34-120	38	34-120	108	34-120	0 D	34-120
2-Fluorobiphenyl	%	71	43-125	91	43-125	109	43-125	76	43-125
p-Terphenyl-d14	%	76	38-141	96	38-141	92	38-141	91	38-141
Phenol-D5	%	34	34-120	49	34-120	105	34-120	40	34-120
2-Fluorophenol	%	0 D	25-125	35	25-125	106	25-125	0 D	25-125
2,4,6-Tribromophenol	%	0 D	36-139	0 D	36-139	106	36-139	0 D	36-139

NA = Not Applicable ND = Not Detected

Date: 06/13/2003
Time: 16:39:24

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/SUB A3/IS-EAST A03-5567 A3556702 06/11/2003		AREA1/SUB A3/IS-WEST A03-5567 A3556701 06/11/2003		BLIND DUP-6-11-03 A03-5567 A3556703 06/11/2003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Acenaphthylene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Anthracene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Benzo(a)anthracene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Benzo(b)fluoranthene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Benzo(k)fluoranthene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Benzo(ghi)perylene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Benzo(a)pyrene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Benzoic acid	UG/KG	ND	92000	ND	190000	ND	95000	NA	
Benzyl alcohol	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Bis(2-chloroethyl) ether	UG/KG	ND	19000	ND	40000	ND	20000	NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	19000	ND	40000	ND	20000	NA	
4-Bromophenyl phenyl ether	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Butyl benzyl phthalate	UG/KG	ND	19000	ND	40000	ND	20000	NA	
4-Chloroaniline	UG/KG	ND	19000	ND	40000	ND	20000	NA	
2-Chloronaphthalene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Chrysene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Dibenzo(a,h)anthracene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Dibenzofuran	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Di-n-butyl phthalate	UG/KG	ND	19000	ND	40000	ND	20000	NA	
1,2-Dichlorobenzene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
1,3-Dichlorobenzene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
1,4-Dichlorobenzene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
3,3'-Dichlorobenzidine	UG/KG	ND	38000	ND	80000	ND	39000	NA	
Diethyl phthalate	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Dimethyl phthalate	UG/KG	ND	19000	ND	40000	ND	20000	NA	
2,4-Dinitrotoluene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
2,6-Dinitrotoluene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Di-n-octyl phthalate	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Fluoranthene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Fluorene	UG/KG	ND	19000	30000 J	40000	ND	20000	NA	
Hexachlorobenzene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Hexachlorobutadiene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Hexachlorocyclopentadiene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Hexachloroethane	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Isophorone	UG/KG	ND	19000	ND	40000	ND	20000	NA	
2-Methylnaphthalene	UG/KG	20000	19000	200000	40000	ND	20000	NA	
Naphthalene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
2-Nitroaniline	UG/KG	ND	92000	ND	190000	ND	95000	NA	

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 06/13/2003
Time: 16:39:24

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/SUB A3/IS-EAST A03-5567 A3556702 06/11/2003		AREA1/SUB A3/IS-WEST A03-5567 A3556701 06/11/2003		BLIND DUP-6-11-03 A03-5567 A3556703 06/11/2003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	92000	ND	190000	ND	95000	NA	
4-Nitroaniline	UG/KG	ND	92000	ND	190000	ND	95000	NA	
Nitrobenzene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
N-nitrosodiphenylamine	UG/KG	ND	19000	ND	40000	ND	20000	NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	19000	ND	40000	ND	20000	NA	
Phenanthrene	UG/KG	12000 J	19000	87000	40000	ND	20000	NA	
Pyrene	UG/KG	ND	19000	21000 J	40000	ND	20000	NA	
1,2,4-Trichlorobenzene	UG/KG	ND	19000	ND	40000	ND	20000	NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	91	50-200	91	50-200	90	50-200	NA	
Naphthalene-D8	%	86	50-200	92	50-200	81	50-200	NA	
Acenaphthene-D10	%	89	50-200	107	50-200	85	50-200	NA	
Phenanthrene-D10	%	99	50-200	117	50-200	93	50-200	NA	
Chrysene-D12	%	107	50-200	130	50-200	93	50-200	NA	
Perylene-D12	%	130	50-200	163	50-200	112	50-200	NA	
Nitrobenzene-D5	%	37	34-120	0 D	34-120	32 D	34-120	NA	
2-Fluorobiphenyl	%	84	43-125	90	43-125	84	43-125	NA	
p-Terphenyl-d14	%	92	38-141	102	38-141	101	38-141	NA	
Phenol-D5	%	48	34-120	0 D	34-120	47	34-120	NA	
2-Fluorophenol	%	39	25-125	0 D	25-125	44	25-125	NA	
2,4,6-Tribromophenol	%	0 D	36-139	0 D	36-139	0 D	36-139	NA	

NA = Not Applicable ND = Not Detected

AREA 1

SUBAREA K&L

BOTTOM, EAST WALL AND SOUTHWALL (FIRST ATTEMPT)

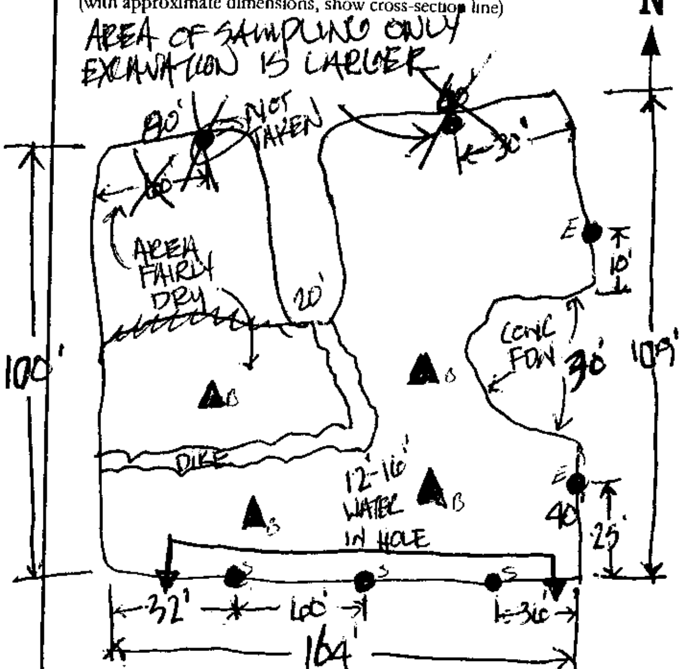
▲ - BOTTOM SAMPLE
● - SIDE WALL SAMPLE

TurnKey Environmental Restoration, LLC

SOIL EXCAVATION LOG

Project:	Voluntary Cleanup Program RD/RA	EXCAVATION LOCATION:	AREA 1, SUBAREA K&L
Project No.:	0062-	Excavation Time/Date:	2:30 / 6/18/03
Client:	Steelfields, LTD	Excavation Method:	
Location:	Buffalo, New York	TK Observer:	RICK DUBISZ, JOHN McCONNELL

Excavation Plan View:
(with approximate dimensions, show cross-section line)



Excavation Cross-Section:

Depth	
Grade - 0'	Various layer of ~~slag~~ loose & cemented slag - (white) plus
2'	layer of loose foundry sands
4'	& gravel
6'	Ground water at approx -5-6'.
8'	Native - LT BRN / Grey clay material
10'	
12'	
14'	
16'	
18'	
20'	

Confirmation Sample I.D.	Depth (fbgs) to sample	Location Within Excavation (Sidewall/Bottom) (North, South, East, West)	PID Reading (ppm)	Photos Y / N	Notes
AREA-1/SubArea K&L SW - S	5-6'	Composite samples along south wall	South wall 5.5ppm	Y	MS/MSD collected
AREA-1/Sub Area K&L SW - E	6-8'	Two composite samples along east wall	East wall 2.3ppm	Y	
AREA-1/Sub Area - Bottom	5-6'	Four composite samples along bottom of excavation	P		Blind dup collected on bottom

COMMENTS:

DEPTH TO GROUNDWATER (fbgs): 5-6'

VISUAL IMPACTS (if any): 6-10" BLACK granular layer at approx 5-6'

OLFACTORY OBSERVATIONS:

DEPTH TO NATIVE SOIL (fbgs): Approx -6'

OTHER OBSERVATIONS: SOUTH WALL HAS NAPTHLENE ODOR

APPROX. QUANTITY OF UN-IMPACTED SOIL REMOVED (CY):

APPROX. QUANTITY OF IMPACTED SOIL REMOVED (CY):

FINAL DESTINATION OF IMPACTED SOIL:

SOURCE OF BACKFILL:

Date: 06/23/2003
Time: 13:36:25

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		AREA1/S-A K&L/BOTTOM A03-5886 A3588603 06/18/2003		AREA1/SUB-A K&L/SW-E A03-5886 A3588602 06/18/2003		AREA1/SUB-A K&L/SW-S A03-5886 A3588601 06/18/2003		BLIND DUP-6-18-03 A03-5886 A3588604 06/18/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	32	13	25	15	ND	27	56	13
n-Butylbenzene	UG/KG	ND	13	ND	15	670	27	250	13
sec-Butylbenzene	UG/KG	ND	13	ND	15	29	27	ND	13
tert-Butylbenzene	UG/KG	ND	13	ND	15	ND	27	ND	13
Ethylbenzene	UG/KG	61	13	27	15	320	27	150	13
Isopropylbenzene	UG/KG	ND	13	41	15	88	27	18	13
p-Cymene	UG/KG	ND	13	ND	15	220	27	ND	13
n-Propylbenzene	UG/KG	ND	13	ND	15	64	27	21	13
Toluene	UG/KG	ND	13	49	15	130	27	33	13
o-Xylene	UG/KG	ND	13	32	15	510	27	83	13
m-Xylene	UG/KG	40 1	13	54 1	15	880 1	27	200 1	13
p-Xylene	UG/KG	ND 1	13	ND 1	15	ND 1	27	ND 1	13
Total Xylenes	UG/KG	40	39	86	46	1400	82	280	39
Methyl tert butyl ether	UG/KG	ND	13	ND	15	ND	27	ND	13
1,2,4-Trimethylbenzene	UG/KG	110	13	66	15	1700	27	400	13
1,3,5-Trimethylbenzene	UG/KG	ND	13	26	15	580	27	200	13
SURROGATE(S)									
Fluorobenzene	%	103	60-130	104	60-130	100	60-130	106	60-130
a,a,a-Trifluorotoluene	%	105	76-127	106	76-127	103	76-127	108	76-127

NA = Not Applicable ND = Not Detected STL Buffalo

Date: 06/23/2003
Time: 13:36:25

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/SUB-A K&L/SW-E A03-5886 A3588602 06/18/2003		AREA1/SUB-A K&L/SW-S A03-5886 A3588601 06/18/2003					
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	5100	2200	15000	4200	NA		NA	
Acenaphthylene	UG/KG	ND	2200	ND	4200	NA		NA	
Anthracene	UG/KG	5400	2200	13000	4200	NA		NA	
Benzo(a)anthracene	UG/KG	3400	2200	6500	4200	NA		NA	
Benzo(b)fluoranthene	UG/KG	2100 J	2200	3100 J	4200	NA		NA	
Benzo(k)fluoranthene	UG/KG	2200	2200	3500 J	4200	NA		NA	
Benzo(ghi)perylene	UG/KG	ND	2200	ND	4200	NA		NA	
Benzo(a)pyrene	UG/KG	2000 J	2200	3400 J	4200	NA		NA	
Benzoic acid	UG/KG	ND	11000	ND	21000	NA		NA	
Benzyl alcohol	UG/KG	ND	2200	ND	4200	NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	2200	ND	4200	NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	2200	ND	4200	NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	2200	ND	4200	NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	2200	ND	4200	NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	2200	ND	4200	NA		NA	
Butyl benzyl phthalate	UG/KG	ND	2200	ND	4200	NA		NA	
4-Chloroaniline	UG/KG	ND	2200	ND	4200	NA		NA	
2-Chloronaphthalene	UG/KG	ND	2200	ND	4200	NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	2200	ND	4200	NA		NA	
Chrysene	UG/KG	2700	2200	5400	4200	NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	2200	ND	4200	NA		NA	
Dibenzofuran	UG/KG	4800	2200	11000	4200	NA		NA	
Di-n-butyl phthalate	UG/KG	ND	2200	ND	4200	NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	2200	ND	4200	NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	2200	ND	4200	NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	2200	ND	4200	NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	4500	ND	8500	NA		NA	
Diethyl phthalate	UG/KG	ND	2200	ND	4200	NA		NA	
Dimethyl phthalate	UG/KG	ND	2200	ND	4200	NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	2200	ND	4200	NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	2200	ND	4200	NA		NA	
Di-n-octyl phthalate	UG/KG	ND	2200	ND	4200	NA		NA	
Fluoranthene	UG/KG	10000	2200	23000	4200	NA		NA	
Fluorene	UG/KG	7700	2200	18000	4200	NA		NA	
Hexachlorobenzene	UG/KG	ND	2200	ND	4200	NA		NA	
Hexachlorobutadiene	UG/KG	ND	2200	ND	4200	NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	2200	ND	4200	NA		NA	
Hexachloroethane	UG/KG	ND	2200	ND	4200	NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	2200	ND	4200	NA		NA	
Isophorone	UG/KG	ND	2200	ND	4200	NA		NA	
2-Methylnaphthalene	UG/KG	4800	2200	10000	4200	NA		NA	
Naphthalene	UG/KG	23000	2200	50000	4200	NA		NA	
2-Nitroaniline	UG/KG	ND	11000	ND	21000	NA		NA	

Date: 06/23/2003
Time: 13:36:25

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/SUB-A K&L/SW-E A03-5886 A3588602 06/18/2003		AREA1/SUB-A K&L/SW-S A03-5886 A3588601 06/18/2003					
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	11000	ND	21000	NA		NA	
4-Nitroaniline	UG/KG	ND	11000	ND	21000	NA		NA	
Nitrobenzene	UG/KG	ND	2200	ND	4200	NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	2200	ND	4200	NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	2200	ND	4200	NA		NA	
Phenanthrene	UG/KG	18000	2200	42000	4200	NA		NA	
Pyrene	UG/KG	7600	2200	17000	4200	NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	2200	ND	4200	NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	132	50-200	118	50-200	NA		NA	
Naphthalene-D8	%	138	50-200	125	50-200	NA		NA	
Acenaphthene-D10	%	136	50-200	125	50-200	NA		NA	
Phenanthrene-D10	%	139	50-200	131	50-200	NA		NA	
Chrysene-D12	%	118	50-200	123	50-200	NA		NA	
Perylene-D12	%	73	50-200	112	50-200	NA		NA	
Nitrobenzene-D5	%	66	34-120	58	34-120	NA		NA	
2-Fluorobiphenyl	%	97	43-125	90	43-125	NA		NA	
p-Terphenyl-d14	%	106	38-141	87	38-141	NA		NA	
Phenol-D5	%	68	34-120	58	34-120	NA		NA	
2-Fluorophenol	%	60	25-125	48	25-125	NA		NA	
2,4,6-Tribromophenol	%	93	36-139	60	36-139	NA		NA	

Date: 06/23/2003
Time: 14:23:51

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	AREA1/S-A K&L/BOTTOM A03-5886 06/18/2003	A3588603						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	6900	2200	NA		NA		NA	
Acenaphthylene	UG/KG	ND	2200	NA		NA		NA	
Anthracene	UG/KG	5400	2200	NA		NA		NA	
Benzo(a)anthracene	UG/KG	2700	2200	NA		NA		NA	
Benzo(b)fluoranthene	UG/KG	1500 J	2200	NA		NA		NA	
Benzo(k)fluoranthene	UG/KG	1500 J	2200	NA		NA		NA	
Benzo(ghi)perylene	UG/KG	ND	2200	NA		NA		NA	
Benzo(a)pyrene	UG/KG	1400 J	2200	NA		NA		NA	
Benzoic acid	UG/KG	ND	10000	NA		NA		NA	
Benzyl alcohol	UG/KG	ND	2200	NA		NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	2200	NA		NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	2200	NA		NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	2200	NA		NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	2200	NA		NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	2200	NA		NA		NA	
Butyl benzyl phthalate	UG/KG	ND	2200	NA		NA		NA	
4-Chloroaniline	UG/KG	ND	2200	NA		NA		NA	
2-Chloronaphthalene	UG/KG	ND	2200	NA		NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	2200	NA		NA		NA	
Chrysene	UG/KG	2200	2200	NA		NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	2200	NA		NA		NA	
Dibenzofuran	UG/KG	5800	2200	NA		NA		NA	
Di-n-butyl phthalate	UG/KG	ND	2200	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	2200	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	2200	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	2200	NA		NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	4400	NA		NA		NA	
Diethyl phthalate	UG/KG	ND	2200	NA		NA		NA	
Dimethyl phthalate	UG/KG	ND	2200	NA		NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	2200	NA		NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	2200	NA		NA		NA	
Di-n-octyl phthalate	UG/KG	ND	2200	NA		NA		NA	
Fluoranthene	UG/KG	11000	2200	NA		NA		NA	
Fluorene	UG/KG	8700	2200	NA		NA		NA	
Hexachlorobenzene	UG/KG	ND	2200	NA		NA		NA	
Hexachlorobutadiene	UG/KG	ND	2200	NA		NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	2200	NA		NA		NA	
Hexachloroethane	UG/KG	ND	2200	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	2200	NA		NA		NA	
Isophorone	UG/KG	ND	2200	NA		NA		NA	
2-Methylnaphthalene	UG/KG	ND	2200	NA		NA		NA	
Naphthalene	UG/KG	20000	2200	NA		NA		NA	
2-Nitroaniline	UG/KG	ND	10000	NA		NA		NA	

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 06/23/2003
Time: 14:23:51

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/S-A K&L/BOTTOM A03-5886 A3588603 06/18/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	10000	NA		NA		NA	
4-Nitroaniline	UG/KG	ND	10000	NA		NA		NA	
Nitrobenzene	UG/KG	ND	2200	NA		NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	2200	NA		NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	2200	NA		NA		NA	
Phenanthrene	UG/KG	21000	2200	NA		NA		NA	
Pyrene	UG/KG	8300	2200	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	2200	NA		NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	127	50-200	NA		NA		NA	
Naphthalene-D8	%	135	50-200	NA		NA		NA	
Acenaphthene-D10	%	135	50-200	NA		NA		NA	
Phenanthrene-D10	%	138	50-200	NA		NA		NA	
Chrysene-D12	%	118	50-200	NA		NA		NA	
Perylene-D12	%	76	50-200	NA		NA		NA	
Nitrobenzene-D5	%	70	34-120	NA		NA		NA	
2-Fluorobiphenyl	%	98	43-125	NA		NA		NA	
p-Terphenyl-d14	%	108	38-141	NA		NA		NA	
Phenol-D5	%	71	34-120	NA		NA		NA	
2-Fluorophenol	%	63	25-125	NA		NA		NA	
2,4,6-Tribromophenol	%	92	36-139	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 06/23/2003
Time: 14:24:16

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		BLIND DUP-6-18-03 A03-5886 A3588604 06/18/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	2000	410	NA		NA		NA	
Acenaphthylene	UG/KG	360 J	410	NA		NA		NA	
Anthracene	UG/KG	1800	410	NA		NA		NA	
Benzo(a)anthracene	UG/KG	980	410	NA		NA		NA	
Benzo(b)fluoranthene	UG/KG	580	410	NA		NA		NA	
Benzo(k)fluoranthene	UG/KG	620	410	NA		NA		NA	
Benzo(ghi)perylene	UG/KG	ND	410	NA		NA		NA	
Benzo(a)pyrene	UG/KG	550	410	NA		NA		NA	
Benzoic acid	UG/KG	ND	2000	NA		NA		NA	
Benzyl alcohol	UG/KG	ND	410	NA		NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	410	NA		NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	410	NA		NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	410	NA		NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	410	NA		NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	410	NA		NA		NA	
Butyl benzyl phthalate	UG/KG	ND	410	NA		NA		NA	
4-Chloroaniline	UG/KG	ND	410	NA		NA		NA	
2-Chloronaphthalene	UG/KG	ND	410	NA		NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	410	NA		NA		NA	
Chrysene	UG/KG	780	410	NA		NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	410	NA		NA		NA	
Dibenzofuran	UG/KG	1800	410	NA		NA		NA	
Di-n-butyl phthalate	UG/KG	ND	410	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	410	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	410	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	410	NA		NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	820	NA		NA		NA	
Diethyl phthalate	UG/KG	ND	410	NA		NA		NA	
Dimethyl phthalate	UG/KG	ND	410	NA		NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	410	NA		NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	410	NA		NA		NA	
Di-n-octyl phthalate	UG/KG	ND	410	NA		NA		NA	
Fluoranthene	UG/KG	3600	410	NA		NA		NA	
Fluorene	UG/KG	2700	410	NA		NA		NA	
Hexachlorobenzene	UG/KG	ND	410	NA		NA		NA	
Hexachlorobutadiene	UG/KG	ND	410	NA		NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	410	NA		NA		NA	
Hexachloroethane	UG/KG	ND	410	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	150 J	410	NA		NA		NA	
Isophorone	UG/KG	ND	410	NA		NA		NA	
2-Methylnaphthalene	UG/KG	570	410	NA		NA		NA	
Naphthalene	UG/KG	6500	410	NA		NA		NA	
2-Nitroaniline	UG/KG	ND	2000	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 06/23/2003
Time: 14:24:16

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		BLIND DUP-6-18-03 A03-5886 A3588604 06/18/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2000	NA		NA		NA	
4-Nitroaniline	UG/KG	ND	2000	NA		NA		NA	
Nitrobenzene	UG/KG	ND	410	NA		NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	410	NA		NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	410	NA		NA		NA	
Phenanthrene	UG/KG	6600	410	NA		NA		NA	
Pyrene	UG/KG	2700	410	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	410	NA		NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	103	50-200	NA		NA		NA	
Naphthalene-D8	%	110	50-200	NA		NA		NA	
Acenaphthene-D10	%	112	50-200	NA		NA		NA	
Phenanthrene-D10	%	116	50-200	NA		NA		NA	
Chrysene-D12	%	98	50-200	NA		NA		NA	
Perylene-D12	%	59	50-200	NA		NA		NA	
Nitrobenzene-D5	%	70	34-120	NA		NA		NA	
2-Fluorobiphenyl	%	94	43-125	NA		NA		NA	
p-Terphenyl-d14	%	102	38-141	NA		NA		NA	
Phenol-D5	%	73	34-120	NA		NA		NA	
2-Fluorophenol	%	66	25-125	NA		NA		NA	
2,4,6-Tribromophenol	%	107	36-139	NA		NA		NA	

NA = Not Applicable ND = Not Detected

AREA I

SUBAREA K&L

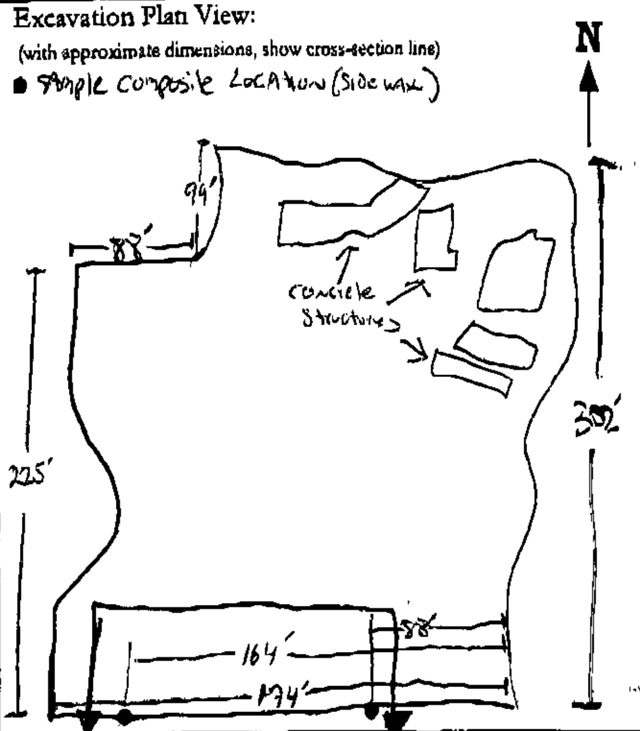
Sidewall South (West Side) Resample

TurnKey Environmental Restoration, LLC

SOIL EXCAVATION LOG

Project:	Voluntary Cleanup Program RD/RA	EXCAVATION LOCATION:	AREA-1 / SubArea K&L
Project No.:	0062-	Excavation Time/Date:	15:30 7/1/03
Client:	Steelfields, LTD	Excavation Method:	345 CAT Excavator
Location:	Buffalo, New York	TK Observer:	RLD

Excavation Plan View:
(with approximate dimensions, show cross-section line)



Excavation Cross-Section:

Depth	
Grade - 0'	
2'	Various layers of stone / & loose slag material
4'	
6'	Native Brn/grey clayey material
8'	
10'	
12'	
14'	
16'	
18'	
20'	

Confirmation Sample I.D.	Depth (fbgs) to sample	Location Within Excavation (Sidewall/Bottom) (North, South, East, West)	PID Reading (ppm)	Photos Y / N	Notes
AREA-1/SubArea K&L/ SW-S-westside	5-6'		–	N	MS/MSD collected, Resampled the south wall.

COMMENTS: ~~South wall [illegible]~~ Resampled westside of the south wall due to SVOCs above limits

DEPTH TO GROUNDWATER (fbgs): 6' During 6/18/03 sampling

VISUAL IMPACTS (if any):

OLFACTORY OBSERVATIONS:

DEPTH TO NATIVE SOIL (fbgs): Approx -5-6'

OTHER OBSERVATIONS:

APPROX. QUANTITY OF UN-IMPACTED SOIL REMOVED (CY):

APPROX. QUANTITY OF IMPACTED SOIL REMOVED (CY):

FINAL DESTINATION OF IMPACTED SOIL: BIOPAD

SOURCE OF BACKFILL:

Date: 07/07/2003
Time: 10:17:30

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/SW-5-WESTSIDE A03-6312 A3631201 07/01/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	13	NA		NA		NA	
n-Butylbenzene	UG/KG	25	13	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	13	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	13	NA		NA		NA	
Ethylbenzene	UG/KG	ND	13	NA		NA		NA	
Isopropylbenzene	UG/KG	ND	13	NA		NA		NA	
p-Cymene	UG/KG	ND	13	NA		NA		NA	
n-Propylbenzene	UG/KG	ND	13	NA		NA		NA	
Toluene	UG/KG	ND	13	NA		NA		NA	
o-Xylene	UG/KG	ND	13	NA		NA		NA	
m-Xylene	UG/KG	15 1	13	NA		NA		NA	
p-Xylene	UG/KG	ND 1	13	NA		NA		NA	
Total Xylenes	UG/KG	15 J	40	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	13	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	18	13	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	13	NA		NA		NA	
SURROGATE(S)									
Fluorobenzene	%	105	60-130	NA		NA		NA	
a,a,a-Trifluorotoluene	%	114	76-127	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 07/07/2003
Time: 10:18:03

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/SW-5-WESTSIDE A03-6312 A3631201 07/01/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	440	NA		NA		NA	
Acenaphthylene	UG/KG	ND	440	NA		NA		NA	
Anthracene	UG/KG	ND	440	NA		NA		NA	
Benzo(a)anthracene	UG/KG	220 J	440	NA		NA		NA	
Benzo(b)fluoranthene	UG/KG	ND	440	NA		NA		NA	
Benzo(k)fluoranthene	UG/KG	ND	440	NA		NA		NA	
Benzo(ghi)perylene	UG/KG	ND	440	NA		NA		NA	
Benzo(a)pyrene	UG/KG	ND	440	NA		NA		NA	
Benzoic acid	UG/KG	ND	2200	NA		NA		NA	
Benzyl alcohol	UG/KG	ND	440	NA		NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	440	NA		NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	440	NA		NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	440	NA		NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	440	NA		NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	440	NA		NA		NA	
Butyl benzyl phthalate	UG/KG	ND	440	NA		NA		NA	
4-Chloroaniline	UG/KG	ND	440	NA		NA		NA	
2-Chloronaphthalene	UG/KG	ND	440	NA		NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	440	NA		NA		NA	
Chrysene	UG/KG	ND	440	NA		NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	440	NA		NA		NA	
Dibenzofuran	UG/KG	ND	440	NA		NA		NA	
Di-n-butyl phthalate	UG/KG	ND	440	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	440	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	440	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	440	NA		NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	890	NA		NA		NA	
Diethyl phthalate	UG/KG	ND	440	NA		NA		NA	
Dimethyl phthalate	UG/KG	ND	440	NA		NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	440	NA		NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	440	NA		NA		NA	
Di-n-octyl phthalate	UG/KG	ND	440	NA		NA		NA	
Fluoranthene	UG/KG	570	440	NA		NA		NA	
Fluorene	UG/KG	ND	440	NA		NA		NA	
Hexachlorobenzene	UG/KG	ND	440	NA		NA		NA	
Hexachlorobutadiene	UG/KG	ND	440	NA		NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	440	NA		NA		NA	
Hexachloroethane	UG/KG	ND	440	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	440	NA		NA		NA	
Isophorone	UG/KG	ND	440	NA		NA		NA	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		NA	
Naphthalene	UG/KG	310 J	440	NA		NA		NA	
2-Nitroaniline	UG/KG	ND	2200	NA		NA		NA	

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 07/07/2003
Time: 10:18:03

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/SW-5-WESTSIDE A03-6312 A3631201 07/01/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2200	NA		NA		NA	
4-Nitroaniline	UG/KG	ND	2200	NA		NA		NA	
Nitrobenzene	UG/KG	ND	440	NA		NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	440	NA		NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	440	NA		NA		NA	
Phenanthrene	UG/KG	660	440	NA		NA		NA	
Pyrene	UG/KG	440	440	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	440	NA		NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	88	50-200	NA		NA		NA	
Naphthalene-D8	%	84	50-200	NA		NA		NA	
Acenaphthene-D10	%	88	50-200	NA		NA		NA	
Phenanthrene-D10	%	98	50-200	NA		NA		NA	
Chrysene-D12	%	99	50-200	NA		NA		NA	
Perylene-D12	%	104	50-200	NA		NA		NA	
Nitrobenzene-D5	%	86	34-120	NA		NA		NA	
2-Fluorobiphenyl	%	90	43-125	NA		NA		NA	
p-Terphenyl-d14	%	93	38-141	NA		NA		NA	
Phenol-D5	%	83	34-120	NA		NA		NA	
2-Fluorophenol	%	78	25-125	NA		NA		NA	
2,4,6-Tribromophenol	%	75	36-139	NA		NA		NA	

NA = Not Applicable ND = Not Detected

AREA 1

SUBAREA K&L

Bottom #3; SW-E#2

50 Fountain Plaza, Suite 1350
Buffalo, New York 14202
Phone: (716) 856-0635
Fax: (716) 856-0583

www.turnkeyllc.com

TurnKey Environmental Restoration, LLC

Fax

To:	Greg Sutton	From:	Tom Forbes
Of:	NYSDEC	Date:	7-15-03
Fax No:		Time:	1:45 pm
Phone:		Pages:	5
Re:	Subarea K&L confirmatory data	CC:	

☐ Urgent X For Review ☐ For Your Information ☐ Please Comment ☐ Please Reply

● Message:

As mentioned in my e-mail – attached are confirmatory data and a location sketch for samples collected from SubArea K&L on 7-11-03.

Please call with any questions.

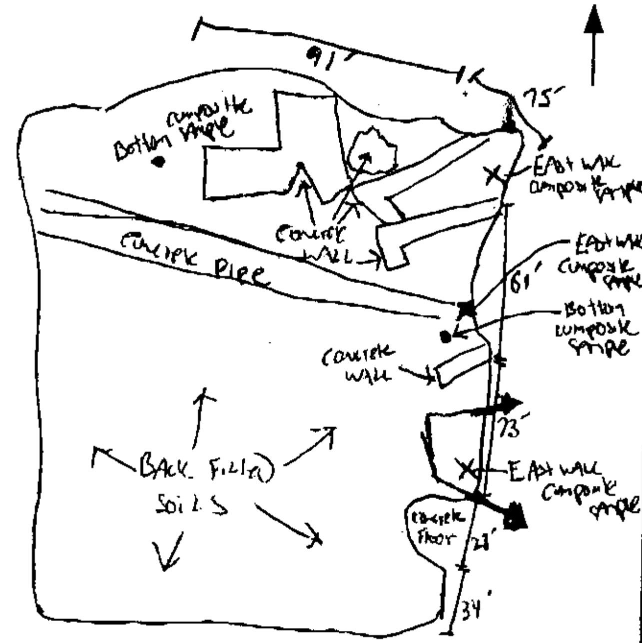
Tom

TurnKey Environmental Restoration, LLC

SOIL EXCAVATION LOG

Project: Voluntary Cleanup Program RD/RA	EXCAVATION LOCATION: Area-1/SubArea K&L - SW-E #2 & Bottom #3
Project No.: 0062-	Excavation Time/Date: 7/11/03
Client: Steelfields, LTD	Excavation Method: CAT 345 Excavator
Location: Buffalo, New York	TK Observer: RLD

Excavation Plan View:
(with approximate dimensions, show cross-section line)



Excavation Cross-Section:

Grade - 0'
Layered fill layers of slag/ slag from surface to bottom of excavation - material brown/white loose, dry near top of excavation.
2'
4'
6'
8'
10'
12'
14'
16'
18'
20'

Confirmation Sample I.D.	Depth (fbgs) to sample	Location Within Excavation (Sidewall/Bottom) (North, South, East, West)	PID Reading (ppm)	Photos Y / N	Notes
Area-1/SubArea K&L SW-E #2	7-8'	East	0	Y	MS/MSD collected
Area-1/SubArea K&L Bottom #3		Bottom	0	Y	Blind Dup 7/11/03 collected

COMMENTS: Made onsite during sampling

DEPTH TO GROUNDWATER (fbgs):

VISUAL IMPACTS (if any): Some oil/staining on water within bottom sample composite

OLFACTORY OBSERVATIONS:

DEPTH TO NATIVE SOIL (fbgs):

OTHER OBSERVATIONS:

APPROX. QUANTITY OF UN-IMPACTED SOIL REMOVED (CY):

APPROX. QUANTITY OF IMPACTED SOIL REMOVED (CY):

FINAL DESTINATION OF IMPACTED SOIL: Bio pad

SOURCE OF BACKFILL: Seneca Mall Stockpile

Date: 07/14/2003
Time: 09:41:16

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AK0326

Client ID / Job No / Sample Date	Lab ID	AREA-1/BLIND DUP0710 A03-6540 A3654003 07/10/2003		AREA-1/BOTTOM #3 A03-6540 A3654002 07/10/2003		AREA-1/SW-E-#2 A03-6540 A3654001 07/10/2003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	13	ND	13	ND	14	NA	
n-Butylbenzene	UG/KG	76	13	100	13	ND	14	NA	
~~sec-Butylbenzene~~	~~UG/KG~~	~~22~~	~~13~~	~~ND~~	~~13~~	~~ND~~	~~14~~	~~NA~~	
tert-Butylbenzene	UG/KG	ND	13	ND	13	ND	14	NA	
Ethylbenzene	UG/KG	ND	13	ND	13	ND	14	NA	
Isopropylbenzene	UG/KG	ND	13	ND	13	ND	14	NA	
p-Cymene	UG/KG	15	13	ND	13	ND	14	NA	
n-Propylbenzene	UG/KG	ND	13	ND	13	ND	14	NA	
Toluene	UG/KG	180	13	33	13	37	14	NA	
o-Xylene	UG/KG	ND	13	ND	13	ND	14	NA	
m-Xylene	UG/KG	22 1	13	25 1	13	ND	14	NA	
p-Xylene	UG/KG	ND 1	13	ND 1	13	ND	14	NA	
Total Xylenes	UG/KG	22 J	40	25 J	38	ND	42	NA	
Methyl tert butyl ether	UG/KG	ND	13	ND	13	ND	14	NA	
1,2,4-Trimethylbenzene	UG/KG	75	13	120	13	ND	14	NA	
1,3,5-Trimethylbenzene	UG/KG	22	13	30	13	ND	14	NA	
SURROGATE(S)									
Fluorobenzene	%	102	60-130	100	60-130	101	60-130	NA	
a,a,a-Trifluorotoluene	%	114	76-127	113	76-127	113	76-127	NA	

Date: 07/14/2003
Time: 09:41:16

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA-1/BLIND DUP0710 A03-6540 A3654003 07/10/2003		AREA-1/BOTTOM #3 A03-6540 A3654002 07/10/2003		AREA-1/SW-E-#2 A03-6540 A3654001 07/10/2003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	440	ND	430	ND	460	NA	
Acenaphthylene	UG/KG	ND	440	ND	430	ND	460	NA	
Anthracene	UG/KG	ND	440	ND	430	280 J	460	NA	
Benzo(a)anthracene	UG/KG	ND	440	ND	430	480	460	NA	
Benzo(b)fluoranthene	UG/KG	ND	440	ND	430	370 J	460	NA	
Benzo(k)fluoranthene	UG/KG	ND	440	ND	430	ND	460	NA	
Benzo(ghi)perylene	UG/KG	ND	440	ND	430	360 J	460	NA	
Benzo(a)pyrene	UG/KG	ND	440	ND	430	480	460	NA	
Benzoic acid	UG/KG	ND	2100	ND	2100	ND	2200	NA	
Benzyl alcohol	UG/KG	ND	440	ND	430	ND	460	NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	440	ND	430	ND	460	NA	
Bis(2-chloroethyl) ether	UG/KG	ND	440	ND	430	ND	460	NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	440	ND	430	ND	460	NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	440	ND	430	ND	460	NA	
4-Bromophenyl phenyl ether	UG/KG	ND	440	ND	430	ND	460	NA	
Butyl benzyl phthalate	UG/KG	ND	440	ND	430	ND	460	NA	
4-Chloroaniline	UG/KG	ND	440	ND	430	ND	460	NA	
2-Chloronaphthalene	UG/KG	ND	440	ND	430	ND	460	NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	440	ND	430	ND	460	NA	
Chrysene	UG/KG	ND	440	ND	430	470	460	NA	
Dibenzo(a,h)anthracene	UG/KG	ND	440	ND	430	ND	460	NA	
Dibenzofuran	UG/KG	ND	440	ND	430	330 J	460	NA	
Di-n-butyl phthalate	UG/KG	ND	440	ND	430	ND	460	NA	
1,2-Dichlorobenzene	UG/KG	ND	440	ND	430	ND	460	NA	
1,3-Dichlorobenzene	UG/KG	ND	440	ND	430	ND	460	NA	
1,4-Dichlorobenzene	UG/KG	ND	440	ND	430	ND	460	NA	
3,3'-Dichlorobenzidine	UG/KG	ND	880	ND	870	ND	920	NA	
Diethyl phthalate	UG/KG	ND	440	ND	430	ND	460	NA	
Dimethyl phthalate	UG/KG	ND	440	ND	430	ND	460	NA	
2,4-Dinitrotoluene	UG/KG	ND	440	ND	430	ND	460	NA	
2,6-Dinitrotoluene	UG/KG	ND	440	ND	430	ND	460	NA	
Di-n-octyl phthalate	UG/KG	ND	440	ND	430	ND	460	NA	
Fluoranthene	UG/KG	ND	440	ND	430	1200	460	NA	
Fluorene	UG/KG	ND	440	ND	430	600	460	NA	
Hexachlorobenzene	UG/KG	ND	440	ND	430	ND	460	NA	
Hexachlorobutadiene	UG/KG	ND	440	ND	430	ND	460	NA	
Hexachlorocyclopentadiene	UG/KG	ND	440	ND	430	ND	460	NA	
Hexachloroethane	UG/KG	ND	440	ND	430	ND	460	NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	440	ND	430	260 J	460	NA	
Isophorone	UG/KG	ND	440	ND	430	ND	460	NA	
2-Methylnaphthalene	UG/KG	ND	440	ND	430	[illegible] J	460	NA	
Naphthalene	UG/KG	ND	440	ND	430	2000	460	NA	
2-Nitroaniline	UG/KG	ND	2100	ND	2100	ND	2200	NA	

NA = Not Applicable ND = Not Detected

Date: 07/14/2003
Time: 09:41:16

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	AREA-1/BLIND DUP0710 A03-6540 07/10/2003	A3654003	AREA-1/BOTTOM #3 A03-6540 07/10/2003	A3654002	AREA-1/SW-E-#2 A03-6540 07/10/2003	A3654001		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2100	ND	2100	ND	2200	NA	
4-Nitroaniline	UG/KG	ND	2100	ND	2100	ND	2200	NA	
Nitrobenzene	UG/KG	ND	440	ND	430	ND	460	NA	
N-nitrosodiphenylamine	UG/KG	ND	440	ND	430	ND	460	NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	440	ND	430	ND	460	NA	
Phenanthrene	UG/KG	ND	440	ND	430	2200	460	NA	
Pyrene	UG/KG	ND	440	ND	430	1500	460	NA	
1,2,4-Trichlorobenzene	UG/KG	ND	440	ND	430	ND	460	NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	122	50-200	136	50-200	118	50-200	NA	
Naphthalene-D8	%	116	50-200	127	50-200	112	50-200	NA	
Acenaphthene-D10	%	112	50-200	123	50-200	115	50-200	NA	
Phenanthrene-D10	%	118	50-200	131	50-200	119	50-200	NA	
Chrysene-D12	%	114	50-200	125	50-200	103	50-200	NA	
Perylene-D12	%	148	50-200	153	50-200	145	50-200	NA	
Nitrobenzene-D5	%	51	34-120	76	34-120	65	34-120	NA	
2-Fluorobiphenyl	%	53	43-125	85	43-125	79	43-125	NA	
p-Terphenyl-d14	%	68	38-141	86	38-141	96	38-141	NA	
Phenol-D5	%	48	34-120	80	34-120	39	34-120	NA	
2-Fluorophenol	%	52	25-125	78	25-125	16 *	25-125	NA	
2,4,6-Tribromophenol	%	54	36-139	79	36-139	18 *	36-139	NA	

AREA I

SUBAREA K&L

Bottom #2; SW-N

50 Fountain Plaza, Suite 1350
Buffalo, New York 14202
Phone: (716) 856-0599
Fax: (716) 856-0583
www.benchmarkees.com

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

To:	Greg Sutton	From:	Tom Forbes
Of:	NYSDEC	Date:	7-10-03
Fax:	851-7226	Time:	2:45 pm
Phone:		Pages:	7
Re:	Steelfields	CC:	

☐ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

As discussed - confirmatory sample data for Subarea K&L
(West sidewall sample was abandoned)

Thanks,

Tom

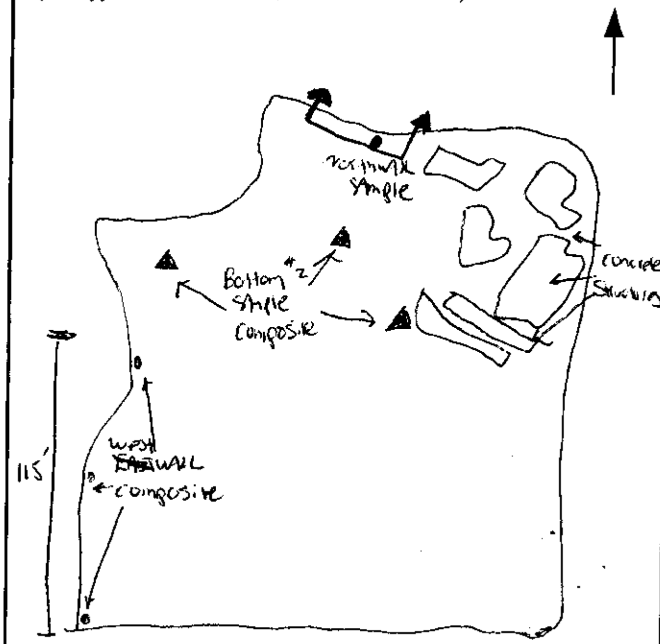
TurnKey Environmental Restoration, LLC

SOIL EXCAVATION LOG

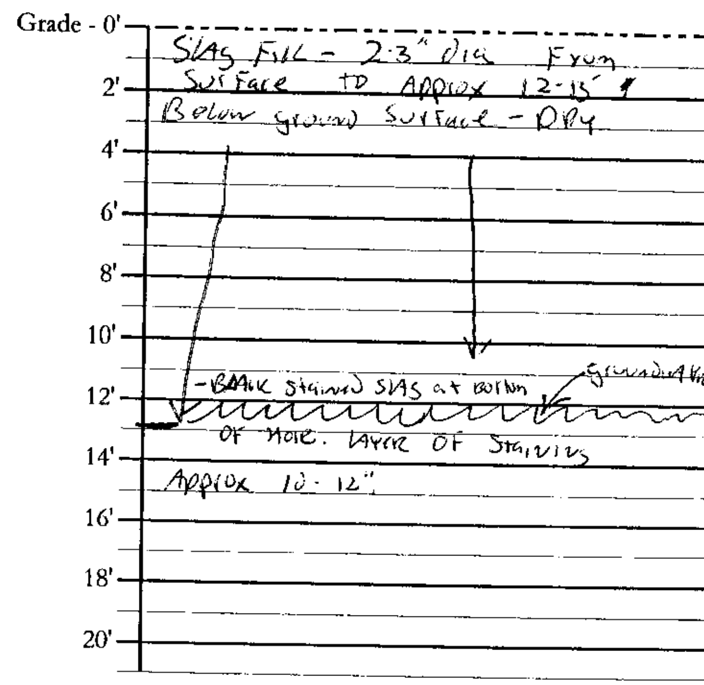
Project:	Voluntary Cleanup Program RD/RA	EXCAVATION LOCATION:	Area-1/SubArea K&L
Project No.:	0062-	Excavation Time/Date:	7/8/03
Client:	Steelfields, LTD	Sample→Excavation Method:	CAT 225 Excavator
Location:	Buffalo, New York	TK Observer:	RLD

Excavation Plan View:

(with approximate dimensions, show cross-section line)



Excavation Cross-Section:



Confirmation Sample I.D.	Depth (fbgs)	Location Within Excavation (Sidewall/Bottom) (North, South, East, West)	PID Reading (ppm)	Photos Y / N	Notes
Area-1/SubArea K&L Bottom #2	12-13'	Bottom	0	Y	MS/MSD Taken
Area-1/SubArea-K&L SW-N	10'	North	0	Y	Blind Duplicate Taken (7-8-03), collected TCL VOC's
Area-1/SubArea-K&L SW-W	3-4'	West	0	Y	Impacted soils observed Naphthalene odor

COMMENTS:

DEPTH TO GROUNDWATER (fbgs):

VISUAL IMPACTS (if any): ~~W~~ West WALL - TAR Impacted Soils

OLFACTORY OBSERVATIONS: Napthalene odor on west wall

DEPTH TO NATIVE SOIL (fbgs): Approx 5-6'

OTHER OBSERVATIONS:

APPROX. QUANTITY OF UN-IMPACTED SOIL REMOVED (CY):

APPROX. QUANTITY OF IMPACTED SOIL REMOVED (CY):

FINAL DESTINATION OF IMPACTED SOIL: Bio Pad

SOURCE OF BACKFILL: Offsite - Seneca Mall Stockpile - NYSDEC Approved

Date: 07/10/2003
Time: 11:08:49

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8260 - TCL VOLATILE ORGANICS+STARS-S

Rept: AN0326

Client ID / Job No / Sample Date (Lab ID)		AREA-1/SW-N / A03-6435 / 07/08/2003	A3643505						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acetone	UG/KG	30	27	NA		NA		NA	
Benzene	UG/KG	ND	5	NA		NA		NA	
Bromodichloromethane	UG/KG	ND	5	NA		NA		NA	
Bromoform	UG/KG	ND	5	NA		NA		NA	
Bromomethane	UG/KG	ND	5	NA		NA		NA	
2-Butanone	UG/KG	ND	27	NA		NA		NA	
Carbon Disulfide	UG/KG	ND	5	NA		NA		NA	
Carbon Tetrachloride	UG/KG	ND	5	NA		NA		NA	
Chlorobenzene	UG/KG	ND	5	NA		NA		NA	
Chloroethane	UG/KG	ND	5	NA		NA		NA	
Chloroform	UG/KG	ND	5	NA		NA		NA	
Chloromethane	UG/KG	ND	5	NA		NA		NA	
Cyclohexane	UG/KG	ND	5	NA		NA		NA	
Dibromochloromethane	UG/KG	ND	5	NA		NA		NA	
1,2-Dibromo-3-chloropropane	UG/KG	ND	5	NA		NA		NA	
1,1-Dichloroethane	UG/KG	ND	5	NA		NA		NA	
1,2-Dichloroethane	UG/KG	ND	5	NA		NA		NA	
Dichlorodifluoromethane	UG/KG	ND	5	NA		NA		NA	
1,1-Dichloroethene	UG/KG	ND	5	NA		NA		NA	
1,2-Dibromoethane	UG/KG	ND	5	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	5	NA		NA		NA	
1,2-Dichloropropane	UG/KG	ND	5	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	5	NA		NA		NA	
cis-1,3-Dichloropropene	UG/KG	ND	5	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	5	NA		NA		NA	
trans-1,3-Dichloropropene	UG/KG	ND	5	NA		NA		NA	
Ethylbenzene	UG/KG	ND	5	NA		NA		NA	
2-Hexanone	UG/KG	ND	27	NA		NA		NA	
Methylene chloride	UG/KG	ND	5	NA		NA		NA	
cis-1,2-Dichloroethene	UG/KG	ND	5	NA		NA		NA	
trans-1,2-Dichloroethene	UG/KG	ND	5	NA		NA		NA	
4-Methyl-2-pentanone	UG/KG	ND	27	NA		NA		NA	
Styrene	UG/KG	ND	5	NA		NA		NA	
1,1,2,2-Tetrachloroethane	UG/KG	ND	5	NA		NA		NA	
Tetrachloroethene	UG/KG	ND	5	NA		NA		NA	
Toluene	UG/KG	ND	5	NA		NA		NA	
1,1,1-Trichloroethane	UG/KG	ND	5	NA		NA		NA	
1,1,2-Trichloroethane	UG/KG	ND	5	NA		NA		NA	
Isopropylbenzene	UG/KG	ND	5	NA		NA		NA	
Trichloroethene	UG/KG	ND	5	NA		NA		NA	
Methyl acetate	UG/KG	ND	5	NA		NA		NA	
Vinyl chloride	UG/KG	ND	11	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	5	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

Date: 07/10/2003
Time: 11:08:49

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8260 - TCL VOLATILE ORGANICS+STARS-S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		AREA-1/SW-N / A03-6435 / 07/08/2003	A3643505						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Total Xylenes	UG/KG	ND	16	NA		NA		NA	
Methylcyclohexane	UG/KG	ND	5	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	5	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	5	NA		NA		NA	
1,1,2-Trichloro-1,2,2-trifluor	UG/KG	ND	5	NA		NA		NA	
Trichlorofluoromethane	UG/KG	ND	5	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	5	NA		NA		NA	
n-Butylbenzene	UG/KG	ND	5	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	5	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	5	NA		NA		NA	
n-Propylbenzene	UG/KG	ND	5	NA		NA		NA	
p-Cymene	UG/KG	ND	5	NA		NA		NA	
IS/SURROGATE(S)									
Chlorobenzene-D5	%	90	50-200	NA		NA		NA	
1,4-Difluorobenzene	%	92	50-200	NA		NA		NA	
1,4-Dichlorobenzene-D4	%	74	50-200	NA		NA		NA	
Toluene-D8	%	101	71-125	NA		NA		NA	
p-Bromofluorobenzene	%	101	68-124	NA		NA		NA	
1,2-Dichloroethane-D4	%	82	61-136	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 07/10/2003
Time: 11:08:49

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		AREA-1/BLIND DUP A03-6435 A3643504 07/08/2003		AREA-1/BOTTOM #2 A03-6435 A3643501 07/08/2003					
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	14	ND	14	NA		NA	
n-Butylbenzene	UG/KG	ND	14	ND	14	NA		NA	
sec-Butylbenzene	UG/KG	ND	14	ND	14	NA		NA	
tert-Butylbenzene	UG/KG	ND	14	ND	14	NA		NA	
Ethylbenzene	UG/KG	ND	14	ND	14	NA		NA	
Isopropylbenzene	UG/KG	ND	14	ND	14	NA		NA	
p-Cymene	UG/KG	ND	14	ND	14	NA		NA	
n-Propylbenzene	UG/KG	ND	14	ND	14	NA		NA	
Toluene	UG/KG	ND	14	ND	14	NA		NA	
o-Xylene	UG/KG	ND	14	ND	14	NA		NA	
m-Xylene	UG/KG	ND	14	ND	14	NA		NA	
p-Xylene	UG/KG	ND	14	ND	14	NA		NA	
Total Xylenes	UG/KG	ND	42	ND	42	NA		NA	
Methyl tert butyl ether	UG/KG	ND	14	ND	14	NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	14	ND	14	NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	14	ND	14	NA		NA	
SURROGATE(S)									
Fluorobenzene	%	102	60-130	103	60-130	NA		NA	
a,a,a-Trifluorotoluene	%	113	76-127	114	76-127	NA		NA	

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 07/10/2003
Time: 11:08:49

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	AREA-1/BLIND DUP A03-6435 07/08/2003	A3643504	AREA-1/BOTTOM #2 A03-6435 07/08/2003	A3643501	AREA-1/SW-N A03-6435 07/08/2003	A3643505		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	480	ND	440	ND	490	NA	
Acenaphthylene	UG/KG	ND	480	ND	440	ND	490	NA	
Anthracene	UG/KG	ND	480	ND	440	ND	490	NA	
Benzo(a)anthracene	UG/KG	ND	480	ND	440	ND	490	NA	
Benzo(b)fluoranthene	UG/KG	ND	480	ND	440	ND	490	NA	
Benzo(k)fluoranthene	UG/KG	ND	480	ND	440	ND	490	NA	
Benzo(ghi)perylene	UG/KG	ND	480	ND	440	ND	490	NA	
Benzo(a)pyrene	UG/KG	ND	480	ND	440	ND	490	NA	
Benzoic acid	UG/KG	ND	2400	ND	2100	ND	2400	NA	
Benzyl alcohol	UG/KG	ND	480	ND	440	ND	490	NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	480	ND	440	ND	490	NA	
Bis(2-chloroethyl) ether	UG/KG	ND	480	ND	440	ND	490	NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	480	ND	440	ND	490	NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	480	ND	440	ND	490	NA	
4-Bromophenyl phenyl ether	UG/KG	ND	480	ND	440	ND	490	NA	
Butyl benzyl phthalate	UG/KG	ND	480	ND	440	ND	490	NA	
4-Chloroaniline	UG/KG	ND	480	ND	440	ND	490	NA	
2-Chloronaphthalene	UG/KG	ND	480	ND	440	ND	490	NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	480	ND	440	ND	490	NA	
Chrysene	UG/KG	ND	480	ND	440	ND	490	NA	
Dibenzo(a,h)anthracene	UG/KG	ND	480	ND	440	ND	490	NA	
Dibenzofuran	UG/KG	ND	480	ND	440	ND	490	NA	
Di-n-butyl phthalate	UG/KG	ND	480	ND	440	ND	490	NA	
1,2-Dichlorobenzene	UG/KG	ND	480	ND	440	ND	490	NA	
1,3-Dichlorobenzene	UG/KG	ND	480	ND	440	ND	490	NA	
1,4-Dichlorobenzene	UG/KG	ND	480	ND	440	ND	490	NA	
3,3'-Dichlorobenzidine	UG/KG	ND	970	ND	880	ND	970	NA	
Diethyl phthalate	UG/KG	ND	480	ND	440	ND	490	NA	
Dimethyl phthalate	UG/KG	ND	480	ND	440	ND	490	NA	
2,4-Dinitrotoluene	UG/KG	ND	480	ND	440	ND	490	NA	
2,6-Dinitrotoluene	UG/KG	ND	480	ND	440	ND	490	NA	
Di-n-octyl phthalate	UG/KG	ND	480	ND	440	ND	490	NA	
Fluoranthene	UG/KG	ND	480	ND	440	ND	490	NA	
Fluorene	UG/KG	ND	480	ND	440	ND	490	NA	
Hexachlorobenzene	UG/KG	ND	480	ND	440	ND	490	NA	
Hexachlorobutadiene	UG/KG	ND	480	ND	440	ND	490	NA	
Hexachlorocyclopentadiene	UG/KG	ND	480	ND	440	ND	490	NA	
Hexachloroethane	UG/KG	ND	480	ND	440	ND	490	NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	480	ND	440	ND	490	NA	
Isophorone	UG/KG	ND	480	ND	440	ND	490	NA	
2-Methylnaphthalene	UG/KG	ND	480	ND	440	ND	490	NA	
Naphthalene	UG/KG	ND	[illegible]	ND	440	ND	490	NA	
2-Nitroaniline	UG/KG	ND	2400	ND	2100	ND	2400	NA	

NA = Not Applicable ND = Not Detected

Date: 07/10/2003
Time: 11:08:49

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		AREA-1/BLIND DUP A03-6435 07/08/2003 A3643504		AREA-1/BOTTOM #2 A03-6435 07/08/2003 A3643501		AREA-1/SW-N A03-6435 07/08/2003 A3643505			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2400	ND	2100	ND	2400	NA	
4-Nitroaniline	UG/KG	ND	2400	ND	2100	ND	2400	NA	
Nitrobenzene	UG/KG	ND	480	ND	440	ND	490	NA	
N-nitrosodiphenylamine	UG/KG	ND	480	ND	440	ND	490	NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	480	ND	440	ND	490	NA	
Phenanthrene	UG/KG	ND	480	ND	440	ND	490	NA	
Pyrene	UG/KG	ND	480	ND	440	ND	490	NA	
1,2,4-Trichlorobenzene	UG/KG	ND	480	ND	440	ND	490	NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	82	50-200	78	50-200	85	50-200	NA	
Naphthalene-D8	%	80	50-200	76	50-200	81	50-200	NA	
Acenaphthene-D10	%	88	50-200	82	50-200	92	50-200	NA	
Phenanthrene-D10	%	92	50-200	81	50-200	94	50-200	NA	
Chrysene-D12	%	92	50-200	87	50-200	99	50-200	NA	
Perylene-D12	%	98	50-200	90	50-200	102	50-200	NA	
Nitrobenzene-D5	%	74	34-120	81	34-120	89	34-120	NA	
2-Fluorobiphenyl	%	79	43-125	84	43-125	88	43-125	NA	
p-Terphenyl-d14	%	95	38-141	99	38-141	100	38-141	NA	
Phenol-D5	%	67	34-120	73	34-120	80	34-120	NA	
2-Fluorophenol	%	62	25-125	70	25-125	76	25-125	NA	
2,4,6-Tribromophenol	%	90	36-139	99	36-139	94	36-139	NA	

NA = Not Applicable ND = Not Detected

AREA I

SUBAREA A

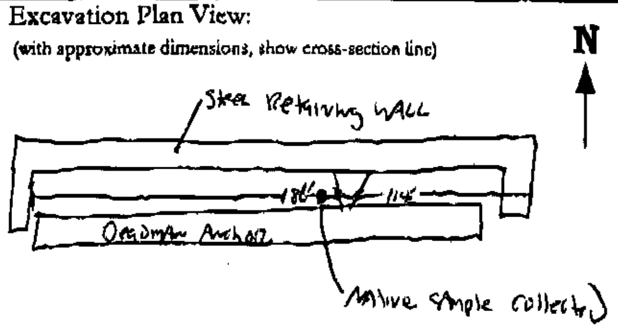
Native Sands Between Deadman Anchor and Sheetpile Wall

SOIL EXCAVATION LOG

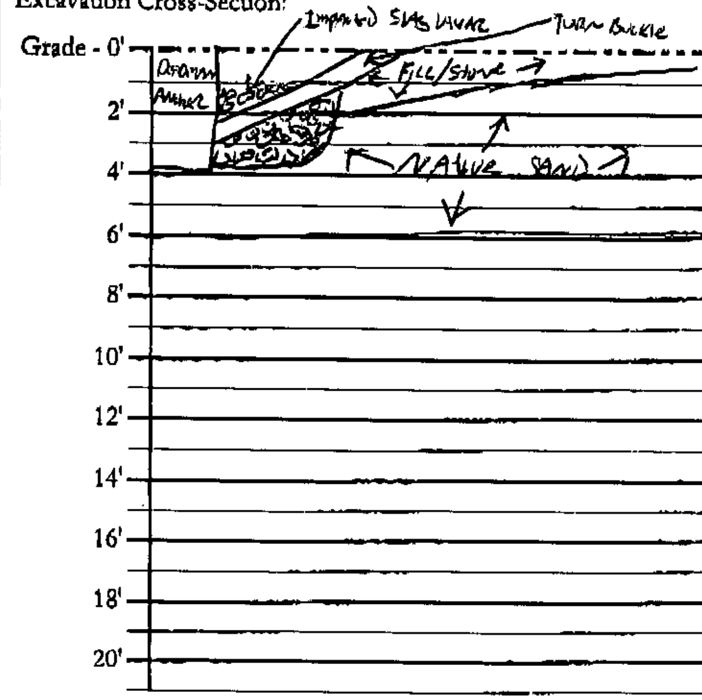
TurnKey Environmental Restoration, LLC

Project:	Voluntary Cleanup Program RD/RA	EXCAVATION LOCATION:	A-1/ SubArea-A
Project No.:	0062-	Excavation Time/Date:	1300 - 7-2-03
Client:	Steelfields, LTD	Excavation Method:	CAT 345 excavator
Location:	Buffalo, New York	TK Observer:	RLD

Excavation Plan View:
(with approximate dimensions, show cross-section line)



Excavation Cross-Section:



Confirmation Sample I.D.	Depth (fbgs) To Sample	Location Within Excavation (Sidewall/Bottom) (North, South, East, West)	PID Reading (ppm)	Photos Y / N	Notes
Area-1/SubArea-A/Native Between Piling & Deadman	5-6'	[illegible]	12-14ppm	Y	Light gray native alluvial sands, slight odor detected,

COMMENTS: As per NYSDEC, ~~[illegible]~~ Turnkey collected A sample of the native material Between Sheet Piling & Deadman Anchor

DEPTH TO GROUNDWATER (fbgs): N/A

VISUAL IMPACTS (if any): Impacted Slag layer - excavated & taken to Bldg 9(?)

OLFACTORY OBSERVATIONS:

DEPTH TO NATIVE SOIL (fbgs):

OTHER OBSERVATIONS:

APPROX. QUANTITY OF UN-IMPACTED SOIL REMOVED (CY):

APPROX. QUANTITY OF IMPACTED SOIL REMOVED (CY):

FINAL DESTINATION OF IMPACTED SOIL:

SOURCE OF BACKFILL:

Date: 07/07/2003
Time: 10:18:21

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/NATIVE A03-6336 A3633601 07/02/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	49	NA		NA		NA	
n-Butylbenzene	UG/KG	7200	49	NA		NA		NA	
sec-Butylbenzene	UG/KG	4800	49	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	49	NA		NA		NA	
Ethylbenzene	UG/KG	1300	49	NA		NA		NA	
Isopropylbenzene	UG/KG	1200	49	NA		NA		NA	
p-Cymene	UG/KG	2000	49	NA		NA		NA	
n-Propylbenzene	UG/KG	1400	49	NA		NA		NA	
Toluene	UG/KG	ND	49	NA		NA		NA	
o-Xylene	UG/KG	ND	49	NA		NA		NA	
m-Xylene	UG/KG	2000 1	49	NA		NA		NA	
p-Xylene	UG/KG	ND 1	49	NA		NA		NA	
Total Xylenes	UG/KG	2000	150	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	49	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	8000	49	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	2300	49	NA		NA		NA	
SURROGATE(S)									
Fluorobenzene	%	109	60-130	NA		NA		NA	
a,a,a-Trifluorotoluene	%	127	76-127	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 07/07/2003
Time: 10:18:44

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		AREA1/NATIVE A03-6336 07/02/2003	A3633601						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	400	NA		NA		NA	
Acenaphthylene	UG/KG	ND	400	NA		NA		NA	
Anthracene	UG/KG	ND	400	NA		NA		NA	
Benzo(a)anthracene	UG/KG	ND	400	NA		NA		NA	
Benzo(b)fluoranthene	UG/KG	ND	400	NA		NA		NA	
Benzo(k)fluoranthene	UG/KG	ND	400	NA		NA		NA	
Benzo(ghi)perylene	UG/KG	ND	400	NA		NA		NA	
Benzo(a)pyrene	UG/KG	ND	400	NA		NA		NA	
Benzoic acid	UG/KG	ND	2000	NA		NA		NA	
Benzyl alcohol	UG/KG	ND	400	NA		NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	400	NA		NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	400	NA		NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	400	NA		NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	400	NA		NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	400	NA		NA		NA	
Butyl benzyl phthalate	UG/KG	ND	400	NA		NA		NA	
4-Chloroaniline	UG/KG	ND	400	NA		NA		NA	
2-Chloronaphthalene	UG/KG	ND	400	NA		NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	400	NA		NA		NA	
Chrysene	UG/KG	ND	400	NA		NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	400	NA		NA		NA	
Dibenzofuran	UG/KG	ND	400	NA		NA		NA	
Di-n-butyl phthalate	UG/KG	ND	400	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	400	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	400	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	400	NA		NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	800	NA		NA		NA	
Diethyl phthalate	UG/KG	ND	400	NA		NA		NA	
Dimethyl phthalate	UG/KG	ND	400	NA		NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	400	NA		NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	400	NA		NA		NA	
Di-n-octyl phthalate	UG/KG	ND	400	NA		NA		NA	
Fluoranthene	UG/KG	ND	400	NA		NA		NA	
Fluorene	UG/KG	ND	400	NA		NA		NA	
Hexachlorobenzene	UG/KG	ND	400	NA		NA		NA	
Hexachlorobutadiene	UG/KG	ND	400	NA		NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	400	NA		NA		NA	
Hexachloroethane	UG/KG	ND	400	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	400	NA		NA		NA	
Isophorone	UG/KG	ND	400	NA		NA		NA	
2-Methylnaphthalene	UG/KG	ND	400	NA		NA		NA	
Naphthalene	UG/KG	ND	400	NA		NA		NA	
2-Nitroaniline	UG/KG	ND	2000	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 07/07/2003
Time: 10:18:44

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	AREA1/NATIVE A03-6336 07/02/2003	A3633601						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2000	NA		NA		NA	
4-Nitroaniline	UG/KG	ND	2000	NA		NA		NA	
Nitrobenzene	UG/KG	ND	400	NA		NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	400	NA		NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	220 J	400	NA		NA		NA	
Phenanthrene	UG/KG	ND	400	NA		NA		NA	
Pyrene	UG/KG	ND	400	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	400	NA		NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	102	50-200	NA		NA		NA	
Naphthalene-D8	%	95	50-200	NA		NA		NA	
Acenaphthene-D10	%	107	50-200	NA		NA		NA	
Phenanthrene-D10	%	115	50-200	NA		NA		NA	
Chrysene-D12	%	104	50-200	NA		NA		NA	
Perylene-D12	%	121	50-200	NA		NA		NA	
Nitrobenzene-D5	%	87	34-120	NA		NA		NA	
2-Fluorobiphenyl	%	86	43-125	NA		NA		NA	
p-Terphenyl-d14	%	91	38-141	NA		NA		NA	
Phenol-D5	%	82	34-120	NA		NA		NA	
2-Fluorophenol	%	79	25-125	NA		NA		NA	
2,4,6-Tribromophenol	%	78	36-139	NA		NA		NA	

NA = Not Applicable ND = Not Detected

VERIFICATION SAMPLING RESULTS
SUBAREA K&L
7/30/03

A1-SUBAREAL-B-2, A1-SUBAREAL-S-2

Date: 08/04/2003
Time: 13:50:55

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN032

Client ID / Job No / Sample Date	Lab ID	A1-SUBAREAL-B-2 / A03-7277 / 07/30/2003	A3727702	A1-SUBAREAL-S-2 / A03-7277 / 07/30/2003	A3727701				
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	14	ND	14	NA		NA	
n-Butylbenzene	UG/KG	ND	14	ND	14	NA		NA	
sec-Butylbenzene	UG/KG	ND	14	ND	14	NA		NA	
tert-Butylbenzene	UG/KG	ND	14	ND	14	NA		NA	
Ethylbenzene	UG/KG	19	14	ND	14	NA		NA	
Isopropylbenzene	UG/KG	ND	14	ND	14	NA		NA	
p-Cymene	UG/KG	ND	14	ND	14	NA		NA	
n-Propylbenzene	UG/KG	ND	14	ND	14	NA		NA	
Toluene	UG/KG	ND	14	ND	14	NA		NA	
o-Xylene	UG/KG	90	14	ND	14	NA		NA	
m-Xylene	UG/KG	120 1	14	ND	14	NA		NA	
p-Xylene	UG/KG	ND 1	14	ND	14	NA		NA	
Total Xylenes	UG/KG	200	42	ND	41	NA		NA	
Methyl tert butyl ether	UG/KG	ND	14	ND	14	NA		NA	
1,2,4-Trimethylbenzene	UG/KG	220	14	ND	14	NA		NA	
1,3,5-Trimethylbenzene	UG/KG	110	14	ND	14	NA		NA	
SURROGATE(S)									
Fluorobenzene	%	100	60-130	101	60-130	NA		NA	
a,a,a-Trifluorotoluene	%	105	76-127	106	76-127	NA		NA	

IA = Not Applicable ND = Not Detected

Client ID / Job No / Sample Date	Lab ID	A1-SUBAREAL-B-2 / A03-7277 / 07/30/2003	A3727702	A1-SUBAREAL-S-2 / A03-7277 / 07/30/2003	A3727701				
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	950	ND	2100	NA		NA	
Acenaphthylene	UG/KG	ND	950	ND	2100	NA		NA	
Anthracene	UG/KG	ND	950	ND	2100	NA		NA	
Benzo(a)anthracene	UG/KG	ND	950	1200 J	2100	NA		NA	
Benzo(b)fluoranthene	UG/KG	ND	950	ND	2100	NA		NA	
Benzo(k)fluoranthene	UG/KG	ND	950	ND	2100	NA		NA	
Benzo(ghi)perylene	UG/KG	ND	950	ND	2100	NA		NA	
Benzo(a)pyrene	UG/KG	ND	950	1200 J	2100	NA		NA	
Benzoic acid	UG/KG	ND	4600	ND	10000	NA		NA	
Benzyl alcohol	UG/KG	ND	950	ND	2100	NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	950	ND	2100	NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	950	ND	2100	NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	950	ND	2100	NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	950	ND	2100	NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	950	ND	2100	NA		NA	
Butyl benzyl phthalate	UG/KG	ND	950	ND	2100	NA		NA	
4-Chloroaniline	UG/KG	ND	950	ND	2100	NA		NA	
2-Chloronaphthalene	UG/KG	ND	950	ND	2100	NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	950	ND	2100	NA		NA	
Chrysene	UG/KG	ND	950	1100 J	2100	NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	950	ND	2100	NA		NA	
Dibenzofuran	UG/KG	ND	950	ND	2100	NA		NA	
Di-n-butyl phthalate	UG/KG	ND	950	ND	2100	NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	950	ND	2100	NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	950	ND	2100	NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	950	ND	2100	NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	1900	ND	4200	NA		NA	
Diethyl phthalate	UG/KG	ND	950	ND	2100	NA		NA	
Dimethyl phthalate	UG/KG	ND	950	ND	2100	NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	950	ND	2100	NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	950	ND	2100	NA		NA	
Di-n-octyl phthalate	UG/KG	ND	950	ND	2100	NA		NA	
Fluoranthene	UG/KG	ND	950	2300	2100	NA		NA	
Fluorene	UG/KG	ND	950	ND	2100	NA		NA	
Hexachlorobenzene	UG/KG	ND	950	ND	2100	NA		NA	
Hexachlorobutadiene	UG/KG	ND	950	ND	2100	NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	950	ND	2100	NA		NA	
Hexachloroethane	UG/KG	ND	950	ND	2100	NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	950	ND	2100	NA		NA	
Isophorone	UG/KG	ND	950	ND	2100	NA		NA	
2-Methylnaphthalene	UG/KG	ND	950	ND	2100	NA		NA	
Naphthalene	UG/KG	8200	950	ND	2100	NA		NA	
2-Nitroaniline	UG/KG	ND	4600	ND	10000	NA		NA	

A = Not Applicable   ND = Not Detected

Client ID / Job No / Sample Date	Lab ID	A1-SUBAREAL-B-2 A03-7277 07/30/2003	A3727702	A1-SUBAREAL-S-2 A03-7277 07/30/2003	A3727701				
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	4600	ND	10000	NA		NA	
4-Nitroaniline	UG/KG	ND	4600	ND	10000	NA		NA	
Nitrobenzene	UG/KG	ND	950	ND	2100	NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	950	ND	2100	NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	950	ND	2100	NA		NA	
Phenanthrene	UG/KG	440 J	950	1400 J	2100	NA		NA	
Pyrene	UG/KG	ND	950	2000 J	2100	NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	950	ND	2100	NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	103	50-200	111	50-200	NA		NA	
Naphthalene-D8	%	106	50-200	115	50-200	NA		NA	
Acenaphthene-D10	%	108	50-200	115	50-200	NA		NA	
Phenanthrene-D10	%	92	50-200	96	50-200	NA		NA	
Chrysene-D12	%	82	50-200	85	50-200	NA		NA	
Perylene-D12	%	90	50-200	93	50-200	NA		NA	
Nitrobenzene-D5	%	62	34-120	82	34-120	NA		NA	
2-Fluorobiphenyl	%	83	43-125	102	43-125	NA		NA	
p-Terphenyl-d14	%	112	38-141	114	38-141	NA		NA	
Phenol-D5	%	58	34-120	80	34-120	NA		NA	
2-Fluorophenol	%	54	25-125	85	25-125	NA		NA	
2,4,6-Tribromophenol	%	124	36-139	113	36-139	NA		NA	

IA = Not Applicable   ND = Not Detected

VERIFICATION SAMPLING RESULTS
SUBAREA K&L
7/22/03

BS-A1, BS-B1, SW-EES, SW-NM-1, SW-SW-1, SW-WES

Date: 07/25/2003
Time: 11:22:08

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		BS-A1 A03-7006 07/22/2003	A3700602	BS-B1 A03-7006 07/22/2003	A3700606	BS-B1 DL A03-7006 07/22/2003	A3700606DL	SW-EES A03-7006 07/22/2003	A3700601
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	500	5500	2300	ND	11000	ND	2300
Acenaphthylene	UG/KG	ND	500	6200	2300	ND	11000	2400	2300
Anthracene	UG/KG	ND	500	14000	2300	13000 D	11000	2000 J	2300
Benzo(a)anthracene	UG/KG	ND	500	13000	2300	12000 D	11000	2500	2300
Benzo(b)fluoranthene	UG/KG	ND	500	9200	2300	8400 DJ	11000	ND	2300
Benzo(k)fluoranthene	UG/KG	ND	500	5200	2300	ND	11000	1400 J	2300
Benzo(ghi)perylene	UG/KG	ND	500	4300	2300	ND	11000	ND	2300
Benzo(a)pyrene	UG/KG	ND	500	9400	2300	8900 DJ	11000	1700 J	2300
Benzoic acid	UG/KG	ND	2400	ND	11000	ND	55000	ND	11000
Benzyl alcohol	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Bis(2-chloroethoxy) methane	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Bis(2-chloroethyl) ether	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Bis(2-ethylhexyl) phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
4-Bromophenyl phenyl ether	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Butyl benzyl phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
4-Chloroaniline	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
2-Chloronaphthalene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
4-Chlorophenyl phenyl ether	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Chrysene	UG/KG	ND	500	10000	2300	10000 DJ	11000	1800 J	2300
Dibenzo(a,h)anthracene	UG/KG	ND	500	2100 J	2300	ND	11000	ND	2300
Dibenzofuran	UG/KG	ND	500	9800	2300	8800 DJ	11000	1900 J	2300
Di-n-butyl phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
1,2-Dichlorobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
1,3-Dichlorobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
1,4-Dichlorobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
3,3'-Dichlorobenzidine	UG/KG	ND	1000	ND	4600	ND	23000	ND	4500
Diethyl phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Dimethyl phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
2,4-Dinitrotoluene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
2,6-Dinitrotoluene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Di-n-octyl phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Fluoranthene	UG/KG	280 J	500	32000	2300	37000 D	11000	7800	2300
Fluorene	UG/KG	ND	500	17000	2300	15000 D	11000	2900	2300
Hexachlorobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Hexachlorobutadiene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Hexachlorocyclopentadiene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Hexachloroethane	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Indeno(1,2,3-cd)pyrene	UG/KG	ND	500	4800	2300	ND	11000	900 J	2300
Isophorone	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
2-Methylnaphthalene	UG/KG	ND	500	8200	2300	7200 DJ	11000	1600 J	2300
Naphthalene	UG/KG	ND	500	31000	2300	32000 D	11000	10000	2300
2-Nitroaniline	UG/KG	ND	2400	ND	11000	ND	55000	ND	11000

NA = Not Applicable   ND = Not Detected

Date: 07/25/2003
Time: 11:22:08

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	BS-A1 A03-7006 07/22/2003	A3700602	BS-B1 A03-7006 07/22/2003	A3700606	BS-B1 DL A03-7006 07/22/2003	A3700606DL	SW-EES A03-7006 07/22/2003	A3700601
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2400	ND	11000	ND	55000	ND	11000
4-Nitroaniline	UG/KG	ND	2400	ND	11000	ND	55000	ND	11000
Nitrobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
N-nitrosodiphenylamine	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
N-Nitroso-Di-n-propylamine	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Phenanthrene	UG/KG	ND	500	42000 E	2300	50000 D	11000	11000	2300
Pyrene	UG/KG	230 J	500	24000	2300	24000 D	11000	5100	2300
1,2,4-Trichlorobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	70	50-200	78	50-200	84	50-200	64	50-200
Naphthalene-D8	%	72	50-200	80	50-200	86	50-200	66	50-200
Acenaphthene-D10	%	76	50-200	79	50-200	85	50-200	65	50-200
Phenanthrene-D10	%	82	50-200	84	50-200	88	50-200	70	50-200
Chrysene-D12	%	80	50-200	79	50-200	82	50-200	66	50-200
Perylene-D12	%	94	50-200	114	50-200	104	50-200	72	50-200
Nitrobenzene-D5	%	66	34-120	56	34-120	41	34-120	34	34-120
2-Fluorobiphenyl	%	85	43-125	83	43-125	72	43-125	71	43-125
p-Terphenyl-d14	%	105	38-141	98	38-141	98	38-141	105	38-141
Phenol-D5	%	66	34-120	57	34-120	47	34-120	39	34-120
2-Fluorophenol	%	62	25-125	47	25-125	39	25-125	30	25-125
2,4,6-Tribromophenol	%	98	36-139	69	36-139	44	36-139	46	36-139

OK

Total SVOC ≅ 24 ppm
OK

Total SVOC 227 ppm
OK

NA = Not Applicable   ND = Not Detected

STL Buffalo

Date: 07/25/2003
Time: 11:22:08

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	SW-NM-1 A03-7006 07/22/2003	A3700604	SW-SW-1 A03-7006 07/22/2003	A3700603	SW-WES A03-7006 07/22/2003	A3700605		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	2400	ND	470	ND	520	NA	
Acenaphthylene	UG/KG	ND	2400	ND	470	ND	520	NA	
Anthracene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzo(a)anthracene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzo(b)fluoranthene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzo(k)fluoranthene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzo(ghi)perylene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzo(a)pyrene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzoic acid	UG/KG	ND	11000	ND	2300	ND	2500	NA	
Benzyl alcohol	UG/KG	ND	2400	ND	470	ND	520	NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	2400	ND	470	ND	520	NA	
Bis(2-chloroethyl) ether	UG/KG	ND	2400	ND	470	ND	520	NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	2400	ND	470	ND	520	NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
4-Bromophenyl phenyl ether	UG/KG	ND	2400	ND	470	ND	520	NA	
Butyl benzyl phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
4-Chloroaniline	UG/KG	ND	2400	ND	470	ND	520	NA	
2-Chloronaphthalene	UG/KG	ND	2400	ND	470	ND	520	NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	2400	ND	470	ND	520	NA	
Chrysene	UG/KG	ND	2400	ND	470	ND	520	NA	
Dibenzo(a,h)anthracene	UG/KG	ND	2400	ND	470	ND	520	NA	
Dibenzofuran	UG/KG	ND	2400	ND	470	ND	520	NA	
Di-n-butyl phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
1,2-Dichlorobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
1,3-Dichlorobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
1,4-Dichlorobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
3,3'-Dichlorobenzidine	UG/KG	ND	4700	ND	950	ND	1000	NA	
Diethyl phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
Dimethyl phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
2,4-Dinitrotoluene	UG/KG	ND	2400	ND	470	ND	520	NA	
2,6-Dinitrotoluene	UG/KG	ND	2400	ND	470	ND	520	NA	
Di-n-octyl phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
Fluoranthene	UG/KG	ND	2400	ND	470	ND	520	NA	
Fluorene	UG/KG	ND	2400	ND	470	ND	520	NA	
Hexachlorobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
Hexachlorobutadiene	UG/KG	ND	2400	ND	470	ND	520	NA	
Hexachlorocyclopentadiene	UG/KG	ND	2400	ND	470	ND	520	NA	
Hexachloroethane	UG/KG	ND	2400	ND	470	ND	520	NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	2400	ND	470	ND	520	NA	
Isophorone	UG/KG	ND	2400	ND	470	ND	520	NA	
2-Methylnaphthalene	UG/KG	ND	2400	ND	470	ND	520	NA	
Naphthalene	UG/KG	ND	2400	ND	470	ND	520	NA	
2-Nitroaniline	UG/KG	ND	11000	ND	2300	ND	2500	NA	

NA = Not Applicable   ND = Not Detected

Client ID / Job No / Sample Date	Lab ID	A1-SUBAREAL-B-2 A03-7277 07/30/2003	A3727702	A1-SUBAREAL-S-2 A03-7277 07/30/2003	A3727701				
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	14	ND	14	NA		NA	
n-Butylbenzene	UG/KG	ND	14	ND	14	NA		NA	
sec-Butylbenzene	UG/KG	ND	14	ND	14	NA		NA	
tert-Butylbenzene	UG/KG	ND	14	ND	14	NA		NA	
Ethylbenzene	UG/KG	19	14	ND	14	NA		NA	
Isopropylbenzene	UG/KG	ND	14	ND	14	NA		NA	
p-Cymene	UG/KG	ND	14	ND	14	NA		NA	
n-Propylbenzene	UG/KG	ND	14	ND	14	NA		NA	
Toluene	UG/KG	ND	14	ND	14	NA		NA	
o-Xylene	UG/KG	90	14	ND	14	NA		NA	
m-Xylene	UG/KG	120 1	14	ND	14	NA		NA	
p-Xylene	UG/KG	ND 1	14	ND	14	NA		NA	
Total Xylenes	UG/KG	200	42	ND	41	NA		NA	
Methyl tert butyl ether	UG/KG	ND	14	ND	14	NA		NA	
1,2,4-Trimethylbenzene	UG/KG	220	14	ND	14	NA		NA	
1,3,5-Trimethylbenzene	UG/KG	110	14	ND	14	NA		NA	
SURROGATE(S)									
Fluorobenzene	%	100	60-130	101	60-130	NA		NA	
a,a,a-Trifluorotoluene	%	105	76-127	106	76-127	NA		NA	

IA = Not Applicable ND = Not Detected

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Client ID / Job No / Lab ID / Sample Date		A1-SUBAREAL-B-2 A03-7277 A3727702 07/30/2003		A1-SUBAREAL-S-2 A03-7277 A3727701 07/30/2003					
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	950	ND	2100	NA		NA	
Acenaphthylene	UG/KG	ND	950	ND	2100	NA		NA	
Anthracene	UG/KG	ND	950	ND	2100	NA		NA	
Benzo(a)anthracene	UG/KG	ND	950	1200 J	2100	NA		NA	
Benzo(b)fluoranthene	UG/KG	ND	950	ND	2100	NA		NA	
Benzo(k)fluoranthene	UG/KG	ND	950	ND	2100	NA		NA	
Benzo(ghi)perylene	UG/KG	ND	950	ND	2100	NA		NA	
Benzo(a)pyrene	UG/KG	ND	950	1200 J	2100	NA		NA	
Benzoic acid	UG/KG	ND	4600	ND	10000	NA		NA	
Benzyl alcohol	UG/KG	ND	950	ND	2100	NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	950	ND	2100	NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	950	ND	2100	NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	950	ND	2100	NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	950	ND	2100	NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	950	ND	2100	NA		NA	
Butyl benzyl phthalate	UG/KG	ND	950	ND	2100	NA		NA	
4-Chloroaniline	UG/KG	ND	950	ND	2100	NA		NA	
2-Chloronaphthalene	UG/KG	ND	950	ND	2100	NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	950	ND	2100	NA		NA	
Chrysene	UG/KG	ND	950	1100 J	2100	NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	950	ND	2100	NA		NA	
Dibenzofuran	UG/KG	ND	950	ND	2100	NA		NA	
Di-n-butyl phthalate	UG/KG	ND	950	ND	2100	NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	950	ND	2100	NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	950	ND	2100	NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	950	ND	2100	NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	1900	ND	4200	NA		NA	
Diethyl phthalate	UG/KG	ND	950	ND	2100	NA		NA	
Dimethyl phthalate	UG/KG	ND	950	ND	2100	NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	950	ND	2100	NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	950	ND	2100	NA		NA	
Di-n-octyl phthalate	UG/KG	ND	950	ND	2100	NA		NA	
Fluoranthene	UG/KG	ND	950	2300	2100	NA		NA	
Fluorene	UG/KG	ND	950	ND	2100	NA		NA	
Hexachlorobenzene	UG/KG	ND	950	ND	2100	NA		NA	
Hexachlorobutadiene	UG/KG	ND	950	ND	2100	NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	950	ND	2100	NA		NA	
Hexachloroethane	UG/KG	ND	950	ND	2100	NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	950	ND	2100	NA		NA	
Isophorone	UG/KG	ND	950	ND	2100	NA		NA	
2-Methylnaphthalene	UG/KG	ND	950	ND	2100	NA		NA	
Naphthalene	UG/KG	8200	950	ND	2100	NA		NA	
2-Nitroaniline	UG/KG	ND	4600	ND	10000	NA		NA	

A = Not Applicable   ND = Not Detected

Client ID / Job No / Sample Date — Lab ID		A1-SUBAREAL-B-2 A03-7277 07/30/2003	A3727702	A1-SUBAREAL-S-2 A03-7277 07/30/2003	A3727701				
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	4600	ND	10000	NA		NA	
4-Nitroaniline	UG/KG	ND	4600	ND	10000	NA		NA	
Nitrobenzene	UG/KG	ND	950	ND	2100	NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	950	ND	2100	NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	950	ND	2100	NA		NA	
Phenanthrene	UG/KG	440 J	950	1400 J	2100	NA		NA	
Pyrene	UG/KG	ND	950	2000 J	2100	NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	950	ND	2100	NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	103	50-200	111	50-200	NA		NA	
Naphthalene-D8	%	106	50-200	115	50-200	NA		NA	
Acenaphthene-D10	%	108	50-200	115	50-200	NA		NA	
Phenanthrene-D10	%	92	50-200	96	50-200	NA		NA	
Chrysene-D12	%	82	50-200	85	50-200	NA		NA	
Perylene-D12	%	90	50-200	93	50-200	NA		NA	
Nitrobenzene-D5	%	62	34-120	82	34-120	NA		NA	
2-Fluorobiphenyl	%	83	43-125	102	43-125	NA		NA	
p-Terphenyl-d14	%	112	38-141	114	38-141	NA		NA	
Phenol-D5	%	58	34-120	80	34-120	NA		NA	
2-Fluorophenol	%	54	25-125	85	25-125	NA		NA	
2,4,6-Tribromophenol	%	124	36-139	113	36-139	NA		NA	

IA = Not Applicable ND = Not Detected

Pkw
Copy

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Client ID / Job No / Sample Date	Lab ID	BS-A1 A03-7006 07/22/2003	A3700602	BS-B1 A03-7006 07/22/2003	A3700606	BS-B1 DL A03-7006 07/22/2003	A3700606DL	SW-EES A03-7006 07/22/2003	A3700601
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	500	5500	2300	ND	11000	ND	2300
Acenaphthylene	UG/KG	ND	500	6200	2300	ND	11000	2400	2300
Anthracene	UG/KG	ND	500	14000	2300	13000 D	11000	2000 J	2300
Benzo(a)anthracene	UG/KG	ND	500	13000	2300	12000 D	11000	2500	2300
Benzo(b)fluoranthene	UG/KG	ND	500	9200	2300	8400 DJ	11000	ND	2300
Benzo(k)fluoranthene	UG/KG	ND	500	5200	2300	ND	11000	1400 J	2300
Benzo(ghi)perylene	UG/KG	ND	500	4300	2300	ND	11000	ND	2300
Benzo(a)pyrene	UG/KG	ND	500	9400	2300	8900 DJ	11000	1700 J	2300
Benzoic acid	UG/KG	ND	2400	ND	11000	ND	55000	ND	11000
Benzyl alcohol	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Bis(2-chloroethoxy) methane	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Bis(2-chloroethyl) ether	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Bis(2-ethylhexyl) phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
4-Bromophenyl phenyl ether	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Butyl benzyl phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
4-Chloroaniline	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
2-Chloronaphthalene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
4-Chlorophenyl phenyl ether	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Chrysene	UG/KG	ND	500	10000	2300	10000 DJ	11000	1800 J	2300
Dibenzo(a,h)anthracene	UG/KG	ND	500	2100 J	2300	ND	11000	ND	2300
Dibenzofuran	UG/KG	ND	500	9800	2300	8800 DJ	11000	1900 J	2300
Di-n-butyl phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
1,2-Dichlorobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
1,3-Dichlorobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
1,4-Dichlorobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
3,3'-Dichlorobenzidine	UG/KG	ND	1000	ND	4600	ND	23000	ND	4500
Diethyl phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Dimethyl phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
2,4-Dinitrotoluene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
2,6-Dinitrotoluene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Di-n-octyl phthalate	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Fluoranthene	UG/KG	280 J	500	32000	2300	37000 D	11000	7800	2300
Fluorene	UG/KG	ND	500	17000	2300	15000 D	11000	2900	2300
Hexachlorobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Hexachlorobutadiene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Hexachlorocyclopentadiene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Hexachloroethane	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Indeno(1,2,3-cd)pyrene	UG/KG	ND	500	4800	2300	ND	11000	900 J	2300
Isophorone	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
2-Methylnaphthalene	UG/KG	ND	500	8200	2300	7200 DJ	11000	1600 J	2300
Naphthalene	UG/KG	ND	500	31000	2300	32000 D	11000	10000	2300
2-Nitroaniline	UG/KG	ND	2400	ND	11000	ND	55000	ND	11000

NA = Not Applicable   ND = Not Detected

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Client ID / Job No / Sample Date — Lab ID		BS-A1 A03-7006 07/22/2003	A3700602	BS-B1 A03-7006 07/22/2003	A3700606	BS-B1 DL A03-7006 07/22/2003	A3700606DL	SW-EES A03-7006 07/22/2003	A3700601
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2400	ND	11000	ND	55000	ND	11000
4-Nitroaniline	UG/KG	ND	2400	ND	11000	ND	55000	ND	11000
Nitrobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
N-nitrosodiphenylamine	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
N-Nitroso-Di-n-propylamine	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
Phenanthrene	UG/KG	ND	500	42000 E	2300	50000 D	11000	11000	2300
Pyrene	UG/KG	230 J	500	24000	2300	24000 D	11000	5100	2300
1,2,4-Trichlorobenzene	UG/KG	ND	500	ND	2300	ND	11000	ND	2300
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	70	50-200	78	50-200	84	50-200	64	50-200
Naphthalene-D8	%	72	50-200	80	50-200	86	50-200	66	50-200
Acenaphthene-D10	%	76	50-200	79	50-200	85	50-200	65	50-200
Phenanthrene-D10	%	82	50-200	84	50-200	88	50-200	70	50-200
Chrysene-D12	%	80	50-200	79	50-200	82	50-200	66	50-200
Perylene-D12	%	94	50-200	114	50-200	104	50-200	72	50-200
Nitrobenzene-D5	%	66	34-120	56	34-120	41	34-120	34	34-120
2-Fluorobiphenyl	%	85	43-125	83	43-125	72	43-125	71	43-125
p-Terphenyl-d14	%	105	38-141	98	38-141	98	38-141	105	38-141
Phenol-D5	%	66	34-120	57	34-120	47	34-120	39	34-120
2-Fluorophenol	%	62	25-125	47	25-125	39	25-125	30	25-125
2,4,6-Tribromophenol	%	98	36-139	69	36-139	44	36-139	46	36-139

OK

Total SVOC ≅ 24 ppm
OK

Total SVOC 22.7 ppm
OK

Date: 07/25/2003
Time: 11:22:08

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		SW-NM-1 A03-7006 07/22/2003	A3700604	SW-SW-1 A03-7006 07/22/2003	A3700603	SW-WES A03-7006 07/22/2003	A3700605		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	2400	ND	470	ND	520	NA	
Acenaphthylene	UG/KG	ND	2400	ND	470	ND	520	NA	
Anthracene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzo(a)anthracene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzo(b)fluoranthene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzo(k)fluoranthene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzo(ghi)perylene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzo(a)pyrene	UG/KG	ND	2400	ND	470	ND	520	NA	
Benzoic acid	UG/KG	ND	11000	ND	2300	ND	2500	NA	
Benzyl alcohol	UG/KG	ND	2400	ND	470	ND	520	NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	2400	ND	470	ND	520	NA	
Bis(2-chloroethyl) ether	UG/KG	ND	2400	ND	470	ND	520	NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	2400	ND	470	ND	520	NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
4-Bromophenyl phenyl ether	UG/KG	ND	2400	ND	470	ND	520	NA	
Butyl benzyl phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
4-Chloroaniline	UG/KG	ND	2400	ND	470	ND	520	NA	
2-Chloronaphthalene	UG/KG	ND	2400	ND	470	ND	520	NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	2400	ND	470	ND	520	NA	
Chrysene	UG/KG	ND	2400	ND	470	ND	520	NA	
Dibenzo(a,h)anthracene	UG/KG	ND	2400	ND	470	ND	520	NA	
Dibenzofuran	UG/KG	ND	2400	ND	470	ND	520	NA	
Di-n-butyl phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
1,2-Dichlorobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
1,3-Dichlorobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
1,4-Dichlorobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
3,3'-Dichlorobenzidine	UG/KG	ND	4700	ND	950	ND	1000	NA	
Diethyl phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
Dimethyl phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
2,4-Dinitrotoluene	UG/KG	ND	2400	ND	470	ND	520	NA	
2,6-Dinitrotoluene	UG/KG	ND	2400	ND	470	ND	520	NA	
Di-n-octyl phthalate	UG/KG	ND	2400	ND	470	ND	520	NA	
Fluoranthene	UG/KG	ND	2400	ND	470	ND	520	NA	
Fluorene	UG/KG	ND	2400	ND	470	ND	520	NA	
Hexachlorobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
Hexachlorobutadiene	UG/KG	ND	2400	ND	470	ND	520	NA	
Hexachlorocyclopentadiene	UG/KG	ND	2400	ND	470	ND	520	NA	
Hexachloroethane	UG/KG	ND	2400	ND	470	ND	520	NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	2400	ND	470	ND	520	NA	
Isophorone	UG/KG	ND	2400	ND	470	ND	520	NA	
2-Methylnaphthalene	UG/KG	ND	2400	ND	470	ND	520	NA	
Naphthalene	UG/KG	ND	2400	ND	470	ND	520	NA	
2-Nitroaniline	UG/KG	ND	11000	ND	2300	ND	2500	NA	

NA = Not Applicable   ND = Not Detected

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Client ID Job No / Lab ID Sample Date		SW-NM-1 A03-7006 07/22/2003	A3700604	SW-SW-1 A03-7006 07/22/2003	A3700603	SW-WES A03-7006 07/22/2003	A3700605		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	11000	ND	2300	ND	2500	NA	
4-Nitroaniline	UG/KG	ND	11000	ND	2300	ND	2500	NA	
Nitrobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
N-nitrosodiphenylamine	UG/KG	ND	2400	ND	470	ND	520	NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	2400	ND	470	ND	520	NA	
Phenanthrene	UG/KG	ND	2400	ND	470	ND	520	NA	
Pyrene	UG/KG	ND	2400	ND	470	ND	520	NA	
1,2,4-Trichlorobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	78	50-200	81	50-200	86	50-200	NA	
Naphthalene-D8	%	79	50-200	82	50-200	88	50-200	NA	
Acenaphthene-D10	%	81	50-200	80	50-200	85	50-200	NA	
Phenanthrene-D10	%	86	50-200	86	50-200	88	50-200	NA	
Chrysene-D12	%	82	50-200	77	50-200	81	50-200	NA	
Perylene-D12	%	103	50-200	98	50-200	97	50-200	NA	
Nitrobenzene-D5	%	64	34-120	58	34-120	59	34-120	NA	
2-Fluorobiphenyl	%	93	43-125	76	43-125	74	43-125	NA	
p-Terphenyl-d14	%	110	38-141	100	38-141	104	38-141	NA	
Phenol-D5	%	63	34-120	60	34-120	60	34-120	NA	
2-Fluorophenol	%	55	25-125	54	25-125	54	25-125	NA	
2,4,6-Tribromophenol	%	77	36-139	92	36-139	98	36-139	NA	

NA = Not Applicable ND = Not Detected

Date: 07/25/2003
Time: 11:22:08

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID Job No Lab ID Sample Date		SW-NM-1 A03-7006 A3700604 07/22/2003		SW-SW-1 A03-7006 A3700603 07/22/2003		SW-WES A03-7006 A3700605 07/22/2003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	11000	ND	2300	ND	2500	NA	
4-Nitroaniline	UG/KG	ND	11000	ND	2300	ND	2500	NA	
Nitrobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
N-nitrosodiphenylamine	UG/KG	ND	2400	ND	470	ND	520	NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	2400	ND	470	ND	520	NA	
Phenanthrene	UG/KG	ND	2400	ND	470	ND	520	NA	
Pyrene	UG/KG	ND	2400	ND	470	ND	520	NA	
1,2,4-Trichlorobenzene	UG/KG	ND	2400	ND	470	ND	520	NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	78	50-200	81	50-200	86	50-200	NA	
Naphthalene-D8	%	79	50-200	82	50-200	88	50-200	NA	
Acenaphthene-D10	%	81	50-200	80	50-200	85	50-200	NA	
Phenanthrene-D10	%	86	50-200	86	50-200	88	50-200	NA	
Chrysene-D12	%	82	50-200	77	50-200	81	50-200	NA	
Perylene-D12	%	103	50-200	98	50-200	97	50-200	NA	
Nitrobenzene-D5	%	64	34-120	58	34-120	59	34-120	NA	
2-Fluorobiphenyl	%	93	43-125	76	43-125	74	43-125	NA	
p-Terphenyl-d14	%	110	38-141	100	38-141	104	38-141	NA	
Phenol-D5	%	63	34-120	60	34-120	60	34-120	NA	
2-Fluorophenol	%	55	25-125	54	25-125	54	25-125	NA	
2,4,6-Tribromophenol	%	77	36-139	92	36-139	98	36-139	NA	

NA = Not Applicable ND = Not Detected

Date: 07/28/2003
Time: 17:13:25

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8270 - TCL SEMIVOLATILE ORGANICS - S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		SAMPLE 1 A03-7083 07/23/2003	A3708301	SAMPLE 2 A03-7083 07/23/2003	A3708302	SAMPLE 3 A03-7083 07/23/2003	A3708303		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Hexachloroethane	UG/KG	ND	3600	ND	3700	ND	3800	NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	3600	ND	3700	ND	3800	NA	
Isophorone	UG/KG	ND	3600	ND	3700	ND	3800	NA	
2-Methylnaphthalene	UG/KG	ND	3600	ND	3700	ND	3800	NA	
2-Methylphenol	UG/KG	ND	3600	ND	3700	ND	3800	NA	
4-Methylphenol	UG/KG	ND	3600	ND	3700	ND	3800	NA	
Naphthalene	UG/KG	ND	3600	ND	3700	ND	3800	NA	
2-Nitroaniline	UG/KG	ND	18000	ND	18000	ND	18000	NA	
3-Nitroaniline	UG/KG	ND	18000	ND	18000	ND	18000	NA	
4-Nitroaniline	UG/KG	ND	18000	ND	18000	ND	18000	NA	
Nitrobenzene	UG/KG	ND	3600	ND	3700	ND	3800	NA	
2-Nitrophenol	UG/KG	ND	3600	ND	3700	ND	3800	NA	
4-Nitrophenol	UG/KG	ND	18000	ND	18000	ND	18000	NA	
N-nitrosodiphenylamine	UG/KG	ND	3600	ND	3700	ND	3800	NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	3600	ND	3700	ND	3800	NA	
Pentachlorophenol	UG/KG	ND	18000	ND	18000	ND	18000	NA	
Phenanthrene	UG/KG	ND	3600	ND	3700	ND	3800	NA	
Phenol	UG/KG	ND	3600	ND	3700	ND	3800	NA	
Pyrene	UG/KG	1800 J	3600	ND	3700	ND	3800	NA	
1,2,4-Trichlorobenzene	UG/KG	ND	3600	ND	3700	ND	3800	NA	
2,4,5-Trichlorophenol	UG/KG	ND	8900	ND	9000	ND	9200	NA	
2,4,6-Trichlorophenol	UG/KG	ND	3600	ND	3700	ND	3800	NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	66	50-200	70	50-200	71	50-200	NA	
Naphthalene-D8	%	68	50-200	72	50-200	75	50-200	NA	
Acenaphthene-D10	%	72	50-200	75	50-200	76	50-200	NA	
Phenanthrene-D10	%	78	50-200	80	50-200	80	50-200	NA	
Chrysene-D12	%	87	50-200	85	50-200	83	50-200	NA	
Perylene-D12	%	53	50-200	50	50-200	44 *	50-200	NA	
Nitrobenzene-D5	%	54	34-120	54	34-120	40	34-120	NA	
2-Fluorobiphenyl	%	90	43-125	84	43-125	74	43-125	NA	
p-Terphenyl-d14	%	84	38-141	76	38-141	69	38-141	NA	
Phenol-D5	%	72	34-120	56	34-120	48	34-120	NA	
2-Fluorophenol	%	52	25-125	50	25-125	37	25-125	NA	
2,4,6-Tribromophenol	%	41	36-139	32 *	36-139	26 *	36-139	NA	

Borrow Soil OK

NA = Not Applicable ND = Not Detected

STL Buffalo

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Client ID / Job No / Sample Date	Lab ID	BS-A1 A03-7006 07/22/2003	A3700602	BS-B1 A03-7006 07/22/2003	A3700606	SW-EES A03-7006 07/22/2003	A3700601	SW-NM-1 A03-7006 07/22/2003	A3700604
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	14	ND	14	34	14	37	15
n-Butylbenzene	UG/KG	ND	14	ND	14	ND	14	120	15
sec-Butylbenzene	UG/KG	ND	14	ND	14	ND	14	16	15
tert-Butylbenzene	UG/KG	ND	14	ND	14	ND	14	ND	15
Ethylbenzene	UG/KG	ND	14	ND	14	ND	14	ND	15
Isopropylbenzene	UG/KG	ND	14	ND	14	ND	14	15	15
p-Cymene	UG/KG	ND	14	ND	14	ND	14	ND	15
n-Propylbenzene	UG/KG	ND	14	ND	14	ND	14	19	15
Toluene	UG/KG	ND	14	ND	14	ND	14	ND	15
o-Xylene	UG/KG	ND	14	20	14	24	14	18	15
m-Xylene	UG/KG	15 1	14	25 1	14	34 1	14	16 1	15
p-Xylene	UG/KG	ND 1	14	ND 1	14	ND 1	14	ND 1	15
Total Xylenes	UG/KG	ND	42	45	42	57	41	34 J	44
Methyl tert butyl ether	UG/KG	ND	14	ND	14	ND	14	ND	15
1,2,4-Trimethylbenzene	UG/KG	18	14	24	14	22	14	45	15
1,3,5-Trimethylbenzene	UG/KG	ND	14	ND	14	16	14	ND 0.306 mg/kg	15
SURROGATE(S)									
Fluorobenzene	%	95	60-130	100	60-130	98	60-130	97	60-130
a,a,a-Trifluorotoluene	%	98	76-127	102	76-127	103	76-127	103	76-127

Date: 07/28/2003
Time: 10:29:51

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN0326

Client ID Job No Sample Date	Lab ID	SW-SW-1 A03-7006 07/22/2003	A3700603	SW-WES A03-7006 07/22/2003	A3700605				
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	14	ND	15	NA		NA	
n-Butylbenzene	UG/KG	ND	14	ND	15	NA		NA	
sec-Butylbenzene	UG/KG	ND	14	ND	15	NA		NA	
tert-Butylbenzene	UG/KG	ND	14	ND	15	NA		NA	
Ethylbenzene	UG/KG	ND	14	ND	15	NA		NA	
Isopropylbenzene	UG/KG	ND	14	ND	15	NA		NA	
p-Cymene	UG/KG	ND	14	ND	15	NA		NA	
n-Propylbenzene	UG/KG	ND	14	ND	15	NA		NA	
Toluene	UG/KG	ND	14	ND	15	NA		NA	
o-Xylene	UG/KG	ND	14	ND	15	NA		NA	
m-Xylene	UG/KG	ND	14	ND	15	NA		NA	
p-Xylene	UG/KG	ND	14	ND	15	NA		NA	
Total Xylenes	UG/KG	ND	42	ND	45	NA		NA	
Methyl tert butyl ether	UG/KG	ND	14	ND	15	NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	14	ND	15	NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	14	ND	15	NA		NA	
SURROGATE(S)									
Fluorobenzene	%	99	60-130	101	60-130	NA		NA	
a,a,a-Trifluorotoluene	%	102	76-127	104	76-127	NA		NA	

NA = Not Applicable ND = Not Detected

VERIFICATION SAMPLING RESULTS
SUBAREA K&L
7/29/03

A1-KL-B, A1-KL-N-B, A1-KL-SW-S

Date: 08/01/2003
Time: 12:29:43

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	A1-KL-B / A03-7261 / 07/29/2003	A3726102	A1-KL-N-B / A03-7261 / 07/29/2003	A3726103	A1-KL-SW-S / A03-7261 / 07/29/2003	A3726101		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	52	13	29	13	53	13	NA	
n-Butylbenzene	UG/KG	ND	13	ND	13	ND	13	NA	
sec-Butylbenzene	UG/KG	ND	13	ND	13	ND	13	NA	
tert-Butylbenzene	UG/KG	ND	13	ND	13	ND	13	NA	
Ethylbenzene	UG/KG	55	13	ND	13	22	13	NA	
Isopropylbenzene	UG/KG	ND	13	ND	13	ND	13	NA	
p-Cymene	UG/KG	ND	13	ND	13	ND	13	NA	
n-Propylbenzene	UG/KG	ND	13	ND	13	ND	13	NA	
Toluene	UG/KG	47	13	29	13	44	13	NA	
o-Xylene	UG/KG	27	13	22	13	52	13	NA	
m-Xylene	UG/KG	62 1	13	24 1	13	59 1	13	NA	
p-Xylene	UG/KG	ND 1	13	ND 1	13	ND 1	13	NA	
Total Xylenes	UG/KG	89	40	46	40	110	38	NA	
Methyl tert butyl ether	UG/KG	ND	13	ND	13	ND	13	NA	
1,2,4-Trimethylbenzene	UG/KG	33	13	26	13	60	13	NA	
1,3,5-Trimethylbenzene	UG/KG	19	13	14	13	25	13	NA	
SURROGATE(S)									
Fluorobenzene	%	99	60-130	99	60-130	98	60-130	NA	
a,a,a-Trifluorotoluene	%	103	76-127	104	76-127	104	76-127	NA	

NA = Not Applicable ND = Not Detected

Date: 08/01/2003
Time: 12:29:43

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		A1-KL-B A03-7261 07/29/2003	A3726102	A1-KL-N-B A03-7261 07/29/2003	A3726103	A1-KL-SW-S A03-7261 07/29/2003	A3726101		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	920	440	ND	450	ND	2100	NA	
Acenaphthylene	UG/KG	ND	440	ND	450	ND	2100	NA	
Anthracene	UG/KG	840	440	ND	450	1200 J	2100	NA	
Benzo(a)anthracene	UG/KG	760	440	320 J	450	1800 J	2100	NA	
Benzo(b)fluoranthene	UG/KG	340 J	440	ND	450	ND	2100	NA	
Benzo(k)fluoranthene	UG/KG	440	440	ND	450	ND	2100	NA	
Benzo(ghi)perylene	UG/KG	ND	440	ND	450	ND	2100	NA	
Benzo(a)pyrene	UG/KG	420 J	440	230 J	450	ND	2100	NA	
Benzoic acid	UG/KG	ND	2100	ND	2200	ND	10000	NA	
Benzyl alcohol	UG/KG	ND	440	ND	450	ND	2100	NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	440	ND	450	ND	2100	NA	
Bis(2-chloroethyl) ether	UG/KG	ND	440	ND	450	ND	2100	NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	440	ND	450	ND	2100	NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	440	ND	450	ND	2100	NA	
4-Bromophenyl phenyl ether	UG/KG	ND	440	ND	450	ND	2100	NA	
Butyl benzyl phthalate	UG/KG	ND	440	ND	450	ND	2100	NA	
4-Chloroaniline	UG/KG	ND	440	ND	450	ND	2100	NA	
2-Chloronaphthalene	UG/KG	ND	440	ND	450	ND	2100	NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	440	ND	450	ND	2100	NA	
Chrysene	UG/KG	610	440	250 J	450	1500 J	2100	NA	
Dibenzo(a,h)anthracene	UG/KG	ND	440	ND	450	ND	2100	NA	
Dibenzofuran	UG/KG	720	440	ND	450	ND	2100	NA	
Di-n-butyl phthalate	UG/KG	ND	440	ND	450	ND	2100	NA	
1,2-Dichlorobenzene	UG/KG	ND	440	ND	450	ND	2100	NA	
1,3-Dichlorobenzene	UG/KG	ND	440	ND	450	ND	2100	NA	
1,4-Dichlorobenzene	UG/KG	ND	440	ND	450	ND	2100	NA	
3,3'-Dichlorobenzidine	UG/KG	ND	880	ND	900	ND	4200	NA	
Diethyl phthalate	UG/KG	ND	440	ND	450	ND	2100	NA	
Dimethyl phthalate	UG/KG	ND	440	ND	450	ND	2100	NA	
2,4-Dinitrotoluene	UG/KG	ND	440	ND	450	ND	2100	NA	
2,6-Dinitrotoluene	UG/KG	ND	440	ND	450	ND	2100	NA	
Di-n-octyl phthalate	UG/KG	ND	440	ND	450	ND	2100	NA	
Fluoranthene	UG/KG	2200	440	770	450	4700	2100	NA	
Fluorene	UG/KG	1100	440	270 J	450	1400 J	2100	NA	
Hexachlorobenzene	UG/KG	ND	440	ND	450	ND	2100	NA	
Hexachlorobutadiene	UG/KG	ND	440	ND	450	ND	2100	NA	
Hexachlorocyclopentadiene	UG/KG	ND	440	ND	450	ND	2100	NA	
Hexachloroethane	UG/KG	ND	440	ND	450	ND	2100	NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	440	ND	450	ND	2100	NA	
Isophorone	UG/KG	ND	440	ND	450	ND	2100	NA	
2-Methylnaphthalene	UG/KG	440	440	ND	450	ND	2100	NA	
Naphthalene	UG/KG	1600	440	2500	450	3700	2100	NA	
2-Nitroaniline	UG/KG	ND	2100	ND	2200	ND	10000	NA	

NA = Not Applicable   ND = Not Detected

Date: 08/01/2003
Time: 12:29:43

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		A1-KL-B A03-7261 07/29/2003	A3726102	A1-KL-N-B A03-7261 07/29/2003	A3726103	A1-KL-SW-S A03-7261 07/29/2003	A3726101		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	2100	ND	2200	ND	10000	NA	
4-Nitroaniline	UG/KG	ND	2100	ND	2200	ND	10000	NA	
Nitrobenzene	UG/KG	ND	440	ND	450	ND	2100	NA	
N-nitrosodiphenylamine	UG/KG	ND	440	ND	450	ND	2100	NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	440	ND	450	ND	2100	NA	
Phenanthrene	UG/KG	3700	440	1000	450	6000	2100	NA	
Pyrene	UG/KG	1600	440	600	450	3700	2100	NA	
1,2,4-Trichlorobenzene	UG/KG	ND	440	ND	450	ND	2100	NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	112	50-200	117	50-200	110	50-200	NA	
Naphthalene-D8	%	117	50-200	124	50-200	115	50-200	NA	
Acenaphthene-D10	%	118	50-200	127	50-200	118	50-200	NA	
Phenanthrene-D10	%	114	50-200	98	50-200	115	50-200	NA	
Chrysene-D12	%	102	50-200	84	50-200	103	50-200	NA	
Perylene-D12	%	110	50-200	85	50-200	112	50-200	NA	
Nitrobenzene-D5	%	62	34-120	60	34-120	42	34-120	NA	
2-Fluorobiphenyl	%	89	43-125	88	43-125	73	43-125	NA	
p-Terphenyl-d14	%	115	38-141	98	38-141	121	38-141	NA	
Phenol-D5	%	55	34-120	58	34-120	43	34-120	NA	
2-Fluorophenol	%	54	25-125	49	25-125	39	25-125	NA	
2,4,6-Tribromophenol	%	115	36-139	123	36-139	92	36-139	NA	

NA = Not Applicable   ND = Not Detected

STEELFIELDS VERIFICATION SAMPLE RESULTS

SUBAREA K&L

8-5-03

A1-SUBAREAL-B-3, A1-SUBAREAL-S-3, A1-SUBAREAL-S-4

TurnKey Environmental Restoration, LLC

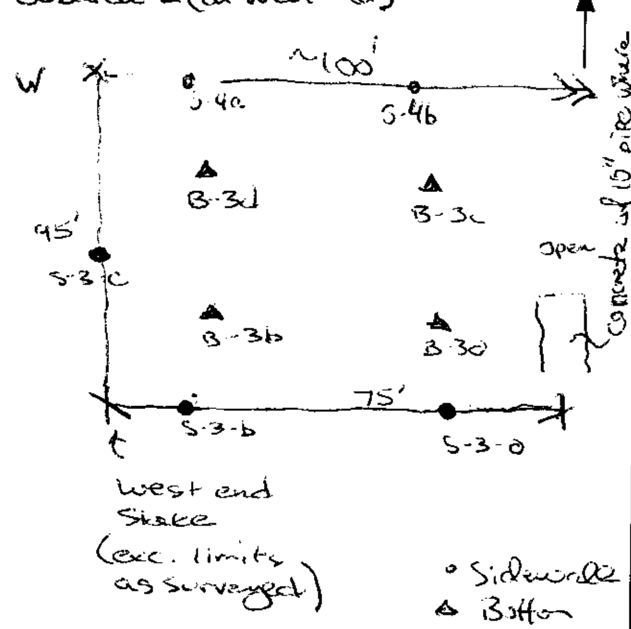
SOIL EXCAVATION LOG

Project: Voluntary Cleanup Program RD/RA
Project No.: 0062-
Client: Steelfields, LTD
Location: Buffalo, New York

EXCAVATION LOCATION: Subarea L – Near Surface from 7/30/03 & to the west & north of the conduit/tunnel
Excavation Time/Date: present ~ 9:45 – 12:15 8/5/03
Excavation Method: Exc.
TK Observer: JMA

Excavation Plan View:
(with approximate dimensions, show cross-section line)

Subarea L (at West end)



Excavation Cross-Section:

Grade - 0'
2'
4' Fill brn
Slag - cemented
6' Native - gray & mottled brn
8'
10'
12'
14'
16'
18'
20'

Confirmation Sample I.D.	Depth (fbgs)	Location Within Excavation (Sidewall/Bottom) (North, South, East, West)	PID Reading (ppm)	Photos Y / N	Notes
AI-SubareaL-S-3	4-6'	Combination West/South Wall Sidewall		N	3 locations for Composite
AI-SubareaL-B-3	6'	Bottom		N	4 locations for Composite
AI-SubareaL-S-4	4-6'	North Wall Sidewall		N	3 locations for Composite

Sample Date 8/5/03

COMMENTS: G. Sutton from NYSDEC present during sampling
DEPTH TO GROUNDWATER (fbgs): —
VISUAL IMPACTS (if any): NONE
OLFACTORY OBSERVATIONS: NONE
DEPTH TO NATIVE SOIL (fbgs): ~6'
OTHER OBSERVATIONS:
APPROX. QUANTITY OF UN-IMPACTED SOIL REMOVED (CY):
APPROX. QUANTITY OF IMPACTED SOIL REMOVED (CY):
FINAL DESTINATION OF IMPACTED SOIL:
SOURCE OF BACKFILL:

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Client ID / Job No / Sample Date — Lab ID		A1-SUBAREAL-B-3 A03-7390 08/05/2003 A3739002		A1-SUBAREAL-S-3 A03-7390 08/05/2003 A3739001		A1-SUBAREAL-S-4 A03-7390 08/05/2003 A3739003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
enzene	UG/KG	ND	14	29	13	ND	13	NA	
-Butylbenzene	UG/KG	ND	14	ND	13	ND	13	NA	
ec-Butylbenzene	UG/KG	ND	14	ND	13	ND	13	NA	
ert-Butylbenzene	UG/KG	ND	14	ND	13	ND	13	NA	
thylbenzene	UG/KG	42	14	90	13	ND	13	NA	
sopropylbenzene	UG/KG	ND	14	ND	13	ND	13	NA	
-Cymene	UG/KG	ND	14	ND	13	ND	13	NA	
-Propylbenzene	UG/KG	ND	14	ND	13	ND	13	NA	
oluene	UG/KG	ND	14	59	13	ND	13	NA	
-Xylene	UG/KG	160	14	100	13	ND	13	NA	
-Xylene	UG/KG	210 1	14	200 1	13	ND	13	NA	
-Xylene	UG/KG	ND 1	14	ND 1	13	ND	13	NA	
otal Xylenes	UG/KG	370	41	300	38	ND	13	NA	
ethyl tert butyl ether	UG/KG	ND	14	ND	13	ND	40	NA	
,2,4-Trimethylbenzene	UG/KG	190	14	190	13	ND	13	NA	
,3,5-Trimethylbenzene	UG/KG	96	14	82	13	ND	13	NA	
SURROGATE(S)									
luorobenzene	%	96	60-130	96	60-130	94	60-130	NA	
,a,a-Trifluorotoluene	%	106	76-127	103	76-127	104	76-127	NA	

= Not Applicable   ND = Not Detected

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Client ID / Job No / Sample Date — Lab ID		A1-SUBAREAL-B-3 A03-7390 08/05/2003	A3739002	A1-SUBAREAL-S-3 A03-7390 08/05/2003	A3739001	A1-SUBAREAL-S-4 A03-7390 08/05/2003	A3739003		
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
:enaphthene	UG/KG	ND	440	450	440	ND	470	NA	
:enaphthylene	UG/KG	ND	440	470	440	ND	470	NA	
ıthracene	UG/KG	270 J	440	620	440	ND	470	NA	
ənzo(a)anthracene	UG/KG	360 J	440	690	440	ND	470	NA	
ənzo(b)fluoranthene	UG/KG	ND	440	500	440	ND	470	NA	
ənzo(k)fluoranthene	UG/KG	ND	440	380 J	440	ND	470	NA	
ənzo(ghi)perylene	UG/KG	ND	440	260 J	440	ND	470	NA	
ənzo(a)pyrene	UG/KG	290 J	440	540	440	ND	470	NA	
ənzoic acid	UG/KG	ND	2100	ND	2100	ND	2300	NA	
ənzyl alcohol	UG/KG	ND	440	ND	440	ND	470	NA	
is(2-chloroethoxy) methane	UG/KG	ND	440	ND	440	ND	470	NA	
is(2-chloroethyl) ether	UG/KG	ND	440	ND	440	ND	470	NA	
,2'-Oxybis(1-Chloropropane)	UG/KG	ND	440	ND	440	ND	470	NA	
is(2-ethylhexyl) phthalate	UG/KG	ND	440	ND	440	ND	470	NA	
-Bromophenyl phenyl ether	UG/KG	ND	440	ND	440	ND	470	NA	
ıtyl benzyl phthalate	UG/KG	ND	440	ND	440	ND	470	NA	
-Chloroaniline	UG/KG	ND	440	ND	440	ND	470	NA	
-Chloronaphthalene	UG/KG	ND	440	ND	440	ND	470	NA	
-Chlorophenyl phenyl ether	UG/KG	ND	440	ND	440	ND	470	NA	
ırysene	UG/KG	270 J	440	490	440	ND	470	NA	
ibenzo(a,h)anthracene	UG/KG	ND	440	ND	440	ND	470	NA	
ibenzofuran	UG/KG	ND	440	640	440	ND	470	NA	
i-n-butyl phthalate	UG/KG	ND	440	ND	440	ND	470	NA	
,2-Dichlorobenzene	UG/KG	ND	440	ND	440	ND	470	NA	
,3-Dichlorobenzene	UG/KG	ND	440	ND	440	ND	470	NA	
,4-Dichlorobenzene	UG/KG	ND	440	ND	440	ND	470	NA	
,3'-Dichlorobenzidine	UG/KG	ND	880	ND	880	ND	940	NA	
iethyl phthalate	UG/KG	ND	440	ND	440	ND	470	NA	
imethyl phthalate	UG/KG	ND	440	ND	440	ND	470	NA	
.4-Dinitrotoluene	UG/KG	ND	440	ND	440	ND	470	NA	
.6-Dinitrotoluene	UG/KG	ND	440	ND	440	ND	470	NA	
i-n-octyl phthalate	UG/KG	ND	440	ND	440	ND	470	NA	
.uoranthene	UG/KG	1000	440	2100	440	ND	470	NA	
.uorene	UG/KG	300 J	440	960	440	ND	470	NA	
·xachlorobenzene	UG/KG	ND	440	ND	440	ND	470	NA	
·xachlorobutadiene	UG/KG	ND	440	ND	440	ND	470	NA	
·xachlorocyclopentadiene	UG/KG	ND	440	ND	440	ND	470	NA	
·xachloroethane	UG/KG	ND	440	ND	440	ND	470	NA	
ıdeno(1,2,3-cd)pyrene	UG/KG	160 J	440	260 J	440	ND	470	NA	
;ophorone	UG/KG	ND	440	ND	440	ND	470	NA	
Methylnaphthalene	UG/KG	ND	440	510	440	ND	470	NA	
ıphthalene	UG/KG	1600	440	2800	440	ND	470	NA	
Nitroaniline	UG/KG	ND	2100	ND	2100	ND	2300	NA	

= Not Applicable ND = Not Detected

Date: 08/07/2003
Time: 12:11:01

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		A1-SUBAREAL-B-3 A03-7390 08/05/2003 — A3739002		A1-SUBAREAL-S-3 A03-7390 08/05/2003 — A3739001		A1-SUBAREAL-S-4 A03-7390 08/05/2003 — A3739003			
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
-Nitroaniline	UG/KG	ND	2100	ND	2100	ND	2300	NA	
-Nitroaniline	UG/KG	ND	2100	ND	2100	ND	2300	NA	
itrobenzene	UG/KG	ND	440	ND	440	ND	470	NA	
-nitrosodiphenylamine	UG/KG	ND	440	ND	440	ND	470	NA	
-Nitroso-Di-n-propylamine	UG/KG	ND	440	ND	440	ND	470	NA	
henanthrene	UG/KG	1100	440	2800	440	ND	470	NA	
yrene	UG/KG	650	440	1400	440	ND	470	NA	
,2,4-Trichlorobenzene	UG/KG	ND	440	ND	440	ND	470	NA	
IS/SURROGATE(S)									
,4-Dichlorobenzene-D4	%	99	50-200	92	50-200	95	50-200	NA	
aphthalene-D8	%	100	50-200	92	50-200	95	50-200	NA	
cenaphthene-D10	%	104	50-200	96	50-200	97	50-200	NA	
henanthrene-D10	%	107	50-200	105	50-200	103	50-200	NA	
hrysene-D12	%	105	50-200	99	50-200	99	50-200	NA	
erylene-D12	%	110	50-200	99	50-200	104	50-200	NA	
itrobenzene-D5	%	69	34-120	63	34-120	76	34-120	NA	
-Fluorobiphenyl	%	82	43-125	77	43-125	86	43-125	NA	
-Terphenyl-d14	%	89	38-141	84	38-141	90	38-141	NA	
henol-D5	%	69	34-120	62	34-120	74	34-120	NA	
-Fluorophenol	%	61	25-125	55	25-125	67	25-125	NA	
,4,6-Tribromophenol	%	109	36-139	96	36-139	106	36-139	NA	

= Not Applicable ND = Not Detected

VERIFICATION SAMPLING RESULTS
SUBAREA N-14
7/28/03

A1-N14-B1, A1-N14-E-1, A1-N14-N-1, A1-N14-S-1

Date: 07/30/2003
Time: 15:53:43

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date — Lab ID		A1-N14-B-1 A03-7206 07/28/2003	A3720603	A1-N14-E-1 A03-7206 07/28/2003	A3720605	A1-N14-N-1 A03-7206 07/28/2003	A3720602	A1-N14-S-1 A03-7206 07/28/2003	A3720601
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	6500	2200	2200	2100	17000	3500	140000 E	3800
Acenaphthylene	UG/KG	2000 J	2200	ND	2100	3900	3500	35000	3800
Anthracene	UG/KG	8100	2200	1400 J	2100	19000	3500	77000 E	3800
Benzo(a)anthracene	UG/KG	4800	2200	1500 J	2100	18000	3500	79000 E	3800
Benzo(b)fluoranthene	UG/KG	2600	2200	ND	2100	15000	3500	87000 E	3800
Benzo(k)fluoranthene	UG/KG	2300	2200	ND	2100	9100	3500	110000 E	3800
Benzo(ghi)perylene	UG/KG	ND	2200	ND	2100	4900	3500	16000	3800
Benzo(a)pyrene	UG/KG	2800	2200	1300 J	2100	14000	3500	58000	3800
Benzoic acid	UG/KG	ND	11000	ND	10000	ND	17000	ND	19000
Benzyl alcohol	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Bis(2-chloroethoxy) methane	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Bis(2-chloroethyl) ether	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Bis(2-ethylhexyl) phthalate	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
4-Bromophenyl phenyl ether	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Butyl benzyl phthalate	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
4-Chloroaniline	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
2-Chloronaphthalene	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
4-Chlorophenyl phenyl ether	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Chrysene	UG/KG	4200	2200	1400 J	2100	16000	3500	61000	3800
Dibenzo(a,h)anthracene	UG/KG	ND	2200	ND	2100	2600 J	3500	9600	3800
Dibenzofuran	UG/KG	4700	2200	1400 J	2100	12000	3500	100000 E	3800
Di-n-butyl phthalate	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
1,2-Dichlorobenzene	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
1,3-Dichlorobenzene	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
1,4-Dichlorobenzene	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
3,3'-Dichlorobenzidine	UG/KG	ND	4500	ND	4300	ND	7000	ND	7700
Diethyl phthalate	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Dimethyl phthalate	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
2,4-Dinitrotoluene	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
2,6-Dinitrotoluene	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Di-n-octyl phthalate	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Fluoranthene	UG/KG	18000	2200	4900	2100	47000	3500	160000 E	3800
Fluorene	UG/KG	7600	2200	2100	2100	19000	3500	130000 E	3800
Hexachlorobenzene	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Hexachlorobutadiene	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Hexachlorocyclopentadiene	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Hexachloroethane	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Indeno(1,2,3-cd)pyrene	UG/KG	1000 J	2200	ND	2100	5900	3500	21000	3800
Isophorone	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
2-Methylnaphthalene	UG/KG	6300	2200	1900 J	2100	9600	3500	190000 E	3800
Naphthalene	UG/KG	35000	2200	15000	2100	55000	3500	580000 E	3800
2-Nitroaniline	UG/KG	ND	11000	ND	10000	ND	17000	ND	19000

NA = Not Applicable   ND = Not Detected

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Client ID / Job No / Sample Date	Lab ID	A1-N14-B-1 A03-7206 07/28/2003	A3720603	A1-N14-E-1 A03-7206 07/28/2003	A3720605	A1-N14-N-1 A03-7206 07/28/2003	A3720602	A1-N14-S-1 A03-7206 07/28/2003	A3720601
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	11000	ND	10000	ND	17000	ND	19000
4-Nitroaniline	UG/KG	ND	11000	ND	10000	ND	17000	ND	19000
Nitrobenzene	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
N-nitrosodiphenylamine	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
N-Nitroso-Di-n-propylamine	UG/KG	ND	2200	ND	2100	ND	3500	ND	3800
Phenanthrene	UG/KG	20000	2200	ND	2100	ND	3500	ND	3800
Pyrene	UG/KG	13000	2200	5200	2100	53000	3500	190000 E	3800
1,2,4-Trichlorobenzene	UG/KG	ND	2200	3900	2100	38000	3500	110000 E	3800
IS/SURROGATE(S)				ND	2100	ND	3500	ND	3800
1,4-Dichlorobenzene-D4	%	103	50-200	104	50-200	104	50-200	96	50-200
Naphthalene-D8	%	103	50-200	107	50-200	106	50-200	88	50-200
Acenaphthene-D10	%	105	50-200	106	50-200	109	50-200	105	50-200
Phenanthrene-D10	%	114	50-200	117	50-200	114	50-200	102	50-200
Chrysene-D12	%	104	50-200	109	50-200	105	50-200	106	50-200
Perylene-D12	%	129	50-200	123	50-200	145	50-200	148	50-200
Nitrobenzene-D5	%	69	34-120	66	34-120	69	34-120	79	34-120
2-Fluorobiphenyl	%	97	43-125	94	43-125	100	43-125	101	43-125
p-Terphenyl-d14	%	118	38-141	111	38-141	115	38-141	109	38-141
Phenol-D5	%	71	34-120	68	34-120	74	34-120	64	34-120
2-Fluorophenol	%	65	25-125	61	25-125	68	25-125	62	25-125
2,4,6-Tribromophenol	%	82	36-139	80	36-139	70	36-139	68	36-139

NA = Not Applicable   ND = Not Detected

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8260 - STARS-S

Client ID / Job No / Sample Date — Lab ID		A1-N14-W-1 A03-7206 07/28/2003	A3720604						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	6	NA		NA		NA	
Ethylbenzene	UG/KG	ND	6	NA		NA		NA	
m/p-Xylenes	UG/KG	ND	12	NA		NA		NA	
o-Xylene	UG/KG	ND	6	NA		NA		NA	
Total Xylenes	UG/KG	ND	19	NA		NA		NA	
Toluene	UG/KG	ND	6	NA		NA		NA	
Isopropylbenzene	UG/KG	ND	6	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	6	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	6	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	6	NA		NA		NA	
n-Butylbenzene	UG/KG	ND	6	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	6	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	6	NA		NA		NA	
n-Propylbenzene	UG/KG	ND	6	NA		NA		NA	
p-Cymene	UG/KG	ND	6	NA		NA		NA	
IS/SURROGATE(S)									
Chlorobenzene-D5	%	99	50-200	NA		NA		NA	
1,4-Difluorobenzene	%	95	50-200	NA		NA		NA	
1,4-Dichlorobenzene-D4	%	94	50-200	NA		NA		NA	
Toluene-D8	%	94	71-125	NA		NA		NA	
p-Bromofluorobenzene	%	96	68-124	NA		NA		NA	
1,2-Dichloroethane-D4	%	99	61-136	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

Date: 07/30/2003
Time: 15:53:43

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8260 - STARS-S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	A1-N14-B-1 A03-7206 07/28/2003	A3720603	A1-N14-E-1 A03-7206 07/28/2003	A3720605	A1-N14-N-1 A03-7206 07/28/2003	A3720602	A1-N14-S-1 A03-7206 07/28/2003	A3720601
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	54	7	3 J	6	6	6	19	6
Ethylbenzene	UG/KG	30	7	6	6	5 J	6	40	6
m/p-Xylenes	UG/KG	300	13	18	13	70	11	340	12
o-Xylene	UG/KG	120	7	18	6	42	6	160	6
Total Xylenes	UG/KG	410	20	36	19	110	17	490	18
Toluene	UG/KG	70	7	2 J	6	9	6	49	6
Isopropylbenzene	UG/KG	6 J	7	2 J	6	ND	6	5 J	6
Methyl tert butyl ether	UG/KG	ND	7	ND	6	ND	6	ND	6
1,2,4-Trimethylbenzene	UG/KG	170	7	28	6	64	6	200	6
1,3,5-Trimethylbenzene	UG/KG	94	7	8	6	32	6	100	6
n-Butylbenzene	UG/KG	ND	7	ND	6	ND	6	ND	6
sec-Butylbenzene	UG/KG	9	7	2 J	6	2 J	6	10	6
tert-Butylbenzene	UG/KG	ND	7	ND	6	ND	6	ND	6
n-Propylbenzene	UG/KG	ND	7	ND	6	ND	6	ND	6
p-Cymene	UG/KG	2 J	7	ND	6	ND	6	2 J	6
IS/SURROGATE(S)									
Chlorobenzene-D5	%	96	50-200	96	50-200	98	50-200	94	50-200
1,4-Difluorobenzene	%	96	50-200	97	50-200	94	50-200	95	50-200
1,4-Dichlorobenzene-D4	%	93	50-200	88	50-200	95	50-200	97	50-200
Toluene-D8	%	99	71-125	98	71-125	94	71-125	100	71-125
p-Bromofluorobenzene	%	102	68-124	99	68-124	98	68-124	106	68-124
1,2-Dichloroethane-D4	%	96	61-136	99	61-136	97	61-136	102	61-136

NA = Not Applicable ND = Not Detected

Date: 07/30/2003
Time: 15:53:43

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	A1-N14-S-1 A03-7206 07/28/2003	A3720601DL	A1-N14-W-1 A03-7206 07/28/2003	A3720604				
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	160000 DJ	190000	9400	3700	NA		NA	
Acenaphthylene	UG/KG	ND	190000	5800	3700	NA		NA	
Anthracene	UG/KG	110000 DJ	190000	21000	3700	NA		NA	
Benzo(a)anthracene	UG/KG	79000 DJ	190000	29000	3700	NA		NA	
Benzo(b)fluoranthene	UG/KG	ND	190000	28000	3700	NA		NA	
Benzo(k)fluoranthene	UG/KG	ND	190000	16000	3700	NA		NA	
Benzo(ghi)perylene	UG/KG	ND	190000	8000	3700	NA		NA	
Benzo(a)pyrene	UG/KG	ND	190000	24000	3700	NA		NA	
Benzoic acid	UG/KG	ND	930000	ND	18000	NA		NA	
Benzyl alcohol	UG/KG	ND	190000	ND	3700	NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	190000	ND	3700	NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	190000	ND	3700	NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	190000	ND	3700	NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	190000	ND	3700	NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	190000	ND	3700	NA		NA	
Butyl benzyl phthalate	UG/KG	ND	190000	ND	3700	NA		NA	
4-Chloroaniline	UG/KG	ND	190000	ND	3700	NA		NA	
2-Chloronaphthalene	UG/KG	ND	190000	ND	3700	NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	190000	ND	3700	NA		NA	
Chrysene	UG/KG	ND	190000	26000	3700	NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	190000	4300	3700	NA		NA	
Dibenzofuran	UG/KG	ND	190000	6200	3700	NA		NA	
Di-n-butyl phthalate	UG/KG	ND	190000	ND	3700	NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	190000	ND	3700	NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	190000	ND	3700	NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	190000	ND	3700	NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	380000	ND	7500	NA		NA	
Diethyl phthalate	UG/KG	ND	190000	ND	3700	NA		NA	
Dimethyl phthalate	UG/KG	ND	190000	ND	3700	NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	190000	ND	3700	NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	190000	ND	3700	NA		NA	
Di-n-octyl phthalate	UG/KG	ND	190000	ND	3700	NA		NA	
Fluoranthene	UG/KG	300000 D	190000	60000	3700	NA		NA	
Fluorene	UG/KG	150000 DJ	190000	12000	3700	NA		NA	
Hexachlorobenzene	UG/KG	ND	190000	ND	3700	NA		NA	
Hexachlorobutadiene	UG/KG	ND	190000	ND	3700	NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	190000	ND	3700	NA		NA	
Hexachloroethane	UG/KG	ND	190000	ND	3700	NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	190000	9900	3700	NA		NA	
Isophorone	UG/KG	ND	190000	ND	3700	NA		NA	
2-Methylnaphthalene	UG/KG	180000 DJ	190000	ND	3700	NA		NA	
Naphthalene	UG/KG	1200000 D	190000	10000	3700	NA		NA	
2-Nitroaniline	UG/KG	ND	930000	ND	18000	NA		NA	

NA = Not Applicable ND = Not Detected

Date: 07/30/2003
Time: 15:53:43

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID Job No Sample Date	Lab ID	A1-N14-S-1 A03-7206 07/28/2003	A3720601DL	A1-N14-W-1 A03-7206 07/28/2003	A3720604				
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
3-Nitroaniline	UG/KG	ND	930000	ND	18000	NA		NA	
4-Nitroaniline	UG/KG	ND	930000	ND	18000	NA		NA	
Nitrobenzene	UG/KG	ND	190000	ND	3700	NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	190000	ND	3700	NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	190000	ND	3700	NA		NA	
Phenanthrene	UG/KG	410000 D	190000	49000	3700	NA		NA	
Pyrene	UG/KG	210000 D	190000	48000	3700	NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	190000	ND	3700	NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	104	50-200	102	50-200	NA		NA	
Naphthalene-D8	%	108	50-200	104	50-200	NA		NA	
Acenaphthene-D10	%	108	50-200	107	50-200	NA		NA	
Phenanthrene-D10	%	112	50-200	116	50-200	NA		NA	
Chrysene-D12	%	102	50-200	107	50-200	NA		NA	
Perylene-D12	%	119	50-200	145	50-200	NA		NA	
Nitrobenzene-D5	%	0 D	34-120	59	34-120	NA		NA	
2-Fluorobiphenyl	%	0 D	43-125	86	43-125	NA		NA	
p-Terphenyl-d14	%	0 D	38-141	97	38-141	NA		NA	
Phenol-D5	%	0 D	34-120	54	34-120	NA		NA	
2-Fluorophenol	%	0 D	25-125	60	25-125	NA		NA	
2,4,6-Tribromophenol	%	0 D	36-139	61	36-139	NA		NA	

NA = Not Applicable   ND = Not Detected

AREA I

SUBAREA Q VERIFICATION SAMPLES

11/5/03 – 11/7/03

SEVERN TRENT STL

E-mailed to G. Sutton 11/10/03

Fax message

To: T. Forbes

Company: Benchmark

Fax: 856-0583

Subject: CA Results

From: B. Fischer

Date: 11-10-03

Pages: 2

This facsimile transmission contains analytical data for STL Buffalo Report #(s): A03-A854 ______ ______ ______. It is understood and agreed by the customer that all data and information stated in this report may be preliminary, may not have been reviewed for completeness or accuracy and could be subject to change based upon a final review. Severn Trent Laboratories, Inc. makes no expressed or implied warranties of any kind, including, but not limited to merchantability and fitness for a particular purpose, and customer agrees that Severn Trent Laboratories, Inc. shall not be liable for any of the customer's losses or damages caused by use of the data.

Severn Trent Laboratories Inc.
STL Buffalo 10 Hazelwood Drive Amherst, New York 14228
Tel 716 691 2600 Fax 716 691 7991 Toll Free 877 STL BFLO • www.stl-inc.com

Date: 11/10/2003
Time: 10:30:22

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
TOTAL METALS

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	AREA1-Q5-EAST SIDE / A03-A854 / 11/07/2003	A3A85401						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Chromium - Total	MG/KG	979 E	0.59	NA		NA		NA	

NA = Not Applicable ND = Not Detected

SEVERN TRENT STL

E-mailed To G-Sutton 11/10/03

Fax message

To: T. Forbes

Company: Benchmark

Fax: 856-0583

Subject: CN Results

From: B. Fischer

Date: 11-7-03

Pages: 2

This facsimile transmission contains analytical data for STL Buffalo Report #(s): A03-A726 _____ _____ _____. It is understood and agreed by the customer that all data and information stated in this report may be preliminary, may not have been reviewed for completeness or accuracy and could be subject to change based upon a final review. Severn Trent Laboratories, Inc. makes no expressed or implied warranties of any kind, including, but not limited to merchantability and fitness for a particular purpose, and customer agrees that Severn Trent Laboratories, Inc. shall not be liable for any of the customer's losses or damages caused by use of the data.

Severn Trent Laboratories Inc.
STL Buffalo 10 Hazelwood Drive Amherst, New York 14228
Tel 716 691 2600 Fax 716 691 7991 Toll Free 877 STL BFLO • www.stl-inc.com

Date: 11/07/2003
Time: 11:38:56

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
TOTAL METALS

Rept: AN0326

Client ID Job No Sample Date	Lab ID	QS-EAST-SW A03-A726 11/05/2003	A3A72601						
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Chromium - Total	MG/KG	952	0.63	NA		NA		NA	

NA = Not Applicable ND = Not Detected

APPENDIX C

RELATED PROJECT CORRESPONDENCE

APPENDIX C

Title	Date Submitted
Off-Site Borrow Soil Sampling Plan	2/19/2003
Subarea D - Proposed ORC Treatment	5/15/2003
Analytical Data for the West Seneca Soil Material *	5/22/2003
Area I, Subarea A - Confirmatory Sampling Results and Proposed approach for Remediation of Residual Impacted Soils Along Sheetpile Deadman	6/17/2003
Subarea K & L - Proposed ORC Treatment	7/31/2003
Area I - Record drawings and excavation volumes **	10/7/2003
Off-Site Soil/Fill Investigation	02/10/05

Note:

**   Analytical Data for the West Seneca Soil Material is included in Appendix D.*
*** Area I – Record Drawings are included in the Figures portion of this report.*

February 19, 2003

New York State Dept. of Environmental Conservation
Division of Environmental Remediation
270 Michigan Avenue
Buffalo, New York 14203-2999

Attention: Mr. Gregory Sutton, P.E.

Re: Steelfields Voluntary Cleanup- Off-Site Borrow Soil Sampling Plan

Gentlemen:

The purpose of this letter is to document the understanding reached via telephone discussions today between myself and Gary Smith (as officers of Steelfields Ltd.), and yourself and Martin Doster regarding sampling and analytical requirements for our proposed initial off-site borrow soil source. The subject borrow source is an on-going storm sewer excavation in north Buffalo as more fully described in the letter dated February 10, 2003 to you from Jerome Plewniak of Modern Construction, LLC.

An initial composite sample was collected by TurnKey and Modern staff on February 14th from a temporary soil stockpile of this source material in the hauling contractor's yard, as observed by a Department field representative. This initial sample is being analyzed for the "full list" of parameters (i.e. VOCs, SVOCs, metals, pesticides, herbicides, and PCBs) in accordance with the Soil/Fill Management Plan (S/FMP) with rapid turn-around of results expected by Friday February 21, 2003. This sample is considered representative of the first 1,000 cubic yards of material. If the analytical results meet the maximum concentration criteria specified in the S/FMP, the first 1,000 c.y. of soil fill will begin to be transported to the site on or around Monday February 24, 2003.

Additional soil samples will be collected along the alignment of the sewer excavation using a geoprobe to collect soil cores down to the design depth of the excavation (varies from approximately 5 to15 feet below grade). Four geoprobe samples will be collected that each represent approximately 1,000 c.y. of the next 4,000 c.y. of soil to be excavated. A composite sample representative of the entire depth of the core will then be analyzed for VOCs, SVOCs, pesticides, herbicides, PCBs, and target metals. Following these four initial geoprobe samples, one additional geoprobe sample will be collected from each remaining segment along the sewer alignment that represents approximately 5,000 c.y. of soil to be excavated. These (5,000 c.y.) geoprobe cores will also be scanned in the field for

VOCs using a PID and be analyzed for SVOCs and target metals only (unless field screening indicated VOCs were present above background, in which case VOCs would also be analyzed). Only segments of the sewer excavation analyzed and found to contain acceptable concentrations in accordance with the S/FMP will be transported to the site for stockpiling.

It was further agreed that TurnKey will have a qualified field technician or geologist visit the stockpile areas on site to visually inspect and screen (using a PID) borrow materials delivered to the site each day. In the event the visual or PID screening indicated the potential for contamination, that material will be sampled and analyzed in accordance with the S/FMP. A daily field log certified by TurnKey's field representative will be maintained in TurnKey's office for review by NYSDEC as requested.

If this representation is inconsistant with your understanding or you require additional clarification, please contact me at your earliest convenience. We intend to initiate the geoprobe sampling and analysis on Monday, February 24, 2003.

Sincerely,

Paul H. Werthman, P.E.
Principal Engineer

May 15, 2003

Mr. Gregory P. Sutton, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, NY 14203-2999

Re: Steelfields Site, Voluntary Cleanup
Subarea D - Proposed ORC Treatment

Dear Mr. Sutton:

On behalf of Steelfields Ltd, we have prepared this correspondence to document our proposed use of Oxygen Release Compound® (ORC®) to complete remediation of SubArea D within Area I of the above-referenced site. As you are aware, soil/fill removal activities within SubArea D have produced an excavation approximately 100' L x 100'W x 22'deep. Verification sampling results for the excavation show conformance with site-specific action levels (SSALs) for the sidewalls, but indicate exceedance of SSALs for benzene and xylenes on the excavation bottom.

Based on the depth of the excavation and the presence of groundwater, continued (deeper) excavation of the area is impractical. Given the absence of floating product on the groundwater, the nature of the soil material (saturated silty/sandy soils), and the susceptibility of benzene and xylenes to aerobic biodegredation, we propose to use ORC® to complete the SubArea D remediation per the RD/RA Work Plan. Specifically, the excavation will be backfilled with enough overburden soil to allow access by a direct-push drill rig without groundwater pumping. ORC will be injected at 20 locations, spaced evenly across the excavation base, at a depth interval of 0-3-feet below the top of the current excavation elevation for a total of 390 lbs of ORC®. The injection grid spacing and proposed mass of ORC® are based on recommendations from a model made available by Regenesis, the ORC® manufacturer. Following ORC® injection, the remainder of the excavation will be backfilled.

Please let us know if you have any questions or comments. We plan to complete this work within the next 5-7 business days.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: 0062-002-100

NYSDEC/ Buffalo- James Tuck
Steelfields- G. Smith, R. Palumbo

June 17, 2003

Mr. Gregory P. Sutton, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, NY 14203-2999

Re: Steelfields Site, Voluntary Cleanup
Area I, Subarea A – Confirmatory Sampling Results and Proposed Approach for Remediation of Residual Impacted Soils Along Sheetpile Deadman

Dear Mr. Sutton:

On behalf of Steelfields Ltd, we have prepared this correspondence to convey the results of confirmatory samples collected from Subarea A of the above-referenced site on June 11, 2003, and to present our intended approach for remediation of remaining impacted soils in the area. As you are aware, soil/fill removal activities performed in Subarea A during the week of June 9 yielded areas of petroleum-stained soil fill adjacent to and beneath a former concrete foundation and under the northeastern end (i.e., closest to South Park Avenue) of the deadman supporting the sheetpile wall in this area. Excavation was completed around these structures to the extent practicable. Confirmatory soil samples were then collected in several areas of the excavation, including soil/fill beneath the concrete foundation and the concrete deadman.

Figure 1, attached, presents a schematic of the excavation area and the locations of the confirmatory samples. Analytical results are attached. As indicated, soil/fill beneath the concrete foundation and at the northeastern end of the deadman exceed, in certain instances, Site-Specific Action Levels (SSALs) of 1 ppm for individual volatile organic compounds (VOCs) as well as the SSAL of 10 ppm for total VOCs. Remaining samples meet SSALs.

Steelfields plans to remove the concrete structure and continue excavation of the soil/fill currently present beneath the concrete as noted in Figure 1. This location will be resampled following completion of the excavation.

Due to the need to maintain the structural integrity of the deadman to support the sheetpile wall, soils between the sheetpile tie-backs and sheetpile wall will be excavated and sequentially backfilled such that only one or two tie-backs are exposed at any time. During this operation, the excavator will remove soil/fill beneath the deadman to the extent feasible without risk of collapse of the structure or the sheetpile wall. It will, however, be necessary to leave a column of undisturbed soil under an approximately 3’ x 5' section of the deadman at the northeast end to support that end. Based on the observed thickness of the impacted soils beneath the northeast end of the deadman (approximately 1 foot) and the concentration of organics in the impacted layer, this represents less than 0.1 lbs of residual organic that will be left in place on the northeast end of the deadman. Similarly, assuming that the excavator is able to remove 1/2 to 2/3 of the soils beneath the remaining length of the deadman between the tie-backs, only 0.03 – 0.04 lbs per foot of residual organic will remain along the length of the deadman. Thus, only a deminimis mass of organics will remain under this approach. Furthermore, the silty clay backfill soils surrounding this small residual subsurface impacted location will further limit any potential migrations.

Please let us know if you have any questions or comments. We plan to complete this work within the next 5-7 business days.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: 0062-002-100

NYSDEC/ Buffalo- James Tuck
Steelfields- G. Smith, R. Palumbo

July 31, 2003

Mr. Gregory P. Sutton, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, NY 14203-2999

Re: Steelfields Site, Voluntary Cleanup
Subarea K & L - Proposed ORC Treatment

Dear Mr. Sutton:

On behalf of Steelfields Ltd. we have prepared this correspondence to document our proposed use of Oxygen Release Compound® (ORC®) to complete remediation of SubArea K & L within Area I of the above-referenced site. As you are aware, soil/fill removal activities within SubArea D have produced a larger than anticipated excavation. All verification samples analyzed to date show conformance with site-specific action levels (SSALs) for the sidewalls and bottom of the excavation. All visibly impacted soil/fill has been removed. Perched shallow groundwater that exhibits a slight oil sheen continues to seep from a very narrow band of slag fill on top of the native till soil along approximately 80 feet of the southern sidewall in the southeast corner of the excavation (see attached sketch). The groundwater yield from this seep is very low (estimated at less than 1 gpm) and is likely to dissipate completely under normally dry weather conditions. The excavation along this sidewall has been extended southward and the visibly impacted groundwater continues to flow from the seep approximately six feet below the original surface grade (i.e. 2-inches or less in nominal thickness).

As the excavation is within approximately 40 feet of the fenceline, no source materials are evident, with low-flow perched groundwater flows, continued excavation of the subarea soil/fill is impractical. Given the nature of the soil/fill material (i.e. slag over seasonally saturated silty/sandy soils) and the susceptibility of benzene and xylenes to aerobic biodegredation, we propose to use ORC® to complete the SubArea K & L remediation per the RD/RA Work Plan. More specifically we propose to inject ORC at 10 to 13 locations spaced 6 to 8 feet apart between the southern limits of the excavation and the fenceline as shown on the attached sketch. The borings or direct push probes will extend to a depth approximately 6-inches into the native till soils. ORC will be injected over the lower 12 -inches of each hole. We anticipate a total of approximately 100 lbs of ORC® will be utilized.

This is considered to be an interim remedial measure as the groundwater model indicates that the influence of the Area II collection system will extend to this location.

Please let us know if you have any questions or comments. We plan to complete this work within the next 10 to 15 business days.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: 0062-008-400

NYSDEC/ Buffalo- James Tuck
Steelfields- G. Smith, R. Palumbo
Modern- J. Plewniak

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

February 10, 2005

Mr. Gregory Sutton, P.E.
New York State Dept. of Environmental Conservation
Division of Environmental Remediation
270 Michigan Avenue
Buffalo, New York 14203-2999

Re: Steelfields, Ltd. Site (V00619-9)
Off-Site Soil/Fill Investigation: Area I - Subarea N-14

Dear Mr. Sutton:

On behalf of Steelfields, Ltd., TurnKey Environmental Restoration, LLC (TurnKey) is submitting this letter report summarizing the findings the Off-Site Soil/Fill Investigation for Subarea N-14 located immediately south of Area I of the Steelfields Site. TurnKey personnel conducted the investigation activities on January 26, 2005 in accordance with the NYSDEC-approved Contingency Plan for Investigation and/or Remediation of Off-Site Soil/Fill South of Subarea N-14 originally presented in the Remedial Design/Remedial Action (RD/RA) Work Plan as Appendix E-3 (revised September 2002).

Geoprobe Investigation

A total of five geoprobe direct-push borings, identified as A1-N14-B-1 through A1-N14-B-5, were advanced through unconsolidated soil/fill material to a minimum of one foot into native soil on Norfolk Southern Property at the locations presented on Figure 1. All direct-push boreholes were advanced using an ATV-mounted direct-push Geoprobe™ drill rig with 1.5-inch diameter samplers 4-feet in length with dedicated PVC sleeves. All non-dedicated drilling tools were decontaminated between boring locations using potable tap water and a phosphate-free detergent (i.e., Alconox™).

Each 4-foot core was described using the Unified Soil Classification System (USCS), scanned each 4-foot core for total volatile organic vapors with a calibrated Photovac 2020 PID equipped with a 10.6 eV lamp, and reported any visual and/or olfactory observations. Due to very cold weather conditions (temperatures below 20º F), PID scans of the soil/fill unit were supplemented with headspace determinations. In general, soil samples representative of each 4-foot core interval were collected, placed in a sealable plastic bag, and kept at or near room temperature (approximately 65-70° F) within the confines of a heated field vehicle for a minimum of 15 minutes prior to measurement. Headspace determinations were measured using the calibrated PID and are summarized below:

726 Exchange Street, Suite 624 | Buffalo, NY 14210
phone: (716) 856-0599 | fax: (716) 856-0583

Boring Location	Total Depth (fbgs)	Soil/Fill Interval (fbgs)	Headspace Determination [1] (ppm)
A1-N14-B-1	8.0	0.0 – 5.0	1.0
A1-N14-B-2	8.0	0.0 – 4.5	1.5
A1-N14-B-3	6.0	0.0 – 4.5	1.8
A1-N14-B-4	6.0	0.0 – 4.5	1.9
A1-N14-B-5	6.0	0.0 – 4.0	4.0

The primary saturated unit was described as soil/fill (FILL). Below the soil/fill unit was a moist native lean clay (CL) unit. Geoprobe boring logs are presented in Attachment 1.

Soil Samples
Upon determination of the soil/fill thickness in conjunction with visual, olfactory, and PID characterization of the soil/fill unit, representative samples were collected from the soil/fill unit at geoprobe boring locations A1-N14-B-1 through A1-N14-B-4 utilizing dedicated stainless steel sampling tools. Representative soil samples were placed in laboratory provided sample bottles, cooled to 4º C in the field, and transported under chain-of-custody command to Severn Trent Laboratories, Inc. located in Amherst, New York. All soil/fill samples were analyzed for STARS Method 8021 volatile organic compounds (VOCs) and Method 8270 semi-VOCs (SVOCs) (base-neutrals only). In accordance with the RD/RA Quality Assurance Plan, one blind duplicate sample was collected from A1-N14-B-3 and one matrix spike/matrix spike duplicate (MS/MSD) sample was collected from A1-N14-B-4.

Analytical Results
Soil/fill analytical results are summarized in the attached Table 1. Soil/fill analytical results were compared to the Site Specific Action Levels (SSALs) established for the Steelfields site in the RD/RA Work Plan (revised September 2002). Only a few compounds were detected above method detection limits, however at concentrations significantly below SSALs. All other compounds were reported as "non-detect". The laboratory analytical data package is presented in Attachment 2.

Extents of Impact
Based upon the visual, olfactory, and PID observations as well as laboratory analytical results, the horizontal and vertical extent of impacts within Subarea N-14 have been

[1] Headspace determinations were measured from a representative sample collected from the soil/fill interval presented.

adequately defined and extend south beyond the Area I fence line less than 10 feet at a depth of approximately 4.5 feet below ground surface (fbgs).

Conclusions/Recommendations

No additional investigation or remediation is proposed. The small remaining excavation on Area I in Subarea N-14 is proposed to be backfilled.

Please contact us if you have any questions.

Sincerely,
Benchmark Environmental Engineering & Science, PLLC

Bryan C. Hann

Bryan C. Hann
Senior Project Hydrogeologist

cc: P. Werthman (Steelfields), w/ enclosure
R. Palumbo (Steelfields), w/o enclosure
G. Smith (Steelfields), w/ enclosure
J. Plewniak (Modern), w/o enclosure
W. Meisner (Benchmark), w/ enclosure
K. Stamy (Norfolk Southern), w/ enclosure

Enclosures

File: 0062-002-525

TABLES

TABLE 1

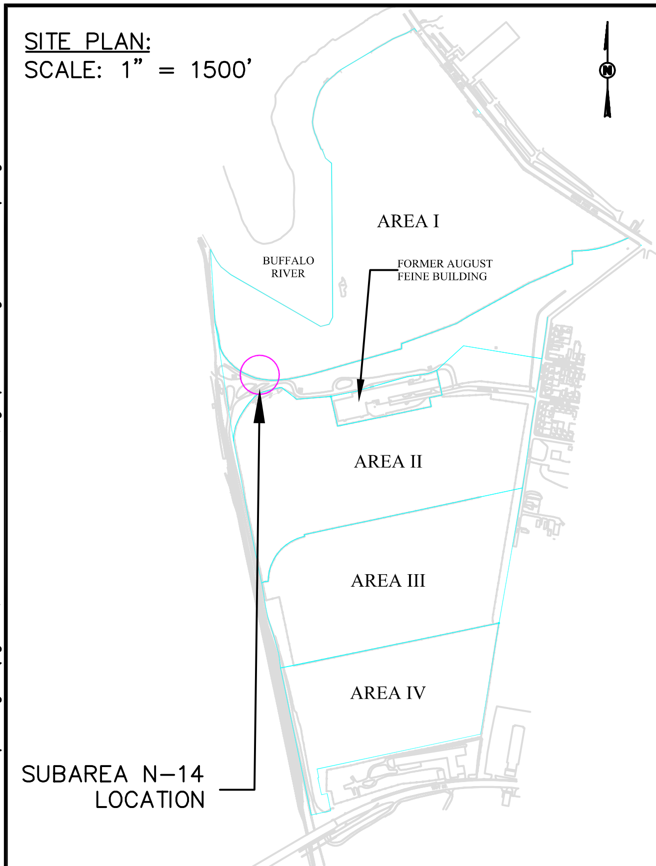
AREA I
SUBAREA N-14 - SUMMARY OF SOIL ANALYTICAL RESULTS

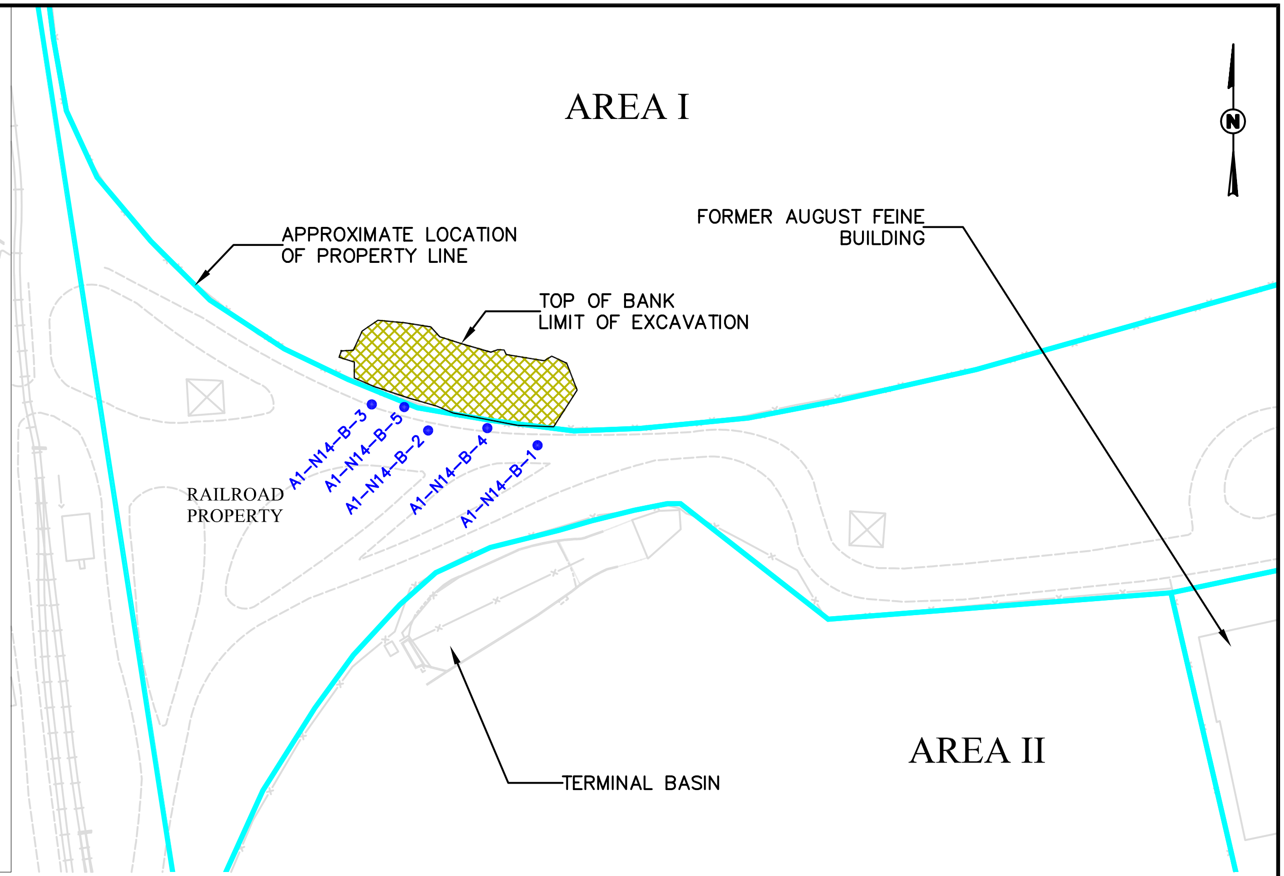
Former Steel Manufacturing Site Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location and Depth (fbgs)					SSALs [3]
	A1-N14-B-1	A1-N14-B-2	A1-N14-B-3	A1-N14-B-4 [1]	Blind Duplicate [2]	
	0.0 - 4.5	0.0 - 4.5	0.0 - 4.5	0.0 - 4.5	0.0 - 4.5	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg [4]						
Benzene	0.054	ND	0.053	0.047	0.038	**1**
Toluene	ND	ND	0.058	0.06	0.054	**1**
1,2,4-Trimethylbenzene	ND	ND	ND	0.017	0.013	**1**
1,3,5-Trimethylbenzene	ND	ND	0.011	0.02	0.014	**1**
o-Xylene	ND	0.012	0.013	0.021	0.02	**1**
m-Xylene	0.014	0.022	0.047	0.055	0.048	**1**
TOTAL VOCs (mg/kg)	**0.068**	**0.034**	**0.182**	**0.22**	**0.187**	**10**
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg [4]						
Acenaphthylene	ND	ND	ND	ND	1.6 J	--
Benzo(a)anthracene	ND	ND	ND	1 J	3.5 J	--
Benzo(b)fluoranthene	ND	ND	1 J	1.2 J	5.2	--
Benzo(k)fluoranthene	ND	ND	ND	1.4 J	3.9	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	3.8	--
Benzo(a)pyrene	ND	ND	0.97 J	1.3 J	5.0	--
Chrysene	0.69 J	ND	0.94 J	1.2 J	4.5	--
Fluoranthene	1.1 J	1.1 J	1.5 J	2 J	6.5	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	4.0	--
Naphthalene	ND	ND	0.89 J	ND	2.4 J	--
Phenanthrene	ND	0.63 J	0.72 J	0.89 J	1.9 J	--
Pyrene	0.98 J	0.8 J	1.3 J	1.6 J	5.7	--
TOTAL SVOCs (mg/kg)	**2.77**	**2.53**	**7.32**	**10.59**	**48**	**500**

Notes:
1. Matrix Spike/Matrix Spike Duplicate (MS/MSD) collected from geoprobe location A1-N14-B-4.
2. Blind Duplicate collected from geoprobe location A1-N14-B-3.
3. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
4. Only those parameters detected above the method detection limit at a minimum of one sample location are presented in this table; all other parameters were reported as "non-detect" (i.e., less than the method detection limit).
5. J = Estimated value.
6. ND = parameter not detected above laboratory detection limit.
7. " -- " = an inidivual SSAL was not established.

FIGURES





150' 0' 150' 300'

SCALE: 1 INCH = 150 FEET
SCALE IN FEET
(approximate)

LEGEND

A1-N14-B-1 ● APPROXIMATE GEOPROBE BORING LOCATION

APPROXIMATE LOCATION OF PROPERTY LINE

APPROXIMATE EXCAVATION LIMITS OF SUBAREA N-14

TurnKey Environmental Restoration, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-002-525

DATE: FEBRUARY 2005

DRAFTED BY: BCH

AREA I: SUBAREA N-14
GEOPROBE BORING LOCATION MAP

OFF-SITE PARCEL INVESTIGATION

FORMER COKE & STEEL MANUFACTURING SITE
BUFFALO, NEW YORK

PREPARED FOR
STEELFIELDS, LTD.

FIGURE 1

FILEPATH: g:\cad\turnkey\steelfields\off-site parcel investigations\area i - subarea n14 report figure\figure 1; area i-subarea n-14, geoprobe boring location map.dwg

ATTACHMENT 1

GEOPROBE BORING LOGS

FIELD GEOPROBE BOREHOLE LOG

Project Name:	Off-Site Investigation: Area I	**BORING NUMBER:**	**A1-N14-B-1**
Project Number:	0062-002-525	**Location:**	South of Subarea N-14
Client:	Steelfields, LTD.	**Start Date/Time:**	01/26/05 / 09:55 AM
Drilling Company:	Nothnagle Drilling	**End Date/Time:**	01/26/05 / 10:30 AM
Driller:	Neal Short	**Logged By:**	TAB
Helper:	Steve Lorenty	**Drilling Method:**	direct push
Rig Type:	geoprobe	**Weather:**	15° F, Light Snow, winds NE - NNE 15 - 20 mph

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Temp. Well Detail (if required)
0 to -4	0 to 4	S1	4.0	0.0 - 2.0 **SOIL/FILL:** Light to dark brown, moist, 80% slag, 20% non-plastic fines, loose when disturbed. 2.0 - 4.0 **SOIL/FILL:** Black, moist, 90% fines, 10% fine sand, non-plastic, loose when disturbed.	SOIL/FILL	0.4 0.7	1.0	A1-N14-B-1	
-4 to -8	4 to 8	S2	4.0	0.0 - 1.0 **SOIL/FILL:** Brown, wet, 90% fines, 10% fine sand, non-plastic, loose when disturbed 1.0 - 4.0 **LEAN CLAY:** Medium to dark grey with iron staining and black specks, moist, 90% fines, 10% fine sand, low to medium plasticity firm	SOIL/FILL CL	0.5 0.0	NA	no	
-8 to -12	8 to 12			EOB @ 8.0 fbgs					
-12 to -16	12 to 16								
-16 to -20	16 to 20								

ABANDONMENT:

Method: cement/bentonite grout:

Approximate quantity used:

Other: Back filled with soil cuttings

TEMPORARY WELL DETAILS (approximate):

Screened Interval: Diameter:

Well Material Other:

FIELD GEOPROBE BOREHOLE LOG

Project Name: Off-Site Investigation: Area I		**BORING NUMBER:**	**A1-N14-B-2**
Project Number: 0062-002-525		**Location:** South of Subarea N-14	
Client: Steelfields, LTD.		**Start Date/Time:** 01/26/05 / 10:30 AM	
Drilling Company: Nothnagle Drilling		**End Date/Time:** 01/26/05 / 10:55 AM	
Driller: Neal Short		**Logged By:** TAB	
Helper: Steve Lorenty		**Drilling Method:** direct push	
Rig Type: geoprobe		**Weather:** 15° F, Light Snow, winds NE - NNE 15 - 20mph	

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Temp. Well Detail (if required)
0	0								
				0.0 - 2.5 **SOIL/FILL:** Light to dark brown, moist, 70% fines, 20% slag, 10% fine sand, non-plastic, loose when disturbed		0.9			
-2	2	S1	4.0		SOIL/FILL			A1-N14-B-2	
				2.5 - 4.0 **SOIL/FILL:** Black, wet, 90% fines, 20% medium sand and fine angular gravel, 10% fine sand, non-plastic, loose when disturbed		0.7	1.5		
-4	4								
				0.0 - 0.5 **SOIL/FILL: Dark** brown, wet, 70% fines, 20% medium sand, 10% fine sand, non-plastic, loose when disturbed	SOIL/FILL	0.5			
-6	6	S2	4.0	0.5 - 4.0 **LEAN CLAY:** Medium to dark grey with iron staining with black specks, moist (upper 0.3" wet), 90% fines, 10% fine sand, low to medium plasticity, firm	CL	0.0	NA	no	
-8	8								
-10	10			EOB @ 8.0 fbgs					
-12	12								
-14	14								
-16	16								
-18	18								
-20	20								

ABANDONMENT:

Method: cement/bentonite grout:

Approximate quantity used:

Other: Back filled with soil cuttings.

TEMPORARY WELL DETAILS (approximate):

Screened Interval: Diameter:

Well Material Other:

FIELD GEOPROBE BOREHOLE LOG

Project Name: Off-Site Investigation: Area I		**BORING NUMBER:**	**A1-N14-B-3**
Project Number: 0062-002-525		**Location:** South of Subarea N-14	
Client: Steelfields, LTD.		**Start Date/Time:** 01/26/05 / 11:05 AM	
Drilling Company: Nothnagle Drilling		**End Date/Time:** 01/26/05 / 11:30 AM	
Driller: Neal Short		**Logged By:** TAB	
Helper: Steve Lorenty		**Drilling Method:** direct push	
Rig Type: geoprobe		**Weather:** 15° F, Light Snow, winds NE - NNE 15 - 20mph	

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Temp. Well Detail (if required)
0	0								
-2	2	S1	4.0	**SOIL/FILL:** Dr brown/black, moist, 70% fines, 20% slag, 10% fine sand, non-plastic, loose when disturbed	SOIL/FILL	0.5	1.8	A1-N14-B-3	
-4	4								
		S2	2.0	0.0 - 0.5 Same as S1 above, wet 0.5 - 2.0 **LEAN CLAY:** Medium to dark grey with iron staining and black specks, moist, 90% fines, 10% fine sand, low to medium plasticity, firm	SOIL/FILL CL	0.4 0.0	NA	no	
-6	6			EOB @ 6.0 fbgs					
-8	8								
-10	10								
-12	12								
-14	14								
-16	16								
-18	18								
-20	20								

ABANDONMENT:

Method: cement/bentonite grout:

Approximate quantity used:

Other: Back filled with soil cuttings.

TEMPORARY WELL DETAILS (approximate):

Screened Interval: Diameter:

Well Material Other:

FIELD GEOPROBE BOREHOLE LOG

Project Name:	Off-Site Investigation: Area I	**BORING NUMBER:**	**A1-N14-B-4**
Project Number:	0062-002-525	**Location:**	South of Subarea N-14
Client:	Steelfields, LTD.	**Start Date/Time:**	01/26/05 / 11:33 AM
Drilling Company:	Nothnagle Drilling	**End Date/Time:**	01/26/05 / 11:45 AM
Driller:	Neal Short	**Logged By:**	TAB
Helper:	Steve Lorenty	**Drilling Method:**	direct push
Rig Type:	geoprobe	**Weather:**	15° F, Light Snow, winds NE - NNE 15 - 20mph

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Temp. Well Detail (if required)
0	0								
				0.0 - 2.5 **SOIL/FILL:** Dark brown, moist, 80% NPF, 10% Slag, 10% Fine Sand, non-plastic, Loose when Disturbed.		0.0			
-2	2	S1	3.0	2.5 - 3.0 **SOIL/FILL:** Black, moist, 90% fines, 10% fine sand, non-plastic, loose when disturbed	SOIL/FILL	0.5	1.9	A1-N14-B-4	
-4	4								
		S2	1.0	0.0 - 0.5 **SOIL/FILL:** Black, wet, 80% fines, 20% fine sand, non-plastic, loose when disturbed	SOIL/FILL	0.5			
				0.5 - 1.0 **LEAN CLAY:** Medium to dark grey with iron staining and black specks, moist, 90% fines, 10% fine sand, low to medium plasticity, firm	CL	0.0	NA	no	
-6	6								
				EOB @ 6.0 fbgs					
-8	8								
-10	10								
-12	12								
-14	14								
-16	16								
-18	18								
-20	20								

ABANDONMENT:

Method: cement/bentonite grout:

Approximate quantity used:

Other: Back filled with soil cuttings.

TEMPORARY WELL DETAILS (approximate):

Screened Interval: Diameter:

Well Material Other:

FIELD GEOPROBE BOREHOLE LOG

Project Name:	Off-Site Investigation: Area I	**BORING NUMBER:**	**A1-N14-B-5**
Project Number:	0062-002-525	**Location:**	South of Subarea N-14
Client:	Steelfields, LTD.	**Start Date/Time:**	01/26/05 / 12:40 AM
Drilling Company:	Nothnagle Drilling	**End Date/Time:**	01/26/05 / 13:00:00 AM
Driller:	Neal Short	**Logged By:**	TAB
Helper:	Steve Lorenty	**Drilling Method:**	direct push
Rig Type:	geoprobe	**Weather:**	15° F, Light Snow, winds NE - NNE 15 - 20mph

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Temp. Well Detail (if required)
0	0								
-2	2	S1	2.5	<u>**SOIL/FILL:**</u> Dark brown/black, moist, 70% fines, 10% slag, 20% fine sand, non-plastic, loose when disturbed	SOIL/FILL	0.0	1.9	No sample taken.	
-4	4								
			1.0	**LEAN CLAY:** Medium to dark grey with iron staining and black specks, moist, 90% fines, 10% fine sand, low to medium plasticity, firm	CL	0.0	na		
-6	6	S2							
				EOB @ 6.0 fbgs					
-8	8								
-10	10								
-12	12								
-14	14								
-16	16								
-18	18								
-20	20								

ABANDONMENT:	
Method:	cement/bentonite grout:
Approximate quantity used:	
Other: Back filled with soil cuttings.	
TEMPORARY WELL DETAILS (approximate):	
Screened Interval:	Diameter:
Well Material	Other:

ATTACHMENT 2

SEVERN TRENT LABORATORIES, INC.

ANALYTICAL DATA PACKAGE

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8021 STARS - S (VERIFICATION)

Client ID / Job No / Lab ID / Sample Date		A1-N14-B-1 (0-4.5') A05-0711 A5071101 01/26/2005		A1-N14-B-2 (0-4.5') A05-0711 A5071102 01/26/2005		A1-N14-B-3 (0-4.5') A05-0711 A5071103 01/26/2005		A1-N14-B-4 (0-4.5') A05-0711 A5071104 01/26/2005	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	54	11	ND	11	53	11	47	12
n-Butylbenzene	UG/KG	ND	11	ND	11	ND	11	ND	12
sec-Butylbenzene	UG/KG	ND	11	ND	11	ND	11	ND	12
tert-Butylbenzene	UG/KG	ND	11	ND	11	ND	11	ND	12
Ethylbenzene	UG/KG	ND	11	ND	11	ND	11	ND	12
Isopropylbenzene	UG/KG	ND	11	ND	11	ND	11	ND	12
p-Cymene	UG/KG	ND	11	ND	11	ND	11	ND	12
n-Propylbenzene	UG/KG	ND	11	ND	11	ND	11	ND	12
Toluene	UG/KG	ND	11	ND	11	58	11	60	12
o-Xylene	UG/KG	ND	11	12	11	13	11	21	12
m-Xylene	UG/KG	14 1	11	22 1	11	47 1	11	55 1	12
p-Xylene	UG/KG	ND 1	11	ND 1	11	ND 1	11	ND 1	12
Total Xylenes	UG/KG	14 J	33	34	34	60	34	76	36
Methyl tert butyl ether	UG/KG	ND	11	ND	11	ND	11	ND	12
1,2,4-Trimethylbenzene	UG/KG	ND	11	ND	11	ND	11	17	12
1,3,5-Trimethylbenzene	UG/KG	ND	11	ND	11	11	11	20	12
SURROGATE(S)									
p-Bromofluorobenzene	%	104	66-134	103	66-134	104	66-134	103	66-134
a,a,a-Trifluorotoluene	%	104	76-127	106	76-127	107	76-127	108	76-127

Date: 02/01/2005 Time: 15:13:10	Steelfields - Former LTV Steel site Steelfields Verification Sampling STEELFIELDS - 8021 STARS - S (VERIFICATION)	Rept: AN0326

Client ID Job No / Lab ID Sample Date		BLIND DUP (0-4.5') A05-0711 / A5071105 01/26/2005							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	38	12	NA		NA		NA	
n-Butylbenzene	UG/KG	ND	12	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	12	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	12	NA		NA		NA	
Ethylbenzene	UG/KG	ND	12	NA		NA		NA	
Isopropylbenzene	UG/KG	ND	12	NA		NA		NA	
p-Cymene	UG/KG	ND	12	NA		NA		NA	
n-Propylbenzene	UG/KG	ND	12	NA		NA		NA	
Toluene	UG/KG	54	12	NA		NA		NA	
o-Xylene	UG/KG	20	12	NA		NA		NA	
m-Xylene	UG/KG	48 1	12	NA		NA		NA	
p-Xylene	UG/KG	ND 1	12	NA		NA		NA	
Total Xylenes	UG/KG	68	36	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	12	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	13	12	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	14	12	NA		NA		NA	
SURROGATE(S)									
p-Bromofluorobenzene	%	104	66-134	NA		NA		NA	
a,a,a-Trifluorotoluene	%	106	76-127	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

Client ID / Job No / Lab ID / Sample Date		A1-N14-B-1 (0-4.5') A05-0711 A5071101 01/26/2005		A1-N14-B-2 (0-4.5') A05-0711 A5071102 01/26/2005		A1-N14-B-3 (0-4.5') A05-0711 A5071103 01/26/2005		A1-N14-B-4 (0-4.5') A05-0711 A5071104 01/26/2005	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Acenaphthylene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Anthracene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Benzo(a)anthracene	UG/KG	ND	1800	ND	1800	ND	1900	1000 J	1900
Benzo(b)fluoranthene	UG/KG	ND	1800	ND	1800	1000 J	1900	1200 J	1900
Benzo(k)fluoranthene	UG/KG	ND	1800	ND	1800	ND	1900	1400 J	1900
Benzo(ghi)perylene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Benzo(a)pyrene	UG/KG	ND	1800	ND	1800	970 J	1900	1300 J	1900
Benzyl alcohol	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Bis(2-chloroethoxy) methane	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Bis(2-chloroethyl) ether	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Bis(2-ethylhexyl) phthalate	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
4-Bromophenyl phenyl ether	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Butyl benzyl phthalate	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
4-Chloroaniline	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
2-Chloronaphthalene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
4-Chlorophenyl phenyl ether	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Chrysene	UG/KG	690 J	1800	ND	1800	940 J	1900	1200 J	1900
Dibenzo(a,h)anthracene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Dibenzofuran	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Di-n-butyl phthalate	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
1,2-Dichlorobenzene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
1,3-Dichlorobenzene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
1,4-Dichlorobenzene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
3,3'-Dichlorobenzidine	UG/KG	ND	3600	ND	3700	ND	3800	ND	3900
Diethyl phthalate	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Dimethyl phthalate	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
2,4-Dinitrotoluene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
2,6-Dinitrotoluene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Di-n-octyl phthalate	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Fluoranthene	UG/KG	1100 J	1800	1100 J	1800	1500 J	1900	2000	1900
Fluorene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Hexachlorobenzene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Hexachlorobutadiene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Hexachlorocyclopentadiene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Hexachloroethane	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Indeno(1,2,3-cd)pyrene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Isophorone	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
2-Methylnaphthalene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Naphthalene	UG/KG	ND	1800	ND	1800	890 J	1900	ND	1900
2-Nitroaniline	UG/KG	ND	8800	ND	8900	ND	9300	ND	9400
3-Nitroaniline	UG/KG	ND	8800	ND	8900	ND	9300	ND	9400

NA = Not Applicable ND = Not Detected

Client ID / Job No / Lab ID / Sample Date		A1-N14-B-1 (0-4.5') A05-0711 A5071101 01/26/2005		A1-N14-B-2 (0-4.5') A05-0711 A5071102 01/26/2005		A1-N14-B-3 (0-4.5') A05-0711 A5071103 01/26/2005		A1-N14-B-4 (0-4.5') A05-0711 A5071104 01/26/2005	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
4-Nitroaniline	UG/KG	ND	8800	ND	8900	ND	9300	ND	9400
Nitrobenzene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
N-nitrosodiphenylamine	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
N-Nitroso-Di-n-propylamine	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
Phenanthrene	UG/KG	ND	1800	630 J	1800	720 J	1900	890 J	1900
Pyrene	UG/KG	980 J	1800	800 J	1800	1300 J	1900	1600 J	1900
1,2,4-Trichlorobenzene	UG/KG	ND	1800	ND	1800	ND	1900	ND	1900
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	96	50-200	95	50-200	94	50-200	98	50-200
Naphthalene-D8	%	97	50-200	97	50-200	94	50-200	97	50-200
Acenaphthene-D10	%	100	50-200	101	50-200	98	50-200	100	50-200
Phenanthrene-D10	%	96	50-200	96	50-200	95	50-200	98	50-200
Chrysene-D12	%	100	50-200	103	50-200	97	50-200	100	50-200
Perylene-D12	%	112	50-200	123	50-200	116	50-200	117	50-200
Nitrobenzene-D5	%	85	30-127	75	30-127	92	30-127	77	30-127
2-Fluorobiphenyl	%	93	36-138	88	36-138	99	36-138	89	36-138
p-Terphenyl-d14	%	92	41-167	83	41-167	99	41-167	94	41-167
Phenol-D5	%	86	34-120	45	34-120	93	34-120	76	34-120
2-Fluorophenol	%	75	26-120	9 *	26-120	82	26-120	58	26-120
2,4,6-Tribromophenol	%	88	42-140	16 *	42-140	97	42-140	46	42-140

Date: 02/01/2005
Time: 15:13:10

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		BLIND DUP (0-4.5') A05-0711 A5071105 01/26/2005							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	3800	NA		NA		NA	
Acenaphthylene	UG/KG	1600 J	3800	NA		NA		NA	
Anthracene	UG/KG	ND	3800	NA		NA		NA	
Benzo(a)anthracene	UG/KG	3500 J	3800	NA		NA		NA	
Benzo(b)fluoranthene	UG/KG	5200	3800	NA		NA		NA	
Benzo(k)fluoranthene	UG/KG	3900	3800	NA		NA		NA	
Benzo(ghi)perylene	UG/KG	3800	3800	NA		NA		NA	
Benzo(a)pyrene	UG/KG	5000	3800	NA		NA		NA	
Benzyl alcohol	UG/KG	ND	3800	NA		NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	3800	NA		NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	3800	NA		NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	3800	NA		NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	3800	NA		NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	3800	NA		NA		NA	
Butyl benzyl phthalate	UG/KG	ND	3800	NA		NA		NA	
4-Chloroaniline	UG/KG	ND	3800	NA		NA		NA	
2-Chloronaphthalene	UG/KG	ND	3800	NA		NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	3800	NA		NA		NA	
Chrysene	UG/KG	4500	3800	NA		NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	3800	NA		NA		NA	
Dibenzofuran	UG/KG	ND	3800	NA		NA		NA	
Di-n-butyl phthalate	UG/KG	ND	3800	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	3800	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	3800	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	3800	NA		NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	7700	NA		NA		NA	
Diethyl phthalate	UG/KG	ND	3800	NA		NA		NA	
Dimethyl phthalate	UG/KG	ND	3800	NA		NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	3800	NA		NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	3800	NA		NA		NA	
Di-n-octyl phthalate	UG/KG	ND	3800	NA		NA		NA	
Fluoranthene	UG/KG	6500	3800	NA		NA		NA	
Fluorene	UG/KG	ND	3800	NA		NA		NA	
Hexachlorobenzene	UG/KG	ND	3800	NA		NA		NA	
Hexachlorobutadiene	UG/KG	ND	3800	NA		NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	3800	NA		NA		NA	
Hexachloroethane	UG/KG	ND	3800	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	4000	3800	NA		NA		NA	
Isophorone	UG/KG	ND	3800	NA		NA		NA	
2-Methylnaphthalene	UG/KG	ND	3800	NA		NA		NA	
Naphthalene	UG/KG	2400 J	3800	NA		NA		NA	
2-Nitroaniline	UG/KG	ND	18000	NA		NA		NA	
3-Nitroaniline	UG/KG	ND	18000	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

STL Buffalo

Date: 02/01/2005
Time: 15:13:10

Steelfields - Former LTV Steel site
Steelfields Verification Sampling
STEELFIELDS - 8270 - TCL BASE NEUTRALS ONLY - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		BLIND DUP (0-4.5') A05-0711 A5071105 01/26/2005							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
4-Nitroaniline	UG/KG	ND	18000	NA		NA		NA	
Nitrobenzene	UG/KG	ND	3800	NA		NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	3800	NA		NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	3800	NA		NA		NA	
Phenanthrene	UG/KG	1900 J	3800	NA		NA		NA	
Pyrene	UG/KG	5700	3800	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	3800	NA		NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	96	50-200	NA		NA		NA	
Naphthalene-D8	%	96	50-200	NA		NA		NA	
Acenaphthene-D10	%	100	50-200	NA		NA		NA	
Phenanthrene-D10	%	98	50-200	NA		NA		NA	
Chrysene-D12	%	101	50-200	NA		NA		NA	
Perylene-D12	%	120	50-200	NA		NA		NA	
Nitrobenzene-D5	%	64	30-127	NA		NA		NA	
2-Fluorobiphenyl	%	73	36-138	NA		NA		NA	
p-Terphenyl-d14	%	78	41-167	NA		NA		NA	
Phenol-D5	%	64	34-120	NA		NA		NA	
2-Fluorophenol	%	48	26-120	NA		NA		NA	
2,4,6-Tribromophenol	%	29 *	42-140	NA		NA		NA	

NA = Not Applicable ND = Not Detected

STL Buffalo

APPENDIX D

TABLES OF SOIL ANALYTICAL RESULTS FOR BORROW SOILS

APPENDIX D

Tables of Soil Analytical Results for Borrow Soils

Package	Subarea	# of Pages
1	Seneca Mall Stockpile – 0 through 6,000 CY	29
2	Seneca Mall Stockpile – 6,000 through 11,000 CY	9
3	Seneca Mall Stockpile – 11,000 through 16,000 CY	9
4	Seneca Mall Stockpile – 16,000 through 31,000 CY	8
5	Electric Avenue, Lackawanna Stockpile – 0 through 6,000 CY	19

Note:

The above table represents a summary of analytical results for samples collected from off-site borrow sources used for backfill in Area I.

TURNKEY ENVIRONMENTAL RESTORATION, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-008-400

DATE: OCTOBER 2005

DRAFTED BY: BCH

LOCATION MAP

CONSTRUCTION CLOSEOUT REPORT

AREA I - FORMER REPUBLIC (LTV) STEEL PLANT PARCEL
BUFFALO, NEW YORK

PREPARED FOR
STEELFIELDS, LTD.

FILEPATH:g:\cad\turnkey\steelfields\construction closeout reports\area i - construction closeout report\figures\appendix d - figure 1; location map.dwg

SENECA MALL STOCKPILE

SAMPLES REPRESENTING 0 THROUGH 6,000 CUBIC YARDS (CY)

Sample I.D.	Sample Frequency (CY)
SENECA MALL 1	0 – 250
SENECA MALL 2	250 – 500
SENECA MALL 3	500 – 750
SENECA MALL 4	750 – 1,000
SENECA MALL 5	1,000 – 2,000
SENECA MALL 6	2,000 – 3,000
SENECA MALL 7	3,000 – 4,000
SENECA MALL 8	4,000 – 5,000
SENECA MALL 9	5,000 – 6,000

SENECA MALL STOCKPILE

SAMPLES REPRESENTING 6,000 THROUGH 11,000 CUBIC YARDS (CY)

Sample I.D.	Sample Frequency (CY)
SENECA MALL STKPILE	6,000 – 11,000

Client ID / Job No / Lab ID / Sample Date		SENECA MALL STKPILE A03-6172 A3617201 06/27/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	1.0	NA		NA		NA	
n-Butylbenzene	UG/KG	ND	1.0	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	1.0	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	1.0	NA		NA		NA	
Ethylbenzene	UG/KG	ND	1.0	NA		NA		NA	
Isopropylbenzene	UG/KG	ND	1.0	NA		NA		NA	
p-Cymene	UG/KG	ND	1.0	NA		NA		NA	
n-Propylbenzene	UG/KG	ND	1.0	NA		NA		NA	
Toluene	UG/KG	ND	1.0	NA		NA		NA	
o-Xylene	UG/KG	ND	1.0	NA		NA		NA	
m-Xylene	UG/KG	ND	1.0	NA		NA		NA	
p-Xylene	UG/KG	ND	1.0	NA		NA		NA	
Total Xylenes	UG/KG	ND	3.0	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	1.0	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	1.0	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	1.0	NA		NA		NA	
SURROGATE(S)									
Fluorobenzene	%	88	60-130	NA		NA		NA	
a,a,a-Trifluorotoluene	%	92	76-127	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 07/01/2003
Time: 15:25:48

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8270 - TCL SEMIVOLATILE ORGANICS - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		SENECA MALL STKPILE A03-6172 A3617201 06/27/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	1900	NA		NA		NA	
Acenaphthylene	UG/KG	ND	1900	NA		NA		NA	
Anthracene	UG/KG	ND	1900	NA		NA		NA	
Benzo(a)anthracene	UG/KG	ND	1900	NA		NA		NA	
Benzo(b)fluoranthene	UG/KG	ND	1900	NA		NA		NA	
Benzo(k)fluoranthene	UG/KG	ND	1900	NA		NA		NA	
Benzo(ghi)perylene	UG/KG	ND	1900	NA		NA		NA	
Benzo(a)pyrene	UG/KG	ND	1900	NA		NA		NA	
Benzoic acid	UG/KG	ND	9100	NA		NA		NA	
Benzyl alcohol	UG/KG	ND	1900	NA		NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	1900	NA		NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	1900	NA		NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	1900	NA		NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	1900	NA		NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	1900	NA		NA		NA	
Butyl benzyl phthalate	UG/KG	ND	1900	NA		NA		NA	
4-Chloroaniline	UG/KG	ND	1900	NA		NA		NA	
4-Chloro-3-methylphenol	UG/KG	ND	1900	NA		NA		NA	
2-Chloronaphthalene	UG/KG	ND	1900	NA		NA		NA	
2-Chlorophenol	UG/KG	ND	1900	NA		NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	1900	NA		NA		NA	
Chrysene	UG/KG	ND	1900	NA		NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	1900	NA		NA		NA	
Dibenzofuran	UG/KG	ND	1900	NA		NA		NA	
Di-n-butyl phthalate	UG/KG	ND	1900	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	1900	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	1900	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	1900	NA		NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	3700	NA		NA		NA	
2,4-Dichlorophenol	UG/KG	ND	1900	NA		NA		NA	
Diethyl phthalate	UG/KG	ND	1900	NA		NA		NA	
2,4-Dimethylphenol	UG/KG	ND	1900	NA		NA		NA	
Dimethyl phthalate	UG/KG	ND	1900	NA		NA		NA	
4,6-Dinitro-2-methylphenol	UG/KG	ND	94000	NA		NA		NA	
2,4-Dinitrophenol	UG/KG	ND	9100	NA		NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	1900	NA		NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	1900	NA		NA		NA	
Di-n-octyl phthalate	UG/KG	ND	1900	NA		NA		NA	
Fluoranthene	UG/KG	ND	1900	NA		NA		NA	
Fluorene	UG/KG	ND	1900	NA		NA		NA	
Hexachlorobenzene	UG/KG	ND	1900	NA		NA		NA	
Hexachlorobutadiene	UG/KG	ND	1900	NA		NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	1900	NA		NA		NA	

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 07/01/2003
Time: 15:25:48

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8270 - TCL SEMIVOLATILE ORGANICS - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		SENECA MALL STKPILE A03-6172 A3617201 06/27/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Hexachloroethane	UG/KG	ND	1900	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	1900	NA		NA		NA	
Isophorone	UG/KG	ND	1900	NA		NA		NA	
2-Methylnaphthalene	UG/KG	ND	1900	NA		NA		NA	
2-Methylphenol	UG/KG	ND	1900	NA		NA		NA	
4-Methylphenol	UG/KG	ND	1900	NA		NA		NA	
Naphthalene	UG/KG	ND	1900	NA		NA		NA	
2-Nitroaniline	UG/KG	ND	9100	NA		NA		NA	
3-Nitroaniline	UG/KG	ND	9100	NA		NA		NA	
4-Nitroaniline	UG/KG	ND	9100	NA		NA		NA	
Nitrobenzene	UG/KG	ND	1900	NA		NA		NA	
2-Nitrophenol	UG/KG	ND	1900	NA		NA		NA	
4-Nitrophenol	UG/KG	ND	9100	NA		NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	1900	NA		NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	1900	NA		NA		NA	
Pentachlorophenol	UG/KG	ND	9100	NA		NA		NA	
Phenanthrene	UG/KG	ND	1900	NA		NA		NA	
Phenol	UG/KG	ND	1900	NA		NA		NA	
Pyrene	UG/KG	ND	1900	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	1900	NA		NA		NA	
2,4,5-Trichlorophenol	UG/KG	ND	4500	NA		NA		NA	
2,4,6-Trichlorophenol	UG/KG	ND	1900	NA		NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	91	50-200	NA		NA		NA	
Naphthalene-D8	%	86	50-200	NA		NA		NA	
Acenaphthene-D10	%	93	50-200	NA		NA		NA	
Phenanthrene-D10	%	93	50-200	NA		NA		NA	
Chrysene-D12	%	119	50-200	NA		NA		NA	
Perylene-D12	%	170	50-200	NA		NA		NA	
Nitrobenzene-D5	%	86	34-120	NA		NA		NA	
2-Fluorobiphenyl	%	104	43-125	NA		NA		NA	
p-Terphenyl-d14	%	91	38-141	NA		NA		NA	
Phenol-D5	%	82	34-120	NA		NA		NA	
2-Fluorophenol	%	74	25-125	NA		NA		NA	
2,4,6-Tribromophenol	%	66	36-139	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 07/01/2003
Time: 15:25:48

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8081 - TCL PESTICIDES - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		SENECA MALL STKPILE A03-6172 A3617201 06/27/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aldrin	UG/KG	ND	7.5	NA		NA		NA	
alpha-BHC	UG/KG	4.5 J	7.5	NA		NA		NA	
beta-BHC	UG/KG	ND	7.5	NA		NA		NA	
gamma-BHC (Lindane)	UG/KG	ND	7.5	NA		NA		NA	
delta-BHC	UG/KG	ND	7.5	NA		NA		NA	
Chlordane	UG/KG	ND	75	NA		NA		NA	
4,4'-DDD	UG/KG	4.2 J	7.5	NA		NA		NA	
4,4'-DDE	UG/KG	ND	7.5	NA		NA		NA	
4,4'-DDT	UG/KG	5.5 J	7.5	NA		NA		NA	
Dieldrin	UG/KG	ND	7.5	NA		NA		NA	
Endosulfan I	UG/KG	ND	7.5	NA		NA		NA	
Endosulfan II	UG/KG	ND	7.5	NA		NA		NA	
Endosulfan Sulfate	UG/KG	ND	7.5	NA		NA		NA	
Endrin	UG/KG	ND	7.5	NA		NA		NA	
Endrin aldehyde	UG/KG	ND	7.5	NA		NA		NA	
Heptachlor	UG/KG	ND	7.5	NA		NA		NA	
Heptachlor epoxide	UG/KG	ND	7.5	NA		NA		NA	
Methoxychlor	UG/KG	ND	7.6	NA		NA		NA	
Toxaphene	UG/KG	ND	150	NA		NA		NA	
SURROGATE(S)									
Tetrachloro-m-xylene	%	60	32-130	NA		NA		NA	
Decachlorobiphenyl	%	132	36-153	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8082 - POLYCHLORINATED BIPHENYLS - S

Client ID / Job No / Lab ID / Sample Date		SENECA HALL STKPILE A03-6172 A3617201 06/27/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aroclor 1016	UG/KG	ND	19	NA		NA		NA	
Aroclor 1221	UG/KG	ND	19	NA		NA		NA	
Aroclor 1232	UG/KG	ND	19	NA		NA		NA	
Aroclor 1242	UG/KG	58	19	NA		NA		NA	
Aroclor 1248	UG/KG	ND	19	NA		NA		NA	
Aroclor 1254	UG/KG	22	19	NA		NA		NA	
Aroclor 1260	UG/KG	26	19	NA		NA		NA	
SURROGATE(S)									
Tetrachloro-m-xylene	%	78	32-148	NA		NA		NA	
Decachlorobiphenyl	%	94	36-153	NA		NA		NA	

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 07/01/2003
Time: 15:25:48

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - METHOD 8151 - HERBICIDES - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		SENECA MALL STKPILE / A03-6172 / A3617201 / 06/27/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
2,4-D	UG/KG	ND	77	NA		NA		NA	
2,4,5-TP (Silvex)	UG/KG	ND	77	NA		NA		NA	
2,4,5-T	UG/KG	ND	77	NA		NA		NA	
SURROGATE(S)									
Dichlorophenyl Acetic Acid	%	41	17-133	NA		NA		NA	

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - SW8463 T METALS (8) - S

Client ID / Job No / Lab ID / Sample Date		SENECA MALL STKPILE A03-6172 A3617201 06/27/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Arsenic - Total	MG/KG	6.6	2.3	NA		NA		NA	
Barium - Total	MG/KG	66.4 EN	0.57	NA		NA		NA	
Cadmium - Total	MG/KG	0.76 N*	0.23	NA		NA		NA	
Chromium - Total	MG/KG	12.1 N*	0.57	NA		NA		NA	
Lead - Total	MG/KG	15.7 N*	1.1	NA		NA		NA	
Mercury - Total	MG/KG	0.045	0.023	NA		NA		NA	
Selenium - Total	MG/KG	ND N*	4.6	NA		NA		NA	
Silver - Total	MG/KG	ND N*	0.57	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Date: 07/01/2003
Time: 15:26:06

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
WET CHEMISTRY ANALYSIS

Rept: AN0326

Client ID / Job No / Sample Date	Lab ID	SENECA MALL STKPILE / A03-6172 A3617201 / 06/27/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Cyanide - Total	UG/G	1.6	1.0	NA		NA		NA	
Leachable pH	S.U.	7.36	0.0100	NA		NA		NA	

STL Buffalo

NA = Not Applicable ND = Not Detected

SENECA MALL STOCKPILE

SAMPLES REPRESENTING 11,000 THROUGH 16,000 CUBIC YARDS (CY)

Sample I.D.	Sample Frequency (CY)
SENECA MALL 11	11,000 – 16,000

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8021 STARS - S (BORROW)

Client ID / Job No / Lab ID / Sample Date		SENECA MALL SAMPLE11 A03-6605 A3660501 07/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	1.0	NA		NA		NA	
n-Butylbenzene	UG/KG	ND	1.0	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	1.0	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	1.0	NA		NA		NA	
Ethylbenzene	UG/KG	ND	1.0	NA		NA		NA	
Isopropylbenzene	UG/KG	ND	1.0	NA		NA		NA	
p-Cymene	UG/KG	6.0	1.0	NA		NA		NA	
n-Propylbenzene	UG/KG	ND	1.0	NA		NA		NA	
Toluene	UG/KG	ND	1.0	NA		NA		NA	
o-Xylene	UG/KG	ND	1.0	NA		NA		NA	
m-Xylene	UG/KG	ND	1.0	NA		NA		NA	
p-Xylene	UG/KG	ND	1.0	NA		NA		NA	
Total Xylenes	UG/KG	ND	3.1	NA		NA		NA	
Methyl tert butyl ether	UG/KG	2.9	1.0	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	1.0	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	1.0	NA		NA		NA	
SURROGATE(S)									
Fluorobenzene	%	69	60-130	NA		NA		NA	
a,a,a-Trifluorotoluene	%	80	76-127	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

Date: 07/15/2003
Time: 15:33:35

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8270 - TCL SEMIVOLATILE ORGANICS - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		SENECA MALL SAMPLE11 A03-6605 A3660501 07/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	350	NA		NA		NA	
Acenaphthylene	UG/KG	ND	350	NA		NA		NA	
Anthracene	UG/KG	ND	350	NA		NA		NA	
Benzo(a)anthracene	UG/KG	ND	350	NA		NA		NA	
Benzo(b)fluoranthene	UG/KG	ND	350	NA		NA		NA	
Benzo(k)fluoranthene	UG/KG	ND	350	NA		NA		NA	
Benzo(ghi)perylene	UG/KG	ND	350	NA		NA		NA	
Benzo(a)pyrene	UG/KG	ND	350	NA		NA		NA	
Benzoic acid	UG/KG	ND	1700	NA		NA		NA	
Benzyl alcohol	UG/KG	ND	350	NA		NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	350	NA		NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	350	NA		NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	350	NA		NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	350	NA		NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	350	NA		NA		NA	
Butyl benzyl phthalate	UG/KG	ND	350	NA		NA		NA	
4-Chloroaniline	UG/KG	ND	350	NA		NA		NA	
4-Chloro-3-methylphenol	UG/KG	ND	350	NA		NA		NA	
2-Chloronaphthalene	UG/KG	ND	350	NA		NA		NA	
2-Chlorophenol	UG/KG	ND	350	NA		NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	350	NA		NA		NA	
Chrysene	UG/KG	ND	350	NA		NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	350	NA		NA		NA	
Dibenzofuran	UG/KG	ND	350	NA		NA		NA	
Di-n-butyl phthalate	UG/KG	ND	350	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	350	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	350	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	350	NA		NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	700	NA		NA		NA	
2,4-Dichlorophenol	UG/KG	ND	350	NA		NA		NA	
Diethyl phthalate	UG/KG	ND	350	NA		NA		NA	
2,4-Dimethylphenol	UG/KG	ND	350	NA		NA		NA	
Dimethyl phthalate	UG/KG	ND	350	NA		NA		NA	
4,6-Dinitro-2-methylphenol	UG/KG	ND	18000	NA		NA		NA	
2,4-Dinitrophenol	UG/KG	ND	1700	NA		NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	350	NA		NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	350	NA		NA		NA	
Di-n-octyl phthalate	UG/KG	ND	350	NA		NA		NA	
Fluoranthene	UG/KG	ND	350	NA		NA		NA	
Fluorene	UG/KG	ND	350	NA		NA		NA	
Hexachlorobenzene	UG/KG	ND	350	NA		NA		NA	
Hexachlorobutadiene	UG/KG	ND	350	NA		NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	350	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

STL Buffalo

Date: 07/15/2003
Time: 15:33:35

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8270 - TCL SEMIVOLATILE ORGANICS - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		SENECA MALL SAMPLE11 / A03-6605 / A3660501 / 07/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Hexachloroethane	UG/KG	ND	350	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	350	NA		NA		NA	
Isophorone	UG/KG	ND	350	NA		NA		NA	
2-Methylnaphthalene	UG/KG	ND	350	NA		NA		NA	
2-Methylphenol	UG/KG	ND	350	NA		NA		NA	
4-Methylphenol	UG/KG	ND	350	NA		NA		NA	
Naphthalene	UG/KG	ND	350	NA		NA		NA	
2-Nitroaniline	UG/KG	ND	1700	NA		NA		NA	
3-Nitroaniline	UG/KG	ND	1700	NA		NA		NA	
4-Nitroaniline	UG/KG	ND	1700	NA		NA		NA	
Nitrobenzene	UG/KG	ND	350	NA		NA		NA	
2-Nitrophenol	UG/KG	ND	350	NA		NA		NA	
4-Nitrophenol	UG/KG	ND	1700	NA		NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	350	NA		NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	350	NA		NA		NA	
Pentachlorophenol	UG/KG	ND	1700	NA		NA		NA	
Phenanthrene	UG/KG	ND	350	NA		NA		NA	
Phenol	UG/KG	ND	350	NA		NA		NA	
Pyrene	UG/KG	ND	350	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	350	NA		NA		NA	
2,4,5-Trichlorophenol	UG/KG	ND	850	NA		NA		NA	
2,4,6-Trichlorophenol	UG/KG	ND	350	NA		NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	67	50-200	NA		NA		NA	
Naphthalene-D8	%	72	50-200	NA		NA		NA	
Acenaphthene-D10	%	76	50-200	NA		NA		NA	
Phenanthrene-D10	%	81	50-200	NA		NA		NA	
Chrysene-D12	%	83	50-200	NA		NA		NA	
Perylene-D12	%	70	50-200	NA		NA		NA	
Nitrobenzene-D5	%	95	34-120	NA		NA		NA	
2-Fluorobiphenyl	%	105	43-125	NA		NA		NA	
p-Terphenyl-d14	%	89	38-141	NA		NA		NA	
Phenol-D5	%	86	34-120	NA		NA		NA	
2-Fluorophenol	%	75	25-125	NA		NA		NA	
2,4,6-Tribromophenol	%	100	36-139	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

Client ID Job No Lab ID Sample Date		SENECA MALL SAMPLE11 A03-6605 A3660501 07/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aldrin	UG/KG	ND	1.8	NA		NA		NA	
alpha-BHC	UG/KG	ND	1.8	NA		NA		NA	
beta-BHC	UG/KG	ND	1.8	NA		NA		NA	
gamma-BHC (Lindane)	UG/KG	ND	1.8	NA		NA		NA	
delta-BHC	UG/KG	ND	1.8	NA		NA		NA	
Chlordane	UG/KG	ND	18	NA		NA		NA	
4,4'-DDD	UG/KG	ND	1.8	NA		NA		NA	
4,4'-DDE	UG/KG	ND	1.8	NA		NA		NA	
4,4'-DDT	UG/KG	3.0	1.8	NA		NA		NA	
Dieldrin	UG/KG	2.2	1.8	NA		NA		NA	
Endosulfan I	UG/KG	ND	1.8	NA		NA		NA	
Endosulfan II	UG/KG	ND	1.8	NA		NA		NA	
Endosulfan Sulfate	UG/KG	ND	1.8	NA		NA		NA	
Endrin	UG/KG	ND	1.8	NA		NA		NA	
Endrin aldehyde	UG/KG	ND	1.8	NA		NA		NA	
Heptachlor	UG/KG	ND	1.8	NA		NA		NA	
Heptachlor epoxide	UG/KG	ND	1.8	NA		NA		NA	
Methoxychlor	UG/KG	ND	1.8	NA		NA		NA	
Toxaphene	UG/KG	ND	36	NA		NA		NA	
SURROGATE(S)									
Tetrachloro-m-xylene	%	86	32-130	NA		NA		NA	
Decachlorobiphenyl	%	93	36-153	NA		NA		NA	

Client ID Job No / Lab ID Sample Date		SENECA MALL SAMPLE11 A03-6605 / A3660501 07/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aroclor 1016	UG/KG	ND	18	NA		NA		NA	
Aroclor 1221	UG/KG	ND	18	NA		NA		NA	
Aroclor 1232	UG/KG	ND	18	NA		NA		NA	
Aroclor 1242	UG/KG	ND	18	NA		NA		NA	
Aroclor 1248	UG/KG	27	18	NA		NA		NA	
Aroclor 1254	UG/KG	32	18	NA		NA		NA	
Aroclor 1260	UG/KG	18	18	NA		NA		NA	
SURROGATE(S)									
Tetrachloro-m-xylene	%	78	32-148	NA		NA		NA	
Decachlorobiphenyl	%	106	36-153	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

Client ID Job No Lab ID Sample Date		SENECA MALL SAMPLE11 A03-6605 A3660501 07/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
2,4-D	UG/KG	ND	72	NA		NA		NA	
2,4,5-TP (Silvex)	UG/KG	ND	72	NA		NA		NA	
2,4,5-T	UG/KG	ND	72	NA		NA		NA	
SURROGATE(S)									
Dichlorophenyl Acetic Acid	%	70	17-133	NA		NA		NA	

Date: 07/15/2003
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Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - SW8463 T METALS (8) - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		SENECA MALL SAMPLE11 A03-6605 A3660501 07/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Arsenic - Total	MG/KG	6.4	2.2	NA		NA		NA	
Barium - Total	MG/KG	59.6 N	0.56	NA		NA		NA	
Cadmium - Total	MG/KG	ND	0.22	NA		NA		NA	
Chromium - Total	MG/KG	12.3	0.56	NA		NA		NA	
Lead - Total	MG/KG	17.0 N*	1.1	NA		NA		NA	
Mercury - Total	MG/KG	0.031	0.023	NA		NA		NA	
Selenium - Total	MG/KG	ND	4.4	NA		NA		NA	
Silver - Total	MG/KG	ND	0.56	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

STL Buffalo

Date: 07/15/2003
Time: 15:33:52

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
WET CHEMISTRY ANALYSIS

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		SENECA MALL SAMPLE11 / A03-6605 / A3660501 / 07/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Cyanide - Total	UG/G	ND	1.0	NA		NA		NA	
Leachable pH	S.U.	8.02	0.0100	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

STL Buffalo

SENECA MALL STOCKPILE

SAMPLES REPRESENTING 16,000 THROUGH 31,000 CUBIC YARDS (CY)

Sample I.D.	Sample Frequency (CY)
SAMPLE 1	16,000 – 21,000
SAMPLE 2	21,000 – 26,000
SAMPLE 3	26,000 – 31,000

ELECTRIC AVENUE, LACKAWANNA STOCKPILE

SAMPLES REPRESENTING 0 THROUGH 6,000 CUBIC YARDS (CY)

Sample I.D.	Sample Frequency (CY)
EATP-1-250	0 – 250
EATP-2-250	250 – 500
EATP-3-250	500 – 750
EATP-4-250	750 – 1,000
EATP-5-1000	1,000 – 2,000
EATP-6-1000	2,000 – 3,000
EATP-7-1000	3,000 – 4,000
EATP-8-1000	4,000 – 5,000
EATP-9-1000	5,000 – 6,000

Date: 08/22/2003
Time: 16:11:32

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8021 STARS - S (BORROW)

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		EATP-1-250 A03-7828 A3782801 08/11/2003		EATP-2-250 A03-7828 A3782802 08/11/2003		EATP-3-250 A03-7828 A3782803 08/11/2003		EATP-4-250 A03-7828 A3782804 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
n-Butylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
sec-Butylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
tert-Butylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
Ethylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
Isopropylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
p-Cymene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
n-Propylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
Toluene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
o-Xylene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
m-Xylene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
p-Xylene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
Total Xylenes	UG/KG	ND	3.4	ND	3.3	ND	3.5	ND	3.5
Methyl tert butyl ether	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
1,2,4-Trimethylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
1,3,5-Trimethylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
SURROGATE(S)									
Fluorobenzene	%	91	60-130	83	60-130	81	60-130	83	60-130
a,a,a-Trifluorotoluene	%	95	76-127	94	76-127	93	76-127	95	76-127

Date: 08/22/2003
Time: 16:11:32

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8021 STARS - S (BORROW)

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		EATP-5-1000 A03-7828 A3782805 08/11/2003		EATP-6-1000 A03-7828 A3782806 08/11/2003		EATP-7-1000 A03-7828 A3782807 08/11/2003		EATP-8-1000 A03-7828 A3782808 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
n-Butylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
sec-Butylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
tert-Butylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
Ethylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
Isopropylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
p-Cymene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
n-Propylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
Toluene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
o-Xylene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
m-Xylene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
p-Xylene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
Total Xylenes	UG/KG	ND	3.4	ND	3.4	ND	3.6	ND	3.5
Methyl tert butyl ether	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
1,2,4-Trimethylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
1,3,5-Trimethylbenzene	UG/KG	ND	1.1	ND	1.1	ND	1.2	ND	1.2
SURROGATE(S)									
Fluorobenzene	%	82	60-130	83	60-130	82	60-130	82	60-130
a,a,a-Trifluorotoluene	%	94	76-127	95	76-127	94	76-127	93	76-127

NA = Not Applicable ND = Not Detected

STL Buffalo

Client ID / Job No / Lab ID / Sample Date		EATP-9-1000 / A03-7828 / A3782809 / 08/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	UG/KG	ND	1.2	NA		NA		NA	
n-Butylbenzene	UG/KG	ND	1.2	NA		NA		NA	
sec-Butylbenzene	UG/KG	ND	1.2	NA		NA		NA	
tert-Butylbenzene	UG/KG	ND	1.2	NA		NA		NA	
Ethylbenzene	UG/KG	ND	1.2	NA		NA		NA	
Isopropylbenzene	UG/KG	ND	1.2	NA		NA		NA	
p-Cymene	UG/KG	ND	1.2	NA		NA		NA	
n-Propylbenzene	UG/KG	ND	1.2	NA		NA		NA	
Toluene	UG/KG	ND	1.2	NA		NA		NA	
o-Xylene	UG/KG	ND	1.2	NA		NA		NA	
m-Xylene	UG/KG	ND	1.2	NA		NA		NA	
p-Xylene	UG/KG	ND	1.2	NA		NA		NA	
Total Xylenes	UG/KG	ND	3.5	NA		NA		NA	
Methyl tert butyl ether	UG/KG	ND	1.2	NA		NA		NA	
1,2,4-Trimethylbenzene	UG/KG	ND	1.2	NA		NA		NA	
1,3,5-Trimethylbenzene	UG/KG	ND	1.2	NA		NA		NA	
SURROGATE(S)									
Fluorobenzene	%	82	60-130	NA		NA		NA	
a,a,a-Trifluorotoluene	%	93	76-127	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Client ID / Job No / Lab ID / Sample Date		EATP-1-250 A03-7828 08/11/2003	A3782801	EATP-2-250 A03-7828 08/11/2003	A3782802	EATP-3-250 A03-7828 08/11/2003	A3782803	EATP-4-250 A03-7828 08/11/2003	A3782804
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	550	ND	400	ND	380	ND	410
Acenaphthylene	UG/KG	ND	550	ND	400	ND	380	ND	410
Anthracene	UG/KG	ND	550	ND	400	ND	380	ND	410
Benzo(a)anthracene	UG/KG	ND	550	280 J	400	ND	380	ND	410
Benzo(b)fluoranthene	UG/KG	ND	550	390 J	400	ND	380	ND	410
Benzo(k)fluoranthene	UG/KG	ND	550	360 J	400	ND	380	ND	410
Benzo(ghi)perylene	UG/KG	ND	550	ND	400	ND	380	ND	410
Benzo(a)pyrene	UG/KG	ND	550	330 J	400	ND	380	ND	410
Benzoic acid	UG/KG	ND	2700	ND	1900	ND	1900	ND	2000
Benzyl alcohol	UG/KG	ND	550	ND	400	ND	380	ND	410
Bis(2-chloroethoxy) methane	UG/KG	ND	550	ND	400	ND	380	ND	410
Bis(2-chloroethyl) ether	UG/KG	ND	550	ND	400	ND	380	ND	410
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	550	ND	400	ND	380	ND	410
Bis(2-ethylhexyl) phthalate	UG/KG	ND	550	ND	400	ND	380	ND	410
4-Bromophenyl phenyl ether	UG/KG	ND	550	ND	400	ND	380	ND	410
Butyl benzyl phthalate	UG/KG	280 J	550	ND	400	ND	380	ND	410
4-Chloroaniline	UG/KG	ND	550	ND	400	ND	380	ND	410
4-Chloro-3-methylphenol	UG/KG	ND	550	ND	400	ND	380	ND	410
2-Chloronaphthalene	UG/KG	ND	550	ND	400	ND	380	ND	410
2-Chlorophenol	UG/KG	ND	550	ND	400	ND	380	ND	410
4-Chlorophenyl phenyl ether	UG/KG	ND	550	ND	400	ND	380	ND	410
Chrysene	UG/KG	ND	550	290 J	400	ND	380	ND	410
Dibenzo(a,h)anthracene	UG/KG	ND	550	ND	400	ND	380	ND	410
Dibenzofuran	UG/KG	ND	550	ND	400	ND	380	ND	410
Di-n-butyl phthalate	UG/KG	ND	550	ND	400	ND	380	ND	410
1,2-Dichlorobenzene	UG/KG	ND	550	ND	400	ND	380	ND	410
1,3-Dichlorobenzene	UG/KG	ND	550	ND	400	ND	380	ND	410
1,4-Dichlorobenzene	UG/KG	ND	550	ND	400	ND	380	ND	410
3,3'-Dichlorobenzidine	UG/KG	ND	1100	ND	800	ND	770	ND	820
2,4-Dichlorophenol	UG/KG	ND	550	ND	400	ND	380	ND	410
Diethyl phthalate	UG/KG	ND	550	ND	400	ND	380	ND	410
2,4-Dimethylphenol	UG/KG	ND	550	ND	400	ND	380	ND	410
Dimethyl phthalate	UG/KG	ND	550	ND	400	ND	380	ND	410
4,6-Dinitro-2-methylphenol	UG/KG	ND	28000	ND	20000	ND	19000	ND	20000
2,4-Dinitrophenol	UG/KG	ND	2700	ND	1900	ND	1900	ND	2000
2,4-Dinitrotoluene	UG/KG	ND	550	ND	400	ND	380	ND	410
2,6-Dinitrotoluene	UG/KG	ND	550	ND	400	ND	380	ND	410
Di-n-octyl phthalate	UG/KG	ND	750	ND	540	ND	520	ND	550
Fluoranthene	UG/KG	ND	550	420	400	ND	380	ND	410
Fluorene	UG/KG	ND	550	ND	400	ND	380	ND	410
Hexachlorobenzene	UG/KG	ND	550	ND	400	ND	380	ND	410
Hexachlorobutadiene	UG/KG	ND	550	ND	400	ND	380	ND	410
Hexachlorocyclopentadiene	UG/KG	ND	550	ND	400	ND	380	ND	410

NA = Not Applicable   ND = Not Detected

Date: 08/22/2003
Time: 16:11:32

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8270 - TCL SEMIVOLATILE ORGANICS - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		EATP-1-250 A03-7828 A3782801 08/11/2003		EATP-2-250 A03-7828 A3782802 08/11/2003		EATP-3-250 A03-7828 A3782803 08/11/2003		EATP-4-250 A03-7828 A3782804 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Hexachloroethane	UG/KG	ND	550	ND	400	ND	380	ND	410
Indeno(1,2,3-cd)pyrene	UG/KG	ND	550	ND	400	ND	380	ND	410
Isophorone	UG/KG	ND	550	ND	400	ND	380	ND	410
2-Methylnaphthalene	UG/KG	ND	550	ND	400	ND	380	ND	410
2-Methylphenol	UG/KG	ND	550	ND	400	ND	380	ND	410
4-Methylphenol	UG/KG	ND	550	ND	400	ND	380	ND	410
Naphthalene	UG/KG	ND	550	ND	400	ND	380	ND	410
2-Nitroaniline	UG/KG	ND	2700	ND	1900	ND	1900	ND	2000
3-Nitroaniline	UG/KG	ND	2700	ND	1900	ND	1900	ND	2000
4-Nitroaniline	UG/KG	ND	2700	ND	1900	ND	1900	ND	2000
Nitrobenzene	UG/KG	ND	550	ND	400	ND	380	ND	410
2-Nitrophenol	UG/KG	ND	550	ND	400	ND	380	ND	410
4-Nitrophenol	UG/KG	ND	2700	ND	1900	ND	1900	ND	2000
N-nitrosodiphenylamine	UG/KG	ND	550	ND	400	ND	380	ND	410
N-Nitroso-Di-n-propylamine	UG/KG	ND	550	ND	400	ND	380	ND	410
Pentachlorophenol	UG/KG	ND	2700	ND	1900	ND	1900	ND	2000
Phenanthrene	UG/KG	ND	550	160 J	400	ND	380	ND	410
Phenol	UG/KG	ND	550	ND	400	ND	380	ND	410
Pyrene	UG/KG	ND	550	430	400	ND	380	ND	410
1,2,4-Trichlorobenzene	UG/KG	ND	550	ND	400	ND	380	ND	410
2,4,5-Trichlorophenol	UG/KG	ND	1300	ND	970	ND	940	ND	990
2,4,6-Trichlorophenol	UG/KG	ND	550	ND	400	ND	380	ND	410
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	113	50-200	119	50-200	115	50-200	125	50-200
Naphthalene-D8	%	111	50-200	117	50-200	111	50-200	116	50-200
Acenaphthene-D10	%	117	50-200	129	50-200	121	50-200	129	50-200
Phenanthrene-D10	%	118	50-200	140	50-200	120	50-200	128	50-200
Chrysene-D12	%	120	50-200	136	50-200	113	50-200	130	50-200
Perylene-D12	%	128	50-200	131	50-200	121	50-200	125	50-200
Nitrobenzene-D5	%	67	34-120	82	34-120	110	34-120	105	34-120
2-Fluorobiphenyl	%	75	43-125	82	43-125	108	43-125	102	43-125
p-Terphenyl-d14	%	85	38-141	88	38-141	116	38-141	103	38-141
Phenol-D5	%	71	34-120	80	34-120	105	34-120	95	34-120
2-Fluorophenol	%	64	25-125	73	25-125	104	25-125	93	25-125
2,4,6-Tribromophenol	%	85	36-139	99	36-139	125	36-139	126	36-139

NA = Not Applicable ND = Not Detected

STL Buffalo

Date: 08/22/2003
Time: 16:11:32

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8270 - TCL SEMIVOLATILE ORGANICS - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		EATP-5-1000 A03-7828 A3782805 08/11/2003		EATP-6-1000 A03-7828 A3782806 08/11/2003		EATP-7-1000 A03-7828 A3782807 08/11/2003		EATP-8-1000 A03-7828 A3782808 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	390	ND	400	ND	390	ND	380
Acenaphthylene	UG/KG	ND	390	ND	400	ND	390	ND	380
Anthracene	UG/KG	ND	390	ND	400	ND	390	ND	380
Benzo(a)anthracene	UG/KG	ND	390	ND	400	ND	390	ND	380
Benzo(b)fluoranthene	UG/KG	ND	390	ND	400	ND	390	ND	380
Benzo(k)fluoranthene	UG/KG	ND	390	ND	400	ND	390	ND	380
Benzo(ghi)perylene	UG/KG	ND	390	ND	400	ND	390	ND	380
Benzo(a)pyrene	UG/KG	ND	390	ND	400	160 J	390	ND	380
Benzoic acid	UG/KG	ND	1900	ND	1900	ND	1900	ND	1900
Benzyl alcohol	UG/KG	ND	390	ND	400	ND	390	ND	380
Bis(2-chloroethoxy) methane	UG/KG	ND	390	ND	400	ND	390	ND	380
Bis(2-chloroethyl) ether	UG/KG	ND	390	ND	400	ND	390	ND	380
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	390	ND	400	ND	390	ND	380
Bis(2-ethylhexyl) phthalate	UG/KG	ND	390	ND	400	ND	390	ND	380
4-Bromophenyl phenyl ether	UG/KG	ND	390	ND	400	ND	390	ND	380
Butyl benzyl phthalate	UG/KG	ND	390	ND	400	ND	390	ND	380
4-Chloroaniline	UG/KG	ND	390	ND	400	ND	390	ND	380
4-Chloro-3-methylphenol	UG/KG	ND	390	ND	400	ND	390	ND	380
2-Chloronaphthalene	UG/KG	ND	390	ND	400	ND	390	ND	380
2-Chlorophenol	UG/KG	ND	390	ND	400	ND	390	ND	380
4-Chlorophenyl phenyl ether	UG/KG	ND	390	ND	400	ND	390	ND	380
Chrysene	UG/KG	ND	390	ND	400	160 J	390	ND	380
Dibenzo(a,h)anthracene	UG/KG	ND	390	ND	400	ND	390	ND	380
Dibenzofuran	UG/KG	ND	390	ND	400	ND	390	ND	380
Di-n-butyl phthalate	UG/KG	ND	390	ND	400	ND	390	ND	380
1,2-Dichlorobenzene	UG/KG	ND	390	ND	400	ND	390	ND	380
1,3-Dichlorobenzene	UG/KG	ND	390	ND	400	ND	390	ND	380
1,4-Dichlorobenzene	UG/KG	ND	390	ND	400	ND	390	ND	380
3,3'-Dichlorobenzidine	UG/KG	ND	770	ND	800	ND	790	ND	770
2,4-Dichlorophenol	UG/KG	ND	390	ND	400	ND	390	ND	380
Diethyl phthalate	UG/KG	ND	390	ND	400	ND	390	ND	380
2,4-Dimethylphenol	UG/KG	ND	390	ND	400	ND	390	ND	380
Dimethyl phthalate	UG/KG	ND	390	ND	400	ND	390	ND	380
4,6-Dinitro-2-methylphenol	UG/KG	ND	19000	ND	20000	ND	20000	ND	19000
2,4-Dinitrophenol	UG/KG	ND	1900	ND	1900	ND	1900	ND	1900
2,4-Dinitrotoluene	UG/KG	ND	390	ND	400	ND	390	ND	380
2,6-Dinitrotoluene	UG/KG	ND	390	ND	400	ND	390	ND	380
Di-n-octyl phthalate	UG/KG	ND	520	ND	540	ND	530	ND	520
Fluoranthene	UG/KG	ND	390	ND	400	200 J	390	160 J	380
Fluorene	UG/KG	ND	390	ND	400	ND	390	ND	380
Hexachlorobenzene	UG/KG	ND	390	ND	400	ND	390	ND	380
Hexachlorobutadiene	UG/KG	ND	390	ND	400	ND	390	ND	380
Hexachlorocyclopentadiene	UG/KG	ND	390	ND	400	ND	390	ND	380

NA = Not Applicable ND = Not Detected

STL Buffalo

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8270 - TCL SEMIVOLATILE ORGANICS - S

Client ID / Job No / Lab ID / Sample Date		EATP-5-1000 A03-7828 A3782805 08/11/2003		EATP-6-1000 A03-7828 A3782806 08/11/2003		EATP-7-1000 A03-7828 A3782807 08/11/2003		EATP-8-1000 A03-7828 A3782808 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Hexachloroethane	UG/KG	ND	390	ND	400	ND	390	ND	380
Indeno(1,2,3-cd)pyrene	UG/KG	ND	390	ND	400	ND	390	ND	380
Isophorone	UG/KG	ND	390	ND	400	ND	390	ND	380
2-Methylnaphthalene	UG/KG	ND	390	ND	400	ND	390	ND	380
2-Methylphenol	UG/KG	ND	390	ND	400	ND	390	ND	380
4-Methylphenol	UG/KG	ND	390	ND	400	ND	390	ND	380
Naphthalene	UG/KG	ND	390	ND	400	ND	390	ND	380
2-Nitroaniline	UG/KG	ND	1900	ND	1900	ND	1900	ND	1900
3-Nitroaniline	UG/KG	ND	1900	ND	1900	ND	1900	ND	1900
4-Nitroaniline	UG/KG	ND	1900	ND	1900	ND	1900	ND	1900
Nitrobenzene	UG/KG	ND	390	ND	400	ND	390	ND	380
2-Nitrophenol	UG/KG	ND	390	ND	400	ND	390	ND	380
4-Nitrophenol	UG/KG	ND	1900	ND	1900	ND	1900	ND	1900
N-nitrosodiphenylamine	UG/KG	ND	390	ND	400	ND	390	ND	380
N-Nitroso-Di-n-propylamine	UG/KG	ND	390	ND	400	ND	390	ND	380
Pentachlorophenol	UG/KG	ND	1900	ND	1900	ND	1900	ND	1900
Phenanthrene	UG/KG	ND	390	ND	400	ND	390	ND	380
Phenol	UG/KG	ND	390	ND	400	ND	390	ND	380
Pyrene	UG/KG	ND	390	ND	400	220 J	390	150 J	380
1,2,4-Trichlorobenzene	UG/KG	ND	390	ND	400	ND	390	ND	380
2,4,5-Trichlorophenol	UG/KG	ND	940	ND	960	ND	960	ND	930
2,4,6-Trichlorophenol	UG/KG	ND	390	ND	400	ND	390	ND	380
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	135	50-200	132	50-200	146	50-200	141	50-200
Naphthalene-D8	%	125	50-200	120	50-200	142	50-200	130	50-200
Acenaphthene-D10	%	142	50-200	133	50-200	155	50-200	147	50-200
Phenanthrene-D10	%	130	50-200	132	50-200	155	50-200	138	50-200
Chrysene-D12	%	129	50-200	132	50-200	147	50-200	138	50-200
Perylene-D12	%	128	50-200	123	50-200	131	50-200	114	50-200
Nitrobenzene-D5	%	89	34-120	95	34-120	93	34-120	107	34-120
2-Fluorobiphenyl	%	94	43-125	100	43-125	98	43-125	104	43-125
p-Terphenyl-d14	%	98	38-141	109	38-141	101	38-141	112	38-141
Phenol-D5	%	84	34-120	84	34-120	88	34-120	97	34-120
2-Fluorophenol	%	82	25-125	82	25-125	84	25-125	92	25-125
2,4,6-Tribromophenol	%	113	36-139	128	36-139	114	36-139	142 *	36-139

NA = Not Applicable ND = Not Detected

Date: 08/22/2003
Time: 16:11:32

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8270 - TCL SEMIVOLATILE ORGANICS - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		EATP-9-1000 / A03-7828 / A3782809 / 08/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	2100	NA		NA		NA	
Acenaphthylene	UG/KG	ND	2100	NA		NA		NA	
Anthracene	UG/KG	ND	2100	NA		NA		NA	
Benzo(a)anthracene	UG/KG	1800 J	2100	NA		NA		NA	
Benzo(b)fluoranthene	UG/KG	1400 J	2100	NA		NA		NA	
Benzo(k)fluoranthene	UG/KG	1600 J	2100	NA		NA		NA	
Benzo(ghi)perylene	UG/KG	ND	2100	NA		NA		NA	
Benzo(a)pyrene	UG/KG	1300 J	2100	NA		NA		NA	
Benzoic acid	UG/KG	ND	10000	NA		NA		NA	
Benzyl alcohol	UG/KG	ND	2100	NA		NA		NA	
Bis(2-chloroethoxy) methane	UG/KG	ND	2100	NA		NA		NA	
Bis(2-chloroethyl) ether	UG/KG	ND	2100	NA		NA		NA	
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	2100	NA		NA		NA	
Bis(2-ethylhexyl) phthalate	UG/KG	ND	2100	NA		NA		NA	
4-Bromophenyl phenyl ether	UG/KG	ND	2100	NA		NA		NA	
Butyl benzyl phthalate	UG/KG	ND	2100	NA		NA		NA	
4-Chloroaniline	UG/KG	ND	2100	NA		NA		NA	
4-Chloro-3-methylphenol	UG/KG	ND	2100	NA		NA		NA	
2-Chloronaphthalene	UG/KG	ND	2100	NA		NA		NA	
2-Chlorophenol	UG/KG	ND	2100	NA		NA		NA	
4-Chlorophenyl phenyl ether	UG/KG	ND	2100	NA		NA		NA	
Chrysene	UG/KG	1600 J	2100	NA		NA		NA	
Dibenzo(a,h)anthracene	UG/KG	ND	2100	NA		NA		NA	
Dibenzofuran	UG/KG	ND	2100	NA		NA		NA	
Di-n-butyl phthalate	UG/KG	ND	2100	NA		NA		NA	
1,2-Dichlorobenzene	UG/KG	ND	2100	NA		NA		NA	
1,3-Dichlorobenzene	UG/KG	ND	2100	NA		NA		NA	
1,4-Dichlorobenzene	UG/KG	ND	2100	NA		NA		NA	
3,3'-Dichlorobenzidine	UG/KG	ND	4200	NA		NA		NA	
2,4-Dichlorophenol	UG/KG	ND	2100	NA		NA		NA	
Diethyl phthalate	UG/KG	ND	2100	NA		NA		NA	
2,4-Dimethylphenol	UG/KG	ND	2100	NA		NA		NA	
Dimethyl phthalate	UG/KG	ND	2100	NA		NA		NA	
4,6-Dinitro-2-methylphenol	UG/KG	ND	100000	NA		NA		NA	
2,4-Dinitrophenol	UG/KG	ND	10000	NA		NA		NA	
2,4-Dinitrotoluene	UG/KG	ND	2100	NA		NA		NA	
2,6-Dinitrotoluene	UG/KG	ND	2100	NA		NA		NA	
Di-n-octyl phthalate	UG/KG	ND	2800	NA		NA		NA	
Fluoranthene	UG/KG	3100	2100	NA		NA		NA	
Fluorene	UG/KG	ND	2100	NA		NA		NA	
Hexachlorobenzene	UG/KG	ND	2100	NA		NA		NA	
Hexachlorobutadiene	UG/KG	ND	2100	NA		NA		NA	
Hexachlorocyclopentadiene	UG/KG	ND	2100	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Client ID / Job No / Lab ID / Sample Date		EATP-9-1000 A03-7828 A3782809 08/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Hexachloroethane	UG/KG	ND	2100	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	UG/KG	ND	2100	NA		NA		NA	
Isophorone	UG/KG	ND	2100	NA		NA		NA	
2-Methylnaphthalene	UG/KG	ND	2100	NA		NA		NA	
2-Methylphenol	UG/KG	ND	2100	NA		NA		NA	
4-Methylphenol	UG/KG	ND	2100	NA		NA		NA	
Naphthalene	UG/KG	ND	2100	NA		NA		NA	
2-Nitroaniline	UG/KG	ND	10000	NA		NA		NA	
3-Nitroaniline	UG/KG	ND	10000	NA		NA		NA	
4-Nitroaniline	UG/KG	ND	10000	NA		NA		NA	
Nitrobenzene	UG/KG	ND	2100	NA		NA		NA	
2-Nitrophenol	UG/KG	ND	2100	NA		NA		NA	
4-Nitrophenol	UG/KG	ND	10000	NA		NA		NA	
N-nitrosodiphenylamine	UG/KG	ND	2100	NA		NA		NA	
N-Nitroso-Di-n-propylamine	UG/KG	ND	2100	NA		NA		NA	
Pentachlorophenol	UG/KG	ND	10000	NA		NA		NA	
Phenanthrene	UG/KG	ND	2100	NA		NA		NA	
Phenol	UG/KG	ND	2100	NA		NA		NA	
Pyrene	UG/KG	3100	2100	NA		NA		NA	
1,2,4-Trichlorobenzene	UG/KG	ND	2100	NA		NA		NA	
2,4,5-Trichlorophenol	UG/KG	ND	5100	NA		NA		NA	
2,4,6-Trichlorophenol	UG/KG	ND	2100	NA		NA		NA	
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	155	50-200	NA		NA		NA	
Naphthalene-D8	%	147	50-200	NA		NA		NA	
Acenaphthene-D10	%	159	50-200	NA		NA		NA	
Phenanthrene-D10	%	155	50-200	NA		NA		NA	
Chrysene-D12	%	142	50-200	NA		NA		NA	
Perylene-D12	%	129	50-200	NA		NA		NA	
Nitrobenzene-D5	%	79	34-120	NA		NA		NA	
2-Fluorobiphenyl	%	106	43-125	NA		NA		NA	
p-Terphenyl-d14	%	127	38-141	NA		NA		NA	
Phenol-D5	%	78	34-120	NA		NA		NA	
2-Fluorophenol	%	63	25-125	NA		NA		NA	
2,4,6-Tribromophenol	%	107	36-139	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Client ID / Job No / Lab ID / Sample Date		EATP-1-250 A03-7828 A3782801 08/11/2003		EATP-2-250 A03-7828 A3782802 08/11/2003		EATP-3-250 A03-7828 A3782803 08/11/2003		EATP-4-250 A03-7828 A3782804 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aldrin	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
alpha-BHC	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
beta-BHC	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
gamma-BHC (Lindane)	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
delta-BHC	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
Chlordane	UG/KG	ND	29	ND	20	ND	19	ND	20
4,4'-DDD	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
4,4'-DDE	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
4,4'-DDT	UG/KG	1.3 J	2.9	4.0	2.0	ND	1.9	ND	2.0
Dieldrin	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
Endosulfan I	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
Endosulfan II	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
Endosulfan Sulfate	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
Endrin	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
Endrin aldehyde	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
Heptachlor	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
Heptachlor epoxide	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
Methoxychlor	UG/KG	ND	2.9	ND	2.0	ND	1.9	ND	2.0
Toxaphene	UG/KG	ND	57	ND	39	ND	38	ND	40
SURROGATE(S)									
Tetrachloro-m-xylene	%	87	32-130	64	32-130	80	32-130	86	32-130
Decachlorobiphenyl	%	96	36-153	209 *	36-153	83	36-153	81	36-153

Client ID / Job No / Lab ID / Sample Date		EATP-5-1000 A03-7828 A3782805 08/11/2003		EATP-6-1000 A03-7828 A3782806 08/11/2003		EATP-7-1000 A03-7828 A3782807 08/11/2003		EATP-8-1000 A03-7828 A3782808 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aldrin	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
alpha-BHC	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
beta-BHC	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
gamma-BHC (Lindane)	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
delta-BHC	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
Chlordane	UG/KG	ND	20	ND	20	ND	20	ND	22
4,4'-DDD	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
4,4'-DDE	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
4,4'-DDT	UG/KG	ND	2.0	ND	2.0	3.0	2.0	5.3	2.2
Dieldrin	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
Endosulfan I	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
Endosulfan II	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
Endosulfan Sulfate	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
Endrin	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
Endrin aldehyde	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
Heptachlor	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
Heptachlor epoxide	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
Methoxychlor	UG/KG	ND	2.0	ND	2.0	ND	2.0	ND	2.2
Toxaphene	UG/KG	ND	39	ND	40	ND	40	ND	44
SURROGATE(S)									
Tetrachloro-m-xylene	%	88	32-130	89	32-130	76	32-130	82	32-130
Decachlorobiphenyl	%	166 *	36-153	90	36-153	86	36-153	158 *	36-153

NA = Not Applicable ND = Not Detected

Date: 08/22/2003
Time: 16:11:32

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8081 - TCL PESTICIDES - S

Rept: AN0326

Client ID / Job No / Lab ID / Sample Date		EATP-9-1000 / A03-7828 / A3782809 / 08/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aldrin	UG/KG	ND	2.1	NA		NA		NA	
alpha-BHC	UG/KG	ND	2.1	NA		NA		NA	
beta-BHC	UG/KG	ND	2.1	NA		NA		NA	
gamma-BHC (Lindane)	UG/KG	ND	2.1	NA		NA		NA	
delta-BHC	UG/KG	ND	2.1	NA		NA		NA	
Chlordane	UG/KG	ND	21	NA		NA		NA	
4,4'-DDD	UG/KG	ND	2.1	NA		NA		NA	
4,4'-DDE	UG/KG	ND	2.1	NA		NA		NA	
4,4'-DDT	UG/KG	3.1	2.1	NA		NA		NA	
Dieldrin	UG/KG	ND	2.1	NA		NA		NA	
Endosulfan I	UG/KG	ND	2.1	NA		NA		NA	
Endosulfan II	UG/KG	ND	2.1	NA		NA		NA	
Endosulfan Sulfate	UG/KG	ND	2.1	NA		NA		NA	
Endrin	UG/KG	ND	2.1	NA		NA		NA	
Endrin aldehyde	UG/KG	ND	2.1	NA		NA		NA	
Heptachlor	UG/KG	ND	2.1	NA		NA		NA	
Heptachlor epoxide	UG/KG	ND	2.1	NA		NA		NA	
Methoxychlor	UG/KG	ND	2.1	NA		NA		NA	
Toxaphene	UG/KG	ND	42	NA		NA		NA	
SURROGATE(S)									
Tetrachloro-m-xylene	%	78	32-130	NA		NA		NA	
Decachlorobiphenyl	%	126	36-153	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

STL Buffalo

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - 8082 - POLYCHLORINATED BIPHENYLS - S

Client ID / Job No / Lab ID / Sample Date		EATP-1-250 A03-7828 A3782801 08/11/2003		EATP-2-250 A03-7828 A3782802 08/11/2003		EATP-3-250 A03-7828 A3782803 08/11/2003		EATP-4-250 A03-7828 A3782804 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aroclor 1016	UG/KG	ND	28	ND	20	ND	20	ND	21
Aroclor 1221	UG/KG	ND	28	ND	20	ND	20	ND	21
Aroclor 1232	UG/KG	ND	28	ND	20	ND	20	ND	21
Aroclor 1242	UG/KG	ND	28	ND	20	ND	20	ND	21
Aroclor 1248	UG/KG	ND	28	ND	20	ND	20	ND	21
Aroclor 1254	UG/KG	ND	28	ND	20	ND	20	ND	21
Aroclor 1260	UG/KG	ND	28	ND	20	ND	20	ND	21
SURROGATE(S)									
Tetrachloro-m-xylene	%	92	32-148	84	32-148	78	32-148	78	32-148
Decachlorobiphenyl	%	89	36-153	88	36-153	80	36-153	80	36-153

Client ID / Job No / Lab ID / Sample Date		EATP-5-1000 A03-7828 A3782805 08/11/2003		EATP-6-1000 A03-7828 A3782806 08/11/2003		EATP-7-1000 A03-7828 A3782807 08/11/2003		EATP-8-1000 A03-7828 A3782808 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aroclor 1016	UG/KG	ND	20	ND	20	ND	20	ND	20
Aroclor 1221	UG/KG	ND	20	ND	20	ND	20	ND	20
Aroclor 1232	UG/KG	ND	20	ND	20	ND	20	ND	20
Aroclor 1242	UG/KG	ND	20	ND	20	ND	20	ND	20
Aroclor 1248	UG/KG	ND	20	ND	20	ND	20	ND	20
Aroclor 1254	UG/KG	ND	20	ND	20	ND	20	ND	20
Aroclor 1260	UG/KG	ND	20	ND	20	ND	20	ND	20
SURROGATE(S)									
Tetrachloro-m-xylene	%	86	32-148	82	32-148	96	32-148	83	32-148
Decachlorobiphenyl	%	78	36-153	82	36-153	84	36-153	81	36-153

NA = Not Applicable   ND = Not Detected

Client ID Job No Lab ID Sample Date		EATP-9-1000 A03-7828 A3782809 08/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aroclor 1016	UG/KG	ND	21	NA		NA		NA	
Aroclor 1221	UG/KG	ND	21	NA		NA		NA	
Aroclor 1232	UG/KG	ND	21	NA		NA		NA	
Aroclor 1242	UG/KG	ND	21	NA		NA		NA	
Aroclor 1248	UG/KG	ND	21	NA		NA		NA	
Aroclor 1254	UG/KG	ND	21	NA		NA		NA	
Aroclor 1260	UG/KG	ND	21	NA		NA		NA	
SURROGATE(S)									
Tetrachloro-m-xylene	%	90	32-148	NA		NA		NA	
Decachlorobiphenyl	%	80	36-153	NA		NA		NA	

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - METHOD 8151 - HERBICIDES - S

Client ID / Job No / Lab ID / Sample Date		EATP-1-250 A03-7828 A3782801 08/11/2003		EATP-2-250 A03-7828 A3782802 08/11/2003		EATP-3-250 A03-7828 A3782803 08/11/2003		EATP-4-250 A03-7828 A3782804 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
2,4-D	UG/KG	ND	29	ND	20	ND	20	ND	21
2,4,5-TP (Silvex)	UG/KG	ND	29	ND	20	ND	20	ND	21
2,4,5-T	UG/KG	ND	29	ND	20	ND	20	ND	21
SURROGATE(S)									
Dichlorophenyl Acetic Acid	%	19	17-133	34	17-133	31	17-133	20	17-133

Client ID / Job No / Lab ID / Sample Date		EATP-5-1000 A03-7828 A3782805 08/11/2003		EATP-6-1000 A03-7828 A3782806 08/11/2003		EATP-7-1000 A03-7828 A3782807 08/11/2003		EATP-8-1000 A03-7828 A3782808 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
2,4-D	UG/KG	ND	20	ND	20	ND	20	ND	20
2,4,5-TP (Silvex)	UG/KG	ND	20	ND	20	ND	20	ND	20
2,4,5-T	UG/KG	ND	20	ND	20	ND	20	ND	20
SURROGATE(S)									
Dichlorophenyl Acetic Acid	%	29	17-133	17	17-133	11 *	17-133	15 *	17-133

Client ID / Job No / Lab ID / Sample Date		EATP-9-1000 A03-7828 A3782809 08/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
2,4-D	UG/KG	ND	22	NA		NA		NA	
2,4,5-TP (Silvex)	UG/KG	ND	22	NA		NA		NA	
2,4,5-T	UG/KG	ND	22	NA		NA		NA	
SURROGATE(S)									
Dichlorophenyl Acetic Acid	%	12 *	17-133	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - SW8463 T METALS (8) - S

Client ID / Job No / Lab ID / Sample Date		EATP-1-250 A03-7828 A3782801 08/11/2003		EATP-2-250 A03-7828 A3782802 08/11/2003		EATP-3-250 A03-7828 A3782803 08/11/2003		EATP-4-250 A03-7828 A3782804 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Arsenic - Total	MG/KG	13.9	3.5	10	2.4	11.8	2.3	10	2.5
Barium - Total	MG/KG	96.7 N	0.87	61.5	0.59	67.8	0.58	66.1	0.63
Cadmium - Total	MG/KG	ND	0.35	ND	0.24	ND	0.23	ND	0.25
Chromium - Total	MG/KG	22.8	0.87	15.0	0.59	15.7	0.58	16.2	0.63
Lead - Total	MG/KG	25.4	1.7	23.2	1.2	15.6	1.2	15.6	1.2
Mercury - Total	MG/KG	ND	0.035	ND	0.024	ND	0.021	ND	0.022
Selenium - Total	MG/KG	ND	6.9	ND	4.7	ND	4.6	ND	5.0
Silver - Total	MG/KG	ND	0.87	ND	0.59	ND	0.58	ND	0.63

Client ID / Job No / Lab ID / Sample Date		EATP-5-1000 A03-7828 A3782805 08/11/2003		EATP-6-1000 A03-7828 A3782806 08/11/2003		EATP-7-1000 A03-7828 A3782807 08/11/2003		EATP-8-1000 A03-7828 A3782808 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Arsenic - Total	MG/KG	12.0	2.4	7.9	2.3	10.6	2.4	10.4	2.5
Barium - Total	MG/KG	73.6	0.59	73.5	0.59	84.3	0.60	80.0	0.62
Cadmium - Total	MG/KG	ND	0.24	ND	0.23	ND	0.24	ND	0.25
Chromium - Total	MG/KG	16.2	0.59	16.7	0.59	17.0	0.60	17.0	0.62
Lead - Total	MG/KG	23.7	1.2	14.7	1.2	41.1	1.2	49.7	1.2
Mercury - Total	MG/KG	ND	0.022	ND	0.025	0.064	0.024	ND	0.025
Selenium - Total	MG/KG	ND	4.7	ND	4.7	ND	4.8	ND	4.9
Silver - Total	MG/KG	ND	0.59	ND	0.59	ND	0.60	ND	0.62

NA = Not Applicable ND = Not Detected

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
STEELFIELDS - SW8463 T METALS (8) - S

Client ID / Job No / Lab ID / Sample Date		EATP-9-1000 / A03-7828 / A3782809 / 08/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Arsenic - Total	MG/KG	12.5	2.5	NA		NA		NA	
Barium - Total	MG/KG	84.9	0.63	NA		NA		NA	
Cadmium - Total	MG/KG	ND	0.25	NA		NA		NA	
Chromium - Total	MG/KG	17.6	0.63	NA		NA		NA	
Lead - Total	MG/KG	72.5	1.3	NA		NA		NA	
Mercury - Total	MG/KG	0.027	0.024	NA		NA		NA	
Selenium - Total	MG/KG	ND	5.1	NA		NA		NA	
Silver - Total	MG/KG	ND	0.63	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

Steelfields - Former LTV Steel site
Steelfields Borrowed Soils
WET CHEMISTRY ANALYSIS

Client ID / Job No / Lab ID / Sample Date		EATP-1-250 A03-7828 A3782801 08/11/2003		EATP-2-250 A03-7828 A3782802 08/11/2003		EATP-3-250 A03-7828 A3782803 08/11/2003		EATP-4-250 A03-7828 A3782804 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Cyanide - Total	UG/G	ND	1.0	ND	1.1	ND	1.1	ND	1.2
Leachable pH	S.U.	7.67	0.0100	7.67	0.0100	7.90	0.0100	7.49	0.0100

Client ID / Job No / Lab ID / Sample Date		EATP-5-1000 A03-7828 A3782805 08/11/2003		EATP-6-1000 A03-7828 A3782806 08/11/2003		EATP-7-1000 A03-7828 A3782807 08/11/2003		EATP-8-1000 A03-7828 A3782808 08/11/2003	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Cyanide - Total	UG/G	ND	1.1	ND	1.2	ND	1.1	ND	1.1
Leachable pH	S.U.	7.68	0.0100	7.66	0.0100	7.71	0.0100	7.79	0.0100

Client ID / Job No / Lab ID / Sample Date		EATP-9-1000 A03-7828 A3782809 08/11/2003							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Cyanide - Total	UG/G	ND	1.2	NA		NA		NA	
Leachable pH	S.U.	7.90	0.0100	NA		NA		NA	

NA = Not Applicable   ND = Not Detected

APPENDIX E

TABLES OF SOIL ANALYTICAL RESULTS FOR TREATED SOILS

APPENDIX E

Tables of Soil Analytical Results for Treated Soil/Fill

Table	***Subarea***	***# of Pages***
E-1	Treated Petroleum-Impacted Soil/Fill Verification VOC Results	2
E-2	Treated Petroleum-Impacted Soil/Fill Verification SVOC Results	3

Note:

The tables identified above summarize analytical results for verification sampling of treated soils excavated from Area 1. For locations at which these samples have been taken, refer to Figure 3-10 incorporated in the main text of this document.

TABLE E-1

TREATED PETROLEUM-IMPACTED SOIL/FILL VERIFICATION VOC RESULTS

Upper Lift 11/06/03 Sample Event
Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	SAMPLE LOCATION										SSALs
	North 1 Composite	North 1 Grab	North 2 Composite	North 2 Grab	North 3 Composite	North 3 Grab	North 4 Composite	North 4 Grab	Southeast 5 Comp	Southeast 5 Grab	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg											
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	2.2	2	**1**
n-Butylbenzene	ND	ND	0.082	0.026	0.11	0.038	0.11	0.09	2.7	1.1	**1**
sec-Butylbenzene	0.044	ND	0.13	0.059	0.27	0.13	0.31	0.22	ND	ND	**1**
tert-Butylbenzene	ND	ND	0.031	ND	0.11	ND	0.068	0.029	ND	ND	**1**
Ethylbenzene	0.024	0.016	ND	ND	ND	0.014	ND	ND	0.23	0.15	**1**
Isopropylbenzene	ND	ND	ND	ND	ND	ND	0.034	ND	ND	ND	**1**
p-Cymene	0.035	ND	0.15	0.057	0.26	0.11	0.33	0.2	0.039	ND	**1**
n-Propylbenzene	0.016	0.024	0.014	ND	0.017	0.016	0.02	ND	ND	ND	**1**
Toluene	0.029	ND	ND	ND	ND	ND	ND	ND	1.4	1.4	**1**
o-Xylene	0.016	0.037	ND	ND	ND	ND	ND	ND	0.35	0.21	**1**
m-Xylene	0.066	ND	0.015	ND	0.022	0.035	0.016	ND	1.5	1.2	**1**
p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1**
Xylenes, Total	0.082	0.037 J	0.015 J	ND	0.022 J	0.035 J	0.016 J	ND	1.8	1.4	**1**
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1**
1,2,4-Trimethylbenzene	0.048	0.032	0.037	0.016	ND	0.046	0.014	ND	0.3	0.23	**1**
1,3,5-Trimethylbenzene	0.018	ND	0.034	ND	0.041	0.021	0.065	0.034	0.37	0.12	**1**
TOTAL VOCs (mg/kg)	**0.378**	**0.146**	**0.508**	**0.158**	**0.852**	**0.445**	**0.983**	**0.573**	**10.889**	**7.81**	**10**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. Blind Duplicate taken at Southeast 5 Grab.

TABLE E-1

TREATED PETROLEUM - IMPACTED SOIL/FILL VERIFICATION VOC RESULTS

Upper Lift 11/06/03 Sample Event
Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	SAMPLE LOCATION									SSALs
	Southeast 6 Composite	Southeast 6 Grab	Southeast 7 Composite	Southeast 7 Grab	Southwest 8 Composite	Southwest 8 Grab	Southwest 9 Composite	Southwest 9 Grab	Blind Dup (7)	
STARS Volatile Organic Compounds (VOCs - Method 8021) - mg/kg										
Benzene	0.1	0.19	0.14	0.69	0.015	ND	ND	0.024	1.3	**1**
n-Butylbenzene	0.044	0.14	ND	0.18	0.026	0.093	ND	ND	0.9	**1**
sec-Butylbenzene	0.19	ND	0.064	ND	0.092	0.1	0.38	0.075	0.23	**1**
tert-Butylbenzene	0.025	0.068	ND	ND	0.018	ND	0.09	0.017	ND	**1**
Ethylbenzene	0.012	0.03	ND	0.15	ND	ND	0.027	0.013	0.11	**1**
Isopropylbenzene	0.013	0.056	ND	0.032	ND	0.016	0.048	ND	ND	**1**
p-Cymene	0.074	0.29	0.042	0.12	0.081	0.1	0.43	0.064	ND	**1**
n-Propylbenzene	ND	0.021	ND	ND	ND	ND	0.022	ND	ND	**1**
Toluene	0.07	0.12	0.085	0.32	0.041	ND	0.058	0.036	0.94	**1**
o-Xylene	0.015	0.052	ND	0.11	0.016	ND	0.016	ND	0.15	**1**
m-Xylene	0.064	0.13	0.076	0.52	0.042	0.016	0.06	0.032	0.8	**1**
p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1**
Xylenes, Total	0.079	0.18	0.076	0.62	0.058	0.016 J	0.076	0.032 J	0.95	**1**
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1**
1,2,4-Trimethylbenzene	0.026	0.2	0.034	0.14	0.032	0.047	0.1	0.029	0.23	**1**
1,3,5-Trimethylbenzene	0.051	0.041	ND	ND	0.025	0.037	0.11	0.023	0.086	**1**
TOTAL VOCs (mg/kg)	**0.763**	**1.518**	**0.517**	**2.882**	**0.446**	**0.425**	**1.417**	**0.345**	**5.696**	**10**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. Blind Duplicate taken at Southeast 5 Grab.

TABLE E-2

ANALYTICAL SUMMARRY
TREATED PETROLEUM - IMPACTED SOIL/FILL VERIFICATION SVOC RESULTS

Upper Lift 11/06/03 Sample Event
Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location							SSALs
	North 1 Composite	North 1 Grab	North 2 Composite	North 2 Grab	North 3 Composite	North 3 Grab	North 4 Composite	
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg								
Acenaphthene	ND	ND	ND	ND	ND	ND	1.1 J	--
Acenaphthylene	ND	0.15 J	ND	ND	ND	ND	4.5	--
Anthracene	ND	0.17 J	ND	ND	ND	ND	6.6	--
Benzo(a)anthracene	ND	0.42	ND	ND	ND	ND	6.1	--
Benzo(b)fluoranthene	ND	0.39 J	ND	ND	ND	0.21 J	3.9	--
Benzo(k)fluoranthene	ND	0.33 J	ND	ND	ND	ND	3.4	--
Benzo(g,h,i)perylene	ND	0.36 J	ND	ND	ND	ND	2 J	--
Benzo(a)pyrene	ND	0.43	ND	ND	0.15 J	0.2 J	4.7	--
Benzoic acid	ND	ND	ND	ND	ND	ND	ND	--
Benzyl alcohol	ND	ND	ND	ND	ND	ND	ND	--
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	ND	ND	--
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	ND	ND	--
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	ND	ND	--
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	--
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	--
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	--
Chrysene	ND	ND	ND	ND	ND	0.17 J	5.4	--
Dibenzo(a,h)anthracene	ND	0.42	ND	ND	ND	ND	ND	--
Dibenzofuran	ND	ND	ND	ND	ND	ND	3.4	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	ND	ND	--
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	--
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	--
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	--
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	ND	--
Fluoranthene	ND	0.73	1.3 J	ND	0.2 J	0.26 J	14	--
Fluorene	ND	ND	ND	ND	ND	ND	6.3	--
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	ND	2.1	--
Indeno(1,2,3-cd)pyrene	ND	0.31 J	ND	ND	ND	ND	ND	--
Isophorone	ND	ND	ND	ND	ND	ND	ND	--
2-Methylnaphthalene	ND	ND	ND	ND	ND	0.14 J	1.9 J	--
Naphthalene	ND	0.16 J	ND	ND	ND	ND	1.7 J	--
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	--
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	ND	ND	--
Phenanthrene	ND	0.37 J	1.2 J	ND	0.12 J	0.12 J	20	--
Pyrene	ND	0.64	1.4 J	ND	0.24 J	0.31 J	10	--
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**0**	**4.88**	**3.9**	**0**	**0.71**	**1.41**	**97.1**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. Blind Duplicate taken at Southeast 5 Grab.

TABLE E-2

ANALYTICAL SUMMARRY
TREATED PETROLEUM - IMPACTED SOIL/FILL VERIFICATION SVOC RESULTS

Upper Lift 11/06/03 Sample Event
Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	North 4 Grab	Southeast 5 Composite	Southeast 5 Grab	Southeast 6 Composite	Southeast 6 Grab	Southeast 7 Composite	SSALs
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg							
Acenaphthene	ND	8.5	3.8	ND	ND	ND	--
Acenaphthylene	ND	4.9	3	ND	ND	ND	--
Anthracene	ND	21	15	ND	1.8 J	ND	--
Benzo(a)anthracene	ND	21	14	ND	3.3 J	3.2 J	--
Benzo(b)fluoranthene	ND	12	7.4	ND	1.9 J	2.2 J	--
Benzo(k)fluoranthene	ND	12	8.8	2.6 J	ND	2.2 J	--
Benzo(g,h,i)perylene	ND	5.8	3.8	ND	ND	ND	--
Benzo(a)pyrene	ND	14	8.9	ND	2.2 J	2.5 J	--
Benzoic acid	ND	ND	ND	ND	ND	ND	--
Benzyl alcohol	ND	ND	ND	1.9 J	ND	ND	--
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	ND	--
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	ND	--
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	ND	--
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	--
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	--
4-Chloroaniline	ND	ND	ND	ND	1.3 J	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	13	ND	ND	ND	--
Chrysene	ND	18	ND	2.5 J	2.8 J	3 J	--
Dibenzo(a,h)anthracene	ND	2 J	2.6	ND	ND	ND	--
Dibenzofuran	ND	5.8	ND	ND	ND	ND	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	ND	--
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	ND	--
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	--
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	--
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	--
Fluoranthene	ND	61 E	31	5.2	8	5.4	--
Fluorene	ND	10	4.5	ND	ND	ND	--
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	6.2	3.9	ND	ND	ND	--
Isophorone	ND	ND	ND	ND	ND	ND	--
2-Methylnaphthalene	ND	5.1	2.1	ND	ND	ND	--
Naphthalene	ND	27	12	ND	3.9 J	ND	--
2-Nitroaniline	ND	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	ND	--
4-Nitroaniline	ND	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	ND	--
Phenanthrene	ND	40 E	18	3.6 J	4.7	1.9 J	--
Pyrene	1.5 J	48 E	28	5.5	7.4	6.9	--
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**1.5**	**322.3**	**179.8**	**21.3**	**37.3**	**27.3**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. Blind Duplicate taken at Southeast 5 Grab.

TABLE E-2

ANALYTICAL SUMMARRY
TREATED PETROLEUM - IMPACTED SOIL/FILL VERIFICATION SVOC RESULTS

Upper Lift 11/06/03 Sample Event
Voluntary Cleanup
Steelfields LTD.
Buffalo, New York

Parameter	Sample Location						SSALs
	Southeast 7 Grab	Southwest 8 Composite	Southwest 8 Grab	Southwest 9 Comp	Southwest 9 Grab	Blind Dup (7)	
STARS Semi-Volatile Organic Compounds (SVOCs - Method 8270) - mg/kg							
Acenaphthene	ND	ND	ND	ND	ND	4.8	--
Acenaphthylene	1.2 J	ND	ND	ND	ND	2.1 J	--
Anthracene	3.7 J	ND	ND	ND	ND	13	--
Benzo(a)anthracene	5.8	ND	ND	ND	2.5 J	12	--
Benzo(b)fluoranthene	3.4 J	ND	ND	ND	1.9 J	8.2	--
Benzo(k)fluoranthene	3.9	ND	ND	ND	ND	6.2	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	4.6	--
Benzo(a)pyrene	4.1	ND	ND	ND	1.9 J	7.9	--
Benzoic acid	ND	ND	ND	ND	ND	ND	--
Benzyl alcohol	ND	ND	ND	ND	ND	ND	--
Bis(2-chloroethoxy) methane	ND	ND	ND	ND	ND	ND	--
Bis(2-chloroethyl) ether	ND	ND	ND	ND	ND	ND	--
2,2'-Oxybis (1-Chloropropane)	ND	ND	ND	ND	ND	ND	--
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	--
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	--
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	--
4-Chloroaniline	ND	ND	ND	ND	ND	ND	--
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	--
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	--
Chrysene	5.1	ND	ND	1.7 J	2.3 J	11	--
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	1.5 J	--
Dibenzofuran	ND	ND	ND	ND	ND	3.2	--
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	--
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	--
1,3-Dichlrobenzene	ND	ND	ND	ND	ND	ND	--
1,4-Dichlrobenzene	ND	ND	ND	ND	ND	ND	--
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	--
Diethyl phthalate	ND	ND	ND	ND	ND	ND	--
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	--
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	--
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	--
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	--
Fluoranthene	13	ND	0.86 J	3.8 J	5.4	32	--
Fluorene	ND	ND	ND	ND	ND	5.5	--
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	--
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	--
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	--
Hexachloroethane	ND	ND	ND	ND	ND	ND	--
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	4.4	--
Isophorone	ND	ND	ND	ND	ND	ND	--
2-Methylnaphthalene	ND	ND	ND	ND	ND	2 J	--
Naphthalene	1.4 J	2.7	ND	ND	2.8 J	13	--
2-Nitroaniline	ND	ND	ND	ND	ND	ND	--
3-Nitroaniline	ND	ND	ND	ND	ND	ND	--
4-Nitroaniline	ND	ND	ND	ND	ND	ND	--
Nitrobenzene	ND	ND	ND	ND	ND	ND	--
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	--
N-Nitroso-Di-n-propylamine	ND	ND	ND	ND	ND	ND	--
Phenanthrene	3.8	ND	ND	1.4 J	1.9 J	22	--
Pyrene	12	1.1 J	1 J	3.8 J	5	28	--
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	--
TOTAL SVOCs (mg/kg)	**57.4**	**3.8**	**1.86**	**10.7**	**23.7**	**181.4**	**500**

Notes:
1. B = Analyte was detected in the associated blank as well as in the sample.
2. E = The reported value is estimated due to interference.
3. J = Estimated value.
4. ND = parameter not detected above laboratory detection limit.
5. SSALs = Site Specific Action Levels as per the RD/RA Work Plan.
6. Blind Duplicate taken at Southeast 5 Grab.

APPENDIX F

COMMUNITY & DOCUMENTATION AIR MONITORING REPORTS

APPENDIX F

The following is a listing of documents submitted to the NYSDEC over the course of 2003 in relation to the air monitoring program. Documentation Air Sampling Reports have been included under this cover. All associated analytical data attachments have been included in electronic format as Attachment 3 to this document. The Community Air Monitoring Reports (CAMP) have also been included under this cover.

Documentation Air Sampling Results

Event Date	Title	Date Submitted
5/6/2003	Documentation Air Sampling Results - May 6-8, 2003	6/10/2003
7/8/2003	Documentation Air Sampling Results - July 8, 2003	8/5/2003
8/21/2003	Documentation Air Sampling Results - August 2003	10/2/2003
9/18/2003	Documentation Air Sampling Results - September 18, 2003	10/7/2003
9/22/2003	Documentation Air Sampling Results - September 22, 2003	10/28/2003
10/17/2003	Documentation Air Sampling Results - October 17, 2003	12/4/2003
11/5/2003	Documentation Air Sampling Results - November 5, 2003	11/25/2003
12/12/2003	Documentation Air Sampling Results - December 12, 2003	12/30/2003

Community Air Monitoring Reports (CAMP)

Month	Title	Date Submitted
Jul-03	Community Air Monitoring Report - Project start - July 2003	9/2/2003
Aug-03	Community Air Monitoring Report - August 2003	9/12/2003
Sep-03	Community Air Monitoring Report - September 2003	10/13/2003
Oct-03	Community Air Monitoring Report - October 2003	11/13/2003
Nov-03	Community Air Monitoring Report - November 2003	12/19/2003

TurnKey Environmental Restoration, LLC

June 10, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site during the period of May 6th through May 8th, 2003. The documentation air monitoring work was performed concurrent with the start of significant earthwork in Area I, as required under the September 2002 Voluntary Cleanup Remedial Design/Remedial Action (RD/RA) Work Plan for the Site.

The monitoring involved collection of samples at three (3) monitoring stations on each of three (3) consecutive days. The approximate locations of the monitoring stations are shown on Figure 1. Downwind stations were comprised of wooden platforms with 5-foot high canopies to protect the pumps. A canopied pump control panel on the southwest corner of the terminal basin served as the upwind station.

At the time of the monitoring, petroleum-impacted soil/fill was being removed from Subarea D of the Site. As such, documentation air samples were collected for total particulate analysis per the RD/RA Work Plan. Sample collection equipment at each station consisted of a Gilian™ air sampling pump fitted with a nylon Dorr-Oliver cyclone filter to remove particulate matter greater than 10 microns (i.e., non-respirable particulates) followed by a 0.5 um pre-weighed PVC filter cartridge as specified under NIOSH Method 0600. The pumps were calibrated on a daily basis prior to the start of sampling against a target airflow rate of 1.7 liters per minute. Following calibration, the pumps and filters were transported to the monitoring stations. The intake tubing was positioned and tethered on the outside of the station canopies at a height of approximately 5-feet above grade to collect air at an elevation representative of the breathing zone. Pumps were activated and allowed to run for approximately 8 hours. The filter cartridges were then removed, sample collection times were recorded, and the volume of air passed through the filter (based on calibrated air flow rate and collection times) was calculated to allow determination of the particulate concentration by the analytical laboratory. Filter cartridges were transported to PSC Analytical Services in Reading, PA for analysis of respirable particulate matter per NIOSH Method 0600.

50 Fountain Plaza, Suite 1350 | Buffalo, NY 14202 | phone: (716)856-0635 | fax: (716)856-0583

Table 1 presents a summary of the daily calibrated flow rates, sample collection times, and volume of sample collected at each monitoring station. Weather conditions experienced during the monitoring period are also presented.

Analytical results are presented in Attachment 1. As indicated, no respirable particulate matter was present above the analytical detection limit (i.e., 50 ug/m^3) on any of the samples collected during this Documentation Air Monitoring event. Accordingly, the documentation air sampling results support the real time particulate monitoring data, which consistently show no exceedance of the Community Air Monitoring Plan respirable particulate limits of 150 ug/m^3 above background.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

TABLE 1
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
MAY 6 - MAY 8, 2003
SAMPLE DURATION AND VOLUME

Date	Weather Conditions	Sample Station	Pump Flow Rate (L/min)	Sample Start Time	Sample Stop Time	Duration (hrs/minutes)	Sample Volume (L)
5/6/2003	Mostly Sunny	Downwind So. - Pump #1	1.718	8:05	15:50	7:45	798.87
	55-70 F	Downwind No. - Pump #2	1.707	8:10	15:55	7:45	793.76
	Wind from W/SW, 2-6 MPH	Upwind - Pump #3	1.73	8:25	16:20	7:55	821.75
5/7/2003	Partly Sunny	Downwind So. - Pump #1	1.717	7:49	15:25	7:36	782.95
	42-68 F	Downwind No. - Pump #2	1.702	7:53	15:28	7:35	774.41
	Wind from W/NW, 3-5 MPH	Upwind - Pump #3	1.712	7:59	15:33	7:34	777.25
5/8/2003	Overcast	Downwind So. - Pump #1	1.711	7:43	15:05	7:22	756.26
	55-70 F	Downwind No. - Pump #2	1.712	7:49	15:10	7:21	754.99
	Wind from N, 3-5 MPH	Upwind - Pump #3	1.731	8:00	15:15	7:15	752.99

August 5, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results- July 2003
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site on July 8, 2003. The documentation air monitoring work was performed concurrent with the performance of significant excavation of tar and petroleum impacted soil/fill at SubArea K & L in Area I and associated stockpiling and grading of this material at the Area III Biopad location. This documentation monitoring event was conducted at the request of the NYSDEC as a one day event based on the short-term nature of the work at the biopile and as required under the September 2002 Voluntary Cleanup Remedial Design/Remedial Action (RD/RA) Work Plan for the Site.

The monitoring involved collection of samples at three (3) monitoring stations on one day, July 8, 2003. The approximate locations of the monitoring stations are shown on Figure 1. Downwind stations were comprised of wooden platforms with 5-foot high canopies to protect the pumps and summa canisters. A canopied pump control panel on the southwest corner of the terminal basin served as the upwind station.

At the time of the monitoring, tar and petroleum-impacted soil/fill was being removed from Subarea K & L of the Site. As such, documentation air samples were collected for volatile organic compounds and total particulate analysis per the RD/RA Work Plan. Sample collection equipment at each station consisted of:

- a Gilian™ air sampling pump fitted with a nylon Dorr-Oliver cyclone filter to remove particulate matter greater than 10 microns (i.e., non-respirable particulates) followed by a 0.5 um pre-weighed PVC filter cartridge as specified under NIOSH Method 0600. The pumps for particulate sampling were calibrated prior to the start of sampling against a target airflow rate of 1.7 liters per minute. Following calibration, the pumps and filters were transported to the monitoring stations. The intake tubing was positioned and tethered on the outside of the station canopies at a height of approximately 5-feet above grade to collect air at an elevation representative of the breathing zone. Pumps were activated and allowed to run for approximately 8 hours. The filter cartridges were then removed, sample collection times were recorded, and the volume of air passed through the filter (based on calibrated air flow rate and collection times) was calculated to allow determination

50 FOUNTAIN PLAZA, SUITE 1350 • BUFFALO, NEW YORK 14202
TEL (716) 856-0635 • FAX (716) 856-0583

of the particulate concentration by the analytical laboratory. Table 1 presents a summary of the daily calibrated flow rates, sample collection times, and volume of sample collected at each monitoring station. Weather conditions experienced during the monitoring period are also presented. Filter cartridges were transported via Severn Trent Laboratories (STL) to Galson Laboratories in Syracuse, New York for analysis of respirable particulate matter per NIOSH Method 0600.

- a Summa canister under vacuum fitted with a preset inlet regulator valve to draw a continuous air sample for 8 hours. Sample collection was initiated by TurnKey on the morning of July 8, 2003 and terminated after 8 hours of sample collection. The valves on the canisters were shut tight and the collection port was sealed. The samples were then transported, under chain-of-custody command, to Severn Trent laboratories (STL) in Burlington, VT for analysis of Target Compound List (TCL) volatile organic compounds (VOCs) in accordance with USEPA Method TO-15.

Table 2, attached, summarizes the analytical data for the detected compounds. The documentation air sampling results support the real time particulate and PID monitoring data, which consistently show no exceedance of the Community Air Monitoring Plan respirable particulate limits of 150 ug/m^3 or total VOC threshold of 5ppm above background.

The Analytical laboratory reports are presented in Attachment 1. Field records identifying work completed at the site on July 8th, meteorological data, and equipment calibration records are presented as Attachment 2.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

TABLE 1
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
JULY 8, 2003
PARTICULATE SAMPLE DURATION AND VOLUME

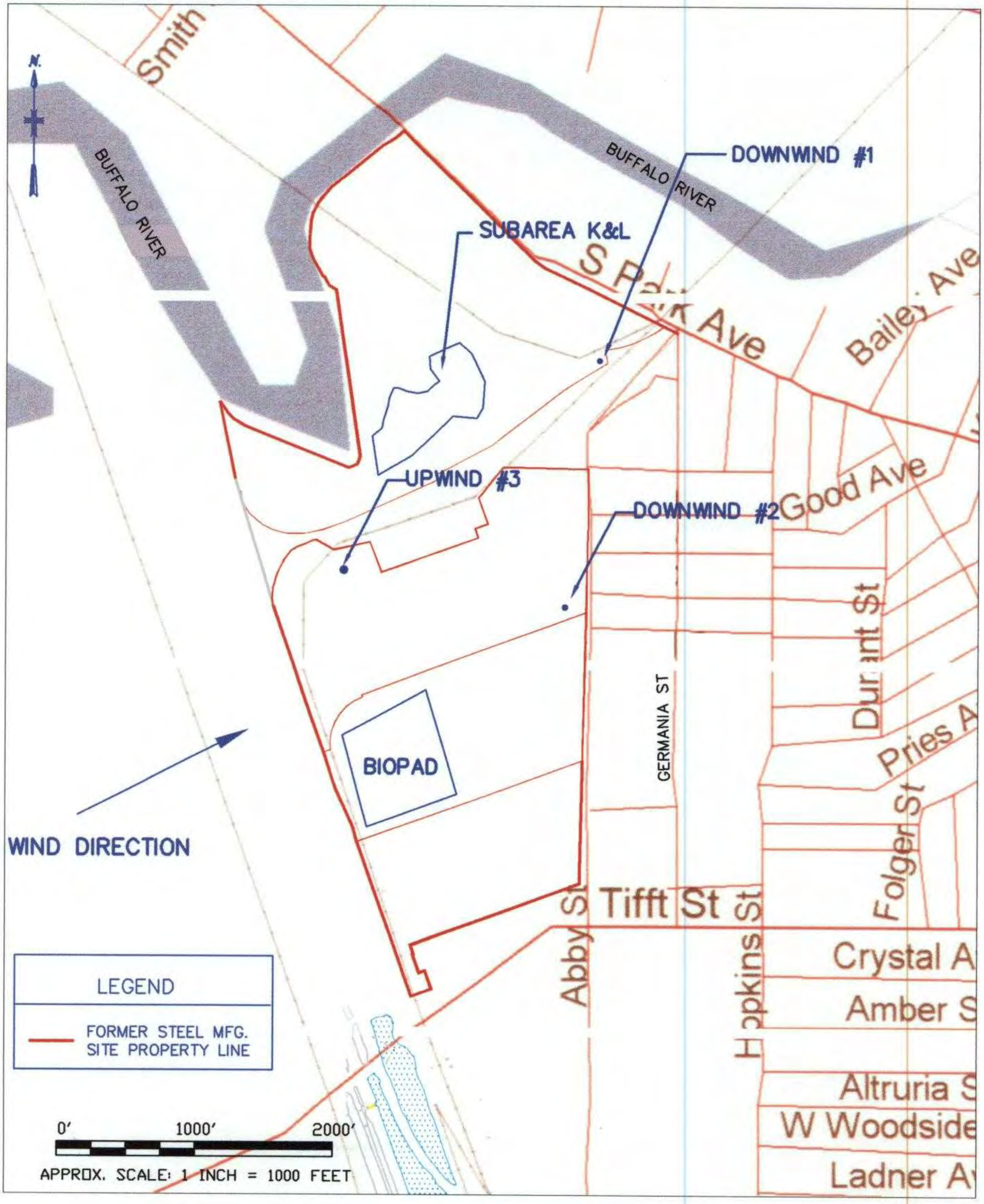
Date	Weather Conditions	Sample Station	Pump Flow Rate (L/min)	Sample Start Time	Sample Stop Time	Duration (hrs/minutes)	Sample Volume (L)
7/8/2003	Partly to Mostly Sunny	Downwind K & L - Pump #1	1.704	7:12	15:27	8:15	843.48
	74-80 F	Downwind Biopad - Pump #2	1.709	7:32	15:43	8:11	839.12
	Wind from W/SW, 6-18 MPH	Upwind - Pump #3	1.708	7:47	15:50	8:03	824.96

TABLE 2

STEELFIELDS SITE DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
JULY 8, 2003

	SAMPLE LOCATIONS					
	Downwind K & L		Downwind Biopad		Upwind	
PARAMETER	(PPBV)	ug/M3	(PPBV)	ug/M3	(PPBV)	ug/M3
VOCS - METHOD TO15						
Dichlorodifluoromethane	0.58	2.92	0.6	3.02	0.6	3.02
Chloromethane	0.73	1.53	0.73	1.53	0.76	1.60
Acetone	ND	ND	6.6	15.97	6.3	15.25
Particulates - NIOSH 0600	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**
Respirable particulates	<0.05	<0.06	<0.05	<0.06	<0.05	<0.06

DATE: ____________________ FIGURE 1



TURNKEY ENVIRONMENTAL RESTORATION, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

JULY 2003 DOCUMENTATION AIR MONITORING

MONITORING STATION LOCATIONS

TurnKey Environmental Restoration, LLC

October 2, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results (Evening Monitoring Event) - August 2003 Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site on August 21, 2003 through August 22, 2003. The documentation air monitoring work was initiated during the evening on August 21st following tilling of the biopad in Area III. This documentation monitoring event was conducted at the request of the NYSDEC.

The monitoring involved collection of samples at three (3) monitoring stations. The approximate locations of the stations are shown on Figure 1. Based on the westerly wind direction two downwind stations were placed on the eastern side of the biopad. The upwind station was located on the western side of the biopad. NYSDEC was present to observe the set up. Each summa canister was placed on a ladder to elevate the intake 5 feet above ground level.

The Summa canisters were fitted with preset inlet regulator valve to draw a continuous air sample for 8 hours. Sample collection was initiated by TurnKey Environmental Restoration at approximately 1600 hours on August 22, 2003 and terminated after 8 hours of sample collection. The samples were then transported, under chain-of-custody command, to Severn Trent Laboratories Inc. (STL) in Knoxville, TN for analysis of Target Compound List (TCL) volatile organic compounds (VOCs) as well as naphthalene in accordance with USEPA Method TO-15.

Table 1, attached, summarizes the analytical data for the detected compounds. The analytical laboratory report is presented in Attachment 1. As indicated, only a small number of compounds were detected at trace levels, with the upwind (background) sample showing many of the same parameters as the downwind station. The documentation air sampling results support the real time PID monitoring data for August 2003, which consistently show no exceedance of the Community Air Monitoring Plan total VOC threshold of 5ppm above background.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: C. O'Connor (NYSDOH)

File: 0062-008-100, CG

TABLE 1

DOCUMENTATION AIR MONITORING RESULTS

SUMMARY OF DOCUMINTATION AIR SAMPLING RESULTS

AUGUST 21 THROUGH 22, 2003 SAMPLING EVENT

TABLE 1

STEELFIELDS Ltd. DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
AUGUST 22, 2003

	SAMPLE LOCATIONS					
	Upwind #1		Downwind #2		Downwind #1	
PARAMETER	(PPBV)	ug/M3	(PPBV)	ug/M3	(PPBV)	ug/M3
VOCS - METHOD TO15						
Dichlorodifluoromethane	0.68	3.42	0.64	3.22	0.57	2.87
Toluene	0.65	2.49	0.49	1.48	0.41	1.57
Trichlorofluoromethane	0.38	2.17	0.31	1.77	ND < 0.31	ND < 0.31
Napthalene	ND < 0.32	ND < 0.32	0.39	2.08	0.66	3.52

FIGURE 1

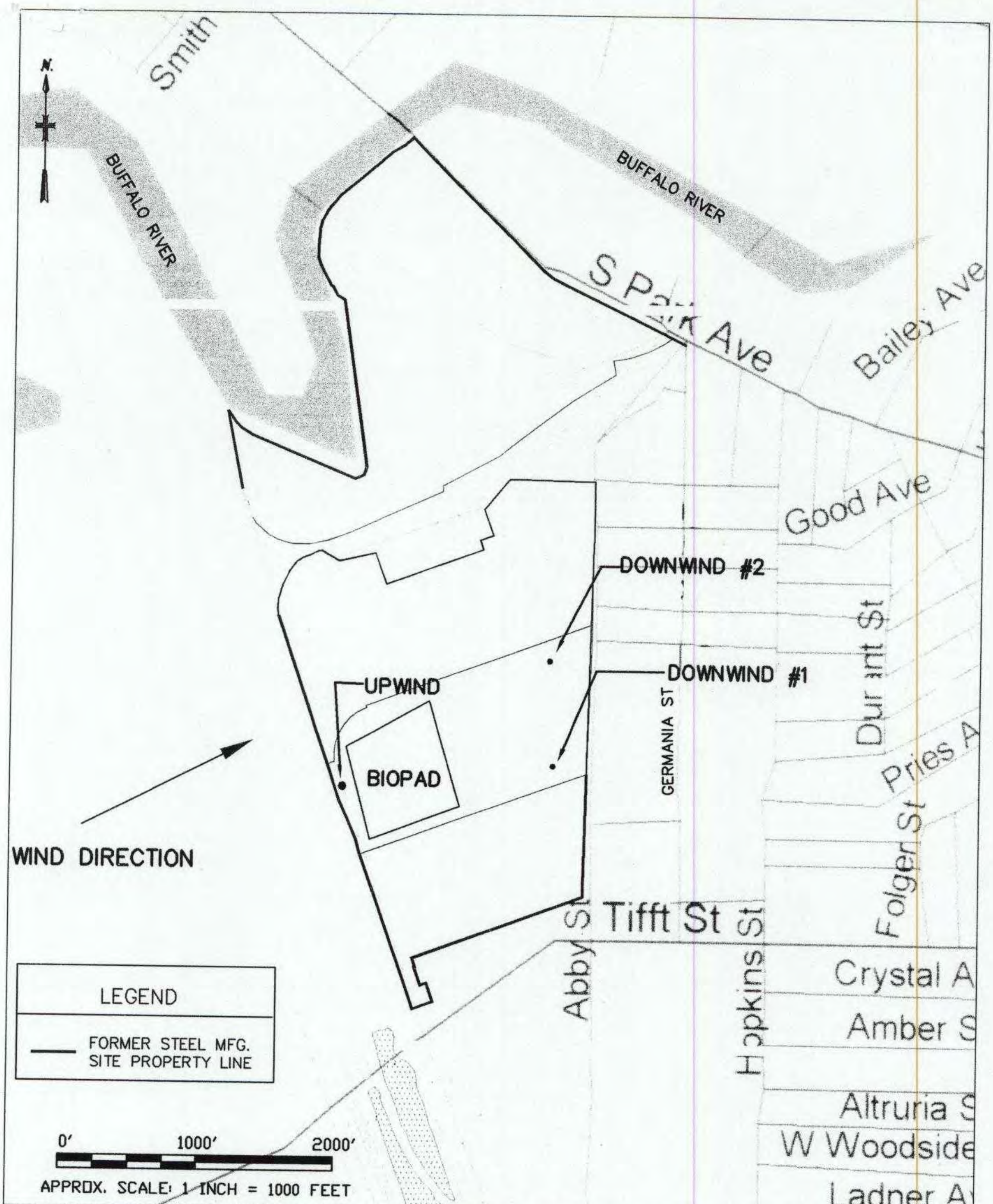
DOCUMENTATION AIR MONITORING RESULTS

SITE MAP WITH SAMPLE LOCATIONS

AUGUST 21 THROUGH 22, 2003 SAMPLING EVENT

DATE: ______________________________

FIGURE 1



TurnKey Environmental Restoration, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

AUGUST 22-23 2003 DOCUMENTATION AIR MONITORING

STATION LOCATIONS

October 7, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results- September2003
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site on September 18, 2003. The documentation air monitoring work was performed concurrent with the performance of significant excavation of Coke in Area IV.

The monitoring involved collection of samples for respirable particulates at three (3) monitoring stations. The approximate locations of the monitoring stations are shown on Figure 1. Downwind stations were comprised of Gilian™ Pumps placed on ladders on the Western Side of the excavation. The upwind pump was placed on a ladder on the Eastern side of the excavation.

Sample collection equipment at each station consisted of a Gilian™ air sampling pump fitted with a nylon Dorr-Oliver cyclone filter to remove particulate matter greater than 10 microns (i.e., non-respirable particulates) followed by a 0.5 um pre-weighed PVC filter cartridge as specified under NIOSH Method 0600. The pumps for particulate sampling were calibrated prior to the start of sampling against a target airflow rate of 1.7 liters per minute. Following calibration, the pumps and filters were transported to the monitoring stations. The intake tubing was positioned and tethered to the ladder at a height approximately 5-feet above grade to collect air at an elevation representative of the breathing zone. Pumps were activated and allowed to run for approximately 8 hours. The filter cartridges were then removed, sample collection times were recorded, and the volume of air passed through the filter (based on calibrated air flow rate and collection times) was calculated to allow determination of the particulate concentration by the analytical laboratory. Table 1 presents a summary of the daily calibrated flow rates, sample collection times, and volume of sample collected at each monitoring station. Weather conditions experienced during the monitoring period are also presented. Filter cartridges were transported via Severn Trent Laboratories (STL) to Galson Laboratories in Syracuse, New York for analysis of respirable particulate matter per NIOSH Method 0600.

Table 2, attached, summarizes the analytical data for the detected respirable particulates. The documentation air sampling results support the real time particulate monitoring data, which with limited exception consistently show no exceedance of the Community Air Monitoring Plan respirable particulate limits of 150 ug/m^3 above background.

The Analytical laboratory reports are presented in Attachment 1. Field records identifying work completed at the site on September 18th, meteorological data, and equipment calibration records are presented as Attachment 2.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: C. O'Connor (NYSDOH)

File: 0062-008-100, CG

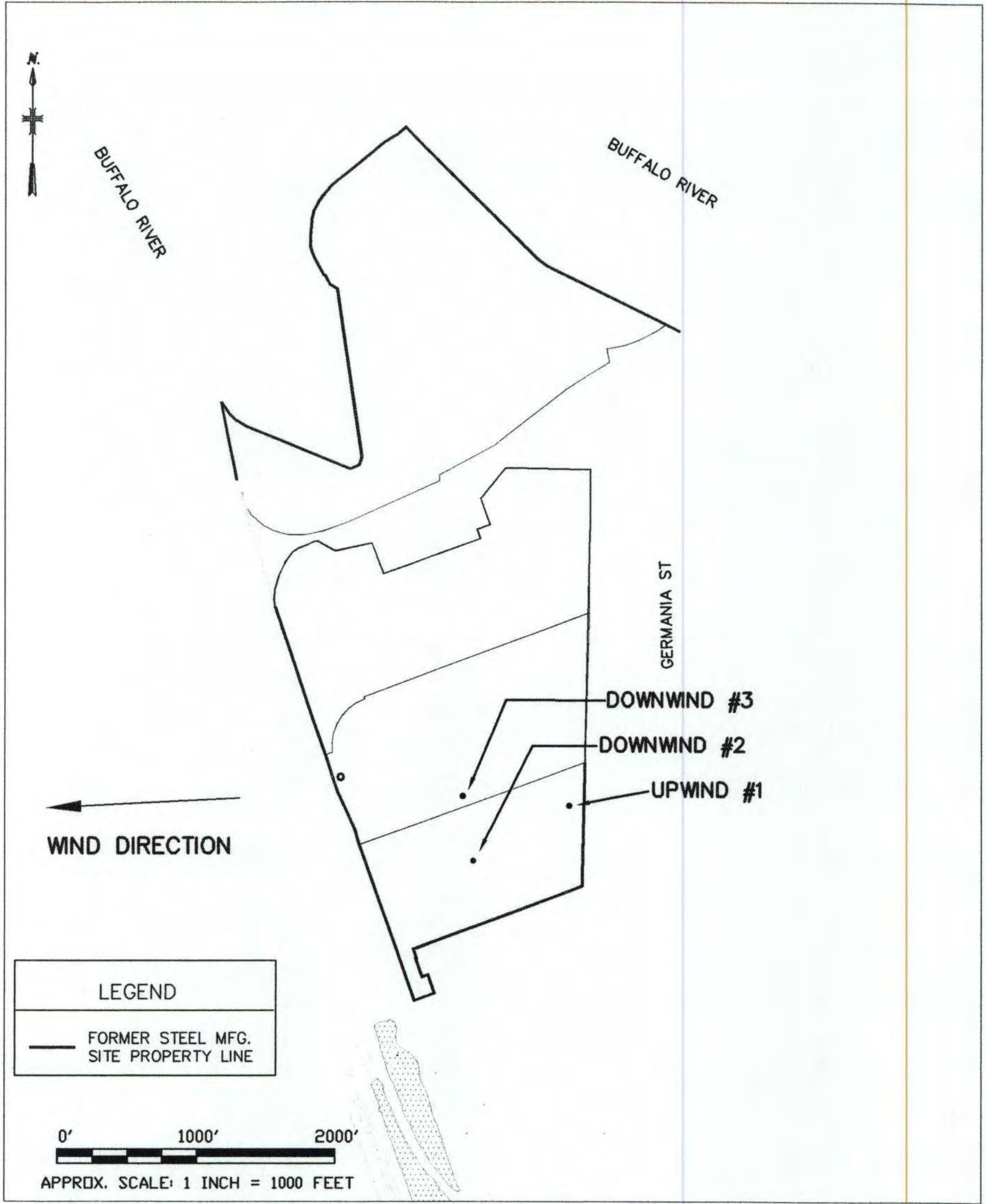
FIGURE 1

DOCUMENTATION AIR MONITORING

SITE MAP WITH SAMPLE LOCATIONS

SEPTEMBER 18, 2003 SAMPLING EVENT

DATE: ______________________ FIGURE 1



TurnKey Environmental Restoration, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

SEPTEMBER 18, 2003 DOCUMENTATION AIR MONITORING

STATION LOCATIONS

TABLE 1
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
18-Sep-03
SAMPLE DURATION AND VOLUME

Date	Weather Conditions	Sample Station	Pump Flow Rate (L/min)	Sample Start Time	Sample Stop Time	Duration (hrs/minutes)	Sample Volume (L)
9/18/2003	Partly Cloudy	Downwind - Pump #3	1.7	7:20	15:30	8:10	833.00
	62-70 F	Downwind - Pump #2	1.71	7:13	15:25	8:12	841.32
	Wind from E, 5 - 22 MPH	Upwind - Pump #1	1.69	6:57	15:18	8:21	846.69

TABLE 2

STEELFIELDS SITE DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
18-Sep-03

PARAMETER	SAMPLE LOCATIONS					
	Downwind # 3		Downwind # 2		Upwind # 1	
Particulates - NIOSH 0600	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**
Respirable particulates	<0.05	<0.06	<0.05	<0.06	<0.05	<0.06

October 28, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results- September 2003
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site on September 22, 2003. The documentation air monitoring work was completed during the day on September 22nd during tilling of the biopad in Area III. This documentation monitoring event was conducted at the request of the NYSDEC.

The monitoring involved collection of samples at three (3) monitoring stations for particulate, volatile organic compound (VOC) and naphthalene analysis. The approximate locations of the monitoring stations are shown on Figure 1. Based on the westerly wind direction recorded at the start of the monitoring event, downwind stations were placed on the eastern side of the biopad while the upwind station was placed on the western side of the biopad. Particulate stations consisted of Gilian™ air sampling pumps fitted with a nylon Dorr-Oliver cyclone filter to remove particulate matter greater than 10 microns (i.e., non-respirable particulates) followed by a 0.5 um pre-weighed PVC filter cartridge as specified under NIOSH Method 0600. The pumps for particulate sampling were calibrated prior to the start of sampling against a target airflow rate of 1.7 liters per minute. Following calibration, the pumps and filters were transported to the monitoring stations. The intake tubing was positioned and tethered to the ladder at a height of approximately 5-feet above grade to collect air at an elevation representative of the breathing zone. Pumps were activated and allowed to run for approximately 8 hours. Samples for VOCs and naphthalene analysis were collected using laboratory-supplied, evacuated summa canisters under fitted with a preset inlet regulator valve to draw a continuous air sample for 8 hours.

During the course of the sampling, wind direction shifted from west to southwesterly. The downwind stations were therefore moved to the positions shown on Figure 2. While relocating the downwind stations, the Gillian pumps were turned off and the valves on summa canisters were shut tight. The amount of time that the

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pumps and canisters were temporarily shut down for relocation was recorded and subtracted from the overall sample collection times to assure that particulate concentrations were properly calculated.

Following completion of the sampling event, the filter cartridges were removed, net sample collection times were recorded, and the volume of air passed through the filter (based on calibrated air flow rate and net collection times) was calculated to allow determination of the particulate concentration by the analytical laboratory[1]. Table 1 presents a summary of the calibrated flow rates, sample collection times, and volume of sample collected at each monitoring station. Weather conditions experienced during the monitoring period are also presented. Filter cartridges were transported via Severn Trent Laboratories (STL) to Galson Laboratories in Syracuse, New York for analysis of respirable particulate matter per NIOSH Method 0600. Concurrent with shut down of the Gillian Pumps, valves on the canisters were shut tight and the collection port was sealed. The summa canisters were then transported, under chain-of-custody command, to Severn Trent laboratories (STL) in Knoxville, TN for analysis of Target Compound List (TCL) volatile organic compounds (VOCs) and naphthalene in accordance with USEPA Method TO-15.

Table 2, attached, summarizes the analytical data for the detected compounds. As indicated, the documentation air sampling results support the real time particulate and PID monitoring data, which consistently show no exceedance of the Community Air Monitoring Plan respirable particulate limits of 150 ug/m^3 or total VOC threshold of 5ppm above background.

The Analytical laboratory reports are presented in Attachment 1. Field records identifying and equipment calibration records are presented as Attachment 2.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: C. O'Connor

[1] Upon retrieval of the sampling devices it was discovered that the wind had knocked over Downwind #2 and Upwind #3. This appeared to occur shortly before termination of the sampling, therefore it was not believed that sample integrity was significantly compromised.

TABLE 1
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
22-Sep-03
SAMPLE DURATION AND VOLUME

Date	Weather Conditions	Sample Station	Pump Flow Rate (L/min)	Sample Start Time	Sample Stop Time	Duration (hrs/minutes)	Sample Volume (L)
9/22/2003		Downwind - Pump #1	1.72	6:50	13:54	6:56*	715.52
	60-70 F	Downwind - Pump #2	1.71	6:56	13:59	6:51*	702.81
	Wind from ENE, 0 - 8 MPH	Upwind - Pump #3	1.69	7:03	14:07	7:04	716.56

* Wind changed direction during sampling. Pumps were temporarily stopped during relocation and then re-started. Duration represents net operating time.

TABLE 2

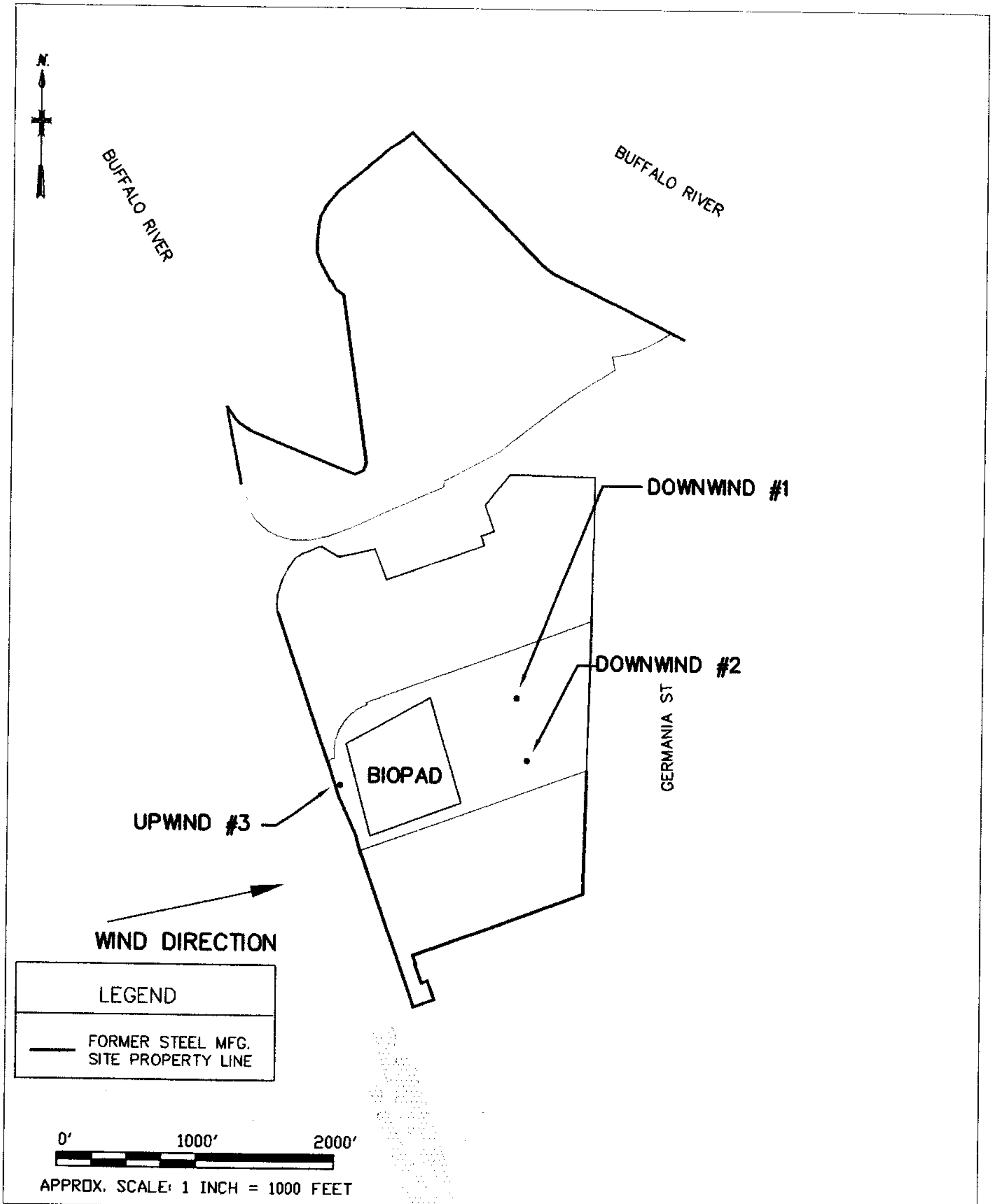
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
22-Sep-03

PARAMETER	SAMPLE LOCATIONS					
	Downwind # 1		Downwind # 2		Upwind # 3	
Particulates - NIOSH 0600	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**
Respirable particulates	<0.05	<0.07	<0.05	<0.07	0.052	0.073

PARAMETER	SAMPLE LOCATIONS					
	Downwind # 1		Downwind # 2		Upwind # 3	
VOCS - METHOD TO-15	**(PPBV)**	**ug/M3**	**(PPBV)**	**ug/M3**	**(PPBV)**	**ug/M3**
Dichlorodifluoromethane	0.7	3.52	0.72	3.62	0.66	3.32
Benzene	0.64	2.08	0.65	2.11	0.74	2.41
Toluene	1.3	4.98	1.4	5.36	1.3	4.98
m/p-Xylenes	0.76	3.35	0.8	3.53	0.76	3.35
NAPHTHALENE (TO-15)	ND < 0.42	-	ND < 0.42	-	ND < 0.42	-

DATE: ______________________

FIGURE 1



TurnKey Environmental Restoration, LLC

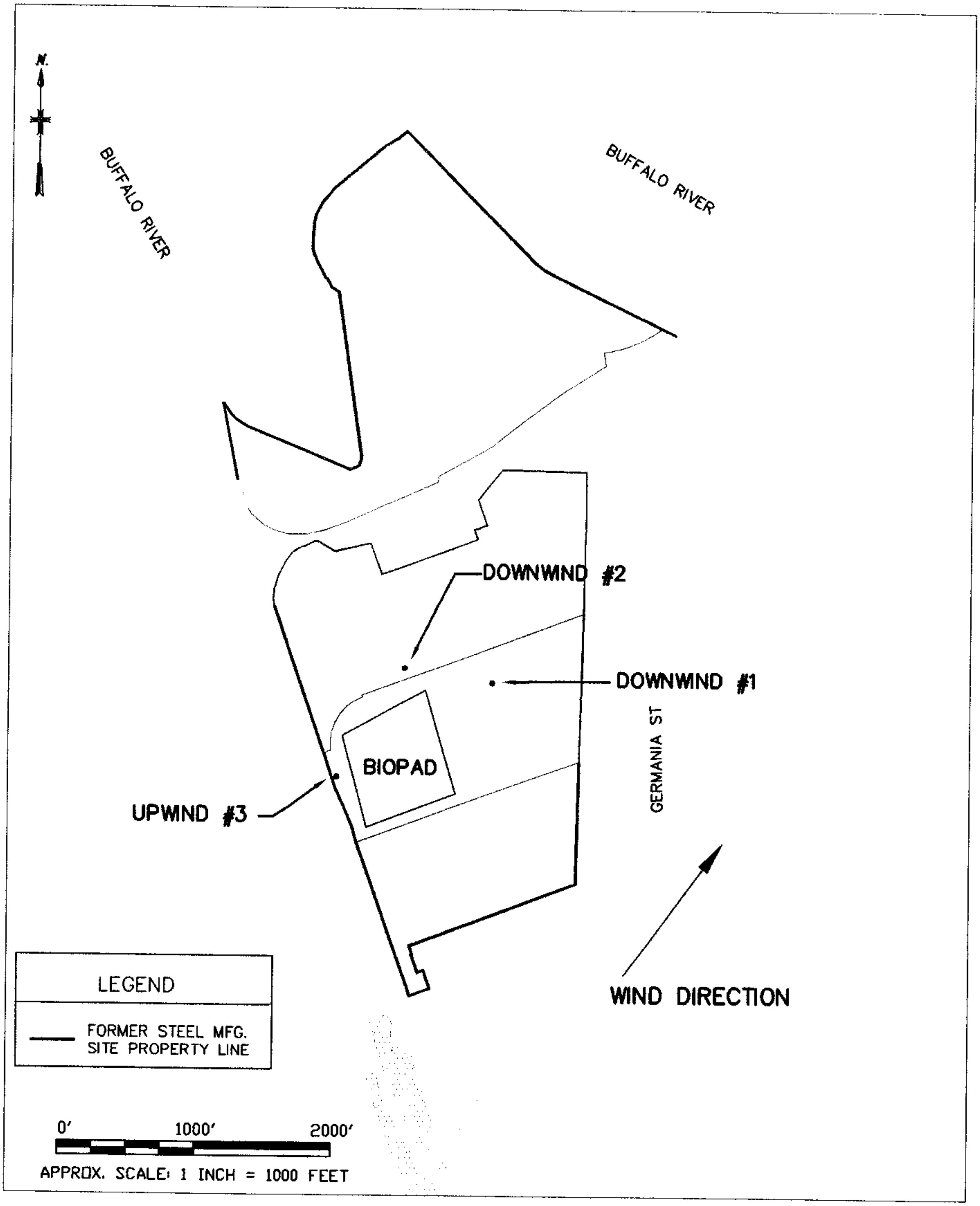
STEELFIELDS, LTD.
BUFFALO, NEW YORK

9/22/03 DOCUMENTATION AIR MONITORING

MORNING MONITORING STATION LOCATIONS

DATE: ______________________

FIGURE 2



TURNKEY ENVIRONMENTAL RESTORATION, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

9/22/03 DOCUMENTATION AIR MONITORING

AFTERNOON MONITORING STATION LOCATIONS

TurnKey Environmental Restoration, LLC

December 4, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results – October 17th, 2003
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of documentation air monitoring performed at the above-referenced site on October 17th, 2003. The documentation air monitoring event was requested by the NYSDEC to check air quality during slurry wall excavation and force main installation.

The monitoring involved collection of samples at three (3) monitoring stations. The approximate locations of the stations are shown on Figure 1. Based on the westerly wind direction two downwind stations were placed on the eastern side of the slurry wall excavation and force main installation. The upwind station was located on the western side of the slurry wall excavation and force main installation.

The Summa canisters were fitted with preset inlet regulator valves to draw a continuous air sample for 8 hours. Sample collection was initiated by TurnKey Environmental Restoration at approximately 1100 hours on October 17, 2003 and terminated after 6 hours of sample collection. The samples were then transported, under chain-of-custody command, to Severn Trent Laboratories Inc. (STL) in Knoxville, TN for analysis of Target Compound List (TCL) volatile organic compounds (VOCs) as well as naphthalene in accordance with USEPA Method TO-15.

Table 1, attached, summarizes the analytical data for the detected compounds. The analytical laboratory report is presented in Attachment 1. As indicated, only a small number of compounds were detected at trace levels. It should be recognized, however, that the October 17th documentation air monitoring was performed during "worst-case" conditions. Specifically, excavation work was being performed in soil/fill significantly-impacted by petroleum constituents and at a location close to the eastern perimeter of the site. Immediate efforts were undertaken to control odors from the soil/fill, including minimizing the excavation face, transporting the spoils to the western end of the biopad, and covering the excavated soil/fill with polyethylene sheeting. As such, the air impacts were of a short-term duration. The documentation air sampling results do, in fact, support the real time PID monitoring data for October 2003, which consistently show no exceedance of the Community Air Monitoring Plan total VOC threshold of 5ppm above background.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: C. O'Connor (NYSDOH)

File: 0062-008-100, CG

FIGURE 1

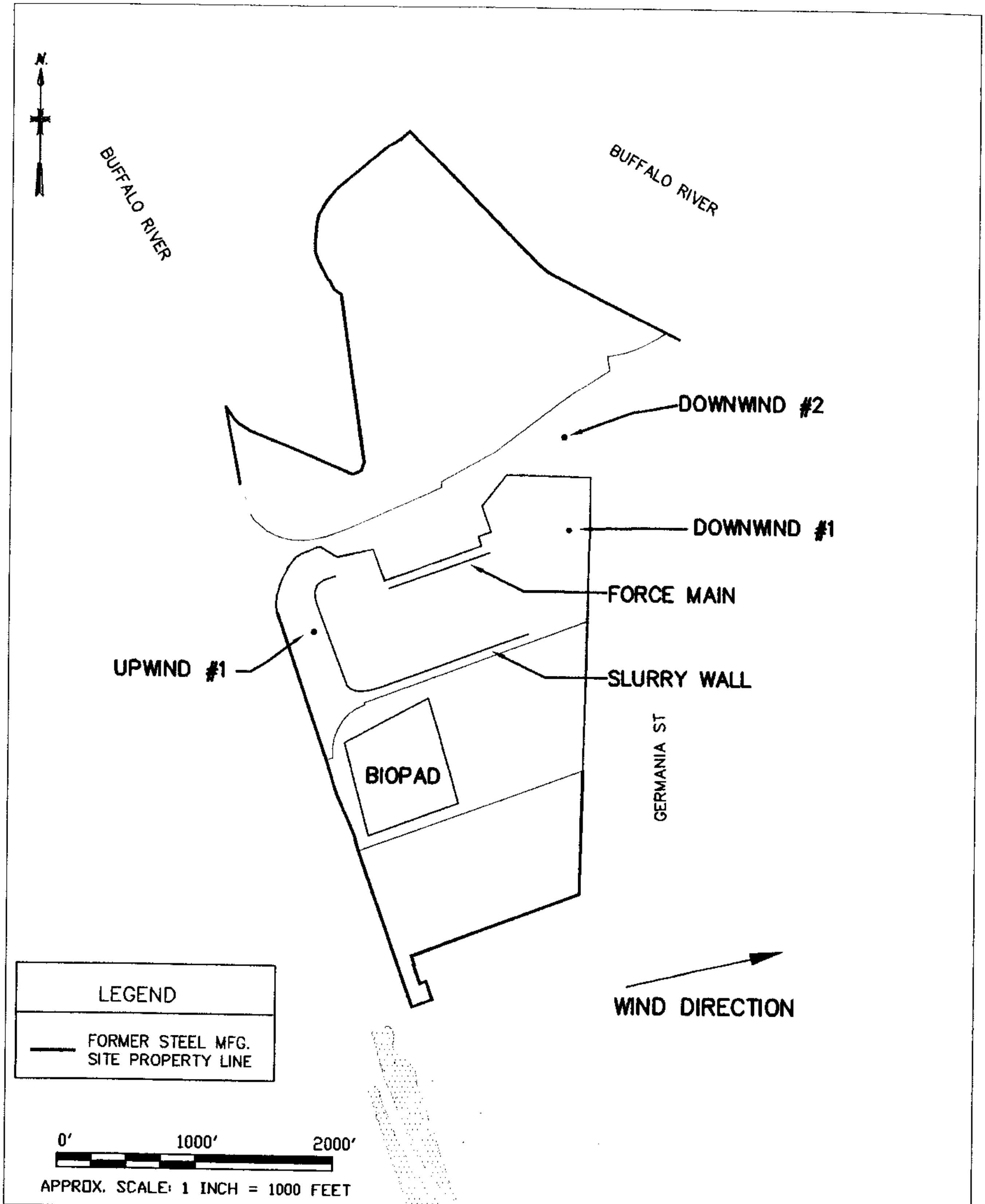
DOCUMENTATION AIR MONITORING RESULTS

SITE MAP WITH SAMPLE LOCATIONS

OCTOBER 17, 2003 SAMPLING EVENT

DATE: ______________________

FIGURE 1



TurnKey Environmental Restoration, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

10/17/03 DOCUMENTATION AIR MONITORING

MONITORING STATION LOCATIONS

TABLE 1

DOCUMENTATION AIR MONITORING RESULTS

SUMMARY OF DOCUMINTATION AIR SAMPLING RESULTS

OCTOBER 17, 2003 SAMPLING EVENT

TABLE 1

STEELFIELDS Ltd. DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
OCTOBER 17, 2003

	SAMPLE LOCATIONS					
	Upwind #1		Downwind #2		Downwind #1	
PARAMETER	(PPBV)	ug/M3	(PPBV)	ug/M3	(PPBV)	ug/M3
VOCS - METHOD TO15						
Benzene	ND < 0.54	ND < 0.54	1.3	4.23	ND < 0.51	ND < 0.51
Dichlorodifluoromethane	0.58	2.92	0.63	3.17	0.66	3.32
Ethylbenzene	ND < 0.54	ND < 0.54	ND < 0.50	ND < 0.50	0.73	3.22
Trichloroethene	ND < 0.54	ND < 0.54	0.76	4.15	ND < 0.51	ND < 0.51
Toluene	ND < 0.54	ND < 0.54	1.3	3.94	1.2	4.60
m/p-Xylenes	ND < 0.54	ND < 0.54	ND < 0.50	ND < 0.50	1.2	5.29
1,2,4 - Trimethylbenzene	0.76	3.80	ND < 0.50	ND < 0.50	1.5	7.50
Trichlorofluoromethane	ND < 0.54	ND < 0.54	0.54	3.08	ND < 0.51	ND < 0.51
Napthalene	ND < 0.54	ND < 0.54	ND < 0.50	ND < 0.50	1.3	6.93

TurnKey Environmental Restoration, LLC

November 25, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results- September2003
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site on November 5, 2003. The documentation air monitoring work was performed concurrent with the performance of significant excavation of sub area Q in Area I.

The monitoring involved collection of samples for respirable particulates, inorganic lead and total chromium at three (3) monitoring stations using six Gilian™ air sample pumps. The approximate locations of the monitoring stations are shown on Figure 1. Downwind stations were comprised of Gilian™ Pumps placed on ladders on the Eastern Side of the excavation. The upwind pump was placed on a ladder on the Western side of the excavation.

Sample collection for respirable particulates consisted of a Gilian™ air sampling pump fitted with a nylon Dorr-Oliver cyclone filter to remove particulate matter greater than 10 microns (i.e., non-respirable particulates) followed by a 0.5 um pre-weighed PVC filter cartridge as specified under NIOSH Method 0600. The pumps for particulate sampling were calibrated prior to the start of sampling against a target airflow rate of 1.7 liters per minute. Following calibration, the pumps and filters were transported to the monitoring stations. The intake tubing was positioned and tethered to the ladder at a height approximately 5-feet above grade to collect air at an elevation representative of the breathing zone. Pumps were activated and allowed to run for approximately 8 hours. The filter cartridges were then removed, sample collection times were recorded, and the volume of air passed through the filter (based on calibrated air flow rate and collection times) was calculated to allow determination of the particulate concentration by the analytical laboratory. Table 1 presents a summary of the daily calibrated flow rates, sample collection times, and volume of sample collected at each monitoring station. Weather conditions experienced during the monitoring period are also presented. Filter cartridges were transported via Severn Trent Laboratories (STL) to Galson Laboratories in Syracuse, New York for analysis of respirable particulate matter per NIOSH Method 0600.

Sample collection for total chromium and inorganic lead consisted of a Gilian™ air sampling pump followed by a 0.8 um cellulose ester filter cartridge as specified under NIOSH Method 7300. The pumps for total chromium and inorganic lead were calibrated prior to the start of sampling against a target airflow rate of 2.0 liters per minute. Following calibration, the pumps and filters were set up in the same manner as the respirable particulate pumps and cartridges. Filter Cartridges were transported via Severn Trent Laboratories (STL) to Galson Laboratories in Syracuse, New York for analysis of total chromium and inorganic lead per NIOSH Method 7300.

Table 2, attached, summarizes the analytical data for the detected respirable particulates, total chromium and inorganic lead. The documentation air sampling results support the real time particulate monitoring data, which with limited exception consistently show no exceedance of the Community Air Monitoring Plan respirable particulate limits of 150 ug/m^3 above background.

The Analytical laboratory reports are presented in Attachment 1. Field records identifying work completed at the site on November 5th, meteorological data, and equipment calibration records are presented as Attachment 2.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: C. O'Connor (NYSDOH)

File: 0062-008-100, CG

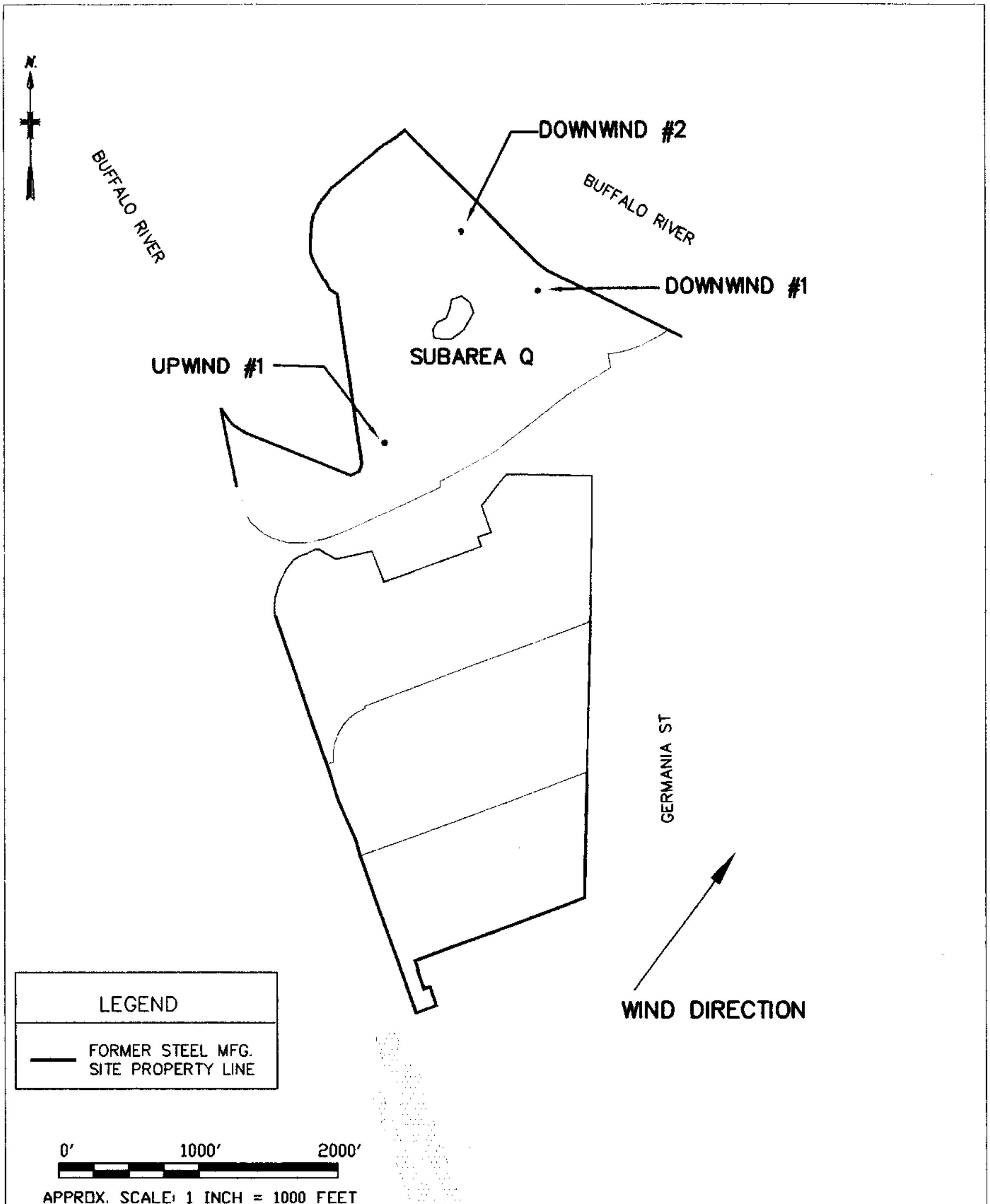
FIGURE 1

DOCUMENTATION AIR MONITORING

SITE MAP WITH SAMPLE LOCATIONS

NOVEMBER 5, 2003 SAMPLING EVENT

DATE: ______________________ FIGURE 1



TurnKey Environmental Restoration, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

11/05/03 DOCUMENTATION AIR MONITORING

AFTERNOON MONITORING STATION LOCATIONS

TABLE 1

DOCUMENTATION AIR MONITORING

SAMPLE DURATION AND VOLUME

NOVEMBER 5, 2003 SAMPLING EVENT

TABLE 1
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
5-Nov-03
SAMPLE DURATION AND VOLUME

Date	Weather Conditions	Sample Station	Pump Flow Rate (L/min)	Sample Start Time	Sample Stop Time	Duration (hrs/minutes)	Sample Volume (L)
11/5/2003	58° - 65°F wind from SSW, 12 - 20 mph Intermittent rain	Downwind #1- Pump 2 (particulate)	1.7	7:12	15:23	8:11	834.70
11/5/2003		Downwind #1- Pump 5 (metals)	1.97	7:12	15:23	8:11	967.27
11/5/2003		Downwind #2 - Pump 6 (metals)	2.12	7:17	15:30	8:13	1045.16
11/5/2003		Downwind #2 - Pump 3 (particulate)	1.69	7:17	15:30	8:13	833.17
11/5/2003		Upwind #1- Pump 4 (metals)	2.03	7:00	15:12	8:12	998.76
11/5/2003		Upwind #1- Pump 1 (particulate)	1.72	7:00	15:12	8:12	846.24

TABLE 2

DOCUMENTATION AIR MONITORING

SUMMARY OF DOCUMINTATION AIR SAMPLING RESULTS

NOVEMBER 5, 2003 SAMPLING EVENT

TABLE 2

STEELFIELDS SITE DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
5-Nov-03

PARAMETER	SAMPLE LOCATIONS					
	Downwind # 3		Downwind # 2		Upwind # 1	
Particulates - NIOSH 0600	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**
Respirable particulates	<0.05	<0.06	<0.05	<0.06	<0.05	<0.06
Inorganic Lead	< 0.00038	< 0.0004	< 0.00038	< 0.0004	< 0.00038	< 0.0004
Total Chromium	<0.0015	<0.002	<0.0015	<0.001	<0.0015	<0.002

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Steelfields, LTD

Community Air Monitoring Summary Report

April 29, 2003 – July 31, 2003

Summary of Remedial Work Performed During the Period:

Excavation and removal of contaminated soil/fill from the following areas to the Area III biopad:

- Area I: K, L, D, A, N-14

Backfill and general grading of overburden soil/fill at the following areas:

- Area I: D, A, K&L (Partial)

Importation and placement of off-site borrow soils for backfill.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays) except for the following dates due to inclement weather: 5/12; 5/13; 5/16; 5/26; 6/5; 6/11; 6/13; 7/11.

Community Air Monitoring Program Results:

Daily logs (initiated on 6/30/03) are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring Plan perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., 5 ppm), except as described below.

- June 2nd, 2003 - A non-representative particulate reading was recorded during one 15-minute interval at the southernmost downwind station at the end of the day. The reading was attributed to inadvertent failure to de-energize the datalogger as the meter was being transported to the field trailer for downloading. No followup Documentation Air Monitoring was required due to the non-representative nature of the reading.

- July 3rd, 2003 - Elevated particulate measurements were recorded at the southern downwind station during one 15-minute period. The readings were attributed to truck traffic in close proximity to the monitoring equipment and inadequate watering of the site access roads due to mechanical breakdown of the water truck earlier in the day. NYSDEC was consulted and agreed that a Documentation Air Monitoring was not required based on the fact that the exceedances were attributed to truck traffic and no visible dust was observed emanating from the work areas.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- 5/6-5/8 – Performed concurrent with start of significant earthwork in Area I.
- 7/8 – Performed concurrent with excavation of tar and petroleum impacted soil/fill at SubArea K&L in Area I; also concurrent with stockpiling and grading of soils on the Area III biopad.

Documentation Air Monitoring reports for the above-described events were previously transmitted to NYSDEC and NYSDOH for review. As indicated in the reports, the results showed non-detectable concentrations or levels similar to background for all parameters.

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Steelfields, LTD

Community Air Monitoring Summary Report

August 1, 2003 – August 31, 2003

Summary of Remedial Work Performed During the Period:

- Completed backfill, grading and seeding of Area I: K, L, D, A, N-14
- Importation and placement of off-site borrow soils for backfill.
- Initiated slurry wall in Area II.
- Turned Biopad on (2) occasions.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays) except for the following dates due to inclement weather: 8/6; 8/26; 8/29.

Community Air Monitoring Program Results

Community air monitoring field records for the month of August are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring Plan perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., <5 ppm), except as described below.

- No exceedences reported for the month of August

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- 8/22 – 8/23 – Performed over night summa canister sampling for VOCs and naphthalene across the biopad

Documentation Air Monitoring reports for the above-described events will be prepared and transmitted to NYSDEC and NYSDOH for review upon receipt of the analytical results.

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Steelfields, LTD

Community Air Monitoring Summary Report

September 1, 2003 – September 30, 2003

Summary of Remedial Work Performed During the Period:

- Completed collection system pipe, manhole and pump station installation.
- Continued construction groundwater pre-treatment system.
- Metallurgical reclamation of coke initiated in Area IV.
- Turned Biopad on four occasions.
- Completed ORC injection in Sub-area K & L.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays) except for the following dates due to inclement weather: 9/2, 9/15[1], 9/19, 9/23, 9/29, 9/30.

Community Air Monitoring Program Results

Community air monitoring field records for the month of September are attached. As indicated, all monitoring results conformed to the September 2003 Community Air Monitoring Plan perimeter particulate thershold (i.e., <150 ug/m^3) and Volatile Organic Compound threshold (i.e., <5 ppm), except as described below.

- September 3rd , 2003 - Elevated PID readings of 6 - 8 ppm were recorded for an approximate ½ hour period. Checked the reading with a separate PID, which gave readings of < 1 ppm. Three attempts were needed to re-zero the original instrument, indicating sensor failure There were no odors detected. DEC stated that no documentation monitoring was needed.
- September 17th , 2003 - Elevated particulate measurements were recorded in Area IV on the first day of coke excavation during one 20-minute period. The readings were attributed to truck traffic in close proximity to the monitoring equipment and inadequate watering of the site access roads. NYSDEC was consulted and agreed that Documentation Air Monitoring was not required based on the fact that the exceedances

[1] Precipitation on this date was intermittent. Monitoring was therefore performed using handheld instruments only; portable stations were not used

were attributed to truck traffic and no visible dust was observed emanating from the excavation areas.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- 9/18 - Performed scheduled respirable particulate documentation air monitoring in Area IV during coke excavation

- 9/22 - Performed scheduled for VOCs, naphthalene and respirable particulates across the biopad during soil tilling work.

A Documentation Air Monitoring Report for the 9/18 event has been submitted to NYSDEC and the NYSDOH. A report for the 9/22 event will be prepared and transmitted to NYSDEC and NYSDOH for review upon receipt of the analytical results.

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Steelfields, LTD

Community Air Monitoring Summary Report

October 1, 2003 – October 31, 2003

Summary of Remedial Work Performed During the Period:

- Area 2 groundwater collection system construction is approximately 80% complete. Force Main was instaled and pressure tested.
- Slurry wall completed as of 11/1/03.
- Area II Groundwater Pretreatment Facility is 85% complete. Electrical, Mechanical and HVAC installation in progress. All of the pretreatment equipment has been received and is being installed.
- Sanitary Service was installed to Abby St.
- Bioremediation of petroleum-impacted soil/fill continued in Area III. Weekly mechanical agitation continued.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays), as well as Saturday October 18, 25, except for the following dates due to inclement weather: 10/1, 10/3, 10/20, 10/21, 10/22, 10/27, 10/29.

Community Air Monitoring Program Results:

Daily logs for the October monitoring period are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., 5 ppm), except as described below.

- Low voltage and/or power on the dust meter datalogger caused invalid readings on several occasions. These were attributable to an extended workday (10 hours), which approached the limit of the datalogger battery charge life. Dates on which false positive readings occurred included: October 13th, October 14th , 2003 October 23rd, and October 28th. No visible dust was observed leaving the work area during these periods. Handheld particulate meter readings confirmed that the readings were false positive due to equipment problems. NYSDEC was notified of the events and stated that Documentation Air Monitoring not required.

- October 15th , 2003 - A particulate value of 200 ug/m³ was recorded downwind of the slurry wall trench construction. Work was halted, and improvments were made to the system. The dust was from the dry bentonite being used to makeup the slurry, not from site soils. Accordingly, NYSDEC did not require Documentation Air Monitoring.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- October 17th, 2003 – Documentation Air Monitoring for VOCs and naphthalene was performed at the request of NYSDEC to monitor air quality during slurry wall excavation.

A Documentation Air Monitoring report for the above-described event was previously transmitted to NYSDEC and NYSDOH for review. As indicated in the report, the downwind results generally showed non-detectable concentrations or levels similar to background.

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Steelfields, LTD

Community Air Monitoring Summary Report

November 1, 2003 – November 30, 2003

Summary of Remedial Work Performed During the Period:

- Area II groundwater collection system was substantially completed
- Lab results for slurry wall quality assurance and quality control sampling show that all samples meet or exceed design and specifications.
- Mechanical, electrical, and HVAC installation substantially complete for Area II pretreatment Facility.
- Area III bio-pad and Area IV off-site parcel sampling was performed and results were received.
- Reclamation of metallurgical coke from Area IV continued.
- Excavation and backfilling of sub-area Q in Area I was completed.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays), as well as Saturday November 1, except for the following dates due to inclement weather: 11/1, 11/3, 11/5, 11/11, 11/12, 11/13, 11/14, 11/17, 11/19, 11/25. Monitoring was discontinued following the 11/25 event due to discontinuation of intrusive work at the site during the reminder of the month.

Community Air Monitoring Program Results:

Daily logs for the November monitoring period are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., 5 ppm), except as described below. It should be noted, however, that on 11/21/03 particulate data for the day was accidently deleted on the dataloggers. However, no visible dust was observed emanating from the work areas at any time during the course of the day.

- No exceedences reported for the month of November.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- November 5th, 2003 – Documentation Air Monitoring for respirable particulates, chromium and inorganic lead was performed at the request of NYSDEC to monitor air quality during sub-area Q excavation in Area I.

A Documentation Air Monitoring report for the above-described event was previously transmitted to NYSDEC and NYSDOH for review. As indicated in the report, the downwind results generally showed non-detectable concentrations or levels similar to background.

Key Tower, Suite 1350
50 Fountain Plaza
Buffalo, New York 14202
Tel (716)856-0599
Fax (716)856-0583

Steelfields, LTD

Community Air Monitoring Summary Report

December 1, 2003 – December 23, 2003

Summary of Remedial Work Performed During the Period:

- Area II groundwater collection system was substantially completed.
- Final lab results for slurry wall quality assurance and quality control sampling have been received.
- Mechanical, electrical, and HVAC installation complete for Area II pretreatment Facility.
- Reclamation of metallurgical coke from Area IV discontinued.
- Relocation of tar-impacted soil/fill from Area III bio-pad into Area II containment cell was initiated.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays), with the exceptions of the following dates:

- December 1st – December 4th, 2003 – no intrusive work was performed on the site on these dates. As agreed by NYSDEC, no monitoring is required when only non-intrusive activities are being performed.
- December 19th – December 31st, 2003 – winter shutdown – no work performed during this period.
- The following dates due to precipitation and/or wet ground conditions - 12/11, 12/12, 12/15, 12/17, 12/18, 12/19.

Community Air Monitoring Program Results:

Daily logs for the December monitoring period are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., 5 ppm), except as described below.

- December 8th – Truck traffic close to the downwind station created a short term (approximately 15 minutes) exceedence of the particulate limit, the haul road was subsequently regraded to bring moister soil to surface, which corrected the problem.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- December 12th and December 18th, 2003 – Documentation Air Monitoring for respirable particulates and volatile organic compounds, including naphthalene, was performed at the request of NYSDEC to monitor air quality during tar impacted soil relocation from the Area III biopad to the containment in Area II.

Documentation Air Monitoring reports for the above-described events were previously transmitted to NYSDEC and NYSDOH for review. As indicated in the reports, the downwind results generally showed non-detectable concentrations or levels similar to background.

APPENDIX G

PETROTRAP™ SPECIFICATION SHEET

PASSIVE SKIMMERS -

Shown Top: 2" PetroTrap™
Bottom: Cut-away view of 4" PetroTrap™

Application - The **PetroTrap™** Passive Skimmer has a hydrophobic filter for the recovery of free phase petroleum hydrocarbons such as gasoline, diesel and jet fuel without collecting well water. Passive Skimmers are used when the free product depth is minimal. The passive skimmer can be used in 2 in. (5.1cm) and larger wells. For faster product recovery or large product volume, use the **SkimRite™** Active Skimmer.

Why our Skimmer is BETTER – the **PetroTrap™** Passive Skimmer is manufactured to endure the rigors of remediation, and comes standard with the following:

- Density float and hydrophobic filter *fusion welded* together (not glued), collection canister made of *thick* PVC, *brass* valve to empty canister, *stainless steel* guide rod, and coiled hose made of a break-through *space-age material* designed for petroleum hydrocarbon recovery. The 4" model has a PVC outer protective casing with slotted housing.
- Cast **Aluminum locking well cap** with gasket compression fitting for the suspension hose.
- 25 feet of nylon reinforced polyethylene **suspension hose.**
- **LIFETIME WARRANTY ON PETROTRAP!!!** (90-day warranty on **PetroTrap-E™**).

How it Works - The density float positions the bottom of the hydrophobic filter at the product- water interface. The stainless steel guide rod allows the filter/buoy to adjust to product/water table changes up to 24 inches (60.96 cm) on **PetroTrap™** or up to 12 inches (30.48 cm) on **PetroTrap-E™** . A flexible coiled tube connects the skimmer to the collection canister. The Aluminum Locking Well Cap and Suspension Hose support the passive skimmer as it hangs in the recovery well. When the top of the **PetroTrap™** is positioned 18 inches (46 cm) above the liquid layer, the hydrophobic filter is at its center position on the guide rod and is exposed to the product layer. From this position, the hydrophobic filter will adjust up 12 inches (+30.48 cm) and down 12 inches (-30.48 cm). For extremely thick product or in tidal areas, begin with the filter at the top of its travel by placing the top of the **PetroTrap™** 6 inches (16 cm) above the liquid layer. You may want to check the liquid level in the well on a site-specific schedule that assures maximum exposure of the filter to the product layer. The brass valve on the canister can be removed and an extension canister can be added to double the collection volume.

ENVIRO PRODUCTS INC.
1431 Rensen Street • Lansing, Michigan 48910
Telephone: (517) 887-1222 • 1-800-ENVIRO 4
Fax: (517) 887-8374

Passive Skimmers To Meet the Needs Of Every Site . . .

PetroTrap-E™

... and Every Budget

PetroTrap™

Enviro Products Means Service!

Call 1-800-ENVIRO-4

PetroTrap-E™ . . .

The **PetroTrap-E**™ units have been designed using the same quality manufacturing as the Original **PetroTrap**™. We have created these low cost alternatives for use on sites with minimal water table fluctuations. The 2-inch (0.7 Liter) and 4-inch (2.0 Liter) models feature a 12-inch buoy travel, a standard 90-day warranty and are competitively priced at **$585.00** and **$635.00**, respectively.

PetroTrap™ . . .

When water table fluctuations are significant, look to the original **PetroTrap**™ for recovery. These units feature a 24-inch buoy travel and a **LIFETIME WARRANTY** that includes labor and material costs for the replacement of parts, *including filters,* for the lifetime of the unit.

2 inch (0.7 Liter) and 4 inch (2.0 Liter) models are available for recovery of most refined fuels. Please contact EPI with your site specifications or with questions on free product recovery.

Warranty covers parts and labor performed at Enviro Products, Inc. manufacturing site.

ENVIRO PRODUCTS INC.

1431 Rensen Street · Lansing · MI 48910
Tel: (517) 887-1222 · Fax: (517) 887-8374
1-800-ENVIRO4 · *www.enviroproducts.com*

Description:

Our unique passive skimmer system which incorporates the use of an active buoy assembly. This buoy assembly removes free product to a sheen.

PetroTrap™ units can be installed in minutes and are ideal on sites where free product recovery must begin *immediately*. The system employs the use of a collection canister, eliminating the need to run electricity or air lines to the well.

Installation is quick and easy–lower the unit into the well much the same way as a bailer, and suspend it using the lanyard/vent tube (standard 25' length). The unit begins recovering product as soon as product is available. Periodically, the canister is emptied manually through the drain valve at the bottom of the canister.

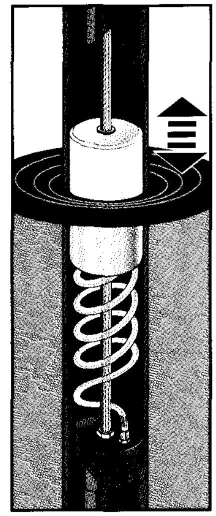
	4" PetroTrap™	2" PetroTrap™
Diameter	3.5"	1.75"
Length	61.0"	76.88"
Weight	18 Lbs.	6.25 Lbs.
Volume	2.0 Liters /.53 Gallons (Other Volumes Optional)	0.7 Liters /.20 Gallons (Other Volumes Optional)
Min. Depth of Water Required	29.0"	39.0"

	4" PetroTrap-E	2" PetroTrap-E™
Diameter	3.5"	1.75"
Length	49.0"	64.88"
Weight	15 Lbs.	5.25 Lbs.
Volume	2.0 Liters /.53 Gallons (Other Volumes Optional)	0.7 Liters /.20 Gallons (Other Volumes Optional)
Min. Depth of Water Required	29.0"	39.0"

PetroTrap™ is manufactured by **Enviro Products Inc.** and is part of **EPI's** line of *"Pure & Simple"* remediation products.

Features:

- No power source required
- Installation takes only minutes
- Effective with petroleum fuels
- Ideal monitoring device to indicate migrating plumes
- Available for 2" and 4" wells



The **PetroTrap**™ filter recovers free product to a sheen

Materials of Construction:

- Stainless steel
- Brass
- Polyethylene
- PVC

Standard System Includes:

- **PetroTrap**™ skimmer assembly (2" or 4" Model)
- 25' suspension hose
- Choice of 2", 4", or 6" locking well cap

Options:

- Additional canister which will double the **PetroTrap's**™ capacity
- Varying lengths of suspension hose

Rentals Available!

For wells where a high yield of free product is expected, consider using a ***SkimRite***™*, EPI's active skimmer system.*

Enviro Products Means Service!

Call 1-800-ENVIRO 4

ENVIRO PRODUCTS INC.
1431 Rensen Street • Suite A • Lansing, Michigan 48910
(517) 887-1222 • 1-800-ENVIRO 4 • Fax: (517) 887-8374
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ENVIRO PRODUCTS INC.

1431 Rensen Street, Lansing, Michigan 48910
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PetroTrap™ Price List

Effective September 18, 2000

	QTY	Price Each	Total Price
COMPLETE SYSTEMS			
Original **PetroTrap™ 4"**			$ 885.00
Original **PetroTrap™ 2"**			$ 885.00
PetroTrap-E™ 2"			$ 585.00
PetroTrap-E™ 4"			$ 635.00
REPLACEMENT / REPAIR COMPONENTS			
Optional Canister (2" or 4")	1.00	$ 115.00	$ 115.00
Suspension Hose (per foot)	1.00	$ 1.26	$ 1.26
Filter Replacement Kit (2" or 4")	1.00	$ 97.00	$ 97.00
Buoy Assembly	1.00	$ 172.52	$ 172.52
Buoy Top Cap	1.00	$ 41.50	$ 41.50
Buoy Bushing	1.00	$ 42.10	$ 42.10
Guide Rod w/ Fittings	1.00	$ 105.00	$ 105.00
Coiled Hose	1.00	$ 23.75	$ 23.75
Slotted Housing (4" only)	1.00	$ 185.00	$ 185.00
Collection Canister	1.00	$ 238.00	$ 238.00
Discharge Valve	1.00	$ 13.50	$ 13.50
Canister Top Cap (4" only)	1.00	$ 42.00	$ 42.00
Canister Top Cap (2" only)	1.00	$ 38.00	$ 38.00
Canister Bottom Cap (2" only)	1.00	$ 38.00	$ 38.00
6" Locking Well Cap	1.00	$ 53.00	$ 53.00
4" Locking Well Cap	1.00	$ 45.00	$ 45.00
2" Locking Well Cap	1.00	$ 37.00	$ 37.00
Aluminum Padlock	1.00	$ 8.42	$ 8.42

Note: Pricing above does not include shipping, handling or any applicable taxes and are subject to change

APPENDIX H

SOIL/FILL MANAGEMENT PLAN

SOIL/FILL MANAGEMENT PLAN
for
FORMER STEEL MANUFACTURING SITE

FORMER STEEL MANUFACTURING SITE
BUFFALO, NY

March 2000 — 0062-001-100
Revised June 2001
Revised September 2002
Revised September 2006

Prepared for:

Steelfields, LTD.
Buffalo, NY

SOIL/FILL MANAGEMENT PLAN FOR FORMER STEEL MANUFACTURING SITE

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SOIL/FILL MANAGEMENT PLAN FOR FORMER STEEL MANUFACTURING SITE

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS
(Contained in Electronic Format Version)
(Area I Construction Closeout Report – Electronic Attachment 4)

1.0 INTRODUCTION

1.1 Background

LTV Steel Company owns, or co-owns with The Hanna Furnace Corporation, a vacant industrial property located along the Buffalo River in Buffalo, New York (See Figure 1-1 and Figure 1-2). The property, hereinafter referred to as the Former Steel Manufacturing Site or Site, is subdivided into four parcels (refer to Figure 1-3) totaling 219 acres, more or less, based on the operational and ownership history of each. The parcels are designated:

- Area I –Republic Steel Plant Parcel
- Area II –Donner-Hanna Coke Plant Parcel
- Area III –Republic Warehouse Parcel
- Area IV –Donner-Hanna Coke Yard Parcel

Two Voluntary Cleanup Site Assessment Reports (April, 1999) were prepared; one characterizing environmental conditions in Area I and the other characterizing the environmental conditions in Area II, III and IV. Two addendum reports to the Area I report (October 1999 and January 2000) and one to the Area II, III, and IV report (January 2000) were prepared to present supplemental site investigation data.

A voluntary cleanup of the Site will be performed in accordance with a Remedial Design/Remedial Action (RD/RA) Work Plan approved by the New York State Department of Environmental Conservation (NYSDEC). The voluntary cleanup program will render the Site suitable for planned redevelopment and use for commercial and industrial purposes.

1.2 Purpose and Scope

The purpose of this Soil/Fill Management Plan (S/FMP) is to protect both the

environment and human health during redevelopment of the Site, subsequent to completion of Voluntary Cleanup activities.

While an assessment of surface and subsurface soil/fill and groundwater at the Site has already been performed and additional off-site field investigations are planned in accordance with the RD/RA Work Plan, subsurface information is never 100 percent complete or accurate, especially on such a large site with a long and diverse manufacturing history. As such, it is not unreasonable to anticipate the possibility that some quantity of subsurface soil/fill contamination may be encountered after completion of the Voluntary Cleanup. In particular, soil/fill contamination may be encountered during development activities such as infrastructure construction (i.e. roads, waterline, sewers, electric cable etc.) or foundation excavation and site grading.

Compliance with this S/FMP is required to properly manage subsurface soil contamination. This S/FMP was developed and incorporated into the Voluntary Cleanup Agreement for the Site with the express purpose of addressing unknown subsurface contamination if and when encountered, thus maintaining the release and covenant not to sue by the NYSDEC. The S/FMP also facilitates the transfer of responsibilities with property ownership.

This S/FMP provides protocols for the proper handling of site soil/fill during development activities, including:

- excavation, grading, sampling and handling of site soils.
- acceptability of soils/fill from off-site sources for backfill or subgrade fill.
- erosion and dust control measures.
- fencing and other access controls.
- health and safety procedures for subsurface construction work and the protection of the surrounding community.
- acceptability and placement of final soil and vegetative cover.
- deed restrictions.

- rezoning of the property.
- program responsibilities.
- notification and reporting requirements.

1.3 Soil/Fill Management Program Responsibility

The developer, Steelfields, LLC and the property owner(s) will be responsible for all monitoring, implementation and reporting requirements of the S/FMP. The developer and owner will not perform, nor contract, nor permit their employees, agents, or assigns to perform any excavations or disturbance of site soils, except as delineated in this S/FMP. Any excavation, regrading or disturbance of on-site soils inconsistent with the provisions of the Plan may be grounds for NYSDEC to void its release from claims, actions, suits, proceeding by the Department against the site owner(s), successor(s) or assigns for environmental conditions on the Site. Such nonconformance with this S/FMP may also void or limit environmental insurance protection of the owner(s) and their successors and assigns in accordance with policy terms and conditions. The property owner(s) or their agents will be responsible for proper notification and reporting to regulatory agencies (i.e., NYSDEC Region 9, Division of Environmental Remediation and NYS Department of Health) prior to and following site development as described in Section 2.8.

The NYSDEC will provide periodic construction oversight and monitoring during site redevelopment activities to verify that the requirements of this S/FMP are adhered to.

2.0 SOIL/FILL MANAGEMENT

2.1 Excavation and Handling of On-Site Soil/Fill

TurnKey Environmental Restoration, LLC or a Professional Engineer with experience in environmental site investigations and the New York State Voluntary Cleanup Program will inspect soil/fill excavations or disturbances on behalf of the subject property owner. The soil/fill will be inspected for staining or discoloration, and will be field screened for the presence of volatile organic compounds (VOCs) with a photoionization detector (PID). The PID detector will be calibrated as per the manufacturer's requirements. Excavated soil/fill that is visibly petroleum or tar-stained, discolored or produces elevated PID readings (i.e. sustained readings of 5 ppm above background or greater) will be stockpiled in an area away from the primary work activities and then sampled for reuse, treatment or disposal. The length of time that potentially impacted soil can be temporarily stockpiled while awaiting analytical results shall be limited to 21 days. Sampling and analysis will be in accordance with the protocols delineated in Section 2.3. Analyzed soil/fill that is determined to contain one or more constituents in excess of the site-specific action levels (SSALs) and additional criteria shown in Table 2-1 shall be covered or treated on-site according to a NYSDEC-approved treatment plan or transported off-site to a permitted waste management facility for disposal. Soil/fill that exhibits no petroleum or tar staining, discoloration or elevated PID readings, or soil/fill, which has been analyzed and found to meet SSALs, may be reused on-site as subgrade backfill. No excavated soil/fill may be removed from the site except for off-site disposal at a permitted waste management facility.

2.2 Subgrade Material

Subgrade material used to backfill excavations or to increase site grades or elevations shall meet the following criteria:

- Excavated on-site soil/fill meeting the requirements of Section 2.1.

- On-site soil/fill treated in accordance with a NYSDEC-approved treatment plan and tested to meet the requirements of Table 2-1.

- Off-site soil/fill originating from known sources having no evidence of disposal or releases of hazardous substances, hazardous, toxic or radioactive wastes, or petroleum and tested to meet all SSALs.

- All off-site sources of material to be used as backfill must be tested in accordance with the Sampling and Analytical Protocol (Section 2.3), and found to contain concentrations less than criteria listed in Table 2-1 plus organic pesticides/herbicides and PCBs as defined in Appendix A of Technical and Administrative Guidance Memorandum (TAGM) Number 4046.

- No off-site materials meeting the definition of a solid waste as defined in 6 NYCRR, Part 360-1.2 (a) shall be used as backfill.

TABLE 2-1

PARAMETER	MAXIMUM CONCENTRATION IN SOIL/FILL (mg/kg) (1,2)
Individual VOC	1
Total VOCs (3)	10
Total SVOCs (4)	500
Total cPAHs (5)	10
Arsenic	75
Barium	1,000
Cadmium	15
Chromium	1,000
Lead	1,000
Mercury	10
Selenium	61
Silver	10
Cyanide (Total Amenable)	1,600

NOTES:
(1) Off-site backfill material shall also meet recommended soil cleanup objectives for organic pesticides/herbicides and PCBs as defined in TAGM 4046.
(2) All analyses shall be performed per USEPA SW-846 methodology or other methods acceptable to NYSDEC.
(3) NYSDEC STARS List VOCs per USEPA Method 8021
(4) Target Compound List (TCL) SVOCs per USEPA Method 8270

(5) Carcinogenic polynuclear aromatic hydrocarbons (i.e., benzo(a)anthracene, benzo(a)pyrene, dibenzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene per USEPA Method 8270.

2.3 Soil/Fill Sampling and Analysis Protocol

2.3.1 Excavated On-Site Soil/Fill

Excavated soil/fill that is visibly stained, discolored or produces elevated PID readings will be sampled and classified for reuse, treatment or off-site disposal. A tiered approach based upon the volume of soil/fill being excavated will be used to determine the frequency of sampling. A minimum of one composite sample will be collected for each 250 cubic yards up to1000 cubic yards of material excavated. If more than 1,000 cubic yards of soils are excavated from the same general vicinity and all samples of the first 1,000 cubic yards meet the SSALs in Table 2-1, the sample collection frequency may be reduced to one composite for each additional 1,000 cubic yards of soil from the same general vicinity, up to 5,000 cubic yards. For excavations that generate greater than 5,000 cubic yards, sampling frequency may be reduced to one sample per 5,000 cubic yards, providing all earlier samples met SSALs. A minimum of four grab samples will be collected for each composite sample. Approximately equal aliquots of the grab samples will be composited in the field using a stainless steel trowel and bowl. The trowel and bowl shall be decontaminated with detergent and tap water between sampling locations. The composite sample will be analyzed by a NYSDOH ELAP certified laboratory for the parameters listed on Table 2-1. VOCs may be excluded from the analysis provided that the soil/fill does not exhibit elevated PID readings.

Any excavated soil that produces elevated PID readings will be separately stockpiled in 1000 cubic yard or smaller piles. A single grab sample will be collected from the stockpile from the zone displaying the most elevated field PID reading. The grab sample will be analyzed by a NYSDOH ELAP certified laboratory for volatile organic compounds (EPA Method 8021). A composite sample shall also be prepared from each stockpile for analysis of the other parameters listed in Table 2-1.

If the analysis of the soil/fill samples reveals levels of parameters greater than one or more SSAL, then a duplicate sample will be analyzed by the Toxicity Characteristic Leaching Procedure (TCLP) method for the particular metal or compounds in question to determine the appropriate off-site disposal method. If TCLP hazardous waste characteristic values are exceeded, the soil/fill will be disposed of in a permitted hazardous waste disposal facility. If TCLP analytical results are below hazardous waste characteristic values, the soil/fill will be either disposed of off-site in a permitted sanitary landfill or possibly on-site within the Area II containment cell.

The containment cell may be used as an on-site disposal area only if:

- The groundwater collection, containment and treatment systems are fully functional,
- The final cover system construction has not been completed,
- There is sufficient space available based on the containment cell design, and
- Prior written approval is received from both the NYSDEC and owner/operator of the containment cell.

All soil/fill disposed of within the containment cell will be compacted in maximum twelve-inch lifts to specified density and uniformly graded to promote positive surface water runoff. Proper erosion and dust control methods as described in Section 2.5 will be implemented during soil placement activities.

2.4 Final Surface Coverage

Vegetative or other (e.g., asphalt, buildings, concrete) surface coverage over the entire redeveloped parcel will be required by the developer or owner as a pre-condition of occupancy.

Topsoil used for the final soil cover shall meet the following general specifications:

1. Fertile, friable, natural loam surface soil, capable of sustaining plant growth, free of, clods of hard earth, plants or roots, sticks or other extraneous material harmful to plant growth. Supply a well-graded topsoil with the following approximate analysis:

(a)

Sieve Size	Percent Passing by Weight
3-inch	100
No. 4	>75
No. 200	>30
0.002 mm	<20

(b) pH 5.5 to pH 7.6.

(c) Minimum organic content of 2.5 percent as determined by ignition loss.

(d) Soluble salt content not greater than 500 ppm.

2. Before delivery, collect soil samples for every 5,000 cubic yards of topsoil provided by Developer.

In addition to the above specifications, all topsoil must be tested and found to contain constituent concentrations less than those specified in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046.
TAGM 4046 establishes soil cleanup objectives for inorganics based on site background. The following background levels for heavy metals will be utilized for topsoil:

Parameter	Concentration (mg/kg)
Arsenic	25
Barium	1000
Cadmium	15
Chromium	350
Lead	400
Mercury	1.0
Selenium	5.0
Silver	5.0

(Note: The methodology used to develop background levels for the above described metals (except lead) is based on background concentrations throughout the Buffalo, N.Y. area as described in Appendix A of the April 1999 Site

Assessment Reports. The proposed limit for lead was derived from the February 1998 NYSDEC document entitled Guidelines for Petroleum Spill Inactivation.)

Grass seed used for the final soil cover shall meet the following general specifications:

1. Grass seed mixture: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.

2. The entire ground surface disturbed by construction operations shall be seeded with 100 lbs/acre of seed conforming to the following:

Name of Grass	Application Rate (lbs/acre)	Purity (%)	Germination (%)
Perennial Ryegrass	10	95	85
Kentucky Bluegrass	20	85	75
Strong Creeping Red Fescue	20	95	80
Chewings Fescue	20	95	80
Hard Fescue	20	95	80
White Clover	10	98	75

   (a) Germination and purity percentages should equal or exceed the minimum seed standards listed. If it is necessary to use seed with a germination percentage less than the minimum recommended above, increase the seeding rate accordingly to compensate for the lower germinations.

   (b) Weed seed content not over 0.25 percent and free of noxious weeds.

   (c) All seed shall be rejected if the label lists any of the following grasses:
      1) Sheep Fescue
      2) Meadow Fescue
      3) Canada Blue
      4) Alta Fescue
      5) Kentucky 31 Fescue
      6) Bent Grass

3. In addition to the seed mixtures listed above, one bushel per acre of oats or rye seed shall be sowed over the entire area, including drainage ditches, to provide a quick shade cover and to prevent erosion during turf establishment.

2.5 Erosion Controls

An important element of soil and fill management on this site is the mitigation and control of surface erosion from stormwater runoff. For this reason a Master Erosion Control Plan to be used by all developers has been developed and incorporated as Attachment A2.

2.6 Dust Controls

Particulate monitoring will be performed along the downwind occupied perimeter of subareas or parcels during subgrade excavation, grading and handling activities in accordance with the Community Monitoring Plan further detailed in Section 3.0 as well as in accordance with NYSDEC TAGM 4031 (Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites) presented in Appendix A4.

Dust suppression techniques will be employed as necessary to mitigate fugitive dust from unvegetated or disturbed soil/fill to the extent practicable during post-remediation construction and redevelopment. Such techniques shall be employed even if the community air monitoring results indicate particulate levels are below action levels. Techniques to be utilized may include one or more of the following:

- Applying water on haul roads.
- Wetting equipment and excavation faces.
- Spraying water on buckets during excavation and dumping.
- Hauling materials in properly tarped containers or vehicles.
- Restricting vehicle speeds on-site.
- Covering excavated areas and materials after excavation activity ceases.
- Reducing the excavation size and/or number of excavations.

All reasonable attempts will be made to keep visible and/or fugitive dust to a minimum.

2.7 Fencing and Access Control

A 6-foot tall chain link fence currently surrounds Area I. Additional interior fencing shall be erected and maintained as necessary by the property owner as

remediation/redevelopment proceeds to control access to subdivided or undeveloped parcels and separate them from parcels in active use. Fencing will be relocated by the property owner(s) as necessary as development proceeds. The Area II containment cell and groundwater pretreatment system will be isolated from the remainder of the Site by a 6-foot chain link fence. All fencing around undeveloped areas will be posted with "No Trespassing" signs.

2.8 Property Use Limitations

Requirements for surface coverage over the site and limitations placed on the type of buildings to be constructed will be enforced through the issuance of building permits by the City of Buffalo. Obtaining a building permit from the City will be contingent upon agreeing to implement and comply with this S/FMP. Site limitations will be enforced through the same deed restrictions described in the Voluntary Cleanup Agreement. Deed restrictions shall be applicable to successors and assigns of the property. Specifically, the deed restrictions will be recorded with the Erie County Clerk and:

1. shall prohibit any parcel or subparcel of the Site from being used for purposes other than for the industrial, commercial, and recreational use (and designed) to preclude contact with contamination by humans without the express written waiver of such prohibition by the NYSDEC (Department), or if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department;

2. shall prohibit the use of the groundwater underlying any parcel or subparcel of the Site for drinking water, industrial, or other purposes;

3. shall require owner(s) or the site and subparcels thereof and their successors and assigns to continue in full force and effect any institutional controls, operation and maintenance, and/or soils management required by the Voluntary Cleanup Agreement (VCA), the RD/RA Work Plan (including the Soil/Fill Management Plan), and/or the O&M Plan;

4. shall provide that Volunteers, on behalf of themselves and their successors and assigns, consent to the enforcement by the Department, or if at such time the Department shall no longer exist, any New York State department, bureau, or

other entity replacing the Department, of the prohibitions and restrictions that the VCA requires to be recorded, and thereby covenant not to contest such enforcement.

5. the prohibitions described in the VCA shall be for the duration provided in that document and shall be enforceable only by the Department, or, if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department, but shall not be enforceable by any other party,

6. if there is performed on the Site an additional response action acceptable to the Department, or, if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department, such as to allow it to be used for residential or other purposes, the Department or its successor shall execute a document in recordable form terminating that portion of the instrument relating to the matter identified in the VCA for the area in the Site which the Department has determined may be used for residential purposes; and

7. in the event of a conflict between the above-described Deed Restrictions and those contained in or attached to the VCA, those contained in or attached to the VCA shall apply.

The industrial/commercial use of the site will also be controlled by the City through zoning restrictions. The responsibility for the operation and maintenance of the collection/cover system and groundwater monitoring shall remain with LTV Steel Company and the Hanna Furnace Corporation and/or their successors or assigns. Said responsibilities will be clearly described in any purchase or sale agreements between LTV Steel/The Hanna Furnace Corporation and possible future property owner(s).

Certain stormwater system design criteria will also be required to be implemented during site development. In areas with known groundwater impacts, subsurface injection of storm water from building and parking area stormwater systems could mobilize additional contaminants. In these areas, stormwater injection (drywells) will be prohibited on the Site and stormwater conveyance pipes will be required to have gasketed joints for water tightness to prevent the infiltration of impacted groundwater into the collection systems.

2.9 Notification and Reporting Requirements

The following minimum notification and reporting requirements shall be followed by the property owner prior to and following site development, as appropriate:

- The NYSDEC and NYSDOH will be notified that subgrade activities are being initiated a minimum of 5 working days in advance of construction.

- A construction certification report stamped by a NYS-licensed Professional Engineer, will be prepared and submitted to the NYSDEC and NYSDOH within 90 days after development of each parcel. At a minimum, the report will include:

    - An area map showing the parcel that was developed;

    - A topographic map of the developed property showing actual building locations and dimensions, roads, parking areas, utility locations, berms, fences, property lines, sidewalks, green areas, contours and other pertinent improvements and features;

    - Plans showing areas and depth of fill removal;

    - Copies of daily inspection reports;

    - Description of erosion control measures;

    - A text narrative describing the excavation activities performed, health and safety monitoring performed (both site specific and Community Air Monitoring), quantities and locations of soil/fill excavated, disposal locations for the soil/fill, soil sampling locations and results, a description of any problems encountered, location and acceptability test results for backfill sources, and other pertinent information necessary to document that the site activities were carried out properly;

    - Plans showing before and after survey elevations on a 100-foot grid system to document the thickness of the clean soil cover system; and

    - A certification that all work was performed in conformance with the S/FMP.

- The owners of developed parcels shall complete and submit to the New York State

Department of Environmental Conservation, an Annual Report by January 15th of the following year. This report shall contain certification that the institutional controls put in place, pursuit to the Soil/Fill Management Plan, are still in place, have not been altered and are still effective. The recommended NYSDEC Certification Form is included as Appendix A3, of this Soil/Fill Management Plan.

3.0 HEALTH AND SAFETY PROCEDURES

During redevelopment activities, the developer shall be responsible for implementing suitable procedures to prevent both site construction workers and the community from adverse exposure to residual parameters of concern and other potential hazards posed by the redevelopment work. This will be accomplished through adherence to a written, parcel-specific worker Health and Safety Plan, prepared in accordance with the regulations contained in OSHA 29CFR 1910.120 and the attached Community Air Monitoring Plan.

Although voluntary cleanup remedial measures are anticipated to reduce the potential for encountering parameters of concern above site-specific action levels, the redevelopment activities governed by this Soils Management Plan are a required element of the Voluntary Cleanup Agreement for the site. Thus, 29CFR 1910.120(a)(1)(iii) indicates that these activities are subject to OSHA's hazardous waste operations and emergency response (Hazwopper) standard. This includes the requirement for preparation and implementation of a site-specific worker Health and Safety Plan addressing the following items:

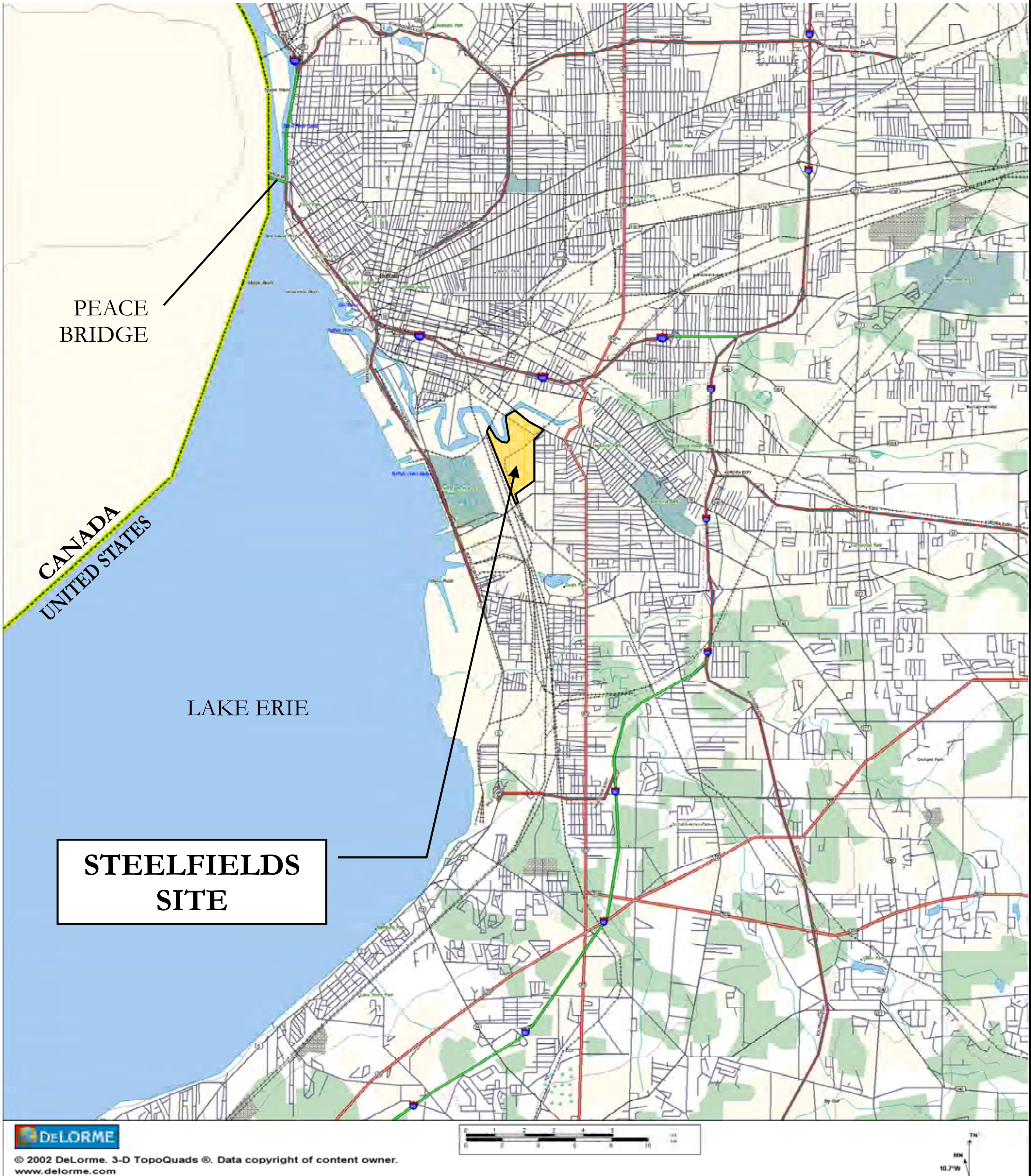
- A safety and health or hazard analysis for each site task and operation.
- Employee training requirements.
- Personal protective equipment (PPE) to be used by employees for the site tasks.
- Medical surveillance requirements.
- Frequency and type of air monitoring, personnel monitoring , and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of equipment.
- Site control measures.
- Decontamination procedures.
- An emergency response plan.
- Confined space entry procedures.

- A spill containment program.

As an integral component of the worker HASP, the developer or site/parcel owner will be responsible for implementing a Community Air Monitoring Plan designed to prevent the surrounding community from adverse exposures due to potential release/migration of airborne particulates or vapors. The community as referenced herein includes potential receptors located off-site (e.g., neighboring residents or businesses) as well as on-site receptors not directly involved in redevelopment activities (e.g. businesses or contractors occupying the site prior to final redevelopment). The Community Air Monitoring Plan presented as Attachment A will be implemented during redevelopment work involving disturbance or handling of Site fill soils. The Plan includes appropriate monitoring, mitigation and response measures consistent with NYSDOH and NYSDEC guidelines. The results of the Community Air Monitoring Plan must be documented to the NYSDEC as described in Section 2.8.

FIGURES

FIGURE 1-1



TURNKEY ENVIRONMENTAL RESTORATION, LLC

726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-008-400

DATE: SEPTEMBER 2004

DRAFTED BY: BCH

SITE REGIONAL MAP

SOIL/FILL MANAGEMENT PLAN

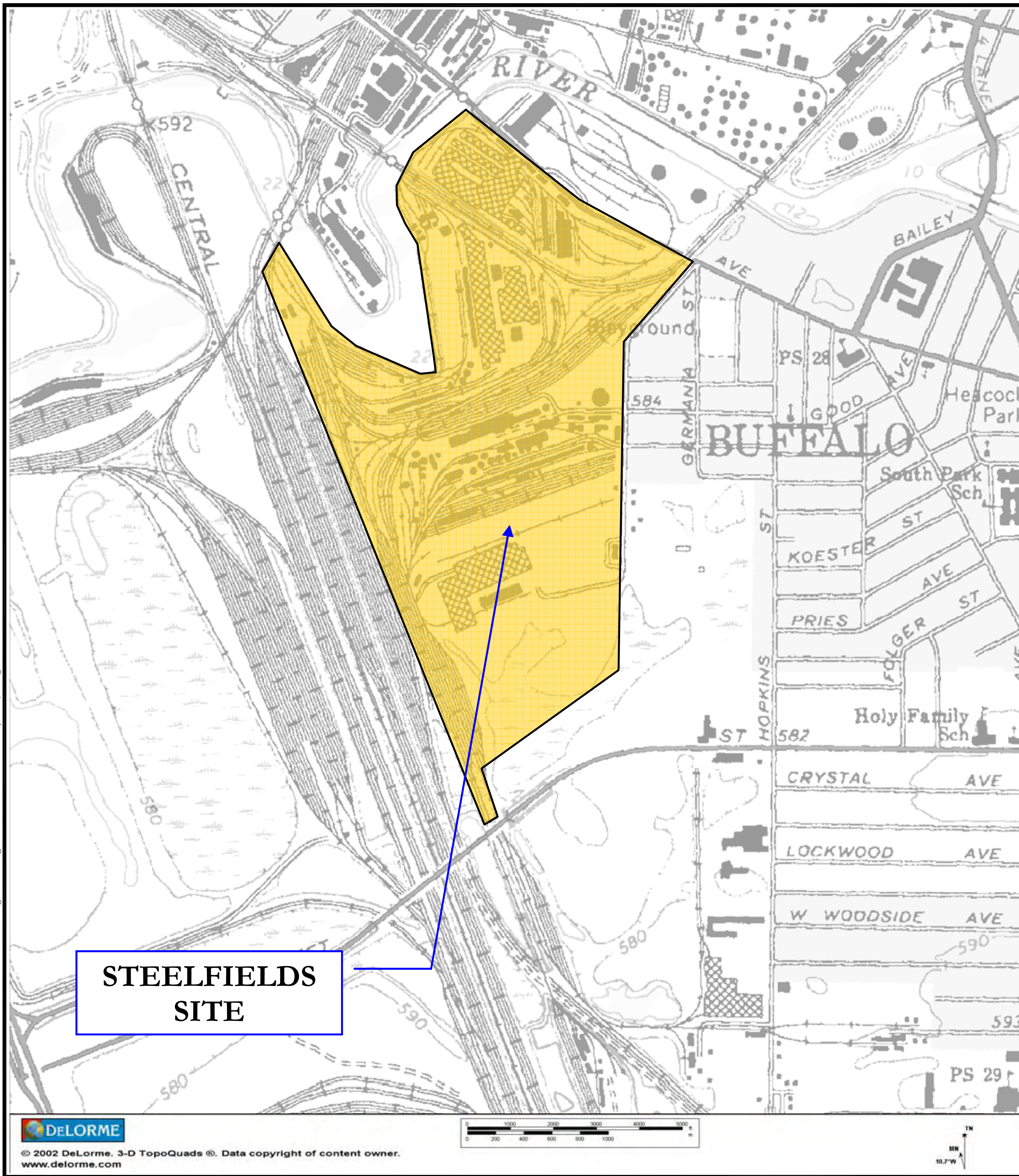
AREA I - FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR

STEELFIELDS, LTD.

FILEPATH:g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 1-1; site regional map.dwg

FIGURE 1-2



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BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-008-400

DATE: SEPTEMBER 2004

DRAFTED BY: BCH

SITE VICINITY MAP

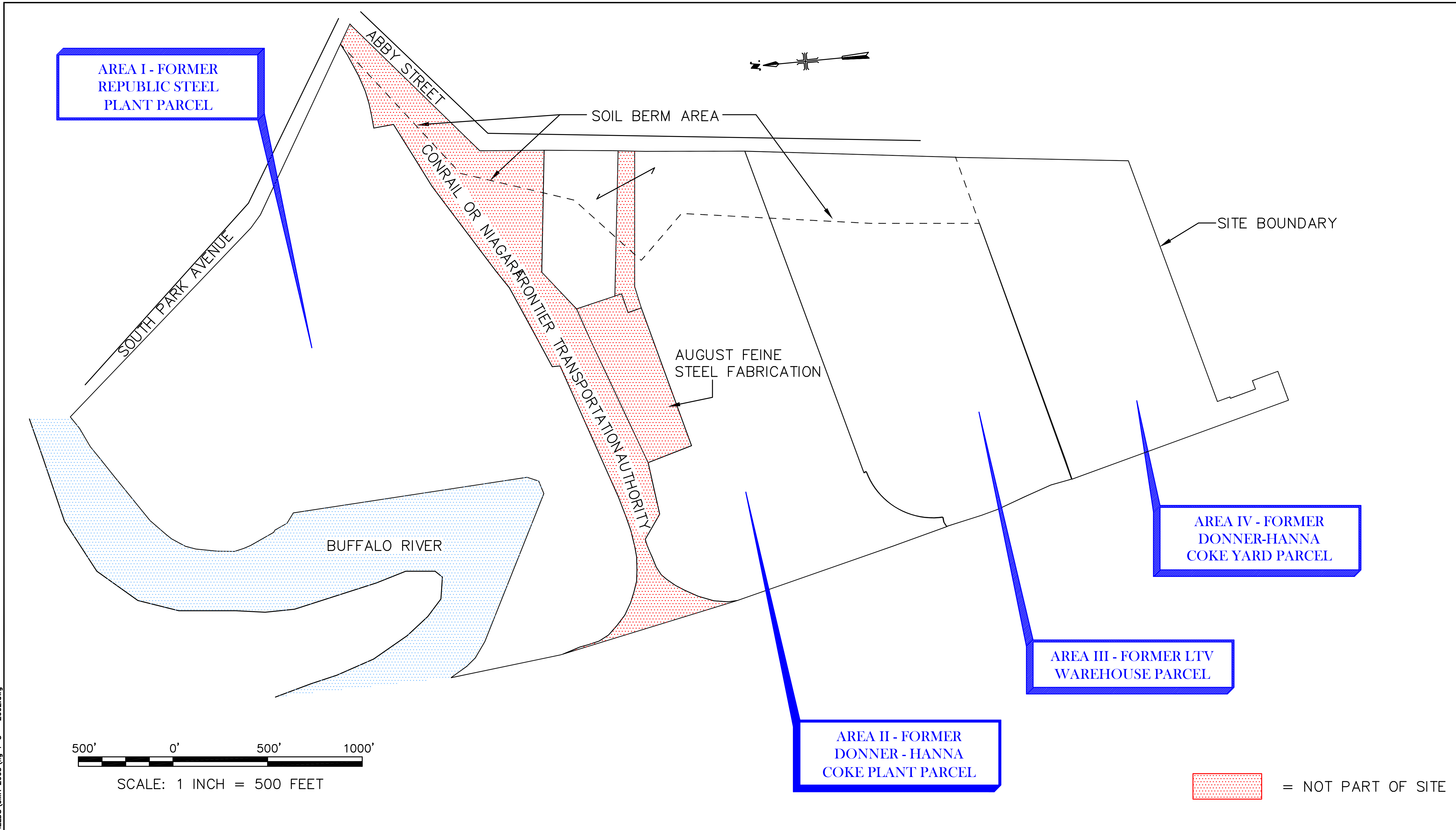
SOIL/FILL MANAGEMENT PLAN

AREA I - FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR

STEELFIELDS, LTD.

FILEPATH:g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 1-2; site vicinity map.dwg



DATE: JANUARY 2004
DRAFTED BY: BCH/WJM
FILEPATH: f:\turnkey\cad\STEELFIELDS\CMR 2003\fig 1-3 – 2002.dwg

TURNKEY ENVIRONMENTAL RESTORATION, LLC

FORMER STEEL MANUFACTURING SITE
SITE MAP
AREA I CLOSE-OUT REPORT
STEELFIELDS LTD

FIGURE 1-3

PROJECT NO.: 0062-008-400
PROJECT LOCATION: BUFFALO, NEW YORK

APPENDIX I

DECLARATION OF COVENANTS AND RESTRICTIONS
(EXHIBIT E)

DECLARATION OF COVENANTS AND RESTRICTIONS

THIS COVENANT, made the _____ day of _______2006 by Steelfields LTD ("Steelfields"), a corporation organized and existing under the laws of the State of New York having an office for the transaction of business at 300 Linden Oaks, Suite 220, Rochester, New York.

WHEREAS, Steelfields is the subject of a Voluntary Agreement executed by its Corporation Secretary as part of the New York State Department of Environmental Conservation's (the "Department's") Voluntary Cleanup Program relative to real property located on South Park and Abby Street in the City of Buffalo, County of Erie, State of New York; and

WHEREAS, for a parcel of the real property known as Area I (hereinafter referred to as "the Property") the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property and such remedy requires that the Property be subject to restrictive covenants.

NOW, THEREFORE, Steelfields, for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration of Covenants and Restrictions, is as shown on a legal description attached to this Declaration as Exhibit "A" and a map attached to this Declaration as Exhibit "B" and made a part hereof.

Second, unless prior written approval by the New York State Department of Environmental Conservation or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property, which threatens the integrity of the vegetative cover, or which results in unacceptable human exposure to contaminated soils.

Third, the owner of the Property shall maintain the vegetative cover in accordance with the Site Management Plan included in the Construction Closeout Report for Area I or, after obtaining the written approval of the Relevant Agency, by covering the Property with another material.

Fourth, the owner of the Property shall prohibit the Property from ever being used for purposes other than for industrial and/or commercial use without the express written waiver of such prohibition by the Relevant Agency.

Fifth, the owner of the Property shall prohibit the use of the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the Relevant Agency.

Sixth, the owner of the Property shall comply with the requirements of the Construction Closeout Report for Area I and maintain in full force and effect any required institutional and engineering controls unless the owner first obtains permission to discontinue such controls from the Relevant Agency;

Seventh, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner, and its successors and assigns, consents to enforcement by the Relevant Agency of the prohibitions and restrictions and hereby covenants not to contest the authority of the Relevant Agency to seek enforcement.

Eighth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

STATE OF NEW YORK)
COUNTY OF ERIE) ss:

On the _____ day of ____ in the year 2007, before me, the undersigned, a Notary Public in and for the State, personally appeared __________________, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument as ________________________ of Steelfields.

Notary Public

APPENDIX J

SITE SURVEY

EXHIBIT A

All that tract or parcel of land, situate in the City of Buffalo, County of Erie and State of New York being part of Lot 17, Township 10, Range 8 of the Ogden Gore Tract and Lots 57, 58 and 60, Township 10, Range 8 of the Buffalo Creek Indian Reservation, bounded and described as follows:

Beginning at a point in the southwest bounds of South Park Avenue (also known as Abbott Road), being 66 feet wide, at a distance of 124.53 feet northwesterly from the northwest bounds of Abby Street, measured along said southwest bounds. Said point being the easterly corner of lands conveyed to Republic Steel Corporation by deed recorded in Liber 5814 at Page 42.

Thence southwesterly, at an angle of 57°-09’-00” measured in the westerly quadrant from the said southwest bounds, a distance of 160.56 feet to the southwest corner of said Republic Steel Corporation lands, being a point of curvature in the former north line of lands owned by the Delaware, Lackawanna and Western Railway Company.

Thence westerly, curving to the right along the arc of a circular curve with a radius of 987.81 feet a distance of 275.12 feet to a point.

Thence southerly, radially to the last described course and along the easterly line of lands conveyed to Republic Steel Corporation by deed recorded in Liber 8777 at page 519, a distance of 99.0 feet to the southeast corner of the last described lands.

Thence southwesterly, at an interior angle of 111°-23’-58” and along the south line of the last described lands, a distance of 385.72 feet to angle point in said south line.

Thence southwesterly, at an exterior angle of 174°-54’-45” and continuing along the south line of the last described lands, a distance of 520.38 feet to a point.

Thence southwesterly, at an exterior angle of 156°-42’-46”, a distance of 40.00 feet to a point in the north line of lands formerly owned by the New York, Lackawanna and Western Railway Company.

Thence westerly, curving to the right along the arc of a circular curve with a radius of 4,911.15 feet, being along the north line of the last described railway, a distance of 78.65 feet to the northeast corner of lands conveyed to Republic Steel Corporation by deed recorded in Liber 7622 at Page 649.

Thence southerly, along the east line of the last described lands, a distance of 6.00 feet the southeast corner of said last described lands.

Thence westerly and northerly, along the south and west lines of the last described parcel, the following courses and distances:

> Westerly, curving to the right along the arc of a circular curve with a radius of 4,767.15 feet, a distance of 285.00 feet to a point of tangency.
>
> Westerly, tangent to the last describe curve, a distance of 172.06 feet to a point.
>
> Southerly, at an exterior angle of 108°-44’-02” a distance of 39.90 feet to a point.

Westerly, at an interior angle of 105°-24'-00" a distance of 745.51 feet to a point.

Westerly, at an interior angle of 175°-27'-34" a distance of 171.82 feet to a point of curvature.

Westerly, curving to the right along the arc of a circular curve with a radius of 625.50 feet, a distance of 134.18 feet to a point of compound curvature.

Westerly, curving to the right along the arc of a circular curve with a radius of 445.85 feet, a distance of 213.99 feet to point of tangency.

Northwesterly, tangent to the last described curve, a distance of 23.46 feet to a point of curvature.

Northwesterly, curving to the right along the arc of a circular curve with a radius of 424.68 feet, a distance of 192.00 feet to a point of compound curvature.

Northwesterly, curving to the right along the arc of a circular curve with a radius of 293.82 feet, a distance of 74.16 feet to point in the east bounds of the South Buffalo Railway.

Thence northerly, along the east bounds of the South Buffalo Railway, a distance of 88.52 feet to a point.

Thence northerly, at an exterior angle of 179°-10'-28" and continuing along the east bounds of the last mentioned railway, a distance of 566.34 feet to a point.

Thence northerly, at an interior angle of 167°-44'-11" and continuing along the east bounds of the last mentioned railway, a distance of 107.48 feet to the intersection of said east bounds with the south edge of water of the Buffalo River.

Thence easterly and northerly, along the south edge of water of the Buffalo River a distance of 3,879.99 feet to its intersection with the southwest bounds of South Park Avenue.

Thence southeasterly, along the southwest bounds of South Park Avenue, a distance of 1,412.77 feet to an angle point in said southwest bounds.

Thence southeasterly, continuing along the southwest bounds of South Park Avenue, at an exterior angle of 161°-28'-32", a distance of 953.66 feet to the point or place of beginning, containing 89.89 acres, more or less.

WORK PLAN
for
LONG-TERM GROUNDWATER MONITORING

FORMER STEEL MANUFACTURING SITE
BUFFALO, NY

March 2000 | 0062-011-100
Revised June 2005
Revised April 2007

Prepared for:

Prepared by:

LIST OF TABLES

LIST OF FIGURES

ATTACHMENTS

1.0 INTRODUCTION

This groundwater monitoring program has been designed to monitor the effectiveness of the source area removal, treatment, and controls to be implemented at the Former Steel Manufacturing Site in accordance with the Voluntary Cleanup Agreement. Groundwater quality trends will be monitored along the perimeter of the Site and along the Buffalo River. Groundwater elevation and/or quality trends will be monitored inside and adjacent to the Area II containment cell to assess its effectiveness in collecting, containing and controlling groundwater flows.

2.0 GROUNDWATER MONITORING PROGRAM

2.1 Monitoring Network

The long-term groundwater monitoring network and monitoring frequency for this program is presented in Table C1. Figure C1 presents the monitoring well locations.

If any existing wells identified to be in the Groundwater Monitoring Program become damaged or unusable during remedial construction, those wells will be replaced within 30 days of completion of remedial construction. The potential need to install additional wells or adjust the location of new wells will be determined during the remedial activities as additional field information is gathered. New well installations will be surveyed to accurately determine their location and elevation.

2.2 Groundwater Flow and Hydrodynamics

For the first year of monitoring (began 2004) following construction of the Area II groundwater collection and containment system, a complete round of water table elevation data will be collected quarterly from the new wells and all other functional wells that remain on the Site and groundwater isopotential maps prepared. Thereafter, groundwater elevation data will be collected and an isopotential map prepared annually. Slug testing will be performed for any new monitoring wells installed adjacent to the Buffalo River (i.e. A1-MW-6) and used for calculating average annual groundwater constituent loadings to the River.

2.3 Groundwater Sampling

2.3.1 Sampling Frequency

Each newly installed well in the Groundwater Monitoring Program will be sampled semi-annually for two years after completion of remedial work in a subarea and then annually thereafter. In addition, existing monitoring wells will be sampled semi-annually for one year after completion of remedial work in a subarea and then annually thereafter. Following semi-annual sampling events, all Monitoring Program wells will continue to be sampled annually thereafter or at the frequency identified on Table C1. Any wells installed after remediation is complete (as listed in Section 2.1) will be sampled to establish a historical baseline for each monitoring well.

2.3.2 Sampling Method

The monitoring wells in the program will be sampled using USEPA Region II Low Stress (i.e. low-flow) Purging and Sampling technique. The low flow method produces samples with lower turbidity and smaller volumes of purge water than using conventional bailer techniques. Low-flow sampling also produces less agitation of the groundwater. As a result, the low-flow method provides a more representative sample, in relation to actual groundwater conditions, by not drastically altering the chemistry of the groundwater while withdrawing the sample. TurnKey's Field Operating Procedure (FOP) for the low-flow technique is provided as Attachment C1.

2.3.3 Analyses

For the first year, groundwater samples will be analyzed for the parameters and analytical methods presented in Table C2. After the first year, the parameter list will be reviewed for each monitoring well to determine whether the parameter list can be reduced based on the analytical results as well as the proposed activities for the site.

2.4 Statistical Evaluations

2.4.1 Parameters of Interest

Based upon the groundwater test results to date, the following parameters of interest will be statistically evaluated for all water quality monitoring wells in Area I:

- Benzene, lead, cyanide and TPH (for those wells that TPH and cyanide are analyzed), and
- Any parameters exceeding the groundwater quality standard for two (2) consecutive events.

For each "parameter of interest", statistical tables in spreadsheet form will be generated that include parameter concentration for each sampling event number, laboratory detection limit, moving average, standard deviation, and mean. The moving average will involve averaging four sequential concentrations in succession for analytical data.

2.4.2 Data Evaluation

For each monitoring location, a graph will then be generated which has the individual sample results and moving average concentration versus sampling event (i.e. time). A trend line will be plotted of the moving average, and evaluated to assess an increasing, decreasing, or neutral trend (neutral is having no significant increasing or decreasing trend).

The results will be interpreted in the following manner:

- If an increasing trend occurs for two consecutive monitoring events and the concentrations of each of the monitoring events are above New York State Groundwater Quality Standards/Guidance Values (GWQS/GV), an evaluation will be made to determine the potential cause. The type of evaluation will depend on which parameter(s) has the increasing trend.

- If there is a neutral or decreasing trend in a monitoring well for four consecutive monitoring events (after source removal or implementation of remedial measure), the parameter list and/or frequency of sampling may be reduced subject to NYSDEC approval.

- If there is a neutral or decreasing long-term trend in a monitoring well for all parameters for eight consecutive monitoring events, that location will be considered for elimination from further monitoring subject to NYSDEC approval.

- If an increasing trend occurs along the Buffalo River, the loadings calculation will be performed for the segment belonging to that well. The methodology described in Attachment C2 will be used to calculate loadings, if needed.

2.5 Immiscible Layer Surveillance

During well development and 2004 Long-Term Groundwater Monitoring sampling activities in Area I, field personnel performed visual immiscible layer surveillance of each well and observed no immiscible layer in any of the on-site monitoring wells, except monitoring well A1-MW-6. Monitoring well A1-MW-6 is located approximately 45-feet from the Buffalo River adjacent to Subarea A as shown on Figure C1. In response to NYSDEC's December 27, 2004 letter, a discussion pertaining to the immiscible layer detected in monitoring well A1-MW-6 was presented in the Long-Term Groundwater Monitoring 2004 Annual Report (revised January 2005).

2.5.1 Product Skimmer Installation and Performance

On February 1, 2005, TurnKey personnel installed the PetroTrap™ free product passive skimmer to mitigate the localized immiscible layer in and adjacent to monitoring well A1-MW-6 in accordance with the Long-Term Groundwater Monitoring (LTGWM) 2004 Annual Report for Area I (revised January 2005). The PetroTrap™ free product passive skimmer separates and recovers petroleum and light hydrocarbons from the groundwater. Incorporating hydrophobic filter technology with a storage canister, the device will automatically collect floating product down to a sheen. The PetroTrap™ has a vertical travel of 24 inches to compensate for water table fluctuation.

At the time of installation of the device, the immiscible layer thickness measured 3.35 feet. Based upon this measurement, the monitoring and product removal was conducted twice per week. Subsequent immiscible layer monitoring events at well A1-MW-6 indicated substantial removal of immiscible material with a corresponding decrease in layer thickness within the well. The attached Table C3 summarizes the recovered immiscible material quantities and layer thickness measurements for each monitoring event since the February 2005 installation. As indicated on Figure C3, substantial immiscible layer removal progress has been made since installation of the device.

2.5.2 Monitoring Procedure

Upon arrival at monitoring well A1-MW-6, field personnel will adhere to the following procedure:

- Don appropriate personal protective equipment, such as poly-coated Tyvek and nitrile gloves.
- Place a large polyethylene tarp covering the ground surface around the well using surrounding stones/concrete pieces to secure the tarp in place.
- Unlock well and remove J-plug.
- Carefully remove the PetroTrap™ device by pulling on the safety rope while rolling up the vent tubing; do not pull the device by the vent tubing.
- While holding the device in a vertical position over the tarp, open the bottom valve to drain the collected product into a sealable storage device, such as a plastic bucket with a lid. The bucket should have calibrated markings on the side so that the quantity of product recovered can be determined and recorded.

- Upon product removal, lay the device on the plastic tarp taking care to avoid contact between the device and un-tarped ground surface.
- Slowly lower the interface probe down to the product surface and record the measurement depth.
- Continue lowering the probe through the immiscible layer to the water table and record the measurement depth.
- Remove probe taking care to wipe excess product from the tape of the probe.
- Gather up the PetroTrap™ device and tubing making sure the coiled hose from the hydrophobic filter assembly and storage canister is not kinked and moves freely.
- Slowly lower the device into the well using the safety rope and unrolling the vent tubing.
- If excess water is recovered from the device, raise the device approximately one-foot. If subsequent visits indicate persistent water infiltration, the hydrophobic filter assembly may require replacement.
- Replace the J-plug and lock the well.
- Gather up all disposables (i.e., tarp, gloves, Tyvek, paper towels etc.) and place in standard garbage bag for disposal.
- Transfer recovered product to a properly labeled and sealed 5-gallon bucket with secondary containment inside the Groundwater Pretreatment Building at the Site. Once the bucket is full, a representative sample will be collected and characterized for appropriate off-site disposal.

2.5.3 Monitoring Schedule

Now that the immiscible layer thickness has been substantially decreased, the monitoring frequency will be conducted monthly. Based upon continued monthly monitoring progress of the device, the frequency of monitoring and product removal may be modified, subject to NYSDEC approval.

2.5.4 Petroleum Product Storage and Disposal

The removed petroleum product will be stored in a properly labeled and sealed 5-gallon bucket with secondary containment inside the Groundwater Pretreatment Building at the Site. As discussed in Section 2.5.2, the immiscible layer has been characterized as petroleum product and will be handled as such. Once the bucket is nearly full, a licensed used oil service contractor will be contacted to pick up the recovered product for proper recycling or disposal.

3.0 REPORTING

During the first two years of semi-annual monitoring described in Section 2.3.1, two reports per year will be provided to the NYSDEC. A semi-annual report summarizing the first semi-annual event that includes graphs with trend lines, sampling data, discussion of results, isopotential map, and analytical data presented as tables and maps and an annual report presenting a summary of all semi-annual analytical data collected during the calendar year as well as an engineering and geologic evaluation of all of the data. After the first two years of semi-annual monitoring described above, one annual report will be provided to the NYSDEC, Region 9 Office, by March 1 of each calendar year that includes the information listed above.

Any and all changes to the Monitoring Program will be approved by the NYSDEC prior to implementation.

TABLES

TABLE 1

GROUNDWATER MONITORING NETWORK AND SAMPLE FREQUENCY

Steelfields, LTD.
Former Steel Manufacturing Site
Buffalo, New York

Well Designation	Type of Well		Former Well Designation [1]	Monitoring Event				
				Year 1		Year 2		Year 3
	New	Existing		1 SA	2SA	1 SA	2SA	Annually
AREA I								
A1-MW-1		x	--	x	x	x		x
A1-MW-2		x	--	x	x	x		x
A1-MW-3		x	--	x	x	x		x
A1-MW-4	x		--	x	x	x	x	x
A1-MW-5	x		--	x	x	x	x	x
A1-MW-6	x		A1-MW-9A	x	x	x	x	x
A1-MW-7	x		--	*water level only*				
A1-MW-8	x		A1-MW-F2	x	x	x	x	x
A1-MW-9	x		A1-P-1	x	x	x	x	x
A1-MW-M2		x	--	x	x	x		x
A1-P-4		x	--	x	x	x		x
AREA II								
A2-MW-3		x	--	x	x	x		x
A2-MW-4		x	--	x	x	x		x
A2-MW-5		x	--	x	x	x		x
A2-MW-6		x	--	*water level only*				
A2-MW-7		x	--	*water level only*				
A2-MW-10		x	--	x	x	x		x
A2-MW-12		x	--	*water level only*				
A2-MW-13		x	--	x	x	x		x
A2-MW-14	x		--	x	x	x	x	x
A2-MW-15 [2]	x		--	x				x
A2-MW-16	x		--	x	x	x	x	x
A2-MW-17	x		--	x	x	x	x	x
A2-MW-18	x		--	*water level only*				
A2-MW-19 [3]	x		--	*water level only*				
Various Piezometers [4]	x		--	*water level only*				
AREA III								
A3-MW-7		x	--	x	x	x		x
A3-MW-9 [3]	x		--	*water level only*				
AREA IV								
A4-MW-4		x	--	x	x	x		x
A4-MW-6		x	--	*water level only*				
A4-MW-7		x	--	x	x	x		x
A4-MW-8		x	--	x	x	x		x
A4-MW-9 [3]	x		--	x	x	x	x	x

Notes:
1. The existing monitoring well was either destroyed during construction activities and not present or required decommissioning due to an obstruction; a replacement well was installed during 2004 drilling activities with a new well designation.
2. Monitoring well will be sampled every two years.
3. Monitoring well will be installed within 30 days of remedial work completion.
4. Various piezometers will be installed in the Area II collection trench to assist in hydraulic monitoring.
5. Monitoring well requires the installation of a protective casing.

TABLE 2

ANALYTICAL PARAMETERS PER AREA

Steelfields, LTD.
Former Steel Manufacturing Site
Buffalo, New York

Areas I & II	Areas III & IV
STARS List VOCs (Method 8021)	STARS List VOCs (Method 8021)
Arsenic (Method 6010)	Arsenic (Method 6010)
Chromium (Method 6010)	Chromium (Method 6010)
Lead (Method 6010)	Lead (Method 6010)
TPH (Method 1664) for wells: A1-MW-1 A1-MW-3 A1-MW-6 A1-MW-9	Cyanide (Method 335)

Notes:
1. For the first semi-annual event, wells will be analyzed for "Full List" (i.e., TCL and STARS List VOCs).

TurnKey Environmental Restoration, LLC

TABLE 3

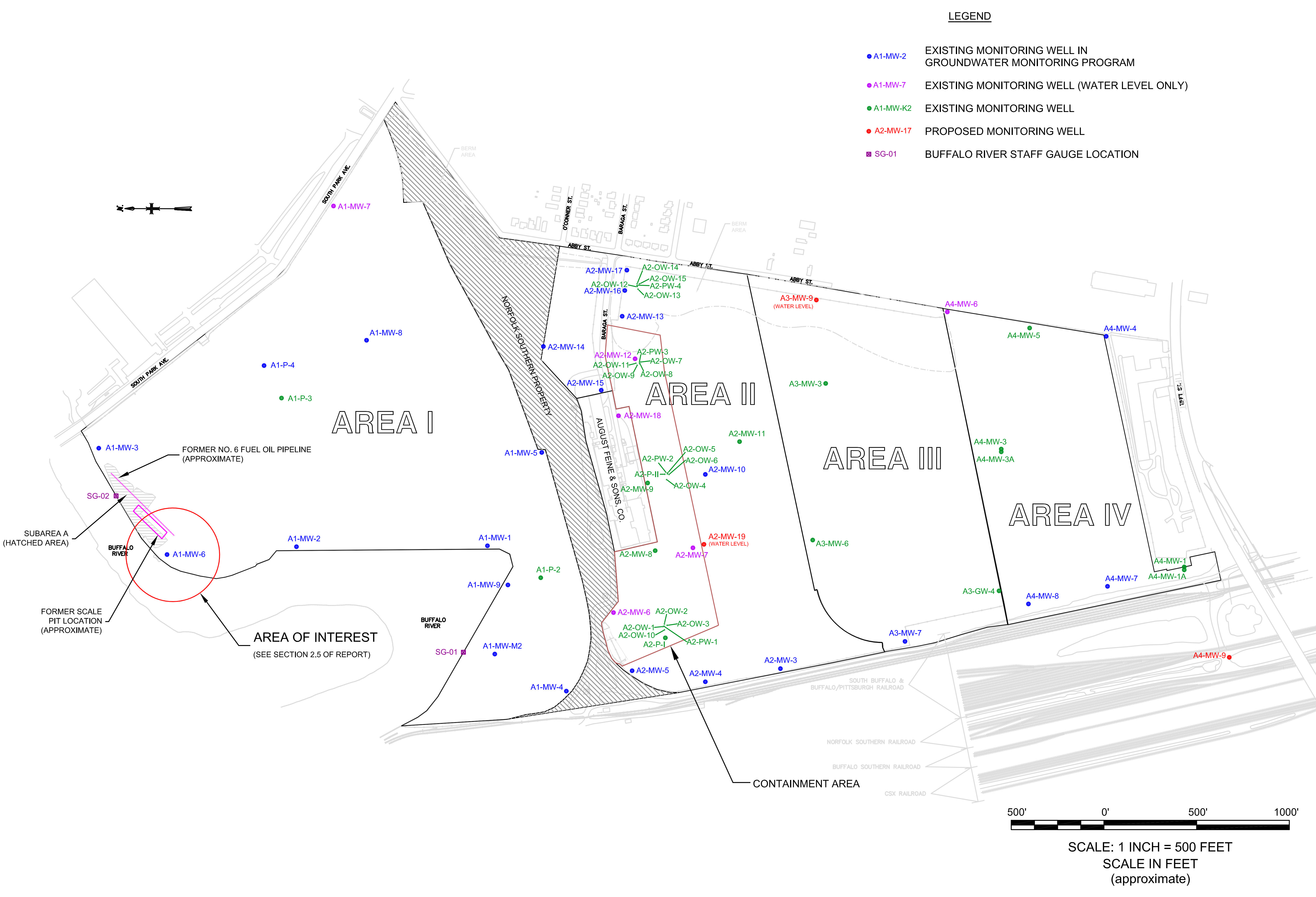
SUMMARY OF LNAPL THICKNESS / REMOVAL IN A1-MW-6

Steelfields, LTD.
Former Steel Manufacturing Site
Buffalo, New York

Date	Days Since Last Visit	LNAPL Measurement			Quantity Removed (oz.)	Progress Report #	Comments
		Top (fbTOR)	Bottom (fbTOR)	Thickness (feet)			
09/21/04	--	18.10	18.40	0.30	NA	1	well development
09/23/04	2	18.10	18.40	0.30	NA		Fall 2004 groundwater monitoring event
02/01/05	131	17.50	20.85	3.35	NA		installed Petro Trap passive skimmer @ 16.00 fbTOR
02/08/05	7	17.94	19.89	1.95	16		first LNAPL removal from Petro Trap
02/11/05	3	17.89	19.75	1.86	20		ok
02/15/05	4	18.10	18.52	0.42	20		ok
02/18/05	3	17.59	17.91	0.32	12		ok
02/25/05	7	18.02	18.51	0.49	2		Petro Trap tubing was tangled
03/04/05	7	18.13	18.63	0.50	6	2	Petro Trap tubing was tangled
03/18/05	14	18.00	18.74	0.74	3.5		checked Petro Trap for leaks, none located
04/08/05	21	17.37	18.20	0.83	24		ok; raised Petro Trap approximately 1-foot
04/14/05	27	17.65	17.81	0.16	22		ok
04/28/05	41	16.23	16.25	0.02	26	3 (to be submitted)	ok
05/17/05	39	17.62	17.80	0.18	14		~14 oz. of water in Petro Trap; raised approx. 1-foot

Total Quantity Removed To Date: 165.5 oz.

FIGURES



DATE: JUNE 2005
DRAFTED BY: BCH
FILEPATH: g:\cad\turnkey\steelfields\long term groundwater monitoring plan\figure c1; proposed and existing monitoring wells -- june 2005.dwg

726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

TurnKey Environmental Restoration, LLC

JOB NO.: 0062-001-100

PROPOSED NEW & EXISTING MONITORING WELLS

LONG TERM GROUNDWATER MONITORING PLAN

FORMER STEEL MANUFACTURING SITE
BUFFALO, NEW YORK

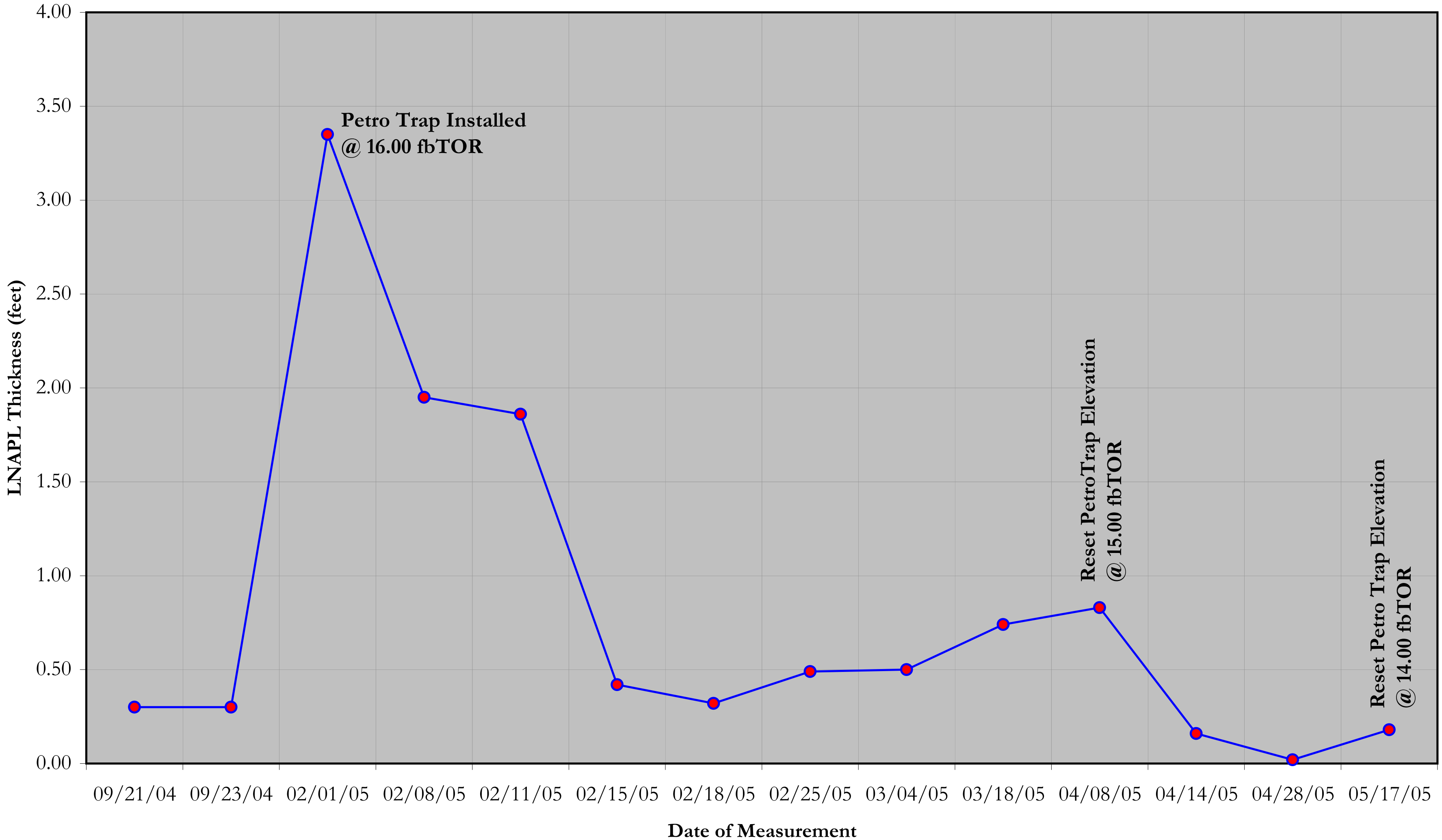
PREPARED FOR
STEELFIELDS, LTD.

FIGURE C1

FIGURE 2

LNAPL THICKNESS WITHIN A1-MW-6 VERSUS TIME

Steelfields, LTD.
Former Steel Manaufacturing Site
Buffalo, New York



ATTACHMENT C1

LOW-FLOW PURGING/SAMPLING STANDARD OPERATING PROCEDURE

BENCHMARK
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FIELD OPERATING PROCEDURES

Low-Flow (Minimal Drawdown) Groundwater Purging & Sampling Procedure

FOP 031.0

LOW FLOW (MINIMAL DRAWDOWN) GROUNDWATER PURGING & SAMPLING PROCEDURES

PURPOSE

This procedure describes the methods used for performing low flow (minimal drawdown) purging, also referred to as micro-purging, at a well prior to groundwater sampling to obtain a representative sample from the water-bearing zone. This method of purging is used to minimize the turbidity of the produced water. This may increase the representativeness of the groundwater samples by avoiding the necessity of filtering suspended solids in the field prior to preservation of the sample.

Well purging is typically performed immediately preceding groundwater sampling. The sample should be collected as soon as the parameters measured in the field (i.e., pH, specific conductance, dissolved oxygen, Eh, temperature, and turbidity) have stabilized.

PROCEDURE

1. Water samples should not be taken immediately following well development. Sufficient time should be allowed to stabilize the groundwater flow regime in the vicinity of the monitoring well. This lag time will depend on site conditions and methods of installation but may exceed one week.

2. Prepare the electronic water level indicator (e-line) in accordance with the procedures referenced in the Benchmark's Groundwater Level Measurement FOP and decontaminate the e-line probe and a lower portion of cable following the procedures referenced in the Benchmark's Non-disposable and Non-dedicated Sampling Equipment Decontamination FOP. Store the e-line in a protected area until use. This may include wrapping the e-line in clean plastic until the time of use.

3. Calibrate all sampling devices and monitoring equipment in accordance with manufacturer's recommendations, the site Quality Assurance Project Plan (QAPP) and/or Field Sampling Plan (FSP). Calibration of field

instrumentation should be followed as specified in Benchmark's Calibration and Maintenance FOP for each individual meter.

4. Inspect the well/piezometer for signs of vandalism or damage and record condition on the Groundwater Well Purge & Sample Collection Log form (sample attached). Specifically, inspect the integrity of the following: concrete surface seal, lock, protective casing and well cover, well casing and J-plug/cap. Report any irregular findings to the Project Manager.

5. Unlock and remove the well protective cap or cover and place on clean plastic to avoid introducing foreign material into the well.

6. Monitor the well for organic vapors using a PID, as per the Work Plan. If a reading of greater than 5 ppm is recorded, the well should be allowed to vent until levels drop below 5 ppm before proceeding with purging.

7. Lower the e-line probe slowly into the monitoring well and record the initial water level in accordance with the procedures referenced in Benchmark's Groundwater Level Measurement FOP. Refer to the construction diagram for the well to identify the screened depth.

8. Decontaminate all non-dedicated pump and tubing equipment following the procedures referenced in the Benchmark's Non-disposable and Non-dedicated Sampling Equipment Decontamination FOP.

9. Lower the purge pump or tubing (i.e., low-flow electrical submersible, peristaltic, etc.) slowly into the well until the pump/tubing intake is approximately in the middle of the screened interval. Rapid insertion of the pump will increase the turbidity of well water, and can increase the required purge time. This step can be eliminated if dedicated tubing is already within the well.

   Placement of the pump close to the bottom of the well will cause increased entrainment of solids, which may have settled in the well over time. Low-flow purging has the advantage of minimizing mixing between the overlying stagnant casing water and water within the screened interval. The objective of low-flow purging is to maintain a purging rate, which minimizes stress (drawdown) of the water level in the well. Low-flow refers to the velocity with which water enters the pump intake and that is imparted to the formation pore water in the immediate vicinity of the well screen.

10. Lower the e-line back down the well as water levels will be frequently monitored during purge and sample activities.

11. Begin pumping to purge the well. The pumping rate should be between 100 and 500 milliliters (ml) per minute (0.03 to 0.13 gallons per minute) depending on site hydrogeology. Periodically check the well water level with the e-line adjusting the flow rate as necessary to stabilize drawdown within the well. If possible, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 feet or less). If the water level exceeds 2 feet below static and declining, slow the purge rate until the water level generally stabilizes. Record each pumping rate and water level during the event.

    The low flow rate determined during purging will be maintained during the collection of analytical samples. At some sites where geologic heterogeneities are sufficiently different within the screened interval, high conductivity zones may be preferentially sampled.

12. Measure and record field parameters (pH, specific conductance, Eh, dissolved oxygen (DO), temperature, and turbidity) during purging activities. In lieu of measuring all of the parameters, a minimum subset could be limited to pH, specific conductance, and turbidity or DO.

    Water quality indicator parameters should be used to determine purging needs prior to sample collection in each well. Stabilization of indicator parameters should be used to determine when formation water is first encountered during purging. In general, the order of stabilization is pH, temperature, and specific conductance, followed by Eh, DO and turbidity. Performance criteria for determination of stabilization should be based on water-level drawdown, pumping rate and equipment specifications for measuring indicator parameters. An in-line flow through cell to continuously measure the above parameters may be used. The in-line device should be disconnected or bypassed during sample collection.

13. Purging will continue until parameters of water quality have stabilized. Record measurements for field indicator parameters (including water levels) at regular intervals during purging. The stability of these parameters with time can be used to guide the decision to discontinue purging. Proper adjustments must be made to stabilize the flow rate as soon as possible.

14. Record well purging and sampling data in the Project Field Book or on the attached Groundwater Well Purge & Sample Collection Log (sample attached). Measurements should be taken approximately every three to five minutes, or as merited given the rapidity of change.

15. Purging is complete when field indicator parameters stabilize. Stabilization is achieved after all field parameters have stabilized for three successive readings. Three successive readings should be within ± 0.1 units for pH, ± 3% for specific conductance, ± 10 mV for Eh, and ± 10% for turbidity and dissolved oxygen. These stabilization guidelines are provided for rough estimates only, actual site-specific knowledge may be used to adjust these requirements higher or lower.

    An in-line water quality measurement device (e.g., flow-through cell) should be used to establish the stabilization time for several field parameters on a well-specific basis. Data on pumping rate, drawdown and volume required for parameter stabilization can be used as a guide for conducting subsequent sampling activities.

16. Collect all project-required samples from the discharge tubing at the flow rate established during purging in accordance with Benchmark's Groundwater Sample Collection Procedures FOP. **If a peristaltic pump and dedicated tubing is used, collect all project-required samples from the discharge tubing as stated before, however volatile organic compounds should be collected in accordance with the procedure presented in the next**

section. Continue to maintain a constant flow rate such that the water level is not drawn down as described above. Fill sample containers with minimal turbulence by allowing the ground water to flow from the tubing along the inside walls of the container.

17. If field filtration is recommended as a result of increased turbidity, an in-line filter equipped with a 0.45-micron filter should be utilized.

18. Replace the dedicated tubing down the well taking care to avoid contact with the ground surface.

19. Restore the well to its capped/covered and locked condition.

20. Upon purge and sample collection completion, slowly lower the e-line to the bottom of the well/piezometer. Record the total depth to the nearest 0.01-foot and compare to the previous total depth measurement. If a significant discrepancy exists, re-measure the total depth. Record observations of purge water to determine whether the well/piezometer had become silted due to inactivity or damaged (i.e., well sand within purge water). Upon confirmation of the new total depth and determination of the cause (i.e., siltation or damage), notify the Project Manager following project field activities.

PERISTALTIC PUMP VOC SAMPLE COLLECTION PROCEDURE

The collection of VOCs from a peristaltic pump and dedicated tubing assembly shall be collected using the following procedure.

1. Once all other required sample containers have been filled, turn off the peristaltic pump. The negative pressure effects of the pump head have not altered groundwater remaining within the dedicated tubing assembly and as such, this groundwater can be collected for VOC analysis.

2. While maintaining the pressure on the flexible tubing within the pump head assembly, carefully remove and coil the polyethylene tubing from the well; taking care to prevent the tubing from coming in contact with the ground

surface and without allowing groundwater to escape or drain from the tubing intake.

3. Once the polyethylene tubing is removed, turn the variable speed control to zero and reverse the pump direction.

4. Slowly increase the pump rate allowing the groundwater within the polyethylene tubing to be "pushed" out of the intake end (i.e., positive displacement) making sure the groundwater within the tubing is not "pulled" through the original discharge end (i.e., negative displacement). Groundwater pulled through the pump head assembly CANNOT be collected for VOC analysis.

5. Slowly fill each VOC vial by holding the vial at a 45-degree angle and allowing the flowing groundwater to cascade down the side until the vial is filled with as minimal disturbance as possible. As the vial fills, slowly rotate the vial to vertical. **DO NOT OVERFILL THE VIAL, AS THE PRESERVATIVE WILL BE LOST.** The vial should be filled only enough so that the water creates a slight meniscus at the vial mouth.

6. Cap the VOC vials leaving no visible headspace (i.e., air-bubbles). Gently tap each vial against your hand checking for air bubbles.

7. If an air bubble is observed, slowly remove the cap and repeat Steps 5 and 6.

ATTACHMENTS

Groundwater Well Purge & Sample Collection Log (sample)

REFERENCES

United States Environmental Protection Agency, 540/S-95/504, 1995. *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures.*

Benchmark FOPs:

007 Calibration and Maintenance of Portable Dissolved Oxygen Meter
008 Calibration and Maintenance of Portable Field pH/Eh Meter
009 Calibration and Maintenance of Portable Field Turbidity Meter
011 Calibration and Maintenance of Portable Photoionization Detector
012 Calibration and Maintenance of Portable Specific Conductance Meter
022 Groundwater Level Measurement
024 Groundwater Sample Collection Procedures
040 Non-Disposable and Non-Dedicated Sampling Equipment Decontamination
046 Sample Labeling, Storage and Shipment Procedures

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ENGINEERING &
SCIENCE, PLLC

LOW FLOW METHOD GROUNDWATER PURGE & SAMPLE COLLECTION LOG

Project Name:	WELL LOCATION:
Project Number:	Sample Matrix: groundwater
Client:	Weather:

WELL DATA:

DATE:	TIME:

Casing Diameter (inches):	Casing Material:
Screened interval (fbTOR):	Screen Material:
Static Water Level (fbTOR):	Bottom Depth (fbTOR):
Elevation Top of Well Riser (fmsl):	Ground Surface Elevation (fmsl):
Elevation Top of Screen (fmsl):	Stick-up (feet):
Standing volume in gallons: [(bottom depth - static water level) x vol calculation in table per well diameter]:	

Volume Calculation

Well Diameter	Volume gal/ft
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469

PURGING DATA:

Pump Type:

Is equipment dedicated to location? yes no	Is tubing dedicated to location? yes no
Depth of Sample (i.e. Level of Intake) (fbTOR):	Approximate Purge Rate (gal/min):

Time	Water Level (fbTOR)	Accumulated Volume (gallons)	pH (units)	Temperature (degrees C)	Specific conductance (μS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	Initial								

SAMPLING DATA:

DATE:	START TIME:	END TIME:

Method: low-flow with dedicated tubing	Was well sampled to dryness? yes no
Initial Water Level (fbTOR):	Was well sampled below top of sand pack? yes no
Final Water Level (fbTOR):	Field Personnel:

PHYSICAL & CHEMICAL DATA:

Appearance:	
Color:	
Odor:	
Sediment Present?	

WATER QUALITY MEASUREMENTS

pH (units)	TEMP. (°C)	SC (uS)	TURB. (NTU)	DO (ppm)	ORP (mV)

REMARKS:

PREPARED BY:

EXHIBIT C1

EPA REGION II LOW STRESS (OR LOW FLOW) PURGING AND SAMPLING PROCEDURE

United States Environmental Protection Agency
Office of Research and Development
Office of Solid Waste and Emergency Response
EPA/540/S-95/504
April 1996

Ground Water Issue

LOW-FLOW (MINIMAL DRAWDOWN) GROUND-WATER SAMPLING PROCEDURES

by Robert W. Puls[1] and Michael J. Barcelona[2]

Background

The Regional Superfund Ground Water Forum is a group of ground-water scientists, representing EPA's Regional Superfund Offices, organized to exchange information related to ground-water remediation at Superfund sites. One of the major concerns of the Forum is the sampling of ground water to support site assessment and remedial performance monitoring objectives. This paper is intended to provide background information on the development of low-flow sampling procedures and its application under a variety of hydrogeologic settings. It is hoped that the paper will support the production of standard operating procedures for use by EPA Regional personnel and other environmental professionals engaged in ground-water sampling.

For further information contact: Robert Puls, 405-436-8543, Subsurface Remediation and Protection Division, NRMRL, Ada, Oklahoma.

I. Introduction

The methods and objectives of ground-water sampling to assess water quality have evolved over time. Initially the emphasis was on the assessment of water quality of aquifers as sources of drinking water. Large water-bearing units were identified and sampled in keeping with that objective. These were highly productive aquifers that supplied drinking water via private wells or through public water supply systems. Gradually, with the increasing awareness of subsurface pollution of these water resources, the understanding of complex hydrogeochemical processes which govern the fate and transport of contaminants in the subsurface increased. This increase in understanding was also due to advances in a number of scientific disciplines and improvements in tools used for site characterization and ground-water sampling. Ground-water quality investigations where pollution was detected initially borrowed ideas, methods, and materials for site characterization from the water supply field and water analysis from public health practices. This included the materials and manner in which monitoring wells were installed and the way in which water was brought to the surface, treated, preserved and analyzed. The prevailing conceptual ideas included convenient generalizations of ground-water resources in terms of large and relatively homogeneous hydrologic *units*. With time it became apparent that conventional water supply generalizations of *homogeneity* did not adequately represent field data regarding pollution of these subsurface resources. The important role of *heterogeneity* became increasingly clear not only in geologic terms, but also in terms of complex physical,

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Superfund Technology Support Center for Ground Water

National Risk Management Research Laboratory
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Technology Innovation Office
Office of Solid Waste and Emergency Response, US EPA, Washington, DC

Walter W. Kovalick, Jr., Ph.D.
Director

chemical and biological subsurface processes. With greater appreciation of the role of heterogeneity, it became evident that subsurface pollution was ubiquitous and encompassed the unsaturated zone to the deep subsurface and included unconsolidated sediments, fractured rock, and *aquitards* or low-yielding or impermeable formations. Small-scale processes and heterogeneities were shown to be important in identifying contaminant distributions and in controlling water and contaminant flow paths.

It is beyond the scope of this paper to summarize all the advances in the field of ground-water quality investigations and remediation, but two particular issues have bearing on ground-water sampling today: aquifer heterogeneity and colloidal transport. Aquifer heterogeneities affect contaminant flow paths and include variations in geology, geochemistry, hydrology and microbiology. As methods and the tools available for subsurface investigations have become increasingly sophisticated and understanding of the subsurface environment has advanced, there is an awareness that in most cases a primary concern for site investigations is characterization of contaminant flow paths rather than entire aquifers. In fact, in many cases, plume thickness can be less than well screen lengths (e.g., 3-6 m) typically installed at hazardous waste sites to detect and monitor plume movement over time. Small-scale differences have increasingly been shown to be important and there is a general trend toward smaller diameter wells and shorter screens.

The hydrogeochemical significance of colloidal-size particles in subsurface systems has been realized during the past several years (Gschwend and Reynolds, 1987; McCarthy and Zachara, 1989; Puls, 1990; Ryan and Gschwend, 1990). This realization resulted from both field and laboratory studies that showed faster contaminant migration over greater distances and at higher concentrations than flow and transport model predictions would suggest (Buddemeier and Hunt, 1988; Enfield and Bengtsson, 1988; Penrose et al., 1990). Such models typically account for interaction between the mobile aqueous and immobile solid phases, but do not allow for a mobile, reactive solid phase. It is recognition of this third *phase* as a possible means of contaminant transport that has brought increasing attention to the manner in which samples are collected and processed for analysis (Puls et al., 1990; McCarthy and Degueldre, 1993; Backhus et al., 1993; U. S. EPA, 1995). If such a phase is present in sufficient mass, possesses high sorption reactivity, large surface area, and remains stable in suspension, it can serve as an important mechanism to facilitate contaminant transport in many types of subsurface systems.

Colloids are particles that are sufficiently small so that the surface free energy of the particle dominates the bulk free energy. Typically, in ground water, this includes particles with diameters between 1 and 1000 nm. The most commonly observed mobile particles include: secondary clay minerals; hydrous iron, aluminum, and manganese oxides; dissolved and particulate organic materials, and viruses and bacteria. These reactive particles have been shown to be mobile under a variety of conditions in both field studies and laboratory column experiments, and as such need to be included in monitoring programs where identification of the *total* mobile contaminant loading (dissolved + naturally suspended particles) at a site is an objective. To that end, sampling methodologies must be used which do not artificially bias *naturally* suspended particle concentrations.

Currently the most common ground-water purging and sampling methodology is to purge a well using bailers or high speed pumps to remove 3 to 5 casing volumes followed by sample collection. This method can cause adverse impacts on sample quality through collection of samples with high levels of turbidity. This results in the inclusion of otherwise immobile artifactual particles which produce an overestimation of certain analytes of interest (e.g., metals or hydrophobic organic compounds). Numerous documented problems associated with filtration (Danielsson, 1982; Laxen and Chandler, 1982; Horowitz et al., 1992) make this an undesirable method of rectifying the turbidity problem, and include the removal of potentially mobile (contaminant-associated) particles during filtration, thus artificially biasing contaminant concentrations low. Sampling-induced turbidity problems can often be mitigated by using low-flow purging and sampling techniques.

Current subsurface conceptual models have undergone considerable refinement due to the recent development and increased use of field screening tools. So-called hydraulic *push* technologies (e.g., cone penetrometer, Geoprobe®, QED HydroPunch®) enable relatively fast screening site characterization which can then be used to design and install a monitoring well network. Indeed, alternatives to conventional monitoring wells are now being considered for some hydrogeologic settings. The ultimate design of any monitoring system should however be based upon adequate site characterization and be consistent with established monitoring objectives.

If the sampling program objectives include accurate assessment of the magnitude and extent of subsurface contamination over time and/or accurate assessment of subsequent remedial performance, then some information regarding plume delineation in three-dimensional space is necessary prior to monitoring well network design and installation. This can be accomplished with a variety of different tools and equipment ranging from hand-operated augers to screening tools mentioned above and large drilling rigs. Detailed information on ground-water flow velocity, direction, and horizontal and vertical variability are essential baseline data requirements. Detailed soil and geologic data are required prior to and during the installation of sampling points. This includes historical as well as detailed soil and geologic logs which accumulate during the site investigation. The use of borehole geophysical techniques is also recommended. With this information (together with other site characterization data) and a clear understanding of sampling objectives, then appropriate location, screen length, well diameter, slot size, etc. for the monitoring well network can be decided. This is especially critical for new in situ remedial approaches or natural attenuation assessments at hazardous waste sites.

In general, the overall goal of any ground-water sampling program is to collect water samples with no alteration in water chemistry; analytical data thus obtained may be used for a variety of specific monitoring programs depending on the regulatory requirements. The sampling methodology described in this paper assumes that the monitoring goal is to sample monitoring wells for the presence of contaminants and it is applicable whether mobile colloids are a concern or not and whether the analytes of concern are metals (and metalloids) or organic compounds.

II. Monitoring Objectives and Design Considerations

The following issues are important to consider prior to the design and implementation of any ground-water monitoring program, including those which anticipate using low-flow purging and sampling procedures.

A. Data Quality Objectives (DQOs)

Monitoring objectives include four main types: detection, assessment, corrective-action evaluation and resource evaluation, along with *hybrid* variations such as site-assessments for property transfers and water availability investigations. Monitoring objectives may change as contamination or water quality problems are discovered. However, there are a number of common components of monitoring programs which should be recognized as important regardless of initial objectives. These components include:

1) Development of a conceptual model that incorporates elements of the regional geology to the local geologic framework. The conceptual model development also includes initial site characterization efforts to identify hydrostratigraphic units and likely flow-paths using a minimum number of borings and well completions;

2) Cost-effective and well documented collection of high quality data utilizing simple, accurate, and reproducible techniques; and

3) Refinement of the conceptual model based on supplementary data collection and analysis.

These fundamental components serve many types of monitoring programs and provide a basis for future efforts that evolve in complexity and level of spatial detail as purposes and objectives expand. High quality, reproducible data collection is a common goal regardless of program objectives.

High quality data collection implies data of sufficient accuracy, precision, and completeness (i.e., ratio of valid analytical results to the minimum sample number called for by the program design) to meet the program objectives. Accuracy depends on the correct choice of monitoring tools and procedures to minimize sample and subsurface disturbance from collection to analysis. Precision depends on the repeatability of sampling and analytical protocols. It can be assured or improved by replication of sample analyses including blanks, field/lab standards and reference standards.

B. Sample Representativeness

An important goal of any monitoring program is collection of data that is truly representative of conditions at the site. The term *representativeness* applies to chemical and hydrogeologic data collected via wells, borings, piezometers, geophysical and soil gas measurements, lysimeters, and temporary sampling points. It involves a recognition of the statistical variability of individual subsurface physical properties, and contaminant or major ion concentration levels, while explaining extreme values. Subsurface temporal and spatial variability are facts. Good professional practice seeks to maximize representativeness by using proven accurate and reproducible techniques to define limits on the distribution of measurements collected at a site. However, measures of representativeness are dynamic and are controlled by evolving site characterization and monitoring objectives. An evolutionary site characterization model, as shown in Figure 1, provides a systematic approach to the goal of consistent data collection.

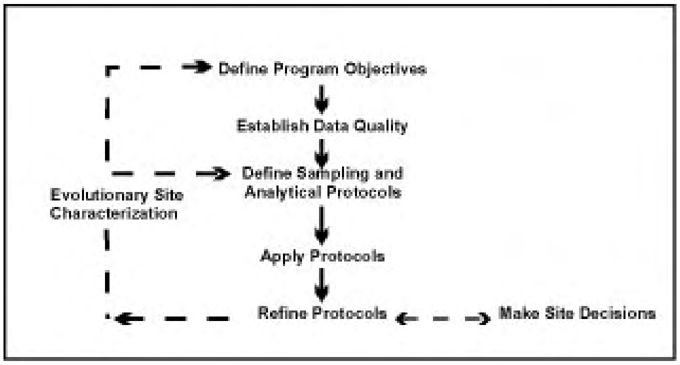

Figure 1. Evolutionary Site Characterization Model

The model emphasizes a recognition of the causes of the variability (e.g., use of inappropriate technology such as using bailers to purge wells; imprecise or operator-dependent methods) and the need to control avoidable errors.

1) Questions of Scale

A sampling plan designed to collect representative samples must take into account the potential scale of changes in site conditions through space and time as well as the chemical associations and behavior of the parameters that are targeted for investigation. In subsurface systems, physical (i.e., aquifer) and chemical properties over time or space are not statistically independent. In fact, samples taken in close proximity (i.e., within distances of a few meters) or within short time periods (i.e., more frequently than monthly) are highly auto-correlated. This means that designs employing high-sampling frequency (e.g., monthly) or dense spatial monitoring designs run the risk of redundant data collection and misleading inferences regarding trends in values that aren't statistically valid. In practice, contaminant detection and assessment monitoring programs rarely suffer these *over-sampling* concerns. In corrective-action evaluation programs, it is also possible that too little data may be collected over space or time. In these cases, false interpretation of the spatial extent of contamination or underestimation of temporal concentration variability may result.

2) Target Parameters

Parameter selection in monitoring program design is most often dictated by the regulatory status of the site. However, background water quality constituents, purging indicator parameters, and contaminants, all represent targets for data collection programs. The tools and procedures used in these programs should be equally rigorous and applicable to all categories of data, since all may be needed to determine or support regulatory action.

C. Sampling Point Design and Construction

Detailed site characterization is central to all decision-making purposes and the basis for this characterization resides in identification of the geologic framework and major hydro-stratigraphic units. Fundamental data for sample point location include: subsurface lithology, head-differences and background geochemical conditions. Each sampling point has a proper use or uses which should be documented at a level which is appropriate for the program's data quality objectives. Individual sampling points may not always be able to fulfill multiple monitoring objectives (e.g., detection, assessment, corrective action).

1) Compatibility with Monitoring Program and Data Quality Objectives

Specifics of sampling point location and design will be dictated by the complexity of subsurface lithology and variability in contaminant and/or geochemical conditions. It should be noted that, regardless of the ground-water sampling approach, few sampling points (e.g., wells, drive-points, screened augers) have zones of influence in excess of a few feet. Therefore, the spatial frequency of sampling points should be carefully selected and designed.

2) Flexibility of Sampling Point Design

In most cases *well-point* diameters in excess of 1 7/8 inches will permit the use of most types of submersible pumping devices for low-flow (minimal drawdown) sampling. It is suggested that *short* (e.g., less than 1.6 m) screens be incorporated into the monitoring design where possible so that comparable results from one device to another might be expected. *Short*, of course, is relative to the degree of vertical water quality variability expected at a site.

3) Equilibration of Sampling Point

Time should be allowed for equilibration of the well or sampling point with the formation after installation. Placement of well or sampling points in the subsurface produces some disturbance of ambient conditions. Drilling techniques (e.g., auger, rotary, etc.) are generally considered to cause more disturbance than *direct-push* technologies. In either case, there may be a period (i.e., days to months) during which water quality near the point may be distinctly different from that in the formation. Proper development of the sampling point and adjacent formation to remove fines created during emplacement will shorten this water quality *recovery* period.

III. Definition of Low-Flow Purging and Sampling

It is generally accepted that water in the well casing is non-representative of the formation water and needs to be purged prior to collection of ground-water samples. However, the water in the screened interval may indeed be representative of the formation, depending upon well construction and site hydrogeology. Wells are purged to some extent for the following reasons: the presence of the air interface at the top of the water column resulting in an oxygen concentration gradient with depth, loss of volatiles up the water column, leaching from or sorption to the casing or filter pack, chemical changes due to clay seals or backfill, and surface infiltration.

Low-flow purging, whether using portable or dedicated systems, should be done using pump-intake located in the middle or slightly above the middle of the screened interval. Placement of the pump too close to the bottom of the well will cause increased entrainment of solids which have collected in the well over time. These particles are present as a result of well development, prior purging and sampling events, and natural colloidal transport and deposition. Therefore, placement of the pump in the middle or toward the top of the screened interval is suggested. Placement of the pump at the top of the water column for sampling is only recommended in unconfined aquifers, screened across the water table, where this is the desired sampling point. Low-flow purging has the advantage of minimizing mixing between the overlying stagnant casing water and water within the screened interval.

A. Low-Flow Purging and Sampling

Low-flow refers to the velocity with which water enters the pump intake and that is imparted to the formation pore water in the immediate vicinity of the well screen. It does not necessarily refer to the flow rate of water discharged at the surface which can be affected by flow regulators or restrictions. Water level drawdown provides the best indication of the stress imparted by a given flow-rate for a given hydrological situation. The objective is to pump in a manner that minimizes stress (drawdown) to the system to the extent practical taking into account established site sampling objectives. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology. Some extremely coarse-textured formations have been successfully sampled in this manner at flow rates to 1 L/min. The effectiveness of using low-flow purging is intimately linked with proper screen location, screen length, and well construction and development techniques. The reestablishment of natural flow paths in both the vertical and horizontal directions is important for correct interpretation of the data. For high resolution sampling needs, screens less than 1 m should be used. Most of the need for purging has been found to be due to passing the sampling device through the overlying casing water which causes mixing of these stagnant waters and the dynamic waters within the screened interval. Additionally, there is disturbance to suspended sediment collected in the bottom of the casing and the displacement of water out into the formation immediately adjacent to the well screen. These disturbances and impacts can be avoided using dedicated sampling equipment, which precludes the need to insert the sampling device prior to purging and sampling.

Isolation of the screened interval water from the overlying stagnant casing water may be accomplished using low-flow minimal drawdown techniques. If the pump intake is located within the screened interval, most of the water pumped will be drawn in directly from the formation with little mixing of casing water or disturbance to the sampling zone. However, if the wells are not constructed and developed properly, zones other than those intended may be sampled. At some sites where geologic heterogeneities are sufficiently different within the screened interval, higher conductivity zones may be preferentially sampled. This is another reason to use shorter screened intervals, especially where high spatial resolution is a sampling objective.

B. Water Quality Indicator Parameters

It is recommended that water quality indicator parameters be used to determine purging needs prior to sample collection in each well. Stabilization of parameters such as pH, specific conductance, dissolved oxygen, oxidation-reduction potential, temperature and turbidity should be used to determine when formation water is accessed during purging. In general, the order of stabilization is pH, temperature, and specific conductance, followed by oxidation-reduction potential, dissolved oxygen and turbidity. Temperature and pH, while commonly used as purging indicators, are actually quite insensitive in distinguishing between formation water and stagnant casing water; nevertheless, these are important parameters for data interpretation purposes and should also be measured. Performance criteria for determination of stabilization should be based on water-level drawdown, pumping rate and equipment specifications for measuring indicator parameters. Instruments are available which utilize in-line flow cells to continuously measure the above parameters.

It is important to establish specific well stabilization criteria and then consistently follow the same methods thereafter, particularly with respect to drawdown, flow rate and sampling device. Generally, the time or purge volume required for parameter stabilization is independent of well depth or well volumes. Dependent variables are well diameter, sampling device, hydrogeochemistry, pump flow rate, and whether the devices are used in a portable or dedicated manner. If the sampling device is already in place (i.e., dedicated sampling systems), then the time and purge volume needed for stabilization is much shorter. Other advantages of dedicated equipment include less purge water for waste disposal, much less decontamination of equipment, less time spent in preparation of sampling as well as time in the field, and more consistency in the sampling approach which probably will translate into less variability in sampling results. The use of dedicated equipment is strongly recommended at wells which will undergo routine sampling over time.

If parameter stabilization criteria are too stringent, then minor oscillations in indicator parameters may cause purging operations to become unnecessarily protracted. It should also be noted that turbidity is a very conservative parameter in terms of stabilization. Turbidity is always the last parameter to stabilize. Excessive purge times are invariably related to the establishment of too stringent turbidity stabilization criteria. It should be noted that natural turbidity levels in ground water may exceed 10 nephelometric turbidity units (NTU).

C. Advantages and Disadvantages of Low-Flow (Minimum Drawdown) Purging

In general, the advantages of low-flow purging include:

- samples which are representative of the *mobile* load of contaminants present (dissolved and colloid-associated);
- minimal disturbance of the sampling point thereby minimizing sampling artifacts;
- less operator variability, greater operator control;

- reduced stress on the formation (minimal drawdown);
- less mixing of stagnant casing water with formation water;
- reduced need for filtration and, therefore, less time required for sampling;
- smaller purging volume which decreases waste disposal costs and sampling time;
- better sample consistency; reduced artificial sample variability.

Some disadvantages of low-flow purging are:
- higher initial capital costs,
- greater set-up time in the field,
- need to transport additional equipment to and from the site,
- increased training needs,
- resistance to change on the part of sampling practitioners,
- concern that new data will indicate a *change in conditions* and trigger an *action*.

IV. Low-Flow (Minimal Drawdown) Sampling Protocols

The following ground-water sampling procedure has evolved over many years of experience in ground-water sampling for organic and inorganic compound determinations and as such summarizes the authors' (and others) experiences to date (Barcelona et al., 1984, 1994; Barcelona and Helfrich, 1986; Puls and Barcelona, 1989; Puls et. al. 1990, 1992; Puls and Powell, 1992; Puls and Paul, 1995). High-quality chemical data collection is essential in ground-water monitoring and site characterization. The primary limitations to the collection of *representative* ground-water samples include: mixing of the stagnant casing and *fresh* screen waters during insertion of the sampling device or ground-water level measurement device; disturbance and resuspension of settled solids at the bottom of the well when using high pumping rates or raising and lowering a pump or bailer; introduction of atmospheric gases or degassing from the water during sample handling and transfer, or inappropriate use of vacuum sampling device, etc.

A. Sampling Recommendations

Water samples should not be taken immediately following well development. Sufficient time should be allowed for the ground-water flow regime in the vicinity of the monitoring well to stabilize and to approach chemical equilibrium with the well construction materials. This lag time will depend on site conditions and methods of installation but often exceeds one week.

Well purging is nearly always necessary to obtain samples of water flowing through the geologic formations in the screened interval. Rather than using a general but arbitrary guideline of purging three casing volumes prior to sampling, it is recommended that an in-line water quality measurement device (e.g., flow-through cell) be used to establish the stabilization time for several parameters (e.g. , pH, specific conductance, redox, dissolved oxygen, turbidity) on a well-specific basis. Data on pumping rate, drawdown, and volume required for parameter stabilization can be used as a guide for conducting subsequent sampling activities.

The following are recommendations to be considered before, during and after sampling:
- use low-flow rates (<0.5 L/min), during both purging and sampling to maintain minimal drawdown in the well;
- maximize tubing wall thickness, minimize tubing length;
- place the sampling device intake at the desired sampling point;
- minimize disturbances of the stagnant water column above the screened interval during water level measurement and sampling device insertion;
- make proper adjustments to stabilize the flow rate as soon as possible;
- monitor water quality indicators during purging;
- collect unfiltered samples to estimate contaminant loading and transport potential in the subsurface system.

B. Equipment Calibration

Prior to sampling, all sampling device and monitoring equipment should be calibrated according to manufacturer's recommendations and the site Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP). Calibration of pH should be performed with at least two buffers which bracket the expected range. Dissolved oxygen calibration must be corrected for local barometric pressure readings and elevation.

C. Water Level Measurement and Monitoring

It is recommended that a device be used which will least disturb the water surface in the casing. Well depth should be obtained from the well logs. Measuring to the bottom of the well casing will only cause resuspension of settled solids from the formation and require longer purging times for turbidity equilibration. Measure well depth after sampling is completed. The water level measurement should be taken from a permanent reference point which is surveyed relative to ground elevation.

D. Pump Type

The use of low-flow (e.g., 0.1-0.5 L/min) pumps is suggested for purging and sampling all types of analytes. All pumps have some limitation and these should be investigated with respect to application at a particular site. Bailers are inappropriate devices for low-flow sampling.

1) General Considerations

There are no unusual requirements for ground-water sampling devices when using low-flow, minimal drawdown techniques. The major concern is that the device give consistent results and minimal disturbance of the sample across a range of *low* flow rates (i.e., < 0.5 L/min). Clearly, pumping rates that cause minimal to no drawdown in one well could easily cause *significant* drawdown in another well finished in a less transmissive formation. In this sense, the pump should not cause undue pressure or temperature changes or physical disturbance on the water sample over a reasonable sampling range. Consistency in operation is critical to meet accuracy and precision goals.

2) Advantages and Disadvantages of Sampling Devices

A variety of sampling devices are available for low-flow (minimal drawdown) purging and sampling and include peristaltic pumps, bladder pumps, electrical submersible pumps, and gas-driven pumps. Devices which lend themselves to both dedication and consistent operation at definable low-flow rates are preferred. It is desirable that the pump be easily adjustable and operate reliably at these lower flow rates. The peristaltic pump is limited to shallow applications and can cause degassing resulting in alteration of pH, alkalinity, and some volatiles loss. Gas-driven pumps should be of a type that does not allow the gas to be in direct contact with the sampled fluid.

Clearly, bailers and other *grab* type samplers are ill-suited for low-flow sampling since they will cause repeated disturbance and mixing of *stagnant* water in the casing and the *dynamic* water in the screened interval. Similarly, the use of inertial lift foot-valve type samplers may cause too much disturbance at the point of sampling. Use of these devices also tends to introduce uncontrolled and unacceptable operator variability.

Summaries of advantages and disadvantages of various sampling devices are listed in Herzog et al. (1991), U. S. EPA (1992), Parker (1994) and Thurnblad (1994).

E. Pump Installation

Dedicated sampling devices (left in the well) capable of pumping and sampling are preferred over <u>any</u> other type of device. Any portable sampling device should be slowly and carefully lowered to the middle of the screened interval or slightly above the middle (e.g., 1-1.5 m below the top of a 3 m screen). This is to minimize excessive mixing of the stagnant water in the casing above the screen with the screened interval zone water, and to minimize resuspension of solids which will have collected at the bottom of the well. These two disturbance effects have been shown to directly affect the time required for purging. There also appears to be a direct correlation between size of portable sampling devices relative to the well bore and resulting purge volumes and times. The key is to minimize disturbance of water and solids in the well casing.

F. Filtration

Decisions to filter samples should be dictated by sampling objectives rather than as a *fix* for poor sampling practices, and field-filtering of certain constituents should not be the default. Consideration should be given as to what the application of field-filtration is trying to accomplish. For assessment of truly dissolved (as opposed to operationally *dissolved* [i.e., samples filtered with 0.45 µm filters]) concentrations of major ions and trace metals, 0.1 µm filters are recommended although 0.45 µm filters are normally used for most regulatory programs. Alkalinity samples must also be filtered if significant particulate calcium carbonate is suspected, since this material is likely to impact alkalinity titration results (although filtration itself may alter the CO_2 composition of the sample and, therefore, affect the results).

Although filtration may be appropriate, filtration of a sample may cause a number of unintended changes to occur (e.g. oxidation, aeration) possibly leading to filtration-induced artifacts during sample analysis and uncertainty in the results. Some of these unintended changes may be unavoidable but the factors leading to them must be recognized. Deleterious effects can be minimized by consistent application of certain filtration guidelines. Guidelines should address selection of filter type, media, pore size, etc. in order to identify and minimize potential sources of uncertainty when filtering samples.

In-line filtration is recommended because it provides better consistency through less sample handling, and minimizes sample exposure to the atmosphere. In-line filters are available in both disposable (barrel filters) and non-disposable (in-line filter holder, flat membrane filters) formats and various filter pore sizes (0.1-5.0 µm). Disposable filter cartridges have the advantage of greater sediment handling capacity when compared to traditional membrane filters. Filters must be pre-rinsed following manufacturer's recommendations. If there are no recommendations for rinsing, pass through a minimum of 1 L of ground water following purging and prior to sampling. Once filtration has begun, a filter cake may develop as particles larger than the pore size accumulate on the filter membrane. The result is that the effective pore diameter of the membrane is reduced and particles smaller than the stated pore size are excluded from the filtrate. Possible corrective measures include prefiltering (with larger pore size filters), minimizing particle loads to begin with, and reducing sample volume.

G. Monitoring of Water Level and Water Quality Indicator Parameters

Check water level periodically to monitor drawdown in the well as a guide to flow rate adjustment. The goal is minimal drawdown (<0.1 m) during purging. This goal may be difficult to achieve under some circumstances due to geologic heterogeneities within the screened interval, and may require adjustment based on site-specific conditions and personal experience. In-line water quality indicator parameters should be continuously monitored during purging. The water quality indicator parameters monitored can include pH, redox potential, conductivity, dissolved oxygen (DO) and turbidity. The last three parameters are often most sensitive. Pumping rate, drawdown, and the time or volume required to obtain stabilization of parameter readings can be used as a future guide to purge the well. Measurements should be taken every three to five minutes if the above suggested rates are used. Stabilization is achieved after all parameters have stabilized for three successive readings. In lieu of measuring all five parameters, a minimum subset would include pH, conductivity, and turbidity or DO. Three successive readings should be within ± 0.1 for pH, ± 3% for conductivity, ± 10 mv for redox potential, and ± 10% for turbidity and DO. Stabilized purge indicator parameter trends are generally obvious and follow either an exponential or asymptotic change to stable values during purging. Dissolved oxygen and turbidity usually require the longest time for stabilization. The above stabilization guidelines are provided for rough estimates based on experience.

H. Sampling, Sample Containers, Preservation and Decontamination

Upon parameter stabilization, sampling can be initiated. If an in-line device is used to monitor water quality parameters, it should be disconnected or bypassed during sample collection. Sampling flow rate may remain at established purge rate or may be adjusted slightly to minimize aeration, bubble formation, turbulent filling of sample bottles, or loss of volatiles due to extended residence time in tubing. Typically, flow rates less than 0.5 L/min are appropriate. The same device should be used for sampling as was used for purging. Sampling should occur in a progression from least to most contaminated well, if this is known. Generally, volatile (e.g., solvents and fuel constituents) and gas sensitive (e.g., Fe^{2+}, CH_4, H_2S/HS^-, alkalinity) parameters should be sampled first. The sequence in which samples for most inorganic parameters are collected is immaterial unless filtered (dissolved) samples are desired. Filtering should be done last and in-line filters should be used as discussed above. During both well purging and sampling, proper protective clothing and equipment must be used based upon the type and level of contaminants present.

The appropriate sample container will be prepared in advance of actual sample collection for the analytes of interest and include sample preservative where necessary. Water samples should be collected directly into this container from the pump tubing.

Immediately after a sample bottle has been filled, it must be preserved as specified in the site (QAPP). Sample preservation requirements are based on the analyses being performed (use site QAPP, FSP, RCRA guidance document [U. S. EPA, 1992] or EPA SW-846 [U. S. EPA, 1982]). It may be advisable to add preservatives to sample bottles in a controlled setting prior to entering the field in order to reduce the chances of improperly preserving sample bottles or introducing field contaminants into a sample bottle while adding the preservatives.

The preservatives should be transferred from the chemical bottle to the sample container using a disposable polyethylene pipet and the disposable pipet should be used only once and then discarded.

After a sample container has been filled with ground water, a Teflon™ (or tin)-lined cap is screwed on tightly to prevent the container from leaking. A sample label is filled out as specified in the FSP. The samples should be stored inverted at 4°C.

Specific decontamination protocols for sampling devices are dependent to some extent on the type of device used and the type of contaminants encountered. Refer to the site QAPP and FSP for specific requirements.

I. Blanks

The following blanks should be collected:

(1) field blank: one field blank should be collected from each source water (distilled/deionized water) used for sampling equipment decontamination or for assisting well development procedures.

(2) equipment blank: one equipment blank should be taken prior to the commencement of field work, from each set of sampling equipment to be used for that day. Refer to site QAPP or FSP for specific requirements.

(3) trip blank: a trip blank is required to accompany each volatile sample shipment. These blanks are prepared in the laboratory by filling a 40-mL volatile organic analysis (VOA) bottle with distilled/deionized water.

V. Low-Permeability Formations and Fractured Rock

The overall sampling program goals or sampling objectives will drive how the sampling points are located, installed, and choice of sampling device. Likewise, site-specific hydrogeologic factors will affect these decisions. Sites with very low permeability formations or fractures causing discrete flow channels may require a unique monitoring approach. Unlike water supply wells, wells installed for ground-water quality assessment and restoration programs are often installed in low water-yielding settings (e.g., clays, silts). Alternative types of sampling points and sampling methods are often needed in these types of environments, because low-permeability settings may require extremely low-flow purging (<0.1 L/min) and may be technology-limited. Where devices are not readily available to pump at such low flow rates, the primary consideration is to avoid dewatering of the well screen. This may require repeated recovery of the water during purging while leaving the pump in place within the well screen.

Use of low-flow techniques may be impractical in these settings, depending upon the water recharge rates. The sampler and the end-user of data collected from such wells need to understand the limitations of the data collected; i.e., a strong potential for underestimation of actual contaminant concentrations for volatile organics, potential false negatives for filtered metals and potential false positives for unfiltered metals. It is suggested that comparisons be made between samples recovered using low-flow purging techniques and samples recovered using passive sampling techniques (i.e., two sets of samples). Passive sample collection would essentially entail acquisition of the sample with no or very little purging using a dedicated sampling system installed within the screened interval or a passive sample collection device.

A. Low-Permeability Formations (<0.1 L/min recharge)

1. Low-Flow Purging and Sampling with Pumps

a. "portable or non-dedicated mode" - Lower the pump (one capable of pumping at <0.1 L/min) to mid-screen or slightly above and set in place for minimum of 48 hours (to lessen purge volume requirements). After 48 hours, use procedures listed in Part IV above regarding monitoring water quality parameters for stabilization, etc., but do not dewater the screen. If excessive drawdown and slow recovery is a problem, then alternate approaches such as those listed below may be better.

b. "dedicated mode" - Set the pump as above at least a week prior to sampling; that is, operate in a dedicated pump mode. With this approach significant reductions in purge volume should be realized. Water quality parameters should stabilize quite rapidly due to less disturbance of the sampling zone.

2. Passive Sample Collection

Passive sampling collection requires insertion of the device into the screened interval for a sufficient time period to allow flow and sample equilibration before extraction for analysis. Conceptually, the extraction of water from low yielding formations seems more akin to the collection of water from the unsaturated zone and passive sampling techniques may be more appropriate in terms of obtaining "representative" samples. Satisfying usual sample volume requirements is typically a problem with this approach and some latitude will be needed on the part of regulatory entities to achieve sampling objectives.

B. Fractured Rock

In fractured rock formations, a low-flow to zero purging approach using pumps in conjunction with packers to isolate the sampling zone in the borehole is suggested. Passive multi-layer sampling devices may also provide the most "representative" samples. It is imperative in these settings to identify flow paths or water-producing fractures prior to sampling using tools such as borehole flowmeters and/or other geophysical tools.

After identification of water-bearing fractures, install packer(s) and pump assembly for sample collection using low-flow sampling in "dedicated mode" or use a passive sampling device which can isolate the identified water-bearing fractures.

VI. Documentation

The usual practices for documenting the sampling event should be used for low-flow purging and sampling techniques. This should include, at a minimum: information on the conduct of purging operations (flow-rate, drawdown, water-quality parameter values, volumes extracted and times for measurements), field instrument calibration data, water sampling forms and chain of custody forms. See Figures 2 and 3 and "Ground Water Sampling Workshop -- A Workshop Summary" (U. S. EPA, 1995) for example forms and other documentation suggestions and information. This information coupled with laboratory analytical data and validation data are needed to judge the "useability" of the sampling data.

VII. Notice

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Figure 2. **Ground Water Sampling Log**

Project _______________ **Site** _______________ **Well No.** _____________ **Date** _________________________

Well Depth ____________ **Screen Length** __________ **Well Diameter** _________ **Casing Type** ____________

Sampling Device _______________ **Tubing type** _____________________ **Water Level** __________________

Measuring Point ___________________ **Other Infor** ____

____

Sampling Personnel ____

Time	pH	Temp	Cond.	Dis.O_2	Turb.	[ ]Conc			Notes

Type of Samples Collected

____

Information: 2 in = 617 ml/ft, 4 in = 2470 ml/ft: $Vol_{cyl} = \pi r^2 h$, $Vol_{sphere} = 4/3\pi\ r^3$

Figure 3. **Ground Water Sampling Log** (with automatic data logging for most water quality parameters)

Project _______________ **Site** _______________ **Well No.** _____________ **Date** ________________________

Well Depth ____________ **Screen Length** __________ **Well Diameter** _________ **Casing Type** ___________

Sampling Device _______________ **Tubing type** _____________________ **Water Level** _________________

Measuring Point ___________________ **Other Infor** ____

____

Sampling Personnel ____

Time	Pump Rate	Turbidity	Alkalinity	[ ] Conc	Notes

Type of Samples Collected

____

Information: 2 in = 617 ml/ft, 4 in = 2470 ml/ft: $Vol_{cyl} = \pi r^2 h$, $Vol_{sphere} = 4/3\pi\ r^3$

ATTACHMENT C2

CALCULATION PROCEDURE-CONTAMINANT LOADING CALCULATION

(TO BE REVISED)

CALCULATION PROCEDURE
CONTAMINANT LOADING CALCULATION

1.0 GENERAL

This procedure presents a method to calculate contaminant loading from the former Steel Manufacturing Site to the Buffalo River, if necessary. This calculation would only be required along the affected segment if an increasing trend in contaminant concentration occurs along the Buffalo River during long-term groundwater monitoring of the site.

2.0 SITE-SPECIFIC CONTAMINANT LOADINGS TO BUFFALO RIVER

Data collected during the long term groundwater monitoring will be used to estimate the groundwater contaminant loading offsite (toward South Park or to the Buffalo River). The calculation of groundwater contaminant mass loading from the Site will be based upon the following assumptions:

- The shoreline of the Buffalo River and the segment along South Park Avenue to the north-northeast will be approximated as four straight lines. Each line will be further segmented as shown on Figure C2-1 and described below:

  Line 1: Segment 1-1 from monitoring well A1-MW-7 to A1-P-4 (approximately 940 feet long). Segment 1-2 from monitoring well A1-P-4 to A1-MW-3 (approximately 1000 feet long).

  Line 2: Segment 2-1 from monitoring well A1-MW-3 to monitoring well A1-MW-6 (approximately 682 feet long). Segment 2-2 from monitoring well A1-MW-6 to monitoring well A1-MW-2 (approximately 700 feet long).

  Line 3: Segment 3-1 from monitoring well A1-MW-2 to monitoring well A1-MW-1 (approximately 1030 feet). Segment 3-2 from monitoring well A1-MW-1 to approximately 230 feet south.

  Line 4: Segment 4-1 from 230 feet south of monitoring well A1-MW-1 to A1-MW-9 (approximately 245 feet). Segment 4-2 from A1-MW-9 to monitoring well A1-MW-M2 (approximately 360 feet). Segment 4-3 from monitoring well A1-MW-M2 approximately 506 feet northwest.

- Only groundwater in the uppermost-saturated zone (viz. fill material) is contributing contaminants to the Buffalo River. Table C2-1 provides saturated fill thickness of existing monitoring wells measured on September 23, 2004.

- The hydraulic conductivity, hydraulic gradient, and groundwater constituent concentration for each segment will be calculated by taking the arithmetic average of the specific variable for each of the wells that define the segment (the values that currently exist are presented in Tables C2-2 and C2-3).

- The west end point of Segment 4-3 will be assumed to have the same chemical properties as monitoring well A1-MW-M2.

- Segment 4-3 hydraulic conductivity will be the average hydraulic conductivity of A1-MW-M2, A1-MW-9, and A1-P-2.

- The hydraulic and chemical properties of south end of Segment 3-2 and the east end of Segment 4-1 will be estimated by interpolating data between A1-MW-1 and A1-MW-9.

- For compounds where the practical quantitation limit exceeds the groundwater quality standard and was detected in Area I groundwater, a value of one-half the method detection limit will be factored into the loading calculations for that compound.

- Any segments with the water table surface existing in the alluvium will be represented with a zero because there would be no flow contribution from saturated fill offsite (Table C-3).

Using the data described above, the groundwater flow rate from the northern boundary of Area I to the Buffalo River will be estimated for each segment using Darcy's Law:

2.1.1.1 **Q=kiA**

where:

Q = Groundwater flow rate

k = average hydraulic conductivity of the segment

i = average hydraulic gradient of the segment

A = saturated cross-sectional area

The estimated groundwater flows from each segment will then be combined to give the total estimated groundwater flow rate from the Site to the River (of 82,446) in cubic feet per day. Groundwater flow rate calculations will be summarized in tabular form (Table 4-7).

Using the groundwater flow rate and the estimated groundwater concentrations for each segment, the off-site contaminant loading will be calculated using the following equation:

$$(\text{Mass Loading})_{i,j} = (6.243 \times 10^{-8})\, Q_i\, C_{i,j}$$

where:

$(\text{Mass Loading})_{i,j}$ = mass loading of constituent j in segment i (lb/day)

Q_i = groundwater flow rate through segment i (ft^3/day)

$C_{i,j}$ = concentration of constituent j in segment i (ug/l)

6.243×10^{-8} = conversion factor to lb/day

Calculations of groundwater contaminant mass loadings for each segment will be summarized in tabular form (Table 4-8) and total off-site contaminant mass loadings from the Site to the Buffalo River summarized in tabular form (Table 4-9). Total off-site VOC and SVOC loadings to the Buffalo River will be estimated in lb/day and shown in tabular (4-9) form.

2.2 3.0 Assessment of Groundwater Impacts on Buffalo River Quality

Using the groundwater contaminant loadings procedure presented above, the estimated increase in downstream constituent concentrations in the Buffalo River at average summer flow rates of 49 million gallons per day (Source: Buffalo River Remedial Action Plan, NYSDEC, November 1989), will be calculated and then compared with New York State Class "D" Water Quality Standards or Guidance Values.

TABLE 2-1

SATURATED FILL THICKNESS FOR MONITORING WELLS

RD/RA Work Plan Appendix C - Long Term Groundwater Monitoring Plan
Steelfields, LTD.
Buffalo, New York

Well Designation	Measurement Date	Ground Elevation (fmsl)	Groundwater Elevation (09/23/04) (fmsl)	Depth to Native Soil (fbgs)	Bottom of Fill Elevation (fmsl)	Saturated Soil/Fill Thickness (feet)
A1-MW-1	09/23/04	583.94	574.94	5.5	578.4	*note 1*
A1-MW-2	09/23/04	584.30	577.78	12.7	571.6	6.2
A1-MW-3	09/23/04	589.68	573.48	17.0	572.7	0.8
A1-MW-6	09/23/04	589.74	573.20	10.0	579.7	*note 1*
A1-MW-7	09/23/04	584.32	574.39	2.0	582.3	*note 1*
A1-MW-9 [2]	09/23/04	585.73	574.75	11.5	574.2	0.5
A1-P-4	09/23/04	586.97	576.21	4.0	583.0	*note 1*
A1-MW-M2	09/23/04	586.08	580.66	6.5	579.6	1.1

Notes:
1. Well screened within native soil. No saturated fill at this location.
2. Monitoring well A1-MW-9 was installed adjacent to and within 6-feet of decommissioned piezometer A1-P-1 on May 10, 2004.

Table 2-2

Calculated Average Groundwater Constituent Concentrations By Segment

Site Assessment Report (Area I)
LTV Steel Company

Constituent	Segment 1-1	Segment 1-2	Segment 1-3	Segment 1-4	Segment 2-1	Segment 2-2	Segment 2-3	Segment 3-1	Segment 3-2	Segment 3-3
Volatile Organic Compounds (ug/L):										
Acetone	27	0	0	0	0	0	0	0	11.5	23
Benzene [(1)]	0.435	0.435	0.435	0.435	0.435	0.435	0.435	0.435	0.435	0.435
Ethylbenzene	0	0	0.0	0.2	1.2	1	0	0	0	0
Toluene	0	0	3.5	6.3	2.8	0	0	0	0	0
Xylene (total) [(2)]	1.75	1.75	7.9	12.7	6.2	1.375	1.75	1.75	1.75	1.75
Semivolatile Organic Compounds (ug/L):										
Acenaphthene	0	0	2	5.1	10.6	7.5	0.21	0.61	0.4	0
Anthracene	0	0	0	0	0	0	0.26	0.76	0.5	0
Fluorene	0	0	3	7.8	16.8	12	0	0	0	0
2-Methylnaphthalene	0	0	10.5	30.8	80.3	60	0	0	0	0
Naphthalene	0	0	4.5	14.6	43.1	33.5	0.74	0.24	0	0
Phenanthrene	0	0	4	11.2	27.2	20	0.26	0.76	0.5	0
Phenol [(3)]	0.465	0.465	1.233	1.848	1.081	0.465	0.465	0.465	0.465	0.465

Notes:

1. Benzene was not detected in the site perimeter groundwater samples. Since the practical quantitation limit was above the groundwater quality standard, a concentration of 1/2 the method detection limit (0.87 ug/L) was used.
2. Xylene was not detected in the site perimeter groundwater samples that define Segments 1-1, 1-2, 2-3, 3-1, 3-2, and 3-3. Since the practical quantitation limit was above the groundwater quality standard, a concentration of 1/2 the method detection limit (3.5 ug/L) was used.
3. Phenol was not detected in the site perimeter groundwater samples that define Segments 1-1, 1-2, 2-2, 2-3, 3-1, 3-2, and 3-3. Since the practical quantitation limit was above the groundwater quality standard, a concentration of 1/2 the method detection limit (0.93 ug/L) was used.

TurnKey Environmental Restoration, LLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE 2-3

CALCULATION OF GROUNDWATER FLOW CONTRIBUTION TO BUFFALO RIVER FROM AREA I

SITE MANAGEMENT PLAN - PART I -APPENDIX IV
Steelfields, LTD.
Buffalo, New York

Line No.	Segment	Location	I (ft/ft)	K (ft/day)	A (ft^2)	Groundwater Flow (ft^3/day)
1	1-1	A1-MW-7	0.0025		0	0.0
		A1-P-4	0.0037	0.68		
	1-2	A1-P-4	0.0037	0.68	292.228	9.2
		A1-MW-3	0.0066	11.6		
2	2-1	A1-MW-3	0.0066	11.6	412.336	15.7
		A1-MW-6	0.0066			
	2-2	A1-MW-6	0.0066		1485.8883	3899.6
		A1-MW-2	0.0181	425.2		
3	3-1	A1-MW-2	0.0181	425.2	1010.739	5831.2
		A1-MW-1	0.0232	133.2		
	3-2	A1-MW-1	0.0232	133.2	97.2675	506.0
		south end	0.0221	325.8		
4	4-1	south end	0.0221	325.8	122.7009	1628.7
		A1-MW-9	0.0355	595.3		
	4-2	A1-MW-9	0.0355	595.3	286.232	2526.4
		A1-MW-M2	0.0238	0.12		
	4-3	A1-MW-M2	0.0238	0.12	774.2628	1.7
		NW end	0.0119	0.12		

Notes:
1. Interpolated groundwater elevations were taken from the September 2004 isopotential map, upgradient of the well location.

= slug testing to be performed

VOLUNTARY CLEANUP SITE ASSESSMENT REPORT
AREA I-REPUBLIC STEEL PLANT PARCEL

FORMER STEEL MANUFACTURING SITE
BUFFALO, NY

Revised April 1999 0002-005-200

Prepared for:
LTV Steel Company, Inc.
Cleveland, OH; and

The Hanna Furnace Corporation
Mishawaka, IN

FORMER STEEL MANUFACTURING SITE
AREA I
VOLUNTARY CLEANUP SITE ASSESSMENT REPORT

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FORMER STEEL MANUFACTURING SITE:
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LIST OF ADDENDA

1	Voluntary Cleanup Site Assessment Report – Area I Republic Steel Plant Parcel & Gas Holder Subarea of Area II, Former Steel Manufacturing Site, October 1999
2	Voluntary Cleanup Site Assessment Report – Area I Republic Steel Plant Parcel, Former Steel Manufacturing Site, January 2000

1.0 INTRODUCTION

1.1 South Buffalo Redevelopment Plan/Intended Use of Site

The City of Buffalo, in partnership with the City of Lackawanna, Erie County, and the Erie County Industrial Development Agency and other stakeholders, has developed a conceptual redevelopment plan for over 1,200 acres of currently inactive and largely vacant industrial properties ("brownfields") in South Buffalo, New York (see Figure 1-1). The redevelopment plan conceptualizes a program for creating employment opportunities while allowing for transportation improvements, open space conservation, wetlands restoration and habitat enhancement, water front access, parks and recreation.

The City of Buffalo has already claimed its first significant brownfields success story under the South Buffalo Redevelopment Plan. The Truscon Property, a former LTV property now owned by the City, was the subject of a fast-track remediation (petroleum spill cleanup) project jointly funded by LTV and the City of Buffalo and completed in late 1996 with the full cooperation of the New York State Department of Environmental Conservation (NYSDEC).

Successful completion of the fast-track remedial efforts allowed the City to close a deal with a developer for construction of a new hydroponics plant that reportedly created over 100 new jobs. The cornerstone of the South Buffalo Redevelopment Plan is the industrial/commercial corridor and Southtowns Connector Highway planned on the site of the former Republic Steel Plant and Donner-Hanna Coke Plant properties (i.e. Former Steel Manufacturing Site). The Redevelopment Plan envisions light manufacturing, warehousing, and distribution facilities on the former Steel Manufacturing Site based on its unique attributes of interstate highway, rail and shipping access and its proximity to the Canadian border crossing at the Peace Bridge and Interstate Route I-90 (see Figures 1-2 and 1-3).

1.2 Background

LTV Steel Company owns, or co-owns with The Hanna Furnace Corporation, a vacant industrial property located on the Buffalo River in Buffalo, New York (See Figure 1-2 and Figure 1-3). The property, hereinafter referred to as the Former Steel Manufacturing Site or Site, is subdivided into the following four parcels totaling 219 acres, more or less, shown on Figure 1-4, based on the operational and ownership history of each:

- Area I - Former Republic (LTV) Steel Plant
- Area II - Former Donner-Hanna Coke Plant
- Area III – Former Republic (LTV) Warehouse
- Area IV - Former Donner- Hanna Coke Yard

A Voluntary Cleanup Site Assessment Report (Reference 1) was prepared to assess the environmental condition of the Site and to establish the basis for a Voluntary Cleanup Plan to support future redevelopment of the Site as a light industrial/corporate park. Based on its review of the Voluntary Cleanup Site Assessment Report, the New York State Department of Environmental Conservation (NYSDEC) requested that additional investigations be performed to better characterize soil and groundwater conditions.

Revised Site Assessment Reports and Voluntary Cleanup Plans were prepared (one each for Areas I and II and a combined plan for Areas III and IV) based upon the results of the additional investigations and proposed site-specific risk-based cleanup levels, and were submitted to the NYSDEC for review (References 2,3, and 4). Subsequently, based upon additional NYSDEC comments, it was decided to pursue a Voluntary Cleanup for Areas II, III and IV together and possibly for Area I separately. As such, Area I is addressed in this document separate from Areas II, III and IV as the regulatory program under which it will be remediated is still under discussion between the Site owners, NYSDEC, and the site purchaser.

1.3 Site History

The Former Republic Steel Plant is the northern-most parcel of the Site. This property is currently owned by LTV Steel Company and is approximately 91 acres in size. In the late 1980's, the Steel Plant structures were demolished and the area regraded.

The property has been used for producing steel since 1906. During the majority of the active site history, the steel plant operated two blast furnaces where molten iron was produced. The molten iron was subsequently converted to steel in two basic oxygen furnaces. The steel ingots produced were sent to the blooming mill where they were passed back and forth in large steel rolls squeezing the ingots into heavy, square or rectangular sections known as blooms. The blooms were then reheated in the bar mills and shaped to customer's requirements.

The plant also operated two sulfuric acid pickling processes. Intermediate pickling was performed on the hot rolled bar products and finishing pickling was performed to achieve final surface quality.

The primary source of wastewater produced at the plant was from the Venturi scrubber used to clean the blast furnace gases. This wastewater was treated in clarifiers located in the northwestern corner of the property. Treated effluent was discharged to the Buffalo River. Wastewater from most of the other cooling processes (Blooming Mill and Bar Mill) was discharged to the Buffalo River following settling of suspended solids and skimming of oil. Spent sulfuric acid from the pickling operations was stored on-site for reuse in neutralization and coagulation processes for the plant wastewater treatment system.

The plant also had numerous above and below ground storage tanks containing various types of oils, greases, gasoline, diesel fuel and heating oil. In addition, there were maintenance shops, scale pits, and several roll finishing buildings.

In the late 1980's, the plant buildings, structures, tanks, vessels, and piping were decommissioned and demolished, with the resulting demolition debris managed in accordance with applicable local, State and Federal regulations. The concrete trenches and pits were cleaned, fractured to prevent water accumulation, and backfilled during the decommissioning and demolition process. Some of the underground piping systems and utilities were also removed in various areas as well. Upon completion of decommissioning activities, the site was graded and seeded to prevent erosion.

Additional site history information is presented in Reference 1.

1.4 Purpose and Scope

The purpose of this report is to update and revise the October 1998 Site Assessment Report for Area I based upon the results of the additional field investigations, performed to date. This report also includes additional documentation (i.e., test pit logs, boring logs and well logs, data quality and usability reports, etc.) as requested by the NYSDEC.

Revised site specific cleanup levels are also proposed based upon discussions with the NYSDEC, review of background soils data from other industrial/commercial properties around the City of Buffalo, and other site-specific testing.

All site data and information presented in the previous investigations have been incorporated into this document along with supplemental information gathered since those reports were prepared.

It is the intent of the site owners to voluntarily cleanup the entire Former Steel Manufacturing Site prior to sale and redevelopment by others. This report was prepared to address the environmental conditions of Area I. Area II, III and IV conditions are addressed in a separate document.

2.0 DEVELOPMENT OF SITE-SPECIFIC ACTION LEVELS IN SOIL/FILL

The Former Steel Manufacturing Site is a brownfields site intended for sale and re-development for light industrial or commercial use following comprehensive remediation of on-site soils and groundwater under NYSDEC's Voluntary Cleanup Program. Due to the large size of the site and the need to complete certain remedial activities before others can be implemented, commercial redevelopment and remedial construction activities will be staggered to allow partial redevelopment and occupancy on cleaned-up portions of the site while other areas undergo or await final remediation. Specifically, redevelopment of the Former Steel Manufacturing Site is anticipated to progress such that Area I will undergo remediation first followed by sale and redevelopment by others. Remediation of Areas II, III and IV, which are segregated from Area I by the NFTA and August Feine property, will primarily occur after the Area I clean-up is complete and redevelopment has started.

Based on this approach to redevelopment, the cleanup objectives for the site soil/fill will include not only implementing remedial measures that are ultimately protective of human health and the environment, but also mitigating potential short term impacts to site construction workers and the surrounding community during the remedial construction and redevelopment period. A detailed discussion of the cleanup approach for the site will be presented in the Voluntary Cleanup Work Plan for the Site. That report will identify the remedial measures to be completed at the Site prior to sale and redevelopment, and will present a Soils Management Plan for soils/fills excavated or handled subsequent to the Voluntary Cleanup during redevelopment activities and for replacement of final soil cover prior to occupancy and use of redeveloped parcels. Integral to the cleanup and redevelopment activities at the site will be the following objectives to protect the public health:

- Complete surface coverage prior to occupancy of a redeveloped parcel. Surface cover will be placed by the developer as a pre-condition of occupancy and will include pavement, buildings, and vegetated "clean"soil cover.

- Installation of fencing to prevent commercial workers and residents from trespassing on un-developed areas of the site.

- Community air monitoring with engineering controls, as necessary, during periods of remedial construction and site redevelopment to prevent un-acceptable fugitive releases of airborne paticulates (i.e. dust).

- Control of surface erosion and run-off during clean-up construction activities.

- Surface stabilization to mitigate potential wind or water-borne migration of surficial soil/fill constituents in disturbed areas of the property that are not undergoing immediate redevelopment (viz., areas outside redeveloped parcels where remedial construction or utility installation has taken place). Although surficial site soils/fill do not currently pose a dust problem due to their granular nature (i.e. slag and compacted soil/rubble) and the existence of natural vegetation areas of the site that are disturbed during remediation activities or by heavy equipment may produce elevated airborne particulate levels until revegetated or otherwise stabilized. As some of these areas will not receive final surface cover until the time of re-development, they will be backfilled such that the upper-most soil lift contains only clean fill, or otherwise stabilized to prevent excessive particulate migration.

Site-specific Action Levels (SSAL's) for soils/fill at the Former Steel Manufacturing Site are presented in this section. These SSAL's represent long-term subsurface concentrations and short-term surficial concentrations that are protective of human health and the environment. The SSAL's should be regarded as screening values that, in combination with other site factors, will assist in defining the need for and extent of pre-development voluntary clean-up actions.

2.1 Parameters of Interest

A comprehensive discussion of the nature and extent of contamination in Area I is presented in Sections 3 and 4. In general, soil/fill constituents detected across the Site at elevated concentrations are the common byproducts of manufactured gas plant and coke processing, coal handling, and steel manufacturing operations. These soil constituents or parameters of interest are:

- **Volatile Organic Compounds (VOCs)** – VOCs present in site soils/fill at elevated concentrations relative to background levels are limited to benzene, toluene, ethylbenzene and xylene (i.e., BTEX). These VOC's are typically associated with coke byproducts and tar handling and disposal. As such they have been detected at elevated concentrations in soil/fill from the former Coke By-Product Subarea of Area II; The Tar Material Subarea of Areas III and IV; and the Blue-Stained Soils/Fill Subareas of Area III.

- **Semi-Volatile Organic Compounds (SVOCs) –** SVOCs detected at the site are almost exclusively limited to poly-aromatic hydrocarbons (PAH's), which are byproducts of incomplete combustion and impurities in petroleum products. As such, they are commonly found in urban soil environments. They are present at concentrations that are elevated compared to "background" across the entire site. The highest concentrations in Area I appear to be related to the storage handling or disposal of petroleum and tar byproducts from the adjacent former Donner- Hanna Coke Plant

- **Inorganics** – heavy metals are present in site soils/fill across the property. Most of these constituents are commonly found in soils at trace levels. Inorganics present in site soils at elevated concentrations relative to "background" or typical concentrations include lead, arsenic and chromium. Mercury is also present in isolated instances. Several of these parameters are components of coke and slag and are present in elevated concentration as a result of coke and slag left at the site.

2.2 Determination of Soil Cleanup Levels

2.2.1 Volatile Organic Compounds (VOCs)

Soil cleanup levels for organic compounds in the soil/fill media were initially proposed for the Former Steel Manufacturing Site based on USEPA Region III risk-based soil cleanup levels, consistent with the proposed commercial/light industrial use of the site as a redeveloped brownfields property. USEPA Region III risk-based soil cleanups were not endorsed by NYSDEC. Alternatively, the volunteers proposed that cleanup be based on ASTM E 1739-95, "Standard Guide for Risk-

Based Corrective Action Applied at Petroleum Release Sites". This approach uses widely-accepted, baseline health risk-assessment methodology to derive site-specific soil cleanup levels for worker exposure to residual BTEX and PAHs, and has been incorporated, in part, into draft spill cleanup guidance currently being developed by NYSDEC's Bureau of Spills Management. Again, NYSDEC rejected the previously proposed risk-based cleanup levels and commented that soils action levels for the Former Steel Manufacturing Site must be protective of not only human health, but also the environment (i.e. groundwater quality).

NYSDEC has published cleanup guidance values for volatile organics that are designed to be protective of both human health and the environment in its Technical and Administrative Guidance Memorandum HWR-94-4046 (i.e., TAGM 4046). TAGM 4046 presents this guidance in two forms: as cleanup objectives for individual VOC parameters, and as cleanup objectives for total (i.e., sum of all detected parameters) VOCs. In instances where properties are slated for voluntary cleanup and non-residential redevelopment with planned surface controls as described above, NYSDEC has applied TAGM 4046 guidance for total VOC concentrations as the Action Level criteria for soils. The Site Specific Action Level (SSAL) proposed herein are less than or equal to 10 mg/kg total VOC's as published in TAGM 4046.soil cleanup objective for VOCs will therefore be less than or equal to 10 parts per million total VOCs as published in TAGM 4046.

2.2.2 Semi-Volatile Organic Compounds (SVOCs)

Action Levels for semi-volatile organic Compounds (SVOC's) were previously proposed based on the same guidelines as for VOCs (i.e., USEPA Region III health risk-based cleanup policy, then ASTM risk-based corrective action guidelines), but were rejected by the NYSDEC. Consistent with TAGM 4046 guidance and precedence in the other voluntary cleanup agreements across New York State, the proposed SSAL for semi-volatile organics in soil/fill will be less than or equal to 500 mg/kg total SVOCs.

2.2.3 Inorganics

TAGM 4046 recommends development of cleanup objectives for inorganics in soils based on human-health risk factors associated with incidental ingestion. Environmental (i.e., groundwater) impacts are not considered in the development of inorganic cleanup objectives in the TAGM, as inorganics do not appreciably partition into groundwater under typical environmental conditions.

The placement of surface soil cover, pavement and buildings over existing surficial soils remaining after the voluntary cleanup will effectively eliminate the potential for exposure to inorganics by incidental ingestion. Similarly, the surface stabilization and community air monitoring will mitigate the lesser potential health impact from inhalation of airborne particulates. Thus, development of site-specific action levels for inorganics in soil would not appear to serve a useful purpose. However, NYSDEC has expressed a concern that elevated levels of inorganics may, under certain environmental conditions, leach from site soils and impact site groundwater. To determine the potential for inorganic leaching at the Former Steel Manufacturing Site, a site-specific leaching test was performed on soil samples exhibiting elevated inorganic levels.

In general, the procedure involved collection of composite and soil/fill samples from the site location where elevated levels of inorganics have previously been recorded, and performing a Synthetic Precipitation Leaching Procedure (SPLP) test on the soils in accordance with USEPA method 1312. The SPLP test was modified to use the site-specific precipitation (melted snow) I lieu of the synthetic precipitation called for under the SPLP protocols. The SPLP leachate was then analyzed for the inorganics identified under federal (RCRA) regulations for waste toxicity characterization (i.e., 40 CFR Part 261) including: arsenic, baraium, cadmium, chromium, lead, mercury, selenium and silver.

Based on this procedure, the proposed Action Levels for inorganics in soil are identified below:

Parameter	Soils Action Level (mg/kg)
Arsenic	75
Barium	1,000
Cadmium	15
Chromium	1,000
Lead	1,300
Mercury	10
Selenium	61
Silver	10

Further details regarding the test methodology, analytical results and derivation of SSALs is presented in Appendix A.

3.0 SOIL/FILL ASSESSMENT

3.1 Introduction

This section of the report is reproduced from the October 15, 1998 Site Assessment Report and Voluntary Cleanup Plan (Reference 2) with modifications as necessary to include the proposed SSALs described in Section 2 and additional field data collected since that report was published. Two new tables (i.e. Tables 3-1 and 3-3) have been added and Figures 3-1 and 3-2 have been updated with the new test pit locations.

3.2 General

The Phase I Environmental Site Assessment (Reference 1) for the LTV Steel Site originally identified 13 subareas within the former Republic Steel Plant Parcel (Area I) where past operations may have resulted in potential environmental conditions. Consequently, a Phase II investigation incorporating soil and groundwater sample collection and analysis was performed to ascertain whether impacts to the property had resulted from these past operations. The Phase II investigation determined that only three of the thirteen subareas exhibited elevated parameter levels in the soils relative to USEPA Region III risk-based concentrations. These subareas, designated as E, K and L, represented the former machine shop/electric shop, the former fuel oil storage subarea, and the former stockhouse or tar/fuel oil underground piping subarea, respectively.

The Phase II results are summarized in Reference 1. In concert with the voluntary cleanup agreement, NYSDEC reviewed and provided technical comments on the report. Issues raised by NYSDEC relative to Area I included the need for further investigation of the former transformer subarea (i.e., Subarea H), as well as concerns regarding the use of EPA Region III risk-based concentrations as screening values for the site soils/fill. In addition, NYSDEC indicated that additional background data would be needed for comparison to site inorganic levels. A

Supplemental Field Investigation was performed in March 1998 to provide to provide additional characterization of Subarea H.

In October 1998, a revised Site Assessment Report and Voluntary Cleanup Plan for Area I (Reference 2) was prepared and submitted to the NYSDEC presenting the results of the supplemental field activities. In December 1998, the NYSDEC issued review comments on the report which, in part, requested that additional data be collected for portions of Area I that had been shown to exhibit high concentrations of lead. The NYSDEC also requested additional test pits and samples for PCB analysis in the Former Transformer Subarea (Subarea H). Additional test pits and samples were subsequently collected in those areas.

The following discussions present the Supplemental Field Investigation results for subarea H, the elevated lead and transformer subarea investigations, as well as a comprehensive overview of all of the soil characterization data obtained for Area I to date in comparison to proposed Site-Specific Action Levels (SSALs).

3.3 Former Transformer Subarea (Subarea H)

In accordance with the Supplemental Field Investigation Work Plan, a soil sample was collected from the former Area I transformer area (Subarea H) in May 1998 for polychlorinated biphenyl (PCB) analysis. The sample, designated A1-SB-H3 was collected by advancing 4-1/4 inch hollow stem augers to a depth of four feet below ground surface. During borehole advancement, continuous split-spoon samples were collected to a depth of eight feet below ground surface. These split-spoon samples were inspected and described on a stratigraphic borehole log by an on-site geologist. In addition, on December 10, 1998, six more test pits were completed in Subarea H to inspect soil conditions and collect additional soil samples. The test pits were labeled A1-TP-39 through A1-TP-44 as shown on Figure 3-2.

Fill material, consisting primarily of silty sand, slag, and brick, was encountered to a depth ranging from approximately 4.5 to 9 feet below ground surface. Foundations and former pipe infrastructure were encountered in A1-TP-39 and A1-TP-40. At locations A1-SB-H3 and A1-TP-41, native soil, described as brown, moist, clayey silt, was encountered beneath the fill. Inspection of the fill or native soil did not reveal any visually oil-stained materials nor any elevated PID readings. Refusal was encountered at three of the six test pits at A1-TP-42, A1-TP-43, and A1-TP-44 at approximately one-foot below grade as a result of a foundation slab.

Subsurface soil samples were collected for analytical testing from A1-SB-H3, 2.7-4.4 feet below grade (fbg); A1-TP-39, surface to 8 fbg; A1-TP-40, surface to 4 fbg; A1-TP-41, surface to 7 fbg; and A1-TP-41, 7 to 8 fbg. The samples from A1-SB-H3 and A1-TP-41, 7-8 fbg were analyzed as discrete samples for PCB analysis. The remaining three test pit samples were composited into one sample and analyzed for PCBs. Table 3-1 provides a summary of the samples submitted and the associated concentrations. The boring log and test pits logs with photographs, analytical data report, and Data Usability Report are included as Appendix B.

The sample of native soil from A1-TP-41 had nondetectable concentrations of PCBs. In addition, no PCBs were detected in the A3-SB-H3 or A1-TP-39/40/41 samples with the exception of Aroclor 1254, which was detected at estimated concentrations of 0.029J mg/kg and 0.71 mg/kg, respectively. These PCB concentrations are significantly lower than the corresponding New York State Department of Environmental Conservation (NYSDEC) Technical Action Guidance Memorandum 4046 (TAGM 4046) value of 10 mg/kg for subsurface soils, and are not considered significant. Thus, the data indicates that no significant release of PCBs has occurred in the Former Transformer Subarea. Accordingly, no cleanup of Subarea H soil/fill is considered necessary.

3.4 Surface Soil/Fill

Surface soil samples collected during the Phase II investigation are discussed in the September 1997 Voluntary Cleanup Site Assessment Report (Ref. 1). The sample locations, designated SS-10 through SS-22, are shown on Figure 3-1. The samples were collected at locations of historical significance, at random locations, and/or where discoloration was evident to provide a comprehensive indication of the extent of surficial contamination, if any, in these areas. All Phase II surface soil samples were collected from 0 to 1 foot below grade using a 3-inch diameter split-spoon sampler, and were analyzed as either discrete or composite samples for Target Compound List (TCL) VOCs, SVOCs, and PCBs, as well as Target Analyte List (TAL) metals and cyanide. Sample analysis was performed in accordance with USEPA SW-846 methodology by a NYSDOH ELAP-certified laboratory. Tables 3-2 and 3-2a provide a summary of the organic and inorganic composite and discrete samples submitted for analysis and the corresponding analytical results along with a comparison to proposed SSALs.

Following the Phase II investigation, four additional surface soil samples were collected and analyzed from Area I in January 1998 in response to a potential purchaser's interest in leasing a portion of the property. The four sample locations, labeled A1-SS-23, A1-SS-24, A1-SS-25 and A1-SB-9 are shown on Figure 3-1. These samples, collected from 0-2 foot below grade via split-spoons, were analyzed as discrete samples for TCL VOCs, PAHs, TAL Metals, cyanide, and pH. Analytical results are presented in Tables 3-2 and 3-2a, excluding pH, which ranged from 8.2 to 10.6 at the four locations.

As presented in Table 3-2, only two volatile organic compounds, methylene chloride and 1,1,1-trichloroethane, from the entire Target Compound VOC List (TCL VOCs) were detected. The Usability Report in Appendix B states that the methylene chloride is likely a laboratory contaminant. The other VOC was at a concentration of 0.021 mg/kg, well below Site-Specific Action Levels and the NYS TAGM level. Semi-volatile organic compound concentrations were also well below the proposed SSAL, thus, no remediation of surficial soils in Area I due to organic contamination will be performed.

As shown in Table 3-2a, inorganic compound concentrations in surface soils are also below SSALs in Area I except for an isolated elevated lead concentration encountered at SS-23. This value is believed to be anomalous based on comparison to other surface soil sample results. To confirm that this, seven additional test pits were located in and around the target lead area in December 1998 as shown on Figure 3-1. One test pit location, A1-TP-32, was performed at the previous elevated lead location (i.e. SS-23). The other test pits were spaced roughly equidistant from that location at distances of 25 and 50 feet away. Surface and subsurface samples were collected at each test pit location. Each of the surficial samples (i.e. surface to 3-inches below grade) were analyzed as discrete samples for lead. (Subsurface results are described in Section 3.4).

The analytical results are summarized in Table 3-3. The seven surficial sample results ranged from non-detect (i.e. 6.45 mg/kg) to 249 mg/kg, many times less than the proposed SSAL for lead. It was therefore concluded that the original SS-23 sample was an anomalous result and that no cleanup of surface soils as a result of inorganic parameters is necessary in Area I.

3.5 Subsurface Soil/Fill

A total of 29 subsurface soil/fill samples were collected from the 13 different historical subareas of interest during the Phase II investigation in Area I. The analytical data was presented in the Voluntary Cleanup Site Assessment Report (Ref. 1) along with a detailed description of the investigation methodology. In general, the subsurface soil investigation encompassed a series of borings and test pits, including borings finished as monitoring wells. Borings in Area I were given the alpha-numeric designation A1 - (A series through M series), with the A through M character corresponding to the 13 subareas of historical interest. In lieu of borings in Subarea L, five test pits designated TP-1, TP-2, TP-3, TP-10 and TP-11 were completed to a depth of 3 to 6 feet below grade in an attempt to locate oil pipelines or associated impacts in this subarea. An additional test pit (TP-9) was also completed to a depth of approximately 5 feet in Subarea K.

Boring and test pit locations are shown on Figure 3-2. All soil borings completed in Area I were advanced using 4-1/4 inch hollow stem augers to completion depths below the surficial fill unit and coincident with or below the fill/native soil contact. Samples from soil borings in each subarea of interest were generally composited and analyzed for TCL SVOCs and TAL inorganic parameters, including cyanide. A single discrete VOC sample was also collected and analyzed from one of the borings in each subarea. Selection of sample intervals for compositing and discrete VOC analysis was based on visual or olfactory evidence of contamination. Native soil located below the coarse fill was often submitted for analysis even if evidence of contamination was not apparent. For the test pit investigation, analysis involved visual and olfactory characterization of the soils, as well as screening the excavated spoils with a photoionization detector (PID) and/or performing headspace testing with the PID. In Subarea L, a composite sample of the fill material from TP-10 (the location exhibiting elevated head space readings) was collected and submitted for analysis of BTEX and PAHs. Tables 3-4, 3-4a, and 3-4b provides a summary of the composite and discrete subsurface boring and test pit samples submitted for analysis and the corresponding analytical results. Only those parameters detected at any of the sample locations are presented in Table 3-4, 3-4a, and 3-4b.

Subsequent to completion of the Phase II investigation, Subareas E, K, and L were identified as potential areas of concern due to elevated PAH levels as compared to previously-proposed USEPA Region III risk-based screening concentrations. Based upon NYSDEC concerns, the USEPA Region III values will not be used. Refer to Section 2 for a description of the SSALs currently proposed. Comparison of the subsurface sample results for these and other subareas to SSALs is presented in the tables. As indicated in Tables 3-4 and 3-4a, organic parameters detected in the subsurface soils were typically below SSALs with the exception of samples in Subareas K, L and D. Subarea D has been identified as exceeding SSALs for total VOCs as shown on Table 3-4. Remediation plans for Subareas K, L, and D are described in the Voluntary Cleanup Work Plan.

To better quantify the extent of subsurface soils in and around Subarea L which contain PAHs, a supplemental investigation in this subarea was undertaken during the week of October 5, 1998. Excavation of additional test pits was performed to delineate the lateral and vertical extent of contamination, with confirmatory sampling to verify the edge of the impacted area. A similar investigation was performed in Subarea K to verify whether and how much soil from this former No. 6 fuel oil storage area may require removal and/or treatment. Figure 3-3 presents the location of the additional test pits. As indicated on Figure 3-3, test pits TP-12 through TP-23 were associated with Subarea L, and test pits TP-24 through TP-31 were associated with Subarea K. Each test pit was excavated to the lower of the top of native soil or the groundwater table, or to refusal. Test pit logs from the October 1998 investigation are presented in Appendix D.

Test pits excavated in Subarea L indicated a narrow band of visual contamination, consisting of tar product and/or stained soils, beginning at TP-17 and running parallel to the former building foundation toward TP-13. Several soil samples were strategically collected from the test pits and analyzed for TCL SVOCs so as to verify the observed limits of the contamination. Concurrent analysis for total petroleum hydrocarbons (TPH) was also performed to provide an indication of the relationship between TPH and SVOC concentrations. Table 3-5 presents the results of sample analyses for Subarea L. Samples collected from intervals where no visual contamination was detected are noted on the table. In general, these samples represent composites collected across the entire test pit depth to the top of native soil or the water surface. In addition, a number of composite samples were collected from fill soils below or above the tar to provide an indication of the impact, if any, to overlying and underlying materials. In the instance of TP-12, TP-13 and TP-15, the test pits were elongated and oriented at an angle away from the tar to provide an indication of the width of the impacted area, as illustrated on Figure 3-3. The TP-13, 0-5.5 foot and TP-15, 0-5 foot samples are composites that were collected upon reaching the apparent outer boundary of the staining (i.e., from the ends of these test pits opposite the product/staining).

In general, most samples from Subarea L with the exception of the sample collected directly within the product-stained soil/fill exhibited non-detectable to low concentrations of SVOCs. Only one sample (from A1-TP-15) collected from the interval below the tar product contained elevated levels above 500 mg/kg total SVOCs. Samples of the tar or visually impacted material contained SVOC concentrations greater than 500 mg/kg. Thus, the data indicates that elevated PAHs are generally associated with product in soils in Subarea L and are limited to a narrow band exhibiting obvious staining or product as described above.

Similar to the supplemental investigation of Subarea L, eight additional test pits were completed in Subarea K (i.e., test pits TP-24 through TP-31 - see Figure 3-3). These test pits were excavated to the lower of native soils or groundwater, or to refusal. An area of petroleum staining, approximately 60 to 80 feet in diameter with varied depth was observed from approximately 4.5 to 5 feet below grade in the vicinity of TP-30, TP-26 and TP-24. Analytical results for soil samples collected from supplemental test pits in Subarea K are presented in Table 3-6. Only those parameters which exhibited a detectable concentration at one of the sample locations are presented. Elevated concentrations of total TCL SVOCs greater than 500 mg/kg were observed from 4.5 – 5 feet below grade in TP-30. Samples from the remaining test pits, located outside the observed area of staining, exhibited substantially lower SVOC concentrations well below the cleanup level of 500 mg/kg SVOCs.

As described in Section 3.3, seven additional test pits were located in and around the subarea of concern for lead in December 1998 (See Figure 3-1 for test pit locations). The test pits were excavated approximately 12-inches into native soil which varied from 1.5 to 2 feet below grade. Test pit A1-TP-34 was excavated to approximately 10 feet below grade to inspect soil and groundwater conditions.

No groundwater was encountered in any of the test pits. Native soil was described as clayey-silt grading into a sandier matrix. Soil/fill material was generally characterized as silt to gravel with trace cinders and coal with significant quantities of slag mixed in, especially at the ground surface. Soils were screened for organics with a PID during excavation with no elevated readings being recorded. Test pit logs, photographs and the associated analytical laboratory report is included in Appendix C. A Data Usability Report is included as Appendix B.

Subsurface samples collected at each test pit location from a depth of 3-inches below grade to the top of native soil were composited and analyzed for TAL metals. Analytical results are summarized in Table 3-3. The composite sample exhibited a lead concentration of 747 mg/kg.

Similar to surface soils, inorganic concentrations shown in Table 3-4b in all subsurface soil samples were below proposed SSALs. Consequently, no cleanup due to inorganic contamination will be performed for subsurface soils/fill in Area I.

4.0 GROUNDWATER ASSESSMENT

4.1 General

The Site Assessment Report and Voluntary Cleanup Plan prepared in October 1998 (Reference 2) included most of the contents of this Groundwater Assessment. Although no new data has been collected since the October 1998 report, certain portions of this report section have been modified to reflect NYSDEC review comments dated December 22, 1998. The following modifications have been made to address those comments:

- Inclusion in the loading calculation of the component of flow discharging beneath South Park Avenue to the north-northeast.
- Use of one-half the method detection limit in the loading calculations for compounds detected in any Area I groundwater.
- Use of an average of A1-MW-M2, A1-P-1, and A1-P-2 hydraulic conductivity values for flow segment 3-3.
- Revision of Table 4-3 to reflect the Class GA Standard for Benzo-a-pyrene and to include the Phase II analytical data for A1-MW-F2 and A1-MW-M2.
- Revision of Figure 4-3 to correct the A1-MW-A2 label.
- The text has been modified to include a more complete description of the fill and native soil characteristics and depth to the shallow aquifer.

4.2 Sensitive Off-Site Receptors

The NYSDEC has identified concerns regarding off-site groundwater migration and potential impacts on sensitive downgradient receptors. The Buffalo River is adjacent to and downgradient of Area I, the former Republic Steel Plant, based upon shallow groundwater potentiometric data. The Buffalo River is considered a "sensitive downgradient sensor" by the NYSDEC. As such, the Supplemental Field Investigation Work Plan (Reference 7) described a perimeter groundwater investigation to address the following objectives related to Area I:

- Define the shallow groundwater flow and quality in Area I adjacent to the Buffalo River.

- Determine whether subsurface petroleum-contamination in Subareas L, K, and E soils/fill are adversely impacting groundwater quality to the extent that there may be an impact on the Buffalo River.

- Calculate the rate of groundwater migration and annual mass load of contaminants migrating from the Site to the Buffalo River under current conditions.

4.3 Perimeter Groundwater Investigation Activities

In general accordance with the Supplemental Field Investigation Work Plan (Reference 7) the following field activities were performed in Area I:

- Installation of monitoring wells A1-MW-1, A1-MW-2, and A1-MW-3 along the Buffalo River (refer to Figure 4-1 for locations).

- Installation of temporary piezometers A1-P-1, A1-P-2, A1-P-3, and A1-P-4 (refer to Figure 4-1 for locations).

- Measuring and recording static water level measurements for all Area I monitoring wells and piezometers.

- Slug testing the following monitoring wells and piezometers: A1-MW-1, A1-MW-2, A1-MW-3, A1-MW-M2, A1-MW-K2, A1-P-1, A1-P-2, A1-P-3, and A1-P-4 to calculate hydraulic conductivity in the shallow aquifer.

- Sampling the following wells for site specific parameters of interest (i.e., benzene, toluene, ethylbenzene, and xylene [BTEX], polynuclear aromatic hydrocarbons [PAHs], phenol, and cyanide,): A1-MW-2, A1-MW-3, and A1-MW-A2 and sampling of A1-MW-K2, A1-MW-1, A1-P-1, A1-P-2, A1-P-3, and A1-P-4 for the same parameters of interest and iron.

Table 4-1 presents a well construction summary that includes the eleven wells in Area I. Monitoring well diagrams for the wells installed during the Supplemental Field Investigation and associated boring logs are included in Appendix E.

4.4 Groundwater Flow

Shallow groundwater elevations measured on April 1, 1998 and June 8, 1998 are presented in Table 4-2 and an Area I groundwater isopotential map illustrating inferred flow direction based on depth-to-groundwater measurements is presented as Figure 4-2. Groundwater occurs at varying depths within Area I ranging from 6.2 to 14.5 feet below grade adjacent to the Buffalo River. In the middle portion of the site groundwater is typically between 3.8 to 8.7 feet below grade. Shallow groundwater flow within Area I is generally toward the River with varying gradients that are relatively flat in the central portion of Area I and become steeper adjacent to the River. The steeper gradients adjacent to the River can be attributed to the steel retaining wall that was used for barge docking and unloading/loading when the Steel Plant was active. The wall exists along most of the River/property boundary and extends from the surface into native soil. This wall causes a damming effect on the localized groundwater table.

Table 4-3 summarizes the thickness of the saturated fill at each monitoring well in April and in June, 1998. Saturated fill thicknesses vary across the site and are generally thin, ranging from 0 feet at A1-MW-1, and A1-MW-F2 and A1-P-4 along South Park Avenue to 4.8 feet thick at A1-MW-2 near the Buffalo River. Monitoring wells where saturated fill is not present are screened in the upper saturated alluvium.

Hydraulic conductivity measurements for Area I are presented in Table 4-4. Hydraulic conductivity results for the monitoring wells screened in fill range from 0.12 ft/day in A1-MW-M2 to 595.3 ft/day in A1-P-1 with an average of 221 ft/day. Native soil produces a range of hydraulic conductivity values from 0.68 in A1-P-4 to 133.2 ft/day in A1-MW-1 with an average value of 67 ft/day. This indicates that the fill in Area I has a highly variable grain size distribution and that the fill is generally coarser than the underlying native soil. Slug test results are presented as Appendix F.

4.5 Groundwater Quality

Analytical results of groundwater quality testing in Area I are presented in Table 4-5. Figure 4-1 presents the location of monitoring wells and piezometers that were sampled. Site specific parameters of interest (i.e., polynuclear aromatic hydrocarbons [PAHs], phenol, cyanide, benzene, toluene, ethylbenzene, and xylene [BTEX] and iron) were analyzed and used as the basis for calculation of average contaminant loadings to the Buffalo River presented in the following section. In addition, analytical data from piezometers A1-MW-F2 and A1-MW-M2 were included on Table 4-5 to provide complete information for the loading calculations to the Buffalo River. Appendix G includes sampling data sheets, laboratory analytical data reports and a Data Usability Report.

4.6 Site-Specific Contaminant Loadings to Buffalo River

Data collected during the Supplemental Field Investigation was used to estimate the groundwater contaminant loading to the Buffalo River. The calculation of groundwater contaminant mass loading from the Site to the Buffalo River is based upon the following assumptions:

- The shoreline of the Buffalo River and the segment along South Park Avenue to the north-northeast was approximated as four straight lines. Each line was further segmented as shown on Figure 4-3 and described below:

  Line 1: Segment 1-1 from monitoring well A1-MW-F2 to A1-P-4 (approximately 450 feet long). Segment 1-2 from monitoring well A1-P-4 to A1-MW-3 (approximately 990 feet long). Segment 1-3 from A1-MW-3 to monitoring well A1-MW-A2 (approximately 357 feet long). Segment 1-4 from monitoring well A1-MW-A2 to the bend in the Buffalo River (approximately 250 feet long).

  Line 2: Segment 2-1 from the bend in the Buffalo River to monitoring well A1-MW-2 (approximately 760 feet). Segment 2-2 from monitoring well A1-MW-2 to monitoring well A1-MW-1 (approximately 1,050 feet). Segment 2-3 from monitoring well A1-MW-1 to approximately 230 feet south.

Line 3: Segment 3-1 from 230 feet south of monitoring well A1-MW-1 to A1-P-1 (approximately 250 feet). Segment 3-2 from A1-P-1 to monitoring well A1-MW-M2 (approximately 377 feet). Segment 3-3 from monitoring well A1-MW-M2 approximately 583 feet northwest.

- Only groundwater in the uppermost-saturated zone (fill material) is contributing contaminants to the Buffalo River. Table 4-3 provides saturated fill thicknesses in June 1998.
- The hydraulic conductivity, hydraulic gradient, and groundwater constituent concentration for each segment was calculated by taking the arithmetic average of the specific variable for each of the wells that define the segment (these values are presented in Table 4-6 and 4-7).
- The west end point of Segment 3-3 was assumed to have the same chemical properties as monitoring well A1-MW-M2.
- Segment 3-3 hydraulic conductivity is the average hydraulic conductivity of A1-MW-M2, A1-P-1, and A1-P-2.
- The hydraulic properties of A1-MW-F2 were estimated by averaging A1-P-3 and A1-P-4.
- The hydraulic properties of A1-MW-A2 were estimated by interpolating data between A1-MW-3 and A1-MW-2.
- The hydraulic and chemical properties of the south end of Segment 1-3 and the north end of Segment 2-1 were estimated by interpolating data between A1-MW-3 and A1-MW-2.
- The hydraulic and chemical properties of south end of Segment 2-3 and the west end of Segment 3-1 were estimated by interpolating data between A1-MW-1 and A1-P-1.
- For compounds where the practical quantitation limit exceeds the groundwater quality standard and that was detected in Area I groundwater, a value of one-half the method detection limit was factored into the loading calculations for that compound.

- For Segment 1-1, the water table surface exists in the alluvium. This segment does not contribute saturated fill flow to the Buffalo River and is represented with a zero on Table 4-7.

Using data described above, the groundwater flow rate from the northern boundary of Area I to the Buffalo River was estimated for each segment using Darcy's Law:

$$Q = KIA$$

where:

Q = Groundwater flow rate

k = average hydraulic conductivity of the segment

i = average hydraulic gradient of the segment

A = saturated cross-sectional area

The estimated groundwater flows from each segment were then combined to give the total estimated groundwater flow rate from the Site to the River of 69,367 cubic feet per day. Groundwater flow rate calculations are summarized in Table 4-7.

Given the groundwater flow rate and the estimated groundwater concentrations for each segment, the off-site contaminant loading was calculated using the following equation:

$$(\text{Mass Loading})_{i,j} = (6.243 \times 10^{-8})\, Q_i\, C_{ij}$$

where:

$(\text{Mass Loading})_{i,j}$ = mass loading of constituent j in segment i (lb/day)

Q_i = groundwater flow rate through segment i (ft^3/day)

$C_{i,j}$ = concentration of constituent j in segment i (ug/l)

6.243×10^{-8} = conversion factor to lb/day

Calculations of groundwater contaminant mass loadings for each segment are summarized in Table 4-8 and total off-site contaminant mass loadings from the Site to the Buffalo River are summarized in Table 4-9. As shown on Table 4-9, the total off-site VOC and SVOC loadings to the Buffalo River are estimated to be approximately 0.045 lb/day and 0.40 lb/day, respectively.

4.7 Assessment of Groundwater Impacts on Buffalo River Quality

Based upon the groundwater contaminant loadings presented above, the estimated increase in downstream constituent concentrations in the Buffalo River at average summer flow rates of 49 million gallons per day (Source: Buffalo River Remedial Action Plan, NYSDEC, November 1989), were calculated. These estimated increases in downstream constituent concentrations were then compared with New York State Class "D" Water Quality Standards or Guidance Values. As shown in Table 4-9, estimated increases in downstream constituent concentrations are at least two orders of magnitude below New York State Class "D" Water Quality Standards or Guidance Values. In addition, a comparison of increases in downstream constituent concentrations with Class "A" Water Quality Standards or Guidance Values shows that increases in downstream constituent concentrations are not likely to adversely affect any potential future upgrade in classification of the Buffalo River to a Class "A" stream since estimated increases are at least an order of magnitude below Class "A" Water Quality Standards or Guidance Values.

The results of the loading analysis are consistent with historical Buffalo River water quality data collected from April 1982 through March 1986 which indicate that none of the VOCs or SVOCs evaluated in the Buffalo River loading analysis were detected in the Buffalo River.

5.0 UNDERGROUND PIPELINE INVESTIGATION

The NYSDEC requested that an investigation be performed to evaluate the former oil transfer pipelines which extended from the large No. 6 fuel oil tanks on the Truscon property to Subarea K in Area I and to the south toward Subarea L. The investigation was planned to evaluate the potential contents of the pipe and to inspect the soil around the pipe to evaluate possible releases from the pipeline.

A total of ten test pits were excavated on March 10, 1998 and March 17, 1998. Test pit locations were selected based on historical site drawings which indicated that the oil transfer pipeline in Area I ran parallel to the Buffalo River either above or below ground. Test pits were excavated perpendicular to the axis of the pipe and of sufficient length so that the pipe, if present, would be intersected by the excavation. If pipe was encountered during the excavation, the pipe was tapped to determine whether it contained oil. Soil was logged and inspected by a project hydrogeologist. The following summarizes the findings of each test pit labeled as Pipe-1 through Pipe-10 (see Figure 5-1 for locations):

- Pipe-1, Pipe-3, Pipe-5, Pipe-7, Pipe-8, and Pipe-9 – Test pits excavated to a depth of 5 to 8 feet. No pipe encountered.
- Pipe-2 and Pipe-4 – Encountered a single, empty 6-inch pipe.
- Pipe-6 and Pipe-10 – Encountered two, 6-inch pipes in each test pit. One pipe, a plastic-coated steel pipe, contained water. The other pipe, a rusty steel pipe, contained mostly water with an oil skim.
- No oil-impacted soil was encountered at any of the test pit locations.

Additional test pits were excavated to determine the extent of the oil encountered in the rusty steel pipe. The results of the additional pipeline investigation are shown on Figure 5-1. As shown on Figure 5-1, in addition to the plastic-coated pipe and rusty pipe which appear to travel towards Subarea K where the above-ground tanks were formerly located, one additional pipe was found near the sharp bend in the Buffalo River traversing to the south, as expected, toward Subarea L. Very stiff oil (likely aged No. 6 fuel oil) was encountered in this additional pipe. As a result of very compact fill, excavation refusal was encountered in the direction toward Subarea K. Numerous test pits were excavated in Subarea L and did not encounter pipeline. Therefore it appears that the approximate limits of oil filled pipeline have been found.

6.0 REFERENCES

1. South Buffalo Redevelopment Plan: Steel Manufacturing Site, Voluntary Cleanup Site Assessment Report, Malcolm Pirnie, September 1997.

2. Steel Manufacturing Site: Area I – Former Republic Steel Plant Parcel Site Assessment Report and Voluntary Cleanup Plan, TurnKey Environmental Restoration, October 15, 1998

3. Steel Manufacturing Site: Area II – Former Donner-Hanna Coke Plant Parcel, Site Assessment Report and Voluntary Cleanup Plan, TurnKey Environmental Restoration, November 9, 1998.

4. Steel Manufacturing site: Area III – Former Republic Steel Warehouse Parcel and Area IV – Former Donner-Hanna Coke Yard, Site Assessment Report and Voluntary Cleanup Plan, TurnKey Environmental Restoration, November 11, 1998.

5. Gas Research Institute – "Management of Manufactured Gas Plant Sites", Vol. 1. Published by Amherst Scientific Publishers , 1996.

6. February 27, 1998; LTV Steel Company Responses to NYSDEC December 2, 1997 Comments.

7. Supplemental Field Investigation Work Plan, Steel Manufacturing Site, Malcolm Pirnie, February, 1998.

Table 3-1

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY-AREA I PCBs

SUBAREA H (Former Transformer Subarea)

Site Assessment Report (Area I)

LTV Steel Company

Polychlorinated Biphenyl Compounds (mg/kg)	Sample Locations		
	A1-SB-H3 (1)(3)(4)	A1-TP-39/40/41 (2)(3)	A1-TP-41 (2)(3)
Sample Depth (ft.below grade)	2.7-4.4'	(5)	7-8'
PCB 1016			
PCB 1221			
PCB 1232			
PCB 1242	0.029 J	0.71	
PCB 1248			
PCB 1254			
PCB 1260			

NOTES:

1. Source: Analytical Summary Report (June 24, 1998) prepared by Columbia Analytical Services for Malcolm Pirnie, Inc.
2. Investigation performed by TurnKey Environmental Restoration in December 1998
3. Blank space in data denotes parameter was not detected.
4. J - Estimated Concentration
5. Variable depths, See individual test pit logs

TurnKey Environmental Restoration, LLC

Table 3-2

SURFACE SOIL/FILL ANALYTICAL SUMMARY - AREA I ORGANICS

Soil Assessment Report (Area I)

LTV Steel Company

Parameter	Proposed Site-Specific Action Level(1)	SAMPLE LOCATIONS														
		SS-10/11 (2)(5)(8)	SS-12/13 (2)(6)(8)	SS-14 (2)(8)	SS-15 (2)(8)	SS-16 (2)(8)	SS-17 (2)(8)	SS-18 (2)	SS-19 (2)(8)	SS-17/18/19 (2)(8)	SS-20/21 (2)(7)(8)	SS-22 (2)(8)	SS-23 (3)(8)	SS-24 (3)(8)	SS-25 (3)(8)	A1-SB-9 (3)(9)
Volatile Organic Compounds (mg/kg)(4)																
Methylene Chloride					0.009		0.009	0.008		Not Analyzed						
1,1,1-Trichloroethane								0.021								
Total VOCs	10	0	0	0	0.009	0	0.009	0.029	0		0	0	0	0	0	0
Semivolatile Organic Compounds (mg/kg)(4)																
Acenaphthylene		4.6					Not Analyzed									
Anthracene		24	0.52													
Benzo(a)anthracene		16	1.4		0.75	0.59				1.5		0.62	0.93			
Benzo(a)pyrene		12	1.4	0.44	0.96	0.53				1.4		0.99	1.4	2.6		
Benzo(b)fluoranthene		15	2.1	0.81	1.1	1.3				2.3	0.48	1.5	1.8	3.0		
Benzo(k)fluoranthene		8.5	1.1		0.67	0.74				1.4		0.84	1.4	2.9		
Benzo(g,h,i)perylene		5.4	0.67	0.45	0.6	0.6				0.92			0.56			
Bis(2-ethylhyxyl)phthalate			0.42		1	0.39						0.76	0.53			
Carbazole		5.5														
Chrysene		21	1.4	0.53	0.8	1				1.6		0.72	1.1			
Fluoranthene		36	2.7	0.82	1.1	1.2				3	0.55	0.5	1.4	3.9		
Indeno(1,2,3-cd)pyrene		5.7	0.65		0.53	0.55				0.86		0.65	0.64			
Phenanthrene		19	2	0.53	0.65	1.3				1.9			0.57			
Pyrene		27	2.2	0.65	1.1	1.3				2.6	0.58	0.87	1.8	4.0		
Total SVOCs	500	200	16.6	4.23	9.3	9.5				17.5	1.61	7.5	12.1	16.4	0	0
PCB (mg/kg)(4)																
PCB 1248		1					Not Analyzed						Not Analyzed			

NOTES:

1. Blank space indicates no Site-Specific Action Level proposed for that parameter.
2. Data from Phase I/II Environmental Site Assessment Report prepared by Malcolm Pirnie, Inc., September, 1997
3. Data from additional investigation performed by Malcolm Pirnie, Inc., January 1998
4. Only parameters detected in one or more samples are listed.
5. Composite sample from SS-10 and SS-11. Discrete VOC samples collected from each location. VOCs were not detected in either sample.
6. Composite sample from SS-12 and SS-13. Discrete VOC samples collected from each location. VOCs were not detected in either sample.
7. Composite sample from SS-20 and SS-21. Discrete VOC samples collected from each location. VOCs were not detected in either sample.
8. Blank space in data denotes parameter was not detected.

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Table 3-2a

SURFACE SOIL/FILL ANALYTICAL SUMMARY - AREA I INORGANICS

Soil Assessment Report (Area I)

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site-Specific Action Level[1]	SAMPLE LOCATIONS														
		SS-10/11 (2)(4)(7)	SS-12/13 (2)(5)(7)	SS-14 (2)(7)	SS-15 (2)(7)	SS-16 (2)(7)	SS-17 (2)	SS-18 (2)	SS-19 (2)	SS-17/18/19 (2)(7)	SS-20/21 (2)(6)(7)	SS-22 (2)(7)	SS-23 (3)(7)(8)	SS-24 (3)(7)	SS-25 (3)(7)	A1-SB-9 (3)(7)
Aluminum		14600	14100	15700	11500	6730				10700	9390	8250	14800	19800	7980	33200
Antimony													27.8	8.51		
Arsenic	75	24.7	25.5	12.2	8.85	7.61				4.37	11.5	8.89	22.2	17.7	19.2	6.57
Barium	1000	152	130	160	191	121				164	143	92.4	261	206	144	261
Beryllium		2.87	3.5	2.19	2.39	1				1.91	1.93	1.4	4.37	3.62	3.05	6.02
Cadmium	15	1.51	1.79	0.831	2.89	3.77				2.37	2.94	1.27	8.55	2.3	8.93	1.55
Calcium		144000	139000	218000	202000	166000	Not Analyz.	Not Analyz.	Not Analyz.	193000	136000	50600	110,000	125000	129000	213000
Chromium	1000	257	197	434	636	891				635	891	73.1	158	67.8	699	45.1
Cobalt		6.5	24.8		6.14	8.19					11.5	6.78	13.7	6.75	14	
Copper		141	170	26.4	92.2	94.6				87.7	146	45.4	296	90.4	104	37.3
Iron		134000	165000	94100	97200	160000				144000	223000	64500	167000	56000	197000	46500
Lead	1300	145	195	79.6	145	397				147	83.7	76.5	65000	251	434	72.2
Magnesium		20000	24700	12300	22000	24200				19700	19100	7320	10000	18500	26400	23300
Manganese		5470	5420	10800	17000	26300				13600	17100	2340	7320	2520	16800	4540
Mercury	10												0.32	0.24	0.317	
Nickel		78.7	122	11.3	63.2	52.8				28.5	57.8	19.3	83	37.8	44.3	13.7
Potassium		1060	1210	850	685	372				857	498	654	1060	1600	708	2720
Selenium	61			21.9	24.6	46.3				57.1	61	8.38				
Silver	10	1.65	1.69	2.53	2.14	4.16				3.05	3		1.71			
Sodium		505	617	341	336	333				452	366	268	358	491	255	988
Thallium													3.05			
Vanadium		53.5	125	201	386	289				203	210	35	116	17.2	281	6.19
Zinc		293	714	143	541	607				341	229	147	405	207	555	128
Cyanide		3.64	3.35	5.11	1.6	4.13				5.1	6.38	2.06			2.19	1.64

Notes:

1. Blank space indicates no Site-Specific Action Level proposed for that parameter.
2. Data from Phase I/II Environmental Site Assessment Report prepared by Malcolm Pirnie, Inc., September, 1997
3. Data from additional investigation performed by Malcolm Pirnie, Inc., January 1998
4. Composite sample from SS-10 & SS-11. Discrete VOC samples collected from each location. VOCs were not detected in either sample.
5. Composite sample from SS-12 & SS-13. Discrete VOC samples collected from each location. VOCs were not detected in either sample.
6. Composite sample from SS-20 & SS-21. Discrete VOC samples collected from each location. VOCs were not detected in either sample.
7. Blank space in data denotes parameter was not detected.
8. Shading denotes that concentration exceeds proposed Site-Specific Action Level.

TURNKEY ENVIRONMENTAL RESTORATION, LLC

Table 3-3

SOIL/FILL ANALYTICAL SUMMARY - AREA I INORGANICS[1]

ELEVATED LEAD SUBAREA

Site Assessment Report (Area I)

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations							
		A1-TP-32/33/34/35/36/37/38	A1-TP-32	A1-TP-33	A1-TP-34	A1-TP-35	A1-TP-36	A1-TP-37	A1-TP-38
Sample Depth(inches below grade)		3"-TOP OF NATIVE	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"
Lead	1300	758	45.2	40.6	6.45U	55.7	249	93.5	60
Aluminum		12100							
Antimony		7.43 U							
Arsenic	75	27.9							
Barium	1000	385							
Beryllium		1.71							
Cadmium	15	10.4							
Calcium		86400							
Chromium	1000	58.1							
Cobalt		15.1							
Copper		261							
Iron		131,000							
Magnesium		9100							
Manganese		2800							
Mercury	10	0.7							
Nickel		67.2							
Potassium		872							
Selenium	61	18.6 U							
Silver	10	6.52							
Sodium		62 U							
Thallium		2.16							
Vanadium		14.0							
Zinc		777							

Notes:

1. Investigation performed by TurnKey Environmental Restoration in December 1998
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U-Indicates compound was analyzed for but was not detected.
4. Composite Sample

TurnKey Environmental Restoration, LLC

Table 3-4

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - AREA I ORGANICS[1]

Soil Assessment Report (Area I)
LTV Steel Company

Volatile Organic Compounds (mg/kg)[2]	Proposed Site Specific Action Level[3]	Sample Locations												
		A1-SB(or MW)-A1,A2,A3 (4)(16)	A1-SB-B1,B2,B3 (5)(16)	A1-SB-C2 (16)	A1-SB-D1,D2,D3 (6)(16)(17)	A1-SB-E1,E2,E3 (7)(16)	A1-SB(or MW)-F1,F2 (8)(16)	A1-SB-G1 (9)(16)	A1-SB-H1,H2 (10)(16)	A1-SB-I1,I2 (11)(16)	A1-SB-J2 (12)(16)	A1-SB(or MW)-K1,K2,K3 (13)(16)	A1-T10 [Subarea L] (14)(16)(17)	A1-SB(or MW)-M1/M2 (15)(16)
Sample Depths (ft. below grade)		8-12	10-14	12-14	10-14	4-8	4-6	8-10,11-11.5	8-10	8-13	10-12,8-10	6-8.5	4-5	6-6.5
Acetone				0.061									NA	0.11
Benzene					6.2									
2-Butanone													NA	0.014
cis-1,2-Dichloroethene						0.042							NA	
Ethylbenzene					7.7								6.6	
Methylene Chloride													NA	0.007
Toluene					3.6									
Total Xylenes					25.0								52	
Trichloroethene						0.150							NA	
Total VOCs	10	0	0	0.061	42.5	0.192	0	0	0	0	0	0	58.6	0.131

Notes:

1. Data from Phase I/II Environmental Site Assessment Report prepared by Malcolm Pirnie, Inc., September 1997
2. Only parameters detected in one or more samples are listed.
3. Blank space indicates no Site-Specific Action Level proposed for that parameter.
4. Sample A1-MW-A2, 8-10 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.
5. Sample A1-SB-B2, 12-14 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.
6. Sample A1-SB-D3, 10-12 feet was analyzed for TCL VOCs. Concentrations of detected parameters are shown.
7. Sample A1-SB-E2, 4-6 feet was analyzed for TCL VOCs. Concentrations of detected parameters are shown.
8. Sample A1-SB-F1, 4-6 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.
9. Sample A1-SB-G1, 11-11.5 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.
10. Sample A1-SB-H1, 8-10 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.
11. Sample A1-SB-I2, 8-10 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.
12. Sample A1-SB-J2, 8-10 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.
13. Sample A1-MW-K2, 6.5-7 feet was analyzed for TCL VOCs. VOCs were not detected in the sample.
14. A sample collected from 5-5.5 feet was analyzed for VOCs.VOCs were not detected at a dilution of 25 ppm.
15. Sample A1-MW-M2, 6-6.5 feet was analyzed for TCL VOCs. Concentrations of detected parameters are shown.
16. Blank space indicates that the parameter was analyzed for but not detected.
17. Shading denotes that concentration exceeds proposed Site-Specific Action Level.
18. NA - Not Analyzed

TurnKey Environmental Restoration, LLC

Table 3-4a

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - AREA I ORGANICS[(1)]

Soil Assessment Report (Area I)

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)[(2)]	Proposed Site-Specific Action Level[(3)]	Sample Locations												
		A1-SB(or MW)-A1,A2,A3 (4)	A1-SB-B1,B2,B3 (4)	A1-SB-C1 (4)	A1-SB-D1,D2,D3 (4)	A1-SB-E1,E2,E3 (4)	A1-SB(or MW)-F1,F2 (4)	A1-SB-G1 (4)	A1-SB-H1,H2 (4)	A1-SB-I1,I2 (4)	A1-SB-J2 (4)	A1-SB(or MW)-K1,K2,K3 (4)	A1-T10 [Subarea L] (4)(5)(6)	A1-SB(or MW)-M1/M2 (4)
Sample Depths (ft. below grade)		8-12	10-14	10-12	10-14	4-8	4-6	8-10,11-11.5	8-10	8-13	10-12,8-10	6-8.5	4-5	6-6.5
Acenapthene				3.1		0.69						10	380	
Acenaphthylene													2200	
Anthracene				2.1		1.6						7.4	2100	
Benzo(a)anthracene						3.9			0.89			8.1	1700	0.6
Benzo(a)pyrene						3.1			0.67			6.1	1400	0.56
Benzo(b)fluoranthene						3.6	0.45		0.88				1600	0.94
Benzo(k)fluoranthene						2.1							660	
Benzo(g,h,i)perylene						1.6								
Chrysene						3.3			0.74			14	1400	0.67
Dibenzo(a,h)anthracene						0.75								
Dibenzofuran						0.51							NA	
Fluoranthene						7.3	0.73	0.7	1.8		0.93	7.3	3900	0.98
Flourene				2.4		0.75					0.51	24	2500	
Indeno(1,2,3-cd)pyrene						1.6							640	
2-Methylnapthalene				13								17	NA	
Napthalene						0.78					0.72		7300	
Phenanthrene		93		9.6		5.8	0.45	0.64	1.4		1.8	33	5100	1.1
Pyrene		42		2.8		6.4	0.66	0.61	1.4		0.7	28	3000	1.2
Total SVOCs	500	135	0	33.0	0	43.8	2.29	1.95	7.78	0	4.66	155	33880	3.28

NOTES:

1. Data from Phase I/II Environmental Site Assessment Report prepared by Malcolm Pirnie, Inc., September 1997
2. Only parameters detected in one or more samples are listed.
3. Blank space indicates no Site-Specific Action Level proposed for that parameter.
4. Blank space indicates that the parameter was analyzed for but not detected.
5. Shading denotes that concentration exceeds proposed Site-Specific Action Level.
6. NA - Not Analyzed

Table 3-4b

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - AREA I INORGANICS[1]

Soil Assessment Report (Area I)

LTV Steel Company

Inorganic Parameters (mg/kg)[2]	Proposed Site Specific Action Levels[3]	Sample Locations												
		A1-SB(or MW)-A1,A2,A3	A1-SB-B1,B2,B3	A1-SB-C1	A1-SB-D1,D2,D3	A1-SB-E1,E2,E3	A1-SB(or MW)-F1,F2	A1-SB-G1	A1-SB-H1,H2	A1-SB-I1,I2	A1-SB-J2	A1-SB(or MW)-K1,K2,K3	A1-T10 [Subarea L]	A1-SB(or MW)-M1/M2
Sample Depth (ft. below grade)		8-12	10-14	10-12	10-14	4-8	4-6	8-10,11-11.5	8-10	8-13	10-12,8-10	6-8.5	4-5	6-6.5
Aluminum		29400	12900	7590	11600	25500	19100	9220	7180	15000	22000	9700		21800
Antimony														
Arsenic	75			3.5	21.8		2.4		16.7			11.6		
Barium	1000	408	117	54.7	118	304	243	62.4	85.5	132	142	85.6		332
Beryllium		3.82			1.03	3.18	1.5	2.9	1.26	0.751	0.928	1.36		1.78
Cadmium	15	1.29			1.25	1.8	1.05	4.72	5.05					1.3
Calcium		174000	14700	8180	39200	159000	56000	49400	16000	80800	12600	21900	Not	136000
Chromium	1000	101	25.9	11.3	20.2	328	71.7	42.6	45.3	22.3	24.8	37.4	Analyz.	393
Cobalt			10.9	7.68			11.3		8.88	9.01	11.6			
Copper		50.1	26.7	19.8	51.5	204	40.2		97.9	25.6	14.2	48.4		84.6
Iron		69900	26500	18700	75000	117000	63500	275000	192000	23800	23800	84100		82600
Lead	1300	11.5	17.4	68.4	116	159	24.2	15.3	293	31.1	14.8	192		118
Magnesium		15400	5180	2860	4490	8040	9930	3290	1880	21900	5210	2930		26900
Manganese		3250	674	303	1010	7500	2360	4180	5370	642	449	1170		16600
Mercury	10				0.323				2.37					
Nickel		70.2	32.6	21.6	18.9	15.6	37.6		51.7	22.1	30.7	18.3		25.4
Potassium		912	2210	1160	1420	1680	2180	673	4830	2760	2060	1510		1730
Selenium	61	3.28	1.04			2.02				4.79	2.48	2.7		13.9
Silver	10													
Sodium		956	206	206	224	553	418	165	503	345	372	320		551
Thallium								2.56						
Vanadium		19.6	23.1	13.3	19.3	69.6	37.5	26.7	33.3	26.9	23.7	46.4		163
Zinc		21.3	87.7	71.9	228	207	128	44	1760	76.3	101	174		192
Cyanide						2.79			3.07			3.78		

NOTES:
1. Data from Phase I/II Environmental Site Assessment Report prepared by Malcolm Pirnie, Inc., September 1997
2. Blank space indicates that the parameter was analyzed for but not detected.
3. Blank space indicates no Site-Specific Action Level proposed for that parameter.

TurnKey Environmental Restoration, LLC

0002-005
3/2/99
Ar-I report/Ar-I tables/A1subsurfvol

Table 3-5

SOIL/FILL ANALYTICAL SUMMARY- AREA I SUBAREA L [1]

Soil Assessment Report (Area I)

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Levels[2]	A1-TP-12	A1-TP-13	A1-TP-13	A1-TP-15	A1-TP-15	A1-TP-17	A1-TP-17	A1-TP-19	A1-TP-22
Sample Depth (ft. below grade)		0-5'[4]	1-5'[5]	0-5.5'[4]	1.5-5'[5]	0-5'[4]	0-3'[4]	3-5'[7]	0-2'[4]	0-4'[4]
Acenaphthene		3.7 U	3.9 U	0.4 U	7.8	3.8 U	0.39 U	350	3.6 U	0.43 U
Acenaphthylene		13	6.5	1.1	78	7.8	1.5	1900	12	0.43 U
Anthracene		12	6.5	0.67	68	4.7	0.82	920	14	0.43 U
Benzo(a)anthracene		26	13	1.7	94	9.3	0.81	790	14	0.43 U
Benzo(b)fluoranthene		33	12	2.0	130	11	0.74	760	14	0.7
Benzo(k)fluoranthene		25	17	2.4	75	13	0.94	770	15	0.78
Benzo(ghi)perylene		17	8.3	1.1	46	6.8	0.39 U	330	5.5	0.51
Benzo(a)pyrene		30	14	2.2	100	11	0.84	860	15	0.8
Carbazole		3.7 U	3.9 U	0.4 U	18	3.8 U	0.5	610	4.6	0.43 U
Chrysene		26	12	1.7	84	9.1	0.69	690	13	0.46
Dibenzo(a,h)anthracene		7.1	3.9 U	0.49	23	3.8 U	0.39 U	210 U	3.6 U	0.43 U
Dibenzofuran		3.7 U	3.9 U	0.4 U	32	3.8 U	0.83	1100	6.3	0.43 U
2,4-Dimethylphenol		7.5 U	7.9 U	0.81 U	16 U	7.6 U	0.8 U	430 U	7.3 U	0.87 U
Fluoranthene		62	37	4.2	210	24	2.9	2600	42	0.9
Fluorene		4.3	3.9 U	0.4 U	57	3.8 U	1.3	1500	15	0.43 U
Indeno(1,2,3-cd)pyrene		19	8.6	1.2	55	7.8	0.4	380	6.6	0.55
2-Methylnaphthalene		7.5 U	7.9 U	0.81 U	16 U	7.6 U	0.8 U	1200	7.3 U	0.87 U
2-Methylphenol		7.5 U	7.9 U	0.81 U	16 U	7.6 U	0.8 U	430 U	7.3 U	0.87 U
Naphthalene		3.7 U	3.9 U	0.4 U	130	3.8 U	3.4	6000	3.6 U	0.43 U
Pentachlorophenol		15 U	15 U	1.6 U	31 U	15 U	1.5 U	830 U	14 U	1.7 U
Phenanthrene		36	24	2.3	180	14	3.4	3300	43	0.43 U
Pyrene		39	21	2.6	140	15	1.4	1300	23	0.57
Total SVOCs	500	401.7	242	29.69	1606.8	194.1	25.54	27260	289.7	13.88

Notes:

1. Data from Phase I/II Environmental Site Assessment Report prepared by Malcolm Pirnie, Inc., September 1997
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U-Indicates compound was analyzed for but was not detected.
4. No visual evidence of contamination present.
5. Soil collected below tar product.
6. Shading denotes that concentration exceeds proposed Site-Specific Action Level.
7. Soil collected was stained with product.

0002-005

3/25/99

Ar-I report/Ar-I tables/A1tprestot

Table 3-6

SOIL/FILL ANALYTICAL SUMMARY- AREA I SUBAREA K (1)

Soil Assessment Report (Area I)

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Levels(2)	A1-TP-24(3)	A1-TP-30(3)	A1-TP-30(3)(5)	A1-TP-31(3)
	Sample Depth (ft. below grade)	1-4'(4)	0-4.5'(4)	4.5-5'(6)	0-6"(4)
Acenaphthene		7.8 U	0.39 U	18 U	0.37 U
Acenaphthylene		7.8 U	0.39 U	65	0.37 U
Anthracene		7.8 U	0.39 U	33	0.37 U
Benzo(a)anthracene		8.1	0.66	31	0.64
Benzo(b)fluoranthene		8.7	0.79	22	1.1
Benzo(k)fluoranthene		9.7	1.1	32	1.1
Benzo(ghi)perylene		7.8 U	0.42	18 U	0.51
Benzo(a)pyrene		9.9	0.85	30	0.83
Carbazole		7.8 U	0.39 U	19	0.37 U
Chrysene		8.2	0.75	31	0.87
Dibenzo(a,h)anthracene		7.8 U	0.39 U	18 U	0.37 U
Dibenzofuran		7.8 U	0.39 U	37	0.37 U
2,4-Dimethylphenol		16 U	0.79 U	37 U	0.75 U
Fluoranthene		27	1.5	84	1.6
Fluorene		7.8 U	0.39 U	57	0.37 U
Indeno(1,2,3-cd)pyrene		7.8 U	0.44	18 U	0.52
2-Methylnaphthalene		16 U	0.79 U	73	0.75 U
2-Methylphenol		16 U	0.79 U	37 U	0.75 U
Naphthalene		13	0.39 U	240	0.37 U
Pentachlorophenol		31 U	1.5 U	72 U	1.5 U
Phenanthrene		21	1.0	140	0.85
Pyrene		15	1.1	63	1.2
Total SVOCs	500	269.8	15.6	1175	15.93

Notes:

1. Data from Phase I/II Environmental Site Assessment Report prepared by Malcolm Pirnie, Inc., September 1997
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U-Indicates compound was analyzed for but was not detected.
4. No visual evidence of contamination present.
5. Shading denotes that concentration exceeds proposed Site-Specific Action Level.
6. Soil collected was stained with product.

TurnKey Environmental Restoration, LLC

Table 4-1

Well Construction Summary for Area I Monitoring Locations

Site Assessment Report (Area I)

LTV Steel Company

Location	Ground Elevation (ftamsl)	PVC Riser Elev. (ftamsl)	Total Depth (ft below grade)	Borehole/ Well Diameter (inch/inch)	Depths (feet below grade)					Installation Date	Depth to Native Soil (ft below grade)	Elevation of Native (famsl)
					Top of Seal	Top of Screen/ Sandpack	Bottom Sand Pack	Type of Sand Pack	Screen Slot Size			
A1-MW-1 (1)	583.96	586.39	19.55	8.25/ 2	3.0	7.0/5.0	17.0	Morie 0	0.010	3/17/98	5.5	578.5
A1-MW-2 (1)	584.38	586.39	12.66	8.25/ 2	3.0	6.0/5.0	11.0	Morie 0	0.010	3/17/98	> 11	< 573.4
A1-MW-3 (1)	589.41	591.98	25.67	8.25/ 2	9.0	13.0/12.0	23.0	Morie 0	0.010	3/17/98	17.0	572.4
A1-P-1 (1)	585.72	588.1	17.46	8.25/ 2	6.0	10.0/8.0	15.0	Morie 0	0.010	3/16/98	11.5	574.2
A1-P-2 (1)	585.51	588.22	10.8	8.25/ 2	1.0	3.0/2.0	8.0	Morie 0	0.010	3/16/98	7.5	578.0
A1-P-3 (1)	589.45	591.88	13.69	8.25/ 2	3.0	6.0/5.0	11.0	Morie 0	0.010	3/18/98	9.0	580.5
A1-P-4 (1)	586.99	589.37	17.37	8.25/ 2	2.0	5.0/4.0	15.0	Morie 0	0.010	3/18/98	4.0	583.0
A1-MW-A2 (2)	589.7 (3)	591.7 (3)	17.0	8.25/ 2	8.0	12.0/10.0	17.0	Morie 00N	0.006	3/25/97	14.7	575.0
A1-MW-F2 (2)	586.2 (3)	588.2 (3)	13.0	8.25/ 2	3.0	8.0/5.0	14.0	Morie 00N	0.006	3/21/97	4.2	582.0
A1-MW-K2 (2)	589.0 (3)	591.0 (3)	11.0	8.25/ 2	2.0	6.0/4.0	11.0	Morie 00N	0.006	3/19/97	8.3	580.7
A1-MW-M2 (2)	585.0 (3)	587.8 (3)	12.8	8.25/ 2	3.5	7.8/5.5	12.8	Morie 00N	0.006	3/19/97	6.5	578.5

NOTES:
(1) Installed under supervision of Malcolm Pirnie, Inc. personnel during Supplemental Field Investigation
(2) Installed during Phase I/II Site Assessment performed by Malcolm Pirnie, Inc.
(3) Elevation data from Environmental Site Assessement Report prepared by Malcolm Pirnie, Inc.

TurnKey Environmental Restoration, LLC

Table 4-2

Water Levels Measured in April and June, 1998[(1)]

Site Assessment Report (Area I)

LTV Steel Company

Well Designation	4/1/98			6/8/98		
	Water Level ft b ref	Reference Elevation famsl	Water Table Elevation	Water Level ft b ref	Reference Elevation famsl	Water Table Elevation
A1-MW-A2	11.62	591.7	580.08	12.35	591.7	579.35
A1-MW-F2	9.06	588.2	579.14	9.28	588.2	578.92
A1-MW-K2	5.91	591	585.09	6.88	591	584.12
A1-MW-M2	8.23	587.8	579.57	7.33	587.8	580.47
A1-MW-1	9.2	586.39	577.19	9.94	586.39	576.45
A1-MW-2	7.08	586.39	579.31	8.2	586.39	578.19
A1-MW-3	16.38	591.98	575.6	16.46	591.98	575.52
A1-P-1	12.57	588.1	575.53	12.74	588.1	575.36
A1-P-2	4.81	588.22	583.41	5.76	588.22	582.46
A1-P-3	8.03	591.88	583.85	8.4	591.88	583.48
A1-P-4	7.46	589.37	581.91	10.74	589.37	578.63

Notes: (1) Depth to groundwater measurements performed by Malcolm Pirnie, Inc. during Supplemental Field Investigation

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Table 4-3

Saturated Fill Thickness for Monitoring Wells

Site Assessment Report (Area I)

LTV Steel Company

Well Designation	Saturated Thickness (feet)
A1-MW-A2	4.4
A1-MW-F2	(2)
A1-MW-K2	3.4
A1-MW-M2	2.0
A1-MW-1	(2)
A1-MW-2	4.8
A1-MW-3	3.1
A1-P-1	1.2
A1-P-2	4.5
A1-P-3	3.0
A1-P-4	(2)

Notes: (1) Saturated thickness for June 8, 1998 depth-to-groundwater measurements

(2) Well screened within native soil. No saturated fill at this location.

Table 4-4

Summary of Hydraulic Conductivity Results

Site Assessment Report for Area I

LTV Steel Company

Well Designation	*Hydraulic Conductivity ft/d*
A1-MW-A2	-
A1-MW-K2	82.2
A1-MW-M2	0.12
A1-MW-1	133.2
A1-MW-2	425.2
A1-MW-3	11.6
A1-P-1	595.3
A1-P-2	121.9
A1-P-3	311.8
A1-P-4	0.68

NOTES: (1) Slug tests were performed by Malcolm Pirnie, Inc. during Supplemental Field Invest. Performed March-April, 1998

Table 4-5

Summary of Groundwater Analytical Results - Organic Parameters

Site Assessment Report (Area I)

LTV Steel Company

Parameter	NYS Class GA Groundwater Quality Stds	Wells Located Adjacent to the Buffalo River						Wells Located in Area I Interior				
		A1-MW-1 (1)	A1-MW-2 (1)	A1-MW-3 (1)	A1-MW-A2 (1)	A1-P-1 (1)	A1-MW-M2 (2)	A1-MW-K2 (1)	A1-MW-F2 (2)	A1-P-2 (1)	A1-P-3 (1)	A1-P-4 (1)
Volatile Organic Compounds (ug/L)												
Acetone	$50^{(3)}$	NA	NA	NA	NA	NA	23	NA	54	NA	NA	NA
Benzene	0.7	5 U	5 U	5 U	5U	5 U	5 U	5U	5 U	6	5 U	5 U
Carbon Disulfide	(4)	NA	NA	NA	NA	NA	10 U	NA	10 U	NA	NA	NA
Ethylbenzene	5	5 U	2 J	5 U	5U	5 U	5 U	5U	5 U	5 U	5 U	5 U
Toluene	5	5 U	5 U	5 U	7	5 U	5 U	5U	5 U	1 J	5 U	5 U
Xylene (Total)	5	15 U	1 J	15 U	14J	15 U	10 U	15U	10 U	15 U	15 U	15 U
Semivolatile Organic Compounds (ug/L)												
Acenaphthene	$20^{(3)}$	10 U	15	10 U	4J	0.8 J	5 U	3J	5 U	10 U	10 U	10 U
Anthracene	$50^{(3)}$	10 U	10 U	10 U	10U	1 J	5 U	10U	5 U	10 U	10 U	10 U
Benzo(a)anthracene	$0.002^{(3)}$	10 U	10 U	10 U	10U	10 U	5 U	10U	5 U	10 U	10 U	10 U
Benzo(b)fluoranthene	$0.002^{(3)}$	10 U	10 U	10 U	10U	10 U	5 U	10U	5 U	10 U	10 U	10 U
Benzo(k)fluoranthene	$0.002^{(3)}$	10 U	10 U	10 U	10U	10 U	5 U	10U	5 U	10 U	10 U	10 U
Benzo(ghi)perylene	(4)	10 U	10 U	10 U	10U	10 U	5 U	10U	5 U	10 U	10 U	10 U
Benzo(a)pyrene	Non Detect	10 U	10 U	10 U	10U	10 U	5 U	10U	5 U	10 U	10 U	10 U
Chrysene	$0.002^{(3)}$	10 U	10 U	10 U	10U	10 U	5 U	10U	5 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	(4)	10 U	10 U	10 U	10U	10 U	5 U	10U	5 U	10 U	10 U	10 U
Fluoranthene	$50^{(3)}$	10 U	10 U	10 U	10U	10 U	5 U	10U	5 U	10 U	10 U	10 U
Fluorene	$50^{(3)}$	10 U	24	10 U	6J	10 U	5 U	5J	5 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	$0.002^{(3)}$	10 U	10 U	10 U	10U	10 U	5 U	10U	5 U	10 U	10 U	10 U
2-Methylnaphthalene	$50^{(3)}$	10 U	120	10 U	21	10 U	10 U	4J	10 U	10 U	10 U	10 U
Naphthalene	$10^{(3)}$	1 J	66	10 U	9J	10 U	5 U	10U	5 U	4 J	10 U	10 U
Phenanthrene	$50^{(3)}$	10 U	40	10 U	8J	1 J	5 U	10U	5 U	10 U	10 U	10 U
Pyrene	$50^{(3)}$	10 U	10 U	10 U	10U	10 U	5 U	10U	5 U	10 U	10 U	10 U
Phenol	1	10 U	10 U	10 U	2J	10 U	10 U	10U	10 U	10 U	10 U	10 U

NOTES:

1. Groundwater collected by Malcolm Pirnie, Inc. during Supplemental Field Investigation in March & April, 1998
2. Source: Malcolm Pirnie, Inc. Phase I/II Investigation Report (September 1997)
3. Guidance Value only.
4. NYS Guidance Value or Standard not available
5. NA - Not Analyzed
6. U-Indicates that the compound was analyzed for but not detected.
7. J - Analyte was positively identified; the associated numerical value is the approx. concentration of the analyte in the sample.
8. Shading denotes that concentration exceeds Groundwater Quality Standard or Guidance Value.

Table 4-5

Summary of Groundwater Analytical Results - Inorganic Parameters

Site Assessment Report (Area I)

LTV Steel Company

Inorganic Parameters (mg/L)	NYS Class GA Groundwater Quality Stds	Wells Located Adjacent to the Buffalo River						Wells Located in Area I Interior				
		A1-MW-1 (1)	A1-MW-2 (1)	A1-MW-3 (1)	A1-MW-A2 (1)	A1-P-1 (1)	A1-MW-M2 (2)	A1-MW-K2 (1)	A1-MW-F2 (2)	A1-P-2 (1)	A1-P-3 (1)	A1-P-4 (1)
Aluminum	(3)	NA	NA	NA	NA	NA	3.18	NA	126	NA	NA	NA
Antimony	0.003(4)	NA	NA	NA	NA	NA	0.06 U	NA	0.06 U	NA	NA	NA
Arsenic	0.025	NA	NA	NA	NA	NA	0.01 U	NA	0.022	NA	NA	NA
Barium	1	NA	NA	NA	NA	NA	0.0382	NA	[redacted]	NA	NA	NA
Beryllium	0.003(4)	NA	NA	NA	NA	NA	0.005 U	NA	[redacted]	NA	NA	NA
Cadmium	0.01	NA	NA	NA	NA	NA	0.005 U	NA	0.005 U	NA	NA	NA
Calcium	(3)	NA	NA	NA	NA	NA	90.1	NA	189	NA	NA	NA
Chromium	0.05	NA	NA	NA	NA	NA	0.01 U	NA	[redacted]	NA	NA	NA
Cobalt	(3)	NA	NA	NA	NA	NA	0.05 U	NA	0.0736	NA	NA	NA
Copper	0.2	NA	NA	NA	NA	NA	0.02 U	NA	[redacted]	NA	NA	NA
Iron	0.3	[redacted]	NA	NA	NA	0.066	[redacted]	[redacted]	[redacted]	0.11	0.03 U	0.19
Lead	0.025	NA	NA	NA	NA	NA	0.05 U	NA	[redacted]	NA	NA	NA
Magnesium	35	NA	NA	NA	NA	NA	10.8	NA	33.9	NA	NA	NA
Manganese	0.3	NA	NA	NA	NA	NA	[redacted]	NA	[redacted]	NA	NA	NA
Mercury	0.002	NA	NA	NA	NA	NA	0.0003 U	NA	0.0003 U	NA	NA	NA
Nickel	(3)	NA	NA	NA	NA	NA	0.04 U	NA	0.231	NA	NA	NA
Potassium	(3)	NA	NA	NA	NA	NA	16.2	NA	37	NA	NA	NA
Selenium	0.01	NA	NA	NA	NA	NA	0.005 U	NA	0.005 U	NA	NA	NA
Silver	0.05	NA	NA	NA	NA	NA	0.01 U	NA	0.01 U	NA	NA	NA
Sodium	20	NA	NA	NA	NA	NA	[redacted]	NA	[redacted]	NA	NA	NA
Thallium	0.004(4)	NA	NA	NA	NA	NA	0.01 U	NA	0.01 U	NA	NA	NA
Vanadium	(3)	NA	NA	NA	NA	NA	0.05 U	NA	0.221	NA	NA	NA
Zinc	0.3	NA	NA	NA	NA	NA	0.0381	NA	[redacted]	NA	NA	NA
Total Cyanide	0.1	0.01 U	0.01 U	0.01 U	0.01U	0.01 U	0.0338	0.027	0.01 U	0.01 U	0.01 U	0.01 U

Notes:

1. Groundwater collected by Malcolm Pirnie, Inc. during Supplemental Field Investigation in March & April, 1998
2. Source: Malcolm Pirnie, Inc. Phase I/II Investigation Report (September 1997)
3. NYS Guidance Value or Standard not available
4. Guidance Value only.
5. NA - Not Analyzed
6. U-Indicates that the compound was analyzed for but not detected.

0002-005
Revised March 1999
GROUNDWATER/Gwres2

Table 4-6

Calculated Average Groundwater Constituent Concentrations By Segment

Site Assessment Report (Area I)
LTV Steel Company

Constituent	Segment 1-1	Segment 1-2	Segment 1-3	Segment 1-4	Segment 2-1	Segment 2-2	Segment 2-3	Segment 3-1	Segment 3-2	Segment 3-3
Volatile Organic Compounds (ug/L):										
Acetone	27	0	0	0	0	0	0	0	11.5	23
Benzene [(1)]	0.435	0.435	0.435	0.435	0.435	0.435	0.435	0.435	0.435	0.435
Ethylbenzene	0	0	0.0	0.2	1.2	1	0	0	0	0
Toluene	0	0	3.5	6.3	2.8	0	0	0	0	0
Xylene (total) [(2)]	1.75	1.75	7.9	12.7	6.2	1.375	1.75	1.75	1.75	1.75
Semivolatile Organic Compounds (ug/L):										
Acenaphthene	0	0	2	5.1	10.6	7.5	0.21	0.61	0.4	0
Anthracene	0	0	0	0	0	0	0.26	0.76	0.5	0
Fluorene	0	0	3	7.8	16.8	12	0	0	0	0
2-Methylnaphthalene	0	0	10.5	30.8	80.3	60	0	0	0	0
Naphthalene	0	0	4.5	14.6	43.1	33.5	0.74	0.24	0	0
Phenanthrene	0	0	4	11.2	27.2	20	0.26	0.76	0.5	0
Phenol [(3)]	0.465	0.465	1.233	1.848	1.081	0.465	0.465	0.465	0.465	0.465

Notes:

1. Benzene was not detected in the site perimeter groundwater samples. Since the practical quantitation limit was above the groundwater quality standard, a concentration of 1/2 the method detection limit (0.87 ug/L) was used.
2. Xylene was not detected in the site perimeter groundwater samples that define Segments 1-1, 1-2, 2-3, 3-1, 3-2, and 3-3. Since the practical quantitation limit was above the groundwater quality standard, a concentration of 1/2 the method detection limit (3.5 ug/L) was used.
3. Phenol was not detected in the site perimeter groundwater samples that define Segments 1-1, 1-2, 2-2, 2-3, 3-1, 3-2, and 3-3. Since the practical quantitation limit was above the groundwater quality standard, a concentration of 1/2 the method detection limit (0.93 ug/L) was used.

Table 4-7

Calculation of Groundwater Flow Contribution to Buffalo River from Area I

Site Assessment Report (Area I)
LTV Steel Company

Description	k (ft/day)	I (ft/ft)	A (ft^2)	Groundwater Flow (ft^3/day)
Line 1:				
A1-F-2	156.2	0.021	-	-
A1-P-4	0.68	0.025	-	-
A1-MW-3	11.6	0.010	-	-
A1-MW-A2	116.1	0.010	-	-
Line 2:				
North End Line 2	191.3	0.012	-	-
A1-MW-2	425.2	0.022	-	-
A1-MW-1	133.2	0.039	-	-
Line 3:				
East End Line 3	325.8	0.041	-	-
A1-P-1	595.3	0.043	-	-
A1-MW-M2	0.12	0.043	-	-
West End Line 3	0.12	0.043	-	-
Line 1:				
Segment 1-1	78.44	0.023	-	-
Segment 1-2	6.2	0.018	1,534	165
Segment 1-3	63.9	0.010	1,339	859
Segment 1-4	153.7	0.011	1,112	1,923
			Total	2,948
Line 2:				
Segment 2-1	308.3	0.017	3,534	18,411
Segment 2-2	279.2	0.030	2,520	21,249
Segment 2-3	229.5	0.040	138	1,270
			Total	40,930
Line 3:				
Segment 3-1	460.5	0.042	300	5,837
Segment 3-2	297.7	0.043	603	7,719
Segment 3-3[(1)]	239.10	0.043	1,166	11,932
			Total	25,489

Notes:
1. Hydraulic conductivty is the average hydraulic conductivity of A1-MW-M2, A1-P-1, and A1-P-2.

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Table 4-8

Groundwater Contaminant Loading to Buffalo River

Site Assessment Report (Area I)
LTV Steel Company

Constituent	Segment 1-1	Segment 1-2	Segment 1-3	Segment 1-4	Segment 2-1	Segment 2-2	Segment 2-3	Segment 3-1	Segment 3-2	Segment 3-3
Volatile Organic Compounds (lbs/day):										
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.54E-03	1.71E-02
Benzene	0.00E+00	4.49E-06	2.33E-05	5.22E-05	5.00E-04	5.77E-04	3.45E-05	1.59E-04	2.10E-04	3.24E-04
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	2.37E-05	1.38E-03	1.33E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	1.88E-04	7.57E-04	3.23E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene (total)	0.00E+00	1.81E-05	4.23E-04	1.53E-03	7.14E-03	1.82E-03	1.39E-04	6.38E-04	8.43E-04	1.30E-03
Total VOC Loading	0.00E+00	2.25E-05	6.34E-04	2.36E-03	1.22E-02	3.73E-03	1.73E-04	7.96E-04	6.59E-03	1.88E-02
Semivolatile Organic Compounds (lbs/day):										
Acenaphthene	0.00E+00	0.00E+00	1.07E-04	6.11E-04	1.22E-02	9.95E-03	1.65E-05	2.22E-04	1.93E-04	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.06E-05	2.77E-04	2.41E-04	0.00E+00
Fluorene	0.00E+00	0.00E+00	1.61E-04	9.34E-04	1.93E-02	1.59E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Methylnaphthalene	0.00E+00	0.00E+00	5.63E-04	3.70E-03	9.23E-02	7.96E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	0.00E+00	0.00E+00	2.41E-04	1.76E-03	4.96E-02	4.44E-02	5.86E-05	8.73E-05	0.00E+00	0.00E+00
Phenanthrene	0.00E+00	0.00E+00	2.14E-04	1.34E-03	3.12E-02	2.65E-02	2.06E-05	2.77E-04	2.41E-04	0.00E+00
Phenol	0.00E+00	4.80E-06	6.60E-05	2.22E-04	1.24E-03	6.17E-04	3.69E-05	1.69E-04	2.24E-04	3.46E-04
Total SVOC Loading	0.00E+00	4.80E-06	1.35E-03	8.56E-03	2.06E-01	1.77E-01	1.53E-04	1.03E-03	8.99E-04	3.46E-04
Total Organic Loading	0.00E+00	2.73E-05	1.99E-03	1.09E-02	2.18E-01	1.81E-01	3.27E-04	1.83E-03	7.49E-03	1.91E-02

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Table 4-9

Estimated Increase in Downstream Constituent Concentration

Site Assessment Report (Area I)
LTV Steel Company

Constituent	Total Loading (lb/day)	Estimated Increase In Downstream Constituent Concentration (ug/L) (1)	New York State Class D Water Quality Standard/Guidance Value (ug/L)	New York State Class A Water Quality Standard/Guidance Value (ug/L)
Volatile Organic Compounds:				
Acetone	0.023	0.055	-	50
Benzene	0.0019	0.0046	6	0.7
Ethylbenzene	0.0027	0.0067	-	5
Toluene	0.0042	0.010	-	5
Xylene (total)	0.014	0.034	-	5
Total VOCs	0.045	0.92	-	-
Semivolatile Organic Compounds:				
Acenaphthene	0.023	0.057	-	20
Anthracene	0.00054	0.011	-	50
Fluorene	0.036	0.74	-	50
2-Methylnaphthalene	0.18	3.59	-	-
Naphthalene	0.10	1.96	-	10
Phenanthrene	0.060	1.22	-	50
Phenol	0.0029	0.060	5	1
Total SVOCs	0.40	8.07	-	-
Total VOCs and SVOCs	0.44	8.99	-	-

Notes:

(1) Assumes the average daily flow rate of the Buffalo River during the summer is 49 million gallons per day. Source: Buffalo River Remedial Action Plan, NYSDEC, November 1989.

\- No New York State Water Quality Standard or Guidance Value.

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Appendix A

Proposed Cleanup Objectives for Inorganics in Site Soils Report

Library

Proposed Cleanup Objectives for Inorganic Constituents in Site Soils

Prepared for:

LTV STEEL COMPANY/THE HANNA FURNACE COMPANY

February 1999

Prepared by:

TURN KEY ENVIRONMENTAL RESTORATION, LLC

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Proposed Cleanup Objectives for Inorganic Constituents in Site Soils

At Former Steel Manufacturing Site, Buffalo, New York

Introduction

This document presents proposed cleanup objectives for inorganic constituents in site soils for use on the former Steel Manufacturing Site to support a voluntary cleanup and redevelopment of Areas II, III, and IV protective of both the environment and human health. The proposed cleanup objectives were developed based on:

- leaching tests performed on site soils
- Buffalo-area background soils data
- site soils data

Maximum Allowable Concentration in Soil Protective of Groundwater Quality

Leaching tests were performed on three soil samples collected from the Steel Manufacturing site. Two samples were collected from locations in Area I and the third sample was collected from Area II. The samples were analyzed for total RCRA metals prior to performing the leaching test to confirm the presence of one or more inorganic constituents at elevated concentrations. The leaching test was then performed with melted snow collected from the site to determine maximum concentrations of inorganics in soil that are solubilized or leached as rain or snow precipitation percolates through site soils to groundwater. The concentrations are considered "maximum" because of the aggressive nature of the test. Table 1 presents the analytical results of total metals in soil samples subjected to the leaching test as well as the resulting leachate concentrations.

The maximum concentration of inorganic parameters protective of groundwater quality was then determined using the "Methodology for Determination of Cleanup Objectives for Inorganic Constituents in Site Soils" (see Attachment 1).

A comparison of the Maximum Allowable Concentration in Soil Protective of Groundwater in Table 1 to the Summary of Inorganics in Site Soil presented in Table 2 indicates that none of the subsurface soil samples collected from Areas I, II, III and IV (excluding portions of which that are not designated for remediation) would adversely impact groundwater quality on or off-site for inorganic parameters. This conclusion is consistent with groundwater quality sampling performed on-site.

Background Buffalo-Area Soils

For the purpose of comparing inorganics in site subsurface soils with background concentrations in soils throughout the Buffalo, New York area, Table 3 was compiled from background soil data contained in the following site investigation reports:

- "Phase I/Phase II Remedial Investigation at the Buffalo Outer Harbor Site," Dvirka and Bartilucci Consulting Engineers (December 1995).
- "Site Investigation/Remedial Alternative Report For The Property, 2560 Hamburg Turnpike (Amadori)", URS Greiner Consultants, Inc. (September 1998).
- "Supplemental Remedial Investigation of Outokumpo American Brass", McLaren Hart Engineers (December 1995).
- "Remedial Investigation of Ramco Steel Site", Dames & Moore (August 1994).
- "Remedial Investigation of Bern Metal/Universal Sites", Blasland, Bouck & Lee, Inc. (November 1995).
- "Remedial Investigation of 318 Urban Street Site", ERM-Northeast, Inc. (November 1992).
- "Final Interim Remedial Report for Diarsenal-Kingsley Park Site", Engineering Science (February 1991).

A comparison of the background data in Table 3 to the site soils data in Table 2 indicates that:

- Inorganic constituents in site soils and "background" soils from around Buffalo, New York are highly variable from location to location, presumably due to a variety of industry and other activities on and near these urban sites.
- Average concentrations in site soils are generally comparable to that of the background soils with the exception of chromium and selenium.

- Chromium concentrations in site soils ranged from 10.6 to 891 mg/kg and averaged about 230 mg/kg compared to a range of 6.5 to 348 mg/kg and an average of 56 mg/kg in background soil. The elevated chromium in site soils is likely a result of extensive quantities of BOF and blast furnace slag fill accumulated on the site from steel making operations (see Attachment 2).
- Selenium concentrations in site soils ranged from non-detect to 61 mg/kg and averaged 7.59 mg/kg compared to a range of non-detect to 4.1 mg/kg and an average of 1.1 mg/kg in background soils. As selenium data in background soil is sparse, some greater variability in site soil is to be expected.

Proposed Inorganic Action Levels

Proposed action levels for inorganics in subsurface soils on the Former Steel Manufacturing Site are presented in Table 4. For reference purposes, maximum concentrations observed in site and background soils are also shown for the eight inorganic parameters. The proposed cleanup objectives are protective of human health and the environment. Human health will be further protected through the placement of cover soils, pavement or concrete building floors and foundations during site redevelopment. Protection of the environment, and more specifically the protection of off-site groundwater quality, has been demonstrated through site-specific groundwater monitoring data (see Site Assessment Reports) and soils leaching data presented herein. The attached Executive Summary of Steelmaking Slag Risk Assessment Report prepared by the Steel Slag Coalition further substantiates the site-specific findings.

Table 1
Former Steel Manufacturing Site
Buffalo, New York

Summary of Synthetic Precipitation Leaching Test and Calculation of Soil Concentrations Protective of Groundwater Quality

Parameter	A1-TP-32/33/34/35/36/37/38		A1-SS-16,0-6"		A2-TP-10,11,12	
	Concentration in Soil	Leachate Concentration by SPLP	Concentration in Soil	Leachate Concentration by SPLP	Concentration in Soil	Leachate Concentration by SPLP
Inorganic Compounds	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L
Arsenic	27.9	0.048 U	11.3	0.009 U	13.2	0.009 U
Barium	385	0.029	163	0.046	284	0.037
Cadmium	10.4	0.025 U	5 U	0.005 U	5 U	0.005 U
Chromium	58	0.025 U	669	0.059	28.2	0.005 U
Lead	758	0.075 U	828	0.015 U	183	0.015 U
Mercury	0.7	0.001 U	0.061	0.001 U	7.3	0.001 U
Selenium	18.6 U	0.095 U	2.8	0.019 U	0.6 U	0.019 U
Silver	6.52	0.025 U	2.5 U	0.005 U	2.5 U	0.005 U

Notes: U- compound was not detected at the detection limit shown.
Shaded sample results were used in calculations below.

CALCULATIONS:

Parameter	A Average Concentration in Soil(1)(3)	B Average Leachate Concentration(2)(4)	C NYSGWQ Std. times 100(4)	D Conversion Factor(5)	Maximum Allowable Concentration In Soil Protective of Groundwater Quality(3)(6)
Arsenic	17.5	0.021	2.5	119	2,100
Barium	277	0.037	100	2679	742,000
Cadmium	10.4	0.025	1	40	400
Chromium	252	0.030	5	169	42,000
Lead	590	0.035	2.5	71	42,000
Mercury	2.69	0.001	0.2	200	500
Selenium	2.8	0.019	1	53	100
Silver	6.52	0.025	5	200	1,300

Notes
(1) Calculated from soil concentrations in shaded cells above. Where the analytical test did not detect concentrations of the particular metal in soil, that sample result was not used in average calculation for that particular metal.
(2) Calculated from leachate concentrations in shaded cells above. Where the analytical test did not detect concentrations of the particular metal in soil, that sample result was not used in average calculation for that particular metal.
(3) Units - mg/kg
(4) Units - mg/l
(5) Calculated result (C divided by B)
(6) Calculated result (A*D) rounded to two significant digits

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Table 2
Former Steel Manufacturing Site
Buffalo, New York

Summary of Inorganics in Site Soils(1)

Parameter	A1-SB-D3	A1-SB-E3	A1-SB-F1	A1-SB-G1	A1-SB-H1	A1-SB-I2	A1-SB-J2	A1-MW-M2	A2-SS-6	A2-SS-7	A2-TP-7/8/9	A2-TP-10/11/12	A2-TP-13/14/15	A2-TP-16/17/18	A2-TP-19/20	A2-TP-7/8/9
	10-14'	4-6'	4-6'	8-10',11-11.5	8-10'	8-10'	8-10'	6-6.5'			0-1'	0-1'	0-1'	0-1'	0-1'	1-4'
Inorganic Compounds (mg/kg)																
Arsenic	21.8	ND	2.4	ND	16.7	ND	ND	ND	14	6.9	17.9	29.2	19	19	17.8	17.7
Barium	118	304	243	62.4	85.5	132	142	332	74.4	271	133	421	78.9	161	68.4	112
Cadmium	1.26	1.8	1.05	4.72	5.05	ND	ND	1.3	1.46	ND	ND	ND	ND	ND	ND	ND
Chromium	20.2	328	71.7	42.6	48	22	25	393	31.8	27.8	18	129	97.1	23.9	46.5	15.7
Lead	116	159	24.2	15.3	293	31.1	14.8	118	83.7	18.1	86.3	106	160	73.7	112	77.1
Mercury	0.32	ND	ND	ND	2.37	ND	ND	ND	4.62	0.66	2.52	6.11	0.91	0.28	0.16	1.16
Selenium	ND	2.02	ND	ND	ND	4.79	2.48	13.9	10.4	7.5	1.58	3.6	1.7	2.16	1.44	1.55
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.44	ND	ND	ND	ND

Parameter	A2-TP-10/11/12	A2-TP-10,11,12	A2-TP-13/14/15	A2-TP-16/17/18	A2-TP-19/20	A1-TP-32 - 36	A1-SS-10/11	A1-SS-12/13	A1-SS-14	A1-SS-15	A1-SS-16	A1-SS-16	A1-SS-17/18/19	A1-SS-20/21	A1-SS-22	A1-SS-23
	1-4'	0-6"	1-4'	1-4'	1-4'	3"-native	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE	0-6"	SURFACE	SURFACE	SURFACE	SURFACE
Inorganic Compounds (mg/kg)																
Arsenic	47.7	13.2	20.2	24.3	21.6	27.9	24.7	25.5	12.2	8.85	7.61	11.3	4.37	11.5	6.89	22.2
Barium	133	284	254	440	52.2	385	152	130	160	191	121	163	164	143	92.4	261
Cadmium	0.77	ND	ND	0.62	ND	10.4	1.51	1.79	0.8	2.69	3.77	ND	2.37	2.94	1.27	8.55
Chromium	18.4	28.2	34.9	17.6	12.2	56.1	257	197	434	636	891	669	635	891	73.1	188
Lead	116	183	53.2	84.9	116	758	145	198	79.6	145	397	628	147	83.7	76.5	
Mercury	4.47	7.3	0.17	0.06	0.18	0.7	ND	ND	ND	ND	ND	0.06	ND	ND	ND	0.32
Selenium	3.23	ND	2.02	3.36	1.06	9.3	ND	ND	21.9	24.6	46.3	2.8	57.1	61	8.38	ND
Silver	ND	ND	1.46	1.22	ND	6.52	1.65	1.69	2.53	2.14	4.16	ND	3.05	2.96	ND	1.71

Parameter	A1-SS-24	A1-SS-25	A1-SB-9	A3-SS-1	A3-SS-2	A3-SS-3	A3-SB-4	A3-SB-5	A3-SB-6	A3-TP-54/55/56	A3-SB-47/48/49/50	A3-TP-57/58/59/60/6	A3-TP-63/64/65	A3-SB-46	A4-TP-46/47/48
	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE	SURFACE	4-6'	4-6'	2.5-3'						
Inorganic Compounds (mg/kg)															
Arsenic	17.7	19.2	6.57	14.5	25.3	19.8	ND	ND	4.39	42.2	ND	42.4	56.8	10.7	64.6
Barium	206	144	261	81.3	193	165	112	163	414	122	125	138	114		137
Cadmium	2.3	5.93	1.55	ND	1.35	0.8	1.1	1.2	1.18	ND	1.43	ND	ND	ND	ND
Chromium	67.8	699	45.1	866	49.3	612	27.2	29.1	106	662	230	237	533	10.6	819
Lead	261	434	72.2	76.1	188	178	19.9	20.1	236	766	168	331	337	12.7	703
Mercury	0.24	0.32	ND	ND	ND	ND	ND	ND	ND	0.11	0.2	ND	0.54	ND	0.14
Selenium	ND	ND	ND	9.12	18.4	4.64				ND	14.7	ND	3.89		ND
Silver	ND	ND	ND	2.34	1.46	2.27				4.64	2.06	2.84	4.35		5.77

Statistical Summary:

Parameter	[illegible]	Number [illegible]	[illegible]	[illegible]	[illegible]
Inorganic Compounds (mg/kg)					
Arsenic	64.6	39	19.1	14.31	48
Barium	440	46	180	103.32	367
Cadmium	10.4	28	2.43	2.67	7.58
Chromium	891	47	230	258.31	800
Lead	828	46	179	203.12	586
Mercury	7.3	24	1.27	2.02	5.31
Selenium	61	29	10.9	15.75	42
Silver	6.52	20	2.43	1.71	5.85

NOTES:

(1) Includes all surface and subsurface soils data for Areas I, II, III, and IV excluding subareas designated for remediation (i.e. Area I Subarea K &L, Area II Containmen Subarea, blue-stained soils and tar in Area III and Area IV).

(2) Average Concentration in samples detected.

ND Not Detected

Blank Space indicates parameter was not analyzed for.

TABLE 3
Former Steel Manufacturing Site
Buffalo, New York

Summary of Background Inorganic Concentrations in Buffalo Area Soils(1)

Parameter	Buffalo Outer Harbor Site-fill(2) SS-125	SS-126	SS-127	SS-128	SS-129	Amadori Proj.(3) BG-1	BG-2	Outokumpo American Brass(4) BKG-1 fill	BKG-2 fill	BKGD-3 fill	BKGD-4 fill	BKGD-5 fill	BKGD-6 fill	BKGD-7 fill	BKGD-9 fill	BKGD-10 fill	Ramco Steel(5) TP-2-1	TP-6-2	Bern Metal(6) BG-1	BG-2	318 Urban St.(7) A11(0-12")	Diarsenal Offsite(8) Samples
Inorganic Compounds (mg/kg)																						
Arsenic	4.2 E	5.9 E	14.6 E	7.4 E	9.1 E	12.1	12.3	1.7	4	2.1 B	3.1 J	3.10 BJ	1.9 B	6.2	4.6 J	20 BJ	1.3 R	1.2 R	22.1 B	25.2 BJ	2.7 J	18.7
Barium	179	73.2	103	97.3	131	61.7	62.2										32.8	48	395 J	1030 J	80.2	
Cadmium	0 U	0.78 B	1.6	1.6	1.2	6.2	5.7	< 5.6	< 6.3	7.2 J	< 0.6	< 0.64	7.5 J	15 J	5.7	< 0.62	< 1.3 R	< 12 R	1.6	3.1	0.82 B	
Chromium	17.3	20.7	27.3	22.8	61.4	57.6	35.7										6.5	12	348 J	50.7 J	11.3	
Lead	82.5	107	357	522	1600	181	163	62	< 32	66	10	11	77	130	70	8.6	10.1	5.3	262	633	83.8 J	1990
Mercury	0.17	0.12	0.33	0.31	0.32		0.07										< 0.11	< 0.1	0.61	0.95	0.12 U	
Selenium	1.2 E	0 UE	0 UE	0 UE	0 UE	3	4.1										< 1 R	< 1 R	0.82 B	0.96 B	1.2 U	
Silver	0 UE	0 UE	0 UE	0 UE	0 UE	0.86	0.37										< 0.25		2.3 B	2.5 B	1 U	

NOTES:
(1) Data summarized by TurnKey Environmental Restoration, LLC from data supplied by NYSDEC
(2) Source: "Phase I/Phase II Remedial Investigation Report at the Buffalo Outer Harbor Site, City of Buffalo", Dvirka and Bartilucci Consulting Engineers, December 1995
(3) Source: "Draft Site Investigation Report for the Site Investigation / Remedial Alternative Report for the property at 2580 Hamburg Turnpike (Amadori Project Site)" URS Greiner Consultants, Inc., September 1998
(4) Source: "Supplemental Remedial Investigation of Outokumpo American Brass Buffalo Plant, Buffalo, New York", McLaren Hart Engineers, December 1995
(5) Source: "Remedial Investigation Report of Ramco Steel Site, Buffalo, New York", Dames & Moore, August 1994
(6) Source: "Remedial Investigation Report of Bern Metal/Universal Sites, Buffalo, New York", Blasland, Bouck & Lee, Inc., November 1995
(7) Source: "Remedial Investigation Report of 318 Urban Street Site, Buffalo, New York for General Electric", ERM-Northeast, Inc., November 1992
(8) Source: "Final Interim Remedial Report for Diarsenal -Kingsley Park Site, City of Buffalo", Engineering Science, February 1991

Blank space denotes parameter was not analyzed for or not reported in the source document. Blank spaces do not factor into the statistical calculations.
U - Compound was not detected at the associated detection limit
E=Result qualified as estimated based on validation criteria
B=Compound concentration is less than the CRDL but greater than the IDL
J=Estimated Value
R=Rejected based on validation results

STATISTICAL SUMMARY:

Parameter	Maximum Concentration	Number of Samples	[illegible]	[illegible]	[illegible]	[illegible]
Inorganic Compounds (mg/kg)						
Arsenic	25.2	22	8.34	7.43	15.8	23.2
Barium	1,030	12	191	281.37	472	753.8
Cadmium	15.0	21	4.08	4.06	8.11	12.2
Chromium	348	12	56	93.81	150	243.8
Lead	1,990	22	294	516.97	811	1,327.7
Mercury	1.0	11	0.284	0.27	0.56	0.831
Selenium	4.1	12	1.10	1.26	2.37	3.63
Silver	2.5	11	0.66	0.93	1.59	2.52

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Table 4
Former Steel Manufacturing Site
Buffalo, New York

Proposed Action Levels for Inorganics in Subsurface Soils

Parameter	Maximum Allowable Concentration In Soil Protective of Groundwater Quality[1]	Maximum Concentration in Site Soils[2]	Maximum Concentration in Background[3]	Proposed Inorganic Action Levels in Soil
Inorganic Compounds (mg/kg)				
Arsenic	2100	64.6	25.2	[illegible]
Barium	742,900	440	1030	[illegible]
Cadmium	400	10.4	15.0	[illegible]
Chromium	42,400	891	348	[illegible]
Lead	42,100	828	1990	[illegible]
Mercury	500	7.3	1.0	[illegible]
Selenium	100	61	4.1	[illegible]
Silver	1,300	6.52	2.5	[illegible]

Notes:
(1) From Table 1
(2) From Table 2
(3) From Table 3

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Attachment 1

Methodology for Determination of Cleanup Objectives for Inorganic Constituents in Site Soils

At Former Steel Manufacturing Site, Buffalo, New York

Introduction

The use of site-specific cleanup objectives on the former Steel Manufacturing Site is necessary to support a voluntary cleanup and redevelopment of Areas II, III, and IV protective of both the environment and human health. Several inorganics, including lead, arsenic, chromium, and mercury, are present in site soil/fill at elevated concentrations relative to "background" concentration in Eastern U.S. soils. The concentrations and type of inorganics detected in soils/fill are not unusual or unexpected based upon the historical use of the site for steel and coke manufacturing. The highest lead concentrations in soil/fill are associated with the "blue-stained" soils in Area III that are designated for excavation and treatment.

These same inorganic constituents were generally not detected or only at low levels in site groundwater samples. As such, on a site-wide scale, the inorganic constituents in site soils/fill have already been demonstrated not to be leachable or mobile in the environment. However, some fill materials present on the site could potentially be contributing elevated concentrations of inorganics to localized on-site groundwater.

Purpose and Scope

Potential human health risks related to ingestion, inhalation, or direct dermal contact of inorganics in site soils/fill are being address through the placement of cover soils, pavement or concrete building floors and foundations during voluntary cleanup or subsequent site redevelopment. As such, this methodology addresses environmental objectives, specifically the protection of off-site groundwater quality from the leaching of inorganics from soil/fill into groundwater and subsequent migration. A number of site-specific factors determine the leachability of inorganic constituents in soil/fill, including:

- Organic content of soil/fill due to its tendency to adsorb inorganic constituents.
- pH of the soil, rainwater infiltration and groundwater as it affects inorganic solubility.

- The form of the inorganic (i.e. metal/alloy, inorganic salt, and organic complex).
- Soil/fill grain size.

Therefore it is necessary to perform a leaching test on representative soil/fill to determine what portion of the total inorganics present in the soil is solubilized and released to groundwater as rainwater percolates through it.

The Synthetic Precipitation Leaching Procedure (EPA Method 1312) is designed to determine the mobility of inorganic analytes present in soil samples. This method is used to simulate the actual site-specific potential of individual compounds present in a representative soil matrix to leach or solubilize in rainwater. By quantifying the fraction of total inorganic in soil that leaches, site-specific cleanup levels can be derived to protect groundwater quality.

The site-specific cleanup levels for inorganic soil constituents developed by this methodology would be used to define the lateral limits of excavation of "blue-stained" soils during Voluntary Cleanup of Area III as well as to determine the acceptability of soils/fill excavated from Areas II, III and IV during subsequent redevelopment to be used as subgrade backfill.

Methodology

The method that is being used is based on the use of EPA Method 1312, Synthetic Precipitation Leaching Procedure (SPLP). This procedure is similar to the TCLP methodology but uses synthetic precipitation as the extraction fluid rather than an acidic buffer (i.e. acetic acid). The use of synthetic precipitation in the SPLP more reflects actual leaching conditions in the field. The SPLP is included as an attachment to this methodology.

Rather than using a precipitation that is representative of rainfall east of the Mississippi River, actual precipitation (i.e. melted snow) from the former Steel Manufacturing Site will be used. The snow will be collected on the same day as the soil samples that will be used in the study. Snow will be delivered to a local analytical laboratory so that the material can be melted and stored appropriately.

Sample Collection

Three samples will be collected from locations that will have elevated levels of at least one of the RCRA metals. In order to assure that samples will be elevated with respect to RCRA metals, each soil sample will be analyzed for total metals prior to performing the SPLP. The aliquot that is used for the total metal analysis will be large enough to use the remainder for the SPLP. Once the results indicate that elevated levels are present, the SPLP will be performed.

Samples will be collected from locations where previous testing has demonstrated elevated levels of RCRA metals using a backhoe to excavate a test pit. The test pit will be excavated to approximately one foot below grade. Soil will be grabbed from different locations within the test pit and mixed well prior to placing the soil in the jar. The samples will be shipped to the laboratory under chain-of-custody procedures.

Data Evaluation

The laboratory will provide one-week turnaround of data in tabular form. Results will include the total RCRA metal concentrations (i.e. arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) and the leached concentrations from the SPLP. A comparison will be made between the total metal concentration and the leached metal concentration as follows to calculate a soil cleanup objective protective of groundwater quality:

- The average total concentration of each RCRA metal in soil will be calculated using all of the soil sample results for which a leaching test is performed and concentrations detected. If the total metal result of a sample is nondetect, that sample result will not be averaged with the others, neither will the leachate result.
- The average leachate concentration of each metal will be calculated using all of the sample results where total metal was detected in the soil. If the leachate result for

any parameter is nondetect, than one-half the detection limit will be used in the calculation.

- The maximum acceptable synthetic leachate concentration protective of groundwater quality will be defined as 100 times the New York State Groundwater Quality Standard for each parameter. This is the same "correction factor" used by NYSDEC in TAGM 4046 – Determination of Soil Cleanup Objectives and Cleanup Goals to account for natural transformation, attenuation, dilution and dispersion of leached soil constituents as they migrate through the saturated zone.
- The maximum acceptable synthetic leachate concentration is compared to or divided by the site-specific average leachate result for each parameter of interest. This factor is multiplied by the average site-specific total inorganic concentration in soil to determine the maximum acceptable concentration in soil protective of groundwater quality.

METHOD 1312

SYNTHETIC PRECIPITATION LEACHING PROCEDURE

1.0 SCOPE AND APPLICATION

1.1 Method 1312 is designed to determine the mobility of both organic and inorganic analytes present in samples of soils, wastes, and wastewaters.

1.2 If a total analysis of the soil, waste, or wastewater demonstrates that individual analytes are not present, or that they are present but at such low concentrations that the appropriate regulatory levels could not possibly be exceeded, Method 1312 need not be run.

1.3 If an analysis of any one of the liquid fractions of the 1312 extract indicates that a regulated compound is present at such high concentrations that, even after accounting for dilution from the other fractions of the extract, the concentration would be above the regulatory level for that compound, then the waste is hazardous and it is not necessary to analyze the remaining fractions of the extract.

1.4 If an analysis of extract obtained using a bottle extractor shows that the concentration of any regulated volatile analyte exceeds the regulatory level for that compound, then the waste is hazardous and extraction using the ZHE is not necessary. However, extract from a bottle extractor cannot be used to demonstrate that the concentration of volatile compounds is below the regulatory level.

2.0 SUMMARY OF METHOD

2.1 For liquid samples (i.e., those containing less than 0.5 percent dry solid material), the sample, after filtration through a 0.6 to 0.8 µm glass fiber filter, is defined as the 1312 extract.

2.2 For samples containing greater than 0.5 percent solids, the liquid phase, if any, is separated from the solid phase and stored for later analysis; the particle size of the solid phase is reduced, if necessary. The solid phase is extracted with an amount of extraction fluid equal to 20 times the weight of the solid phase. The extraction fluid employed is a function of the region of the country where the sample site is located if the sample is a soil. If the sample is a waste or wastewater, the extraction fluid employed is a pH 4.2 solution. A special extractor vessel is used when testing for volatile analytes (see Table 1 for a list of volatile compounds). Following extraction, the liquid extract is separated from the sample by 0.6 to 0.8 µm glass fiber filter.

2.3 If compatible (i.e., multiple phases will not form on combination), the initial liquid phase of the waste is added to the liquid extract, and these are analyzed together. If incompatible, the liquids are analyzed separately and the results are mathematically combined to yield a volume-weighted average concentration.

3.0 INTERFERENCES

3.1 Potential interferences that may be encountered during analysis are discussed in the individual analytical methods.

4.0 APPARATUS AND MATERIALS

4.1 Agitation apparatus: The agitation apparatus must be capable of rotating the extraction vessel in an end-over-end fashion (see Figure 1) at 30 ± 2 rpm. Suitable devices known to EPA are identified in Table 2.

4.2 Extraction Vessels

4.2.1 Zero Headspace Extraction Vessel (ZHE). This device is for use only when the sample is being tested for the mobility of volatile analytes (i.e., those listed in Table 1). The ZHE (depicted in Figure 2) allows for liquid/solid separation within the device and effectively precludes headspace. This type of vessel allows for initial liquid/solid separation, extraction, and final extract filtration without opening the vessel (see Step 4.3.1). These vessels shall have an internal volume of 500-600 mL and be equipped to accommodate a 90-110 mm filter. The devices contain VITON®[1] O-rings which should be replaced frequently. Suitable ZHE devices known to EPA are identified in Table 3.

For the ZHE to be acceptable for use, the piston within the ZHE should be able to be moved with approximately 15 psi or less. If it takes more pressure to move the piston, the O-rings in the device should be replaced. If this does not solve the problem, the ZHE is unacceptable for 1312 analyses and the manufacturer should be contacted.

The ZHE should be checked for leaks after every extraction. If the device contains a built-in pressure gauge, pressurize the device to 50 psi, allow it to stand unattended for 1 hour, and recheck the pressure. If the device does not have a built-in pressure gauge, pressurize the device to 50 psi, submerge it in water, and check for the presence of air bubbles escaping from any of the fittings. If pressure is lost, check all fittings and inspect and replace O-rings, if necessary. Retest the device. If leakage problems cannot be solved, the manufacturer should be contacted.

Some ZHEs use gas pressure to actuate the ZHE piston, while others use mechanical pressure (see Table 3). Whereas the volatiles procedure (see Step 7.3) refers to pounds-per-square-inch (psi), for the mechanically actuated piston, the pressure applied is measured in torque-inch-pounds. Refer to the manufacturer's instructions as to the proper conversion.

4.2.2 Bottle Extraction Vessel. When the sample is being evaluated using the nonvolatile extraction, a jar with sufficient capacity to hold the sample and the extraction fluid is needed. Headspace is allowed in this vessel.

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[1]VITON® is a trademark of Du Pont.

The extraction bottles may be constructed from various materials, depending on the analytes to be analyzed and the nature of the waste (see Step 4.3.3). It is recommended that borosilicate glass bottles be used instead of other types of glass, especially when inorganics are of concern. Plastic bottles, other than polytetrafluoroethylene, shall not be used if organics are to be investigated. Bottles are available from a number of laboratory suppliers. When this type of extraction vessel is used, the filtration device discussed in Step 4.3.2 is used for initial liquid/solid separation and final extract filtration.

4.3 Filtration Devices: It is recommended that all filtrations be performed in a hood.

4.3.1 Zero-Headspace Extraction Vessel (ZHE): When the sample is evaluated for volatiles, the zero-headspace extraction vessel described in Step 4.2.1 is used for filtration. The device shall be capable of supporting and keeping in place the glass fiber filter and be able to withstand the pressure needed to accomplish separation (50 psi).

NOTE: When it is suspected that the glass fiber filter has been ruptured, an in-line glass fiber filter may be used to filter the material within the ZHE.

4.3.2 Filter Holder: When the sample is evaluated for other than volatile analytes, a filter holder capable of supporting a glass fiber filter and able to withstand the pressure needed to accomplish separation may be used. Suitable filter holders range from simple vacuum units to relatively complex systems capable of exerting pressures of up to 50 psi or more. The type of filter holder used depends on the properties of the material to be filtered (see Step 4.3.3). These devices shall have a minimum internal volume of 300 mL and be equipped to accommodate a minimum filter size of 47 mm (filter holders having an internal capacity of 1.5 L or greater, and equipped to accommodate a 142 mm diameter filter, are recommended). Vacuum filtration can only be used for wastes with low solids content (<10 percent) and for highly granular, liquid-containing wastes. All other types of wastes should be filtered using positive pressure filtration. Suitable filter holders known to EPA are shown in Table 4.

4.3.3 Materials of Construction: Extraction vessels and filtration devices shall be made of inert materials which will not leach or absorb sample components. Glass, polytetrafluoroethylene (PTFE), or type 316 stainless steel equipment may be used when evaluating the mobility of both organic and inorganic components. Devices made of high-density polyethylene (HDPE), polypropylene (PP), or polyvinyl chloride (PVC) may be used only when evaluating the mobility of metals. Borosilicate glass bottles are recommended for use over other types of glass bottles, especially when inorganics are analytes of concern.

4.4 Filters: Filters shall be made of borosilicate glass fiber, shall contain no binder materials, and shall have an effective pore size of 0.6 to 0.8-μm or equivalent. Filters known to EPA which meet these specifications are identified in Table 5. Pre-filters must not be used. When evaluating the mobility of metals, filters shall be acid-washed prior to use by rinsing with 1N nitric acid followed by three consecutive rinses with deionized distilled water (a minimum of 1-L per rinse is recommended). Glass fiber filters are fragile and should be handled with care.

4.5 pH Meters: The meter should be accurate to ± 0.05 units at 25°C.

4.6 ZHE Extract Collection Devices: TEDLAR®[2] bags or glass, stainless steel or PTFE gas-tight syringes are used to collect the initial liquid phase and the final extract when using the ZHE device. These devices listed are recommended for use under the following conditions:

4.6.1 If a waste contains an aqueous liquid phase or if a waste does not contain a significant amount of nonaqueous liquid (i.e., <1 percent of total waste), the TEDLAR® bag or a 600 mL syringe should be used to collect and combine the initial liquid and solid extract.

4.6.2 If a waste contains a significant amount of nonaqueous liquid in the initial liquid phase (i.e., >1 percent of total waste), the syringe or the TEDLAR® bag may be used for both the initial solid/liquid separation and the final extract filtration. However, analysts should use one or the other, not both.

4.6.3 If the waste contains no initial liquid phase (is 100 percent solid) or has no significant solid phase (is 100 percent liquid), either the TEDLAR® bag or the syringe may be used. If the syringe is used, discard the first 5 mL of liquid expressed from the device. The remaining aliquots are used for analysis.

4.7 ZHE Extraction Fluid Transfer Devices: Any device capable of transferring the extraction fluid into the ZHE without changing the nature of the extraction fluid is acceptable (e.g., a positive displacement or peristaltic pump, a gas-tight syringe, pressure filtration unit (see Step 4.3.2), or other ZHE device).

4.8 Laboratory Balance: Any laboratory balance accurate to within ± 0.01 grams may be used (all weight measurements are to be within ± 0.1 grams).

4.9 Beaker or Erlenmeyer flask, glass, 500 mL.

4.10 Watchglass, appropriate diameter to cover beaker or Erlenmeyer flask.

4.11 Magnetic stirrer.

5.0 REAGENTS

5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used,

[2]TEDLAR® is a registered trademark of Du Pont.

provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

5.2 Reagent water. All references to reagent water in this method refer to one of the following, as appropriate.

5.2.1 Inorganic Analytes: Water which is generated by any method which would achieve the performance standards for ASTM Type II water. The analyte(s) of concern must be no higher than the highest of either (1) the detection limit, or (2) five percent of the regulatory level for that analyte, or (3) five percent of the measured concentration in the sample.

5.2.2 Volatile Analytes: Water in which an interferant is not observed at the method detection limit of the compounds of interest. Organic-free water can be generated by passing tap water through a carbon filter bed containing about 1 lb. of activated carbon. A water purification system may be used to generate organic-free deionized water. Organic-free water may also be prepared by boiling water for 15 minutes. Subsequently, while maintaining the temperature at 90°C, bubble a contaminant-free inert gas through the water for 1 hour. The analyte(s) of concern must be no higher than the highest of either (1) the detection limit, or (2) five percent of the regulatory level for that analyte, or (3) five percent of the measured concentration in the sample.

5.2.3 Semivolatile Analytes: Water in which an interferant is not observed at the method detection limit of the compounds of interest. Organic-free water can be generated by passing tap water through a carbon filter bed containing about 1 lb. of activated carbon. A water purification system may be used to generate organic-free deionized water. The analyte(s) of concern must be no higher than the highest of either (1) the detection limit, or (2) five percent of the regulatory level for that analyte, or (3) five percent of the measured concentration in the sample.

5.3 Sulfuric acid/nitric acid (60/40 weight percent mixture) H_2SO_4/HNO_3. Cautiously mix 60 g of concentrated sulfuric acid with 40 g of concentrated nitric acid.

5.4 Extraction fluids.

5.4.1 Extraction fluid #1: This fluid is made by adding the 60/40 weight percent mixture of sulfuric and nitric acids to reagent water (Step 5.2) until the pH is 4.20 ± 0.05. The fluid is used to determine the leachability of soil from a site that is east of the Mississippi River.

NOTE: Solutions are unbuffered and exact pH may not be attained.

5.4.2 Extraction fluid #2: This fluid is made by adding the 60/40 weight percent mixture of sulfuric and nitric acids to reagent water (Step 5.2) until the pH is 5.00 ± 0.05. The fluid is used to determine the leachability of soil from a site that is west of the Mississippi River.

5.4.3 Extraction fluid #3: This fluid is reagent water (Step 5.2) and is used to determine cyanide and volatiles leachability.

NOTE: These extraction fluids should be monitored frequently for impurities. The pH should be checked prior to use to ensure that these fluids are made up accurately. If impurities are found or the pH is not within the above specifications, the fluid shall be discarded and fresh extraction fluid prepared.

5.5 Analytical standards shall be prepared according to the appropriate analytical method.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

6.1 All samples shall be collected using an appropriate sampling plan.

6.2 There may be requirements on the minimal size of the field sample depending upon the physical state or states of the waste and the analytes of concern. An aliquot is needed for the preliminary evaluations of the percent solids and the particle size. An aliquot may be needed to conduct the nonvolatile analyte extraction procedure (see Step 1.4 concerning the use of this extract for volatile organics). If volatile organics are of concern, another aliquot may be needed. Quality control measures may require additional aliquots. Further, it is always wise to collect more sample just in case something goes wrong with the initial attempt to conduct the test.

6.3 Preservatives shall not be added to samples before extraction.

6.4 Samples may be refrigerated unless refrigeration results in irreversible physical change to the waste. If precipitation occurs, the entire sample (including precipitate) should be extracted.

6.5 When the sample is to be evaluated for volatile analytes, care shall be taken to minimize the loss of volatiles. Samples shall be collected and stored in a manner intended to prevent the loss of volatile analytes (e.g., samples should be collected in Teflon-lined septum capped vials and stored at 4°C. Samples should be opened only immediately prior to extraction).

6.6 1312 extracts should be prepared for analysis and analyzed as soon as possible following extraction. Extracts or portions of extracts for metallic analyte determinations must be acidified with nitric acid to a pH < 2, unless precipitation occurs (see Step 7.2.14 if precipitation occurs). Extracts should be preserved for other analytes according to the guidance given in the individual analysis methods. Extracts or portions of extracts for organic analyte determinations shall not be allowed to come into contact with the atmosphere (i.e., no headspace) to prevent losses. See Section 8.0 (Quality Control) for acceptable sample and extract holding times.

7.0 PROCEDURE

7.1 Preliminary Evaluations

Perform preliminary 1312 evaluations on a minimum 100 gram aliquot of sample. This aliquot may not actually undergo 1312 extraction. These preliminary evaluations include: (1) determination of the percent solids (Step 7.1.1); (2) determination of whether the waste contains insignificant solids and is, therefore, its own extract after filtration (Step 7.1.2); and (3) determination of whether the solid portion of the waste requires particle size reduction (Section 7.1.3).

7.1.1 Preliminary determination of percent solids: Percent solids is defined as that fraction of a waste sample (as a percentage of the total sample) from which no liquid may be forced out by an applied pressure, as described below.

7.1.1.1 If the sample will obviously yield no free liquid when subjected to pressure filtration (i.e., is 100% solids), weigh out a representative subsample (100 g minimum) and proceed to Step 7.1.3.

7.1.1.2 If the sample is liquid or multiphasic, liquid/solid separation to make a preliminary determination of percent solids is required. This involves the filtration device discussed in Step 4.3.2, and is outlined in Steps 7.1.1.3 through 7.1.1.9.

7.1.1.3 Pre-weigh the filter and the container that will receive the filtrate.

7.1.1.4 Assemble filter holder and filter following the manufacturer's instructions. Place the filter on the support screen and secure.

7.1.1.5 Weigh out a subsample of the waste (100 gram minimum) and record the weight.

7.1.1.6 Allow slurries to stand to permit the solid phase to settle. Samples that settle slowly may be centrifuged prior to filtration. Centrifugation is to be used only as an aid to filtration. If used, the liquid should be decanted and filtered followed by filtration of the solid portion of the waste through the same filtration system.

7.1.1.7 Quantitatively transfer the sample to the filter holder (liquid and solid phases). Spread the sample evenly over the surface of the filter. If filtration of the waste at 4°C reduces the amount of expressed liquid over what would be expressed at room temperature, then allow the sample to warm up to room temperature in the device before filtering.

NOTE: If sample material (>1 percent of original sample weight) has obviously adhered to the container used to transfer the sample to the filtration apparatus, determine the weight of this residue and subtract it from the sample weight determined in Step 7.1.1.5 to determine the weight of the sample that will be filtered.

Gradually apply vacuum or gentle pressure of 1-10 psi, until air or pressurizing gas moves through the filter. If this point is not reached under 10 psi, and if no additional liquid has passed through the filter in any 2-minute interval, slowly increase the pressure in 10 psi increments to a maximum of 50 psi. After each incremental increase of 10 psi, if the pressurizing gas has not moved through the filter, and if no additional liquid has passed through the filter in any 2-minute interval, proceed to the next 10-psi increment. When the pressurizing gas begins to move through the filter, or when liquid flow has ceased at 50 psi (i.e., filtration does not result in any additional filtrate within any 2-minute period), stop the filtration.

NOTE: Instantaneous application of high pressure can degrade the glass fiber filter and may cause premature plugging.

7.1.1.8 The material in the filter holder is defined as the solid phase of the sample, and the filtrate is defined as the liquid phase.

NOTE: Some samples, such as oily wastes and some paint wastes, will obviously contain some material that appears to be a liquid, but even after applying vacuum or pressure filtration, as outlined in Step 7.1.1.7, this material may not filter. If this is the case, the material within the filtration device is defined as a solid. Do not replace the original filter with a fresh filter under any circumstances. Use only one filter.

7.1.1.9 Determine the weight of the liquid phase by subtracting the weight of the filtrate container (see Step 7.1.1.3) from the total weight of the filtrate-filled container. Determine the weight of the solid phase of the sample by subtracting the weight of the liquid phase from the weight of the total sample, as determined in Step 7.1.1.5 or 7.1.1.7.

Record the weight of the liquid and solid phases. Calculate the percent solids as follows:

$$\text{Percent solids} = \frac{\text{Weight of solid (Step 7.1.1.9)}}{\text{Total weight of waste (Step 7.1.1.5 or 7.1.1.7)}} \times 100$$

7.1.2 If the percent solids determined in Step 7.1.1.9 is equal to or greater than 0.5%, then proceed either to Step 7.1.3 to determine whether the solid material requires particle size reduction or to Step 7.1.2.1 if it is noticed that a small amount of the filtrate is entrained in wetting of the filter. If the percent solids determined in Step 7.1.1.9 is less than 0.5%, then proceed to Step 7.2.9 if the nonvolatile 1312 analysis is to be performed, and to Section 7.3 with a fresh portion of the waste if the volatile 1312 analysis is to be performed.

7.1.2.1 Remove the solid phase and filter from the filtration apparatus.

7.1.2.2 Dry the filter and solid phase at 100 ± 20°C until two successive weighings yield the same value within ± 1 percent. Record the final weight.

Note: Caution should be taken to ensure that the subject solid will not flash upon heating. It is recommended that the drying oven be vented to a hood or other appropriate device.

7.1.2.3 Calculate the percent dry solids as follows:

$$\text{Percent dry solids} = \frac{(\text{Weight of dry sample + filter}) - \text{tared weight of filter}}{\text{Initial weight of sample (Step 7.1.1.5 or 7.1.1.7)}} \times 100$$

7.1.2.4 If the percent dry solids is less than 0.5%, then proceed to Step 7.2.9 if the nonvolatile 1312 analysis is to be performed, and to Step 7.3 if the volatile 1312 analysis is to be performed. If the percent dry solids is greater than or equal to 0.5%, and if the nonvolatile 1312 analysis is to be performed, return to the beginning of this Section (7.1) and, with a fresh portion of sample, determine whether particle size reduction is necessary (Step 7.1.3).

7.1.3 Determination of whether the sample requires particle-size reduction (particle-size is reduced during this step): Using the solid portion of the sample, evaluate the solid for particle size. Particle-size reduction is required, unless the solid has a surface area per gram of material equal to or greater than 3.1 cm^2, or is smaller than 1 cm in its narrowest dimension (i.e., is capable of passing through a 9.5 mm (0.375 inch) standard sieve). If the surface area is smaller or the particle size larger than described above, prepare the solid portion of the sample for extraction by crushing, cutting, or grinding the waste to a surface area or particle size as described above. If the solids are prepared for organic volatiles extraction, special precautions must be taken (see Step 7.3.6).

Note: Surface area criteria are meant for filamentous (e.g., paper, cloth, and similar) waste materials. Actual measurement of surface area is not required, nor is it recommended. For materials that do not obviously meet the criteria, sample-specific methods would need to be developed and employed to measure the surface area. Such methodology is currently not available.

7.1.4 Determination of appropriate extraction fluid:

7.1.4.1 For soils, if the sample is from a site that is east of the Mississippi River, extraction fluid #1 should be used. If the sample is from a site that is west of the Mississippi River, extraction fluid #2 should be used.

7.1.4.2 For wastes and wastewater, extraction fluid #1 should be used.

7.1.4.3 For cyanide-containing wastes and/or soils, extraction fluid #3 (reagent water) must be used because leaching of cyanide- containing samples under acidic conditions may result in the formation of hydrogen cyanide gas.

7.1.5 If the aliquot of the sample used for the preliminary evaluation (Steps 7.1.1 - 7.1.4) was determined to be 100% solid at Step 7.1.1.1, then it can be used for the Section 7.2 extraction (assuming at least 100 grams remain), and the Section 7.3 extraction (assuming at least 25 grams remain). If the aliquot was subjected to the procedure in Step 7.1.1.7, then another aliquot shall be used for the volatile extraction procedure in Section 7.3. The aliquot of the waste subjected to the procedure in Step 7.1.1.7 might be appropriate for use for the Section 7.2 extraction if an adequate amount of solid (as determined by Step 7.1.1.9) was obtained. The amount of solid necessary is dependent upon whether a sufficient amount of extract will be produced to support the analyses. If an adequate amount of solid remains, proceed to Step 7.2.10 of the nonvolatile 1312 extraction.

7.2 Procedure when Volatiles are not Involved

A minimum sample size of 100 grams (solid and liquid phases) is recommended. In some cases, a larger sample size may be appropriate, depending on the solids content of the waste sample (percent solids, See Step 7.1.1), whether the initial liquid phase of the waste will be miscible with the aqueous extract of the solid, and whether inorganics, semivolatile organics, pesticides, and herbicides are all analytes of concern. Enough solids should be generated for extraction such that the volume of 1312 extract will be sufficient to support all of the analyses required. If the amount of extract generated by a single 1312 extraction will not be sufficient to perform all of the analyses, more than one extraction may be performed and the extracts from each combined and aliquoted for analysis.

7.2.1 If the sample will obviously yield no liquid when subjected to pressure filtration (i.e., is 100 percent solid, see Step 7.1.1), weigh out a subsample of the sample (100 gram minimum) and proceed to Step 7.2.9.

7.2.2 If the sample is liquid or multiphasic, liquid/solid separation is required. This involves the filtration device described in Step 4.3.2 and is outlined in Steps 7.2.3 to 7.2.8.

7.2.3 Pre-weigh the container that will receive the filtrate.

7.2.4 Assemble the filter holder and filter following the manufacturer's instructions. Place the filter on the support screen and secure. Acid wash the filter if evaluating the mobility of metals (see Step 4.4).

Note: Acid washed filters may be used for all nonvolatile extractions even when metals are not of concern.

7.2.5 Weigh out a subsample of the sample (100 gram minimum) and record the weight. If the waste contains <0.5 percent dry solids (Step 7.1.2), the liquid portion of the waste, after filtration, is defined as the 1312 extract. Therefore, enough of the sample should be filtered so that the amount of filtered liquid will support all of the analyses required of the 1312 extract. For wastes containing >0.5 percent dry solids (Steps 7.1.1 or 7.1.2), use the percent solids information obtained in Step 7.1.1 to determine the optimum sample size (100 gram minimum) for filtration. Enough solids should be generated by filtration to support the analyses to be performed on the 1312 extract.

7.2.6 Allow slurries to stand to permit the solid phase to settle. Samples that settle slowly may be centrifuged prior to filtration. Use centrifugation only as an aid to filtration. If the sample is centrifuged, the liquid should be decanted and filtered followed by filtration of the solid portion of the waste through the same filtration system.

7.2.7 Quantitatively transfer the sample (liquid and solid phases) to the filter holder (see Step 4.3.2). Spread the waste sample evenly over the surface of the filter. If filtration of the waste at 4°C reduces the amount of expressed liquid over what would be expressed at room temperature, then allow the sample to warm up to room temperature in the device before filtering.

NOTE: If waste material (>1 percent of the original sample weight) has obviously adhered to the container used to transfer the sample to the filtration apparatus, determine the weight of this residue and subtract it from the sample weight determined in Step 7.2.5, to determine the weight of the waste sample that will be filtered.

Gradually apply vacuum or gentle pressure of 1-10 psi, until air or pressurizing gas moves through the filter. If this point if not reached under 10 psi, and if no additional liquid has passed through the filter in any 2-minute interval, slowly increase the pressure in 10-psi increments to maximum of 50 psi. After each incremental increase of 10 psi, if the pressurizing gas has not moved through the filter, and if no additional liquid has passed through the filter in any 2-minute interval, proceed to the next 10-psi increment. When the pressurizing gas begins to move through the filter, or when the liquid flow has ceased at 50 psi (i.e., filtration does not result in any additional filtrate within a 2-minute period), stop the filtration.

NOTE: Instantaneous application of high pressure can degrade the glass fiber filter and may cause premature plugging.

7.2.8 The material in the filter holder is defined as the solid phase of the sample, and the filtrate is defined as the liquid phase. Weigh the filtrate. The liquid phase may now be either analyzed (see Steps 7.2.12) or stored at 4°C until time of analysis.

NOTE: Some wastes, such as oily wastes and some paint wastes, will obviously contain some material which appears to be a liquid. Even after applying vacuum or pressure filtration, as outlined in Step 7.2.7, this material may not filter. If this is the case, the material within the filtration device is defined as a solid, and is carried through the extraction as a solid. Do not replace the original filter with a fresh filter under any circumstances. Use only one filter.

7.2.9 If the sample contains <0.5% dry solids (see Step 7.1.2), proceed to Step 7.2.13. If the sample contains >0.5 percent dry solids (see Step 7.1.1 or 7.1.2), and if particle-size reduction of the solid was needed in Step 7.1.3, proceed to Step 7.2.10. If the sample as received passes a 9.5 mm sieve, quantitatively transfer the solid material into the extractor bottle along with the filter used to separate the initial liquid from the solid phase, and proceed to Step 7.2.11.

7.2.10 Prepare the solid portion of the sample for extraction by crushing, cutting, or grinding the waste to a surface area or particle-size as described in Step 7.1.3. When the surface area or particle-size has been appropriately altered, quantitatively transfer the solid material into an extractor bottle. Include the filter used to separate the initial liquid from the solid phase.

NOTE: Sieving of the waste is not normally required. Surface area requirements are meant for filamentous (e.g., paper, cloth) and similar waste materials. Actual measurement of surface area is not recommended. If sieving is necessary, a Teflon-coated sieve should be used to avoid contamination of the sample.

7.2.11 Determine the amount of extraction fluid to add to the extractor vessel as follows:

$$\text{Weight of extraction fluid} = \frac{20 \times \%\ \text{solids (Step 7.1.1)} \times \text{weight of waste filtered (Step 7.2.5 or 7.2.7)}}{100}$$

Slowly add this amount of appropriate extraction fluid (see Step 7.1.4) to the extractor vessel. Close the extractor bottle tightly (it is recommended that Teflon tape be used to ensure a tight seal), secure in rotary extractor device, and rotate at 30 ± 2 rpm for 18 ± 2 hours. Ambient temperature (i.e., temperature of room in which extraction takes place) shall be maintained at 22 ± 3°C during the extraction period.

NOTE: As agitation continues, pressure may build up within the extractor bottle for some types of sample (e.g., limed or calcium carbonate-containing sample may evolve gases such as carbon dioxide). To relieve excess pressure, the extractor bottle may be periodically opened (e.g., after 15 minutes, 30 minutes, and 1 hour) and vented into a hood.

7.2.12 Following the 18 ± 2 hour extraction, separate the material in the extractor vessel into its component liquid and solid phases by filtering through a new glass fiber filter, as outlined in Step 7.2.7.

For final filtration of the 1312 extract, the glass fiber filter may be changed, if necessary, to facilitate filtration. Filter(s) shall be acid-washed (see Step 4.4) if evaluating the mobility of metals.

7.2.13 Prepare the 1312 extract as follows:

7.2.13.1 If the sample contained no initial liquid phase, the filtered liquid material obtained from Step 7.2.12 is defined as the 1312 extract. Proceed to Step 7.2.14.

7.2.13.2 If compatible (e.g., multiple phases will not result on combination), combine the filtered liquid resulting from Step 7.2.12 with the initial liquid phase of the sample obtained in Step 7.2.7. This combined liquid is defined as the 1312 extract. Proceed to Step 7.2.14.

7.2.13.3 If the initial liquid phase of the waste, as obtained from Step 7.2.7, is not or may not be compatible with the filtered liquid resulting from Step 7.2.12, do not combine these liquids. Analyze these liquids, collectively defined as the 1312 extract, and combine the results mathematically, as described in Step 7.2.14.

7.2.14 Following collection of the 1312 extract, the pH of the extract should be recorded. Immediately aliquot and preserve the extract for analysis. Metals aliquots must be acidified with nitric acid to pH $<$ 2. If precipitation is observed upon addition of nitric acid to a small aliquot of the extract, then the remaining portion of the extract for metals analyses shall not be acidified and the extract shall be analyzed as soon as possible. All other aliquots must be stored under refrigeration (4°C) until analyzed. The 1312 extract shall be prepared and analyzed according to appropriate analytical methods. 1312 extracts to be analyzed for metals shall be acid digested except in those instances where digestion causes loss of metallic analytes. If an analysis of the undigested extract shows that the concentration of any regulated metallic analyte exceeds the regulatory level, then the waste is hazardous and digestion of the extract is not necessary. However, data on undigested extracts alone cannot be used to demonstrate that the waste is not hazardous. If the individual phases are to be analyzed separately, determine the volume of the individual phases (to ± 0.5 percent), conduct the appropriate analyses, and combine the results mathematically by using a simple volume-weighted average:

$$\text{Final Analyte Concentration} = \frac{(V_1)(C_1) + (V_2)(C_2)}{V_1 + V_2}$$

where:

V_1 = The volume of the first phase (L).
C_1 = The concentration of the analyte of concern in the first phase (mg/L).
V_2 = The volume of the second phase (L).
C_2 = The concentration of the analyte of concern in the second phase (mg/L).

7.2.15 Compare the analyte concentrations in the 1312 extract with the levels identified in the appropriate regulations. Refer to Section 8.0 for quality assurance requirements.

7.3 Procedure when Volatiles are Involved

Use the ZHE device to obtain 1312 extract for analysis of volatile compounds only. Extract resulting from the use of the ZHE shall not be used to evaluate the mobility of non-volatile analytes (e.g., metals, pesticides, etc.).

The ZHE device has approximately a 500 mL internal capacity. The ZHE can thus accommodate a maximum of 25 grams of solid (defined as that fraction of a sample from which no additional liquid may be forced out by an applied pressure of 50 psi), due to the need to add an amount of extraction fluid equal to 20 times the weight of the solid phase.

Charge the ZHE with sample only once and do not open the device until the final extract (of the solid) has been collected. Repeated filling of the ZHE to obtain 25 grams of solid is not permitted.

Do not allow the sample, the initial liquid phase, or the extract to be exposed to the atmosphere for any more time than is absolutely necessary. Any manipulation of these materials should be done when cold (4°C) to minimize loss of volatiles.

7.3.1 Pre-weigh the (evacuated) filtrate collection container (see Step 4.6) and set aside. If using a TEDLAR® bag, express all liquid from the ZHE device into the bag, whether for the initial or final liquid/solid separation, and take an aliquot from the liquid in the bag for analysis. The containers listed in Step 4.6 are recommended for use under the conditions stated in Steps 4.6.1-4.6.3.

7.3.2 Place the ZHE piston within the body of the ZHE (it may be helpful first to moisten the piston O-rings slightly with extraction fluid). Adjust the piston within the ZHE body to a height that will minimize the distance the piston will have to move once the ZHE is charged with sample (based upon sample size requirements determined from Step 7.3, Step 7.1.1 and/or 7.1.2). Secure the gas inlet/outlet flange (bottom flange) onto the ZHE body in accordance with the manufacturer's instructions. Secure the glass fiber filter between the support screens and set aside. Set liquid inlet/outlet flange (top flange) aside.

7.3.3 If the sample is 100% solid (see Step 7.1.1), weigh out a subsample (25 gram maximum) of the waste, record weight, and proceed to Step 7.3.5.

<0.5% (GAM)

7.3.4 If the sample contains <~~5%~~ dry solids (Step 7.1.2), the liquid portion of waste, after filtration, is defined as the 1312 extract. Filter enough of the sample so that the amount of filtered liquid will support all of the volatile analyses required. For samples containing ≥~~5%~~ ≥ 0.5% dry solids (Steps 7.1.1 and/or 7.1.2), use the percent solids information (GA obtained in Step 7.1.1 to determine the optimum sample size to charge into the ZHE. The recommended sample size is as follows:

7.3.4.1 For samples containing <5% solids (see Step 7.1.1), weigh out a 500 gram subsample of waste and record the weight.

7.3.4.2 For wastes containing >5% solids (see Step 7.1.1), determine the amount of waste to charge into the ZHE as follows:

$$\text{Weight of waste to charge ZHE} = \frac{25}{\text{percent solids (Step 7.1.1)}} \times 100$$

Weigh out a subsample of the waste of the appropriate size and record the weight.

7.3.5 If particle-size reduction of the solid portion of the sample was required in Step 7.1.3, proceed to Step 7.3.6. If particle-size reduction was not required in Step 7.1.3, proceed to Step 7.3.7.

7.3.6 Prepare the sample for extraction by crushing, cutting, or grinding the solid portion of the waste to a surface area or particle size as described in Step 7.1.3.1. Wastes and appropriate reduction equipment should be refrigerated, if possible, to 4°C prior to particle-size reduction. The means used to effect particle-size reduction must not generate heat in and of itself. If reduction of the solid phase of the waste is necessary, exposure of the waste to the atmosphere should be avoided to the extent possible.

NOTE: Sieving of the waste is not recommended due to the possibility that volatiles may be lost. The use of an appropriately graduated ruler is recommended as an acceptable alternative. Surface area requirements are meant for filamentous (e.g., paper, cloth) and similar waste materials. Actual measurement of surface area is not recommended.

When the surface area or particle-size has been appropriately altered, proceed to Step 7.3.7.

7.3.7 Waste slurries need not be allowed to stand to permit the solid phase to settle. Do not centrifuge samples prior to filtration.

7.3.8 Quantitatively transfer the entire sample (liquid and solid phases) quickly to the ZHE. Secure the filter and support screens into the top flange of the device and secure the top flange to the ZHE body in accordance with the manufacturer's instructions. Tighten all ZHE fittings and place the device in the vertical position (gas inlet/outlet flange on the bottom). Do not attach the extraction collection device to the top plate.

Note: If sample material (>1% of original sample weight) has obviously adhered to the container used to transfer the sample to the ZHE, determine the weight of this residue and subtract it from the sample weight determined in Step 7.3.4 to determine the weight of the waste sample that will be filtered.

Attach a gas line to the gas inlet/outlet valve (bottom flange) and, with the liquid inlet/outlet valve (top flange) open, begin applying gentle pressure of 1-10 psi (or more if necessary) to force all headspace slowly out of the ZHE device into a hood. At the first appearance of liquid from the liquid inlet/outlet valve, quickly close the valve and discontinue pressure. If filtration of the waste at 4°C reduces the amount of expressed liquid over what would be expressed at room temperature, then allow the sample to warm up to room temperature in the device before filtering. If the waste is 100 percent solid (see Step 7.1.1), slowly increase the pressure to a maximum of 50 psi to force most of the headspace out of the device and proceed to Step 7.3.12.

7.3.9 Attach the evacuated pre-weighed filtrate collection container to the liquid inlet/outlet valve and open the valve. Begin applying gentle pressure of 1-10 psi to force the liquid phase of the sample into the filtrate collection container. If no additional liquid has passed through the filter in any 2-minute interval, slowly increase the pressure in 10-psi increments to a maximum of 50 psi. After each incremental increase of 10 psi, if no additional liquid has passed through the filter in any 2-minute interval, proceed to the next 10-psi increment. When liquid flow has ceased such that continued pressure filtration at 50 psi does not result in any additional filtrate within a 2-minute period, stop the filtration. Close the liquid inlet/outlet valve, discontinue pressure to the piston, and disconnect and weigh the filtrate collection container.

NOTE: Instantaneous application of high pressure can degrade the glass fiber filter and may cause premature plugging.

7.3.10 The material in the ZHE is defined as the solid phase of the sample and the filtrate is defined as the liquid phase.

NOTE: Some samples, such as oily wastes and some paint wastes, will obviously contain some material which appears to be a liquid. Even after applying pressure filtration, this material will not filter. If this is the case, the material within the filtration device is defined as a solid, and is carried through the 1312 extraction as a solid.

If the original waste contained <0.5 percent dry solids (see Step 7.1.2), this filtrate is defined as the 1312 extract and is analyzed directly. Proceed to Step 7.3.15.

7.3.11 The liquid phase may now be either analyzed immediately (see Steps 7.3.13 through 7.3.15) or stored at 4°C under minimal headspace conditions until time of analysis. Determine the weight of extraction fluid #3 to add to the ZHE as follows:

$$\text{Weight of extraction fluid} = \frac{20 \times \text{\% solids (Step 7.1.1)} \times \text{weight of waste filtered (Step 7.3.4 or 7.3.8)}}{100}$$

NOTE: An in-line glass fiber filter may be used to filter the material within the ZHE if it is suspected that the glass fiber filter has been ruptured

7.3.14 If the original sample contained no initial liquid phase, the filtered liquid material obtained from Step 7.3.13 is defined as the 1312 extract. If the sample contained an initial liquid phase, the filtered liquid material obtained from Step 7.3.13 and the initial liquid phase (Step 7.3.9) are collectively defined as the 1312 extract.

7.3.15 Following collection of the 1312 extract, immediately prepare the extract for analysis and store with minimal headspace at 4°C until analyzed. Analyze the 1312 extract according to the appropriate analytical methods. If the individual phases are to be analyzed separately (i.e., are not miscible), determine the volume of the individual phases (to 0.5%), conduct the appropriate analyses, and combine the results mathematically by using a simple volume- weighted average:

$$\text{Final Analyte Concentration} = \frac{(V_1)\ (C_1) + (V_2)\ (C_2)}{V_1 + V_2}$$

where:

V_1 = The volume of the first phases (L).
C_1 = The concentration of the analyte of concern in the first phase (mg/L).
V_2 = The volume of the second phase (L).
C_2 = The concentration of the analyte of concern in the second phase (mg/L).

7.3.16 Compare the analyte concentrations in the 1312 extract with the levels identified in the appropriate regulations. Refer to Section 8.0 for quality assurance requirements.

8.0 QUALITY CONTROL

8.1 A minimum of one blank (using the same extraction fluid as used for the samples) for every 20 extractions that have been conducted in an extraction vessel.

8.2 A matrix spike shall be performed for each waste type (e.g., wastewater treatment sludge, contaminated soil, etc.) unless the result exceeds the regulatory level and the data is being used solely to demonstrate that the waste property exceeds the regulatory level. A minimum of one matrix spike must be analyzed for each analytical batch. The bias determined from the matrix spike determination shall be used to correct the measured values. (See Steps 8.2.4 and 8.2.5) As a minimum, follow the matrix spike addition guidance provided in each analytical method.

8.2.1 Matrix spikes are to be added after filtration of the 1312 extract and before preservation. Matrix spikes should not be added prior to 1312 extraction of the sample.

8.2.2 In most cases, matrix spike levels should be added at a concentration equivalent to the corresponding regulatory level. If the analyte concentration is less than one half the regulatory level, the spike concentration may be as low as one half of the analyte concentration, but may not be less than five times the method detection limit. In order to avoid differences in matrix effects, the matrix spikes must be added to the same nominal volume of 1312 extract as that which was analyzed for the unspiked sample.

8.2.3 The purpose of the matrix spike is to monitor the performance of the analytical methods used, and to determine whether matrix interferences exist. Use of other internal calibration methods, modification of the analytical methods, or use of alternate analytical methods may be needed to accurately measure the analyte concentration in the 1312 extract when the recovery of the matrix spike is below the expected analytical method performance.

8.2.4 Matrix spike recoveries are calculated by the following formula:

$$\%R \text{ (\% Recovery)} = 100\ (X_s - X_u) / K$$

where:

X_s = measured value for the spiked sample
X_u = measured value for the unspiked sample, and
K = known value of the spike in the sample.

8.2.5 Measured values are corrected for analytical bias using the following formula:

$$X_c = 100\ (X_u / \%R)$$

where:

X_c = corrected value, and
X_u = measured value of the unspiked sample.

8.3 All quality control measures described in the appropriate analytical methods shall be followed.

8.4 Samples must undergo 1312 extraction within the following time periods:

SAMPLE MAXIMUM HOLDING TIMES (days)

	From: Field Collection To: 1312 extraction	From: 1312 extraction To: Preparative extraction	From: Preparative extraction To: determinative analysis	Total Elapsed Time
Volatiles	14	NA	14	28
Semi-volatiles	14	7	40	61
Mercury	28	NA	28	56
Metals, except mercury	180	NA	180	360
NA = Not Applicable				

If sample holding times are exceeded, the values obtained will be considered minimal concentrations. Exceeding the holding time is not acceptable in establishing that a waste does not exceed the regulatory level. Exceeding the holding time will not invalidate characterization if the waste exceeds the regulatory level.

9.0 METHOD PERFORMANCE

9.1 Precision results for semi-volatiles and metals: An eastern soil with high organic content and a western soil with low organic content were used for the semi-volatile and metal leaching experiments. Both types of soil were analyzed prior to contaminant spiking. The results are shown in Table 6. The concentrations of contaminants leached from the soils were consistently reproducible, as shown by the low relative standard deviations (RSDs) of the recoveries (generally less than 10 % for most of the compounds).

9.2 Precision results for volatiles: Four different soils were spiked and tested for the extraction of volatiles. Soils One and Two were from western and eastern Superfund sites. Soils Three and Four were mixtures of a western soil with low organic content and two different municipal sludges. The results are shown in Table 7. Extract concentrations of volatile organics from the eastern soil were lower than from the western soil. Replicate leachings of Soils Three and Four showed lower precision than the leachates from the Superfund soils.

10.0 REFERENCES

1.0 Environmental Monitoring Systems Laboratory, "QA Support for RCRA Testing: Annual Report". EPA Contract 68-03-3249, January 1989.

2.0 Research Triangle Institute, "Interlaboratory Comparison of Methods 1310, 1311, and 1312 for Lead in Soil". U.S. EPA Contract 68-01-7075, November 1988.

Table 1. Volatile Analytes[1]

Compound	CAS No.
Acetone	67-64-1
Benzene	71-43-2
n-Butyl alcohol	71-36-3
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Chlorobenzene	108-90-7
Chloroform	67-66-3
1,2-Dichloroethane	107-06-2
1,1-Dichloroethylene	75-35-4
Ethyl acetate	141-78-6
Ethyl benzene	100-41-4
Ethyl ether	60-29-7
Isobutanol	78-83-1
Methanol	67-56-1
Methylene chloride	75-09-2
Methyl ethyl ketone	78-93-3
Methyl isobutyl ketone	108-10-1
Tetrachloroethylene	127-18-4
Toluene	108-88-3
1,1,1,-Trichloroethane	71-55-6
Trichloroethylene	79-01-6
Trichlorofluoromethane	75-69-4
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1
Vinyl chloride	75-01-4
Xylene	1330-20-7

[1] When testing for any or all of these analytes, the zero-headspace extractor vessel shall be used instead of the bottle extractor.

Table 2. Suitable Rotary Agitation Apparatus[1]

	Location	Model No.
sting and Services,	Warrington, PA (215) 343-4490	4-vessel extractor (DC20S); 8-vessel extractor (DC20); 12-vessel extractor (DC20B)
sign and ng Company	Alexandria, VA (703) 549-5999	2-vessel (3740-2); 4-vessel (3740-4); 6-vessel (3740-6); 8-vessel (3740-8); 12-vessel (3740-12); 24-vessel (3740-24)
Machine and	Lynchburg, VA (804) 845-6424	8-vessel (08-00-00) 4-vessel (04-00-00)
op and	Santurce, PR (809) 752-4004	8-vessel (011001)
ufacturing	Whitmore Lake, MI (313) 449-4116	10-vessel (10VRE) 5-vessel (5VRE)
	Bedford, MA (800) 225-3384	4-ZHE or 4 1-liter bottle extractor (YT300RAHW)

ıt rotates the extraction vessel in an end-over-end fashion at 30
table.

Size
142 mm 47 mm
142 mm 47 mm
142 mm 47 mm

ı of the waste
waste and the
y be used when
:er holder is

Pore Size (μm)
0.7
0.7
0.7
0.7

:hod is suitable.

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Table 3. Suitable Zero-Headspace Extractor Vessels[1]

Company	Location	Model No.
Analytical Testing & Consulting Services, Inc.	Warrington, PA (215) 343-4490	C102, Mechanical Pressure Device
Associated Design and Manufacturing Company	Alexandria, VA (703) 549-5999	3745-ZHE, Gas Pressure Device
Lars Lande Manufacturing[2]	Whitmore Lake, MI (313) 449-4116	ZHE-11, Gas Pressure Device
Millipore Corporation	Bedford, MA (800) 225-3384	YT30090HW, Gas Pressure Device
Environmental Machine and Design, Inc.	Lynchburg, VA (804) 845-6424	VOLA-TOX1, Gas Pressure Device

[1] Any device that meets the specifications listed in Step 4.2.1 of the method is suitable.

[2] This device uses a 110 mm filter.

Table 4. Suitable Filter Holders[1]

Company	Location	Model/ Catalogue #	Size
Nucleopore Corporation	Pleasanton, CA (800) 882-7711	425910 410400	142 mm 47 mm
Micro Filtration Systems	Dublin, CA (800) 334-7132 (415) 828-6010	302400 311400	142 mm 47 mm
Millipore Corporation	Bedford, MA (800) 225-3384	YT30142HW XX1004700	142 mm 47 mm

[1] Any device capable of separating the liquid from the solid phase of the waste is suitable, providing that it is chemically compatible with the waste and the constituents to be analyzed. Plastic devices (not listed above) may be used when only inorganic analytes are of concern. The 142 mm size filter holder is recommended.

Table 5. Suitable Filter Media[1]

Company	Location	Model	Pore Size (μm)
Millipore Corporation	Bedford, MA (800) 225-3384	AP40	0.7
Nucleopore Corporation	Pleasanton, CA (415) 463-2530	211625	0.7
Whatman Laboratory Products, Inc.	Clifton, NJ (201) 773-5800	GFF	0.7
Micro Filtration Systems	Dublin, CA (800) 334-7132 (415) 828-6010	GF75	0.7

[1] Any filter that meets the specifications in Step 4.4 of the Method is suitable.

TABLE 6 - METHOD 1312 PRECISION RESULTS FOR SEMI-VOLATILES AND METALS

	Amount Spiked (μg)	Eastern Soil (pH 4.2) Amount Recovered* (μg)	Eastern Soil (pH 4.2) % RSD	Western Soil (pH 5.0) Amount Recovered* (μg)	Western Soil (pH 5.0) % RSD
FORTIFIED ANALYTES					
bis(2-chloroethyl)-ether	1040	834	12.5	616	14.2
2-Chlorophenol	1620	1010	6.8	525	54.9
1,4-Dichlorobenzene	2000	344	12.3	272	34.6
1,2-Dichlorobenzene	8920	1010	8.0	1520	28.4
2-Methylphenol	3940	1860	7.7	1130	32.6
Nitrobenzene	1010	812	10.0	457	21.3
2,4-Dimethylphenol	1460	200	18.4	18	87.6
Hexachlorobutadiene	6300	95	12.9	280	22.8
Acenaphthene	3640	210	8.1	310**	7.7
2,4-Dinitrophenol	1300	896**	6.1	23**	15.7
2,4-Dinitrotoluene	1900	1150	5.4	585	54.4
Hexachlorobenzene	1840	3.7	12.0	10	173.2
gamma BHC (Lindane)	7440	230	16.3	1240	55.2
beta BHC	640	35	13.3	65.3	51.7
METALS					
Lead	5000	70	4.3	10	51.7
Cadmium	1000	387	2.3	91	71.3

* - Triplicate analyses.
** - Duplicate analyses; one value was rejected as an outlier at the 90% confidence level using the Dixon Q test.

TABLE 7 - METHOD 1312 PRECISION RESULTS FOR VOLATILES

Compound Name	Soil No. 1 (Western) Avg. %Rec.*	Soil No. 1 (Western) %RSD	Soil No. 2 (Eastern) Avg. %Rec.*	Soil No. 2 (Eastern) %RSD	Soil No. 3 (Western and Sludge) Avg. %Rec.**	Soil No. 3 (Western and Sludge) %RSD	Soil No. 4 (Western and Sludge) Avg. %Rec.***	Soil No. 4 (Western and Sludge) %RSD
Acetone	44.0	12.4	43.8	2.25	116.0	11.5	21.3	71.4
Acrylonitrile	52.5	68.4	50.5	70.0	49.3	44.9	51.8	4.6
Benzene	47.8	8.29	34.8	16.3	49.8	36.7	33.4	41.1
n-Butyl Alcohol (1-Butanol)	55.5	2.91	49.2	14.6	65.5	37.2	73.0	13.9
Carbon disulfide	21.4	16.4	12.9	49.5	36.5	51.5	21.3	31.5
Carbon tetrachloride	40.6	18.6	22.3	29.1	36.2	41.4	24.0	34.0
Chlorobenzene	64.4	6.76	41.5	13.1	44.2	32.0	33.0	24.9
Chloroform	61.3	8.04	54.8	16.4	61.8	29.1	45.8	38.6
1,2-Dichloroethane	73.4	4.59	68.7	11.3	58.3	33.3	41.2	37.8
1,1-Dichloroethane	31.4	14.5	22.9	39.3	32.0	54.4	16.8	26.4
Ethyl acetate	76.4	9.65	75.4	4.02	23.0	119.8	11.0	115.5
Ethylbenzene	56.2	9.22	23.2	11.5	37.5	36.1	27.2	28.6
Ethyl ether	48.0	16.4	55.1	9.72	37.3	31.2	42.0	17.6
Isobutanol (4-Methyl -1-propanol)	0.0	ND	0.0	ND	61.8	37.7	76.0	12.2
Methylene chloride	47.5	30.3	42.2	42.9	52.0	37.4	37.3	16.6
Methyl ethyl ketone (2-Butanone)	56.7	5.94	61.9	3.94	73.7	31.3	40.6	39.0
Methyl isobutyl ketone	81.1	10.3	88.9	2.99	58.3	32.6	39.8	40.3
1,1,1,2-Tetrachloro-ethane	69.0	6.73	41.1	11.3	50.8	31.5	36.8	23.8
1,1,2,2-Tetrachloro-ethane	85.3	7.04	58.9	4.15	64.0	25.7	53.6	15.8
Tetrachloroethene	45.1	12.7	15.2	17.4	26.2	44.0	18.6	24.2
Toluene	59.2	8.06	49.3	10.5	45.7	35.2	31.4	37.2
1,1,1-Trichloro-ethane	47.2	16.0	33.8	22.8	40.7	40.6	26.2	38.8
1,1,2-Trichloro-ethane	76.2	5.72	67.3	8.43	61.7	28.0	46.4	25.4
Trichloroethene	54.5	11.1	39.4	19.5	38.8	40.9	25.6	34.1
Trichloro-fluoromethane	20.7	24.5	12.6	60.1	28.5	34.0	19.8	33.9
1,1,2-Trichloro-trifluoroethane	18.1	26.7	6.95	58.0	21.5	67.8	15.3	24.8
Vinyl chloride	10.2	20.3	7.17	72.8	25.0	61.0	11.8	25.4

* Triplicate analyses
** Six replicate analyses
*** Five replicate analyses

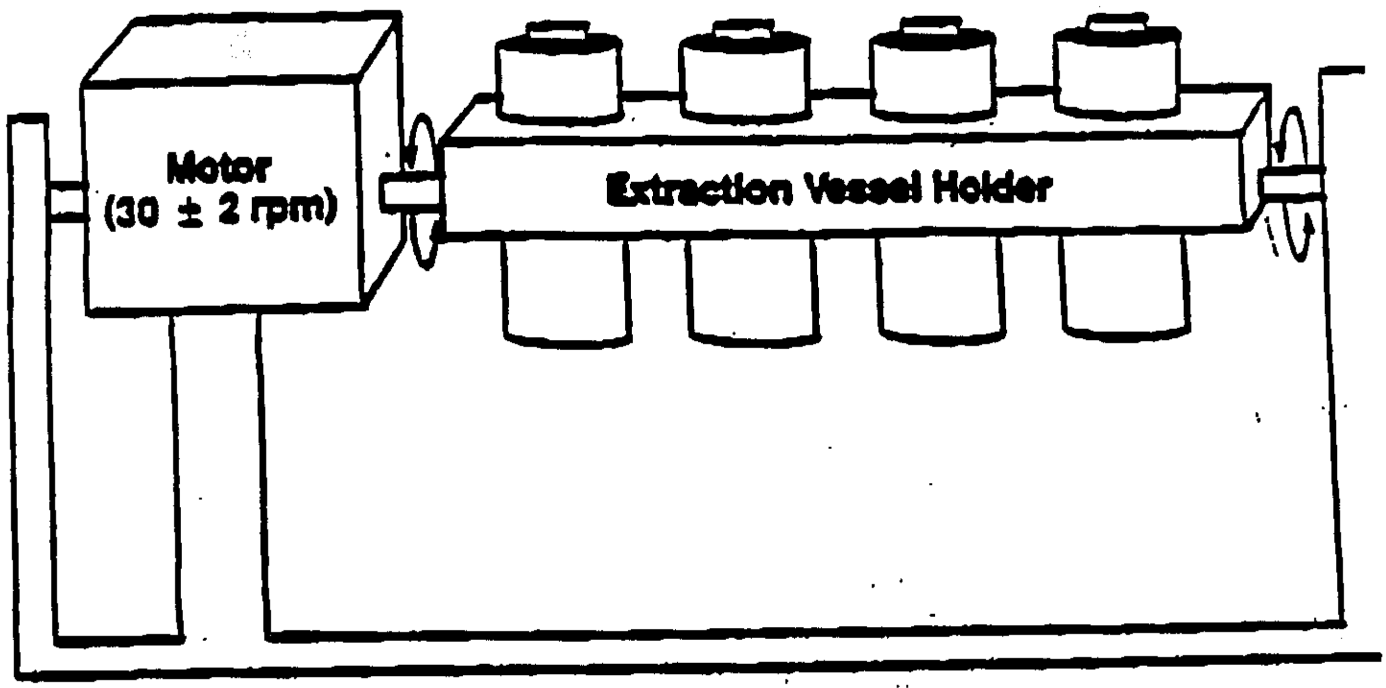


Figure 1. Rotary Agitation Apparatus

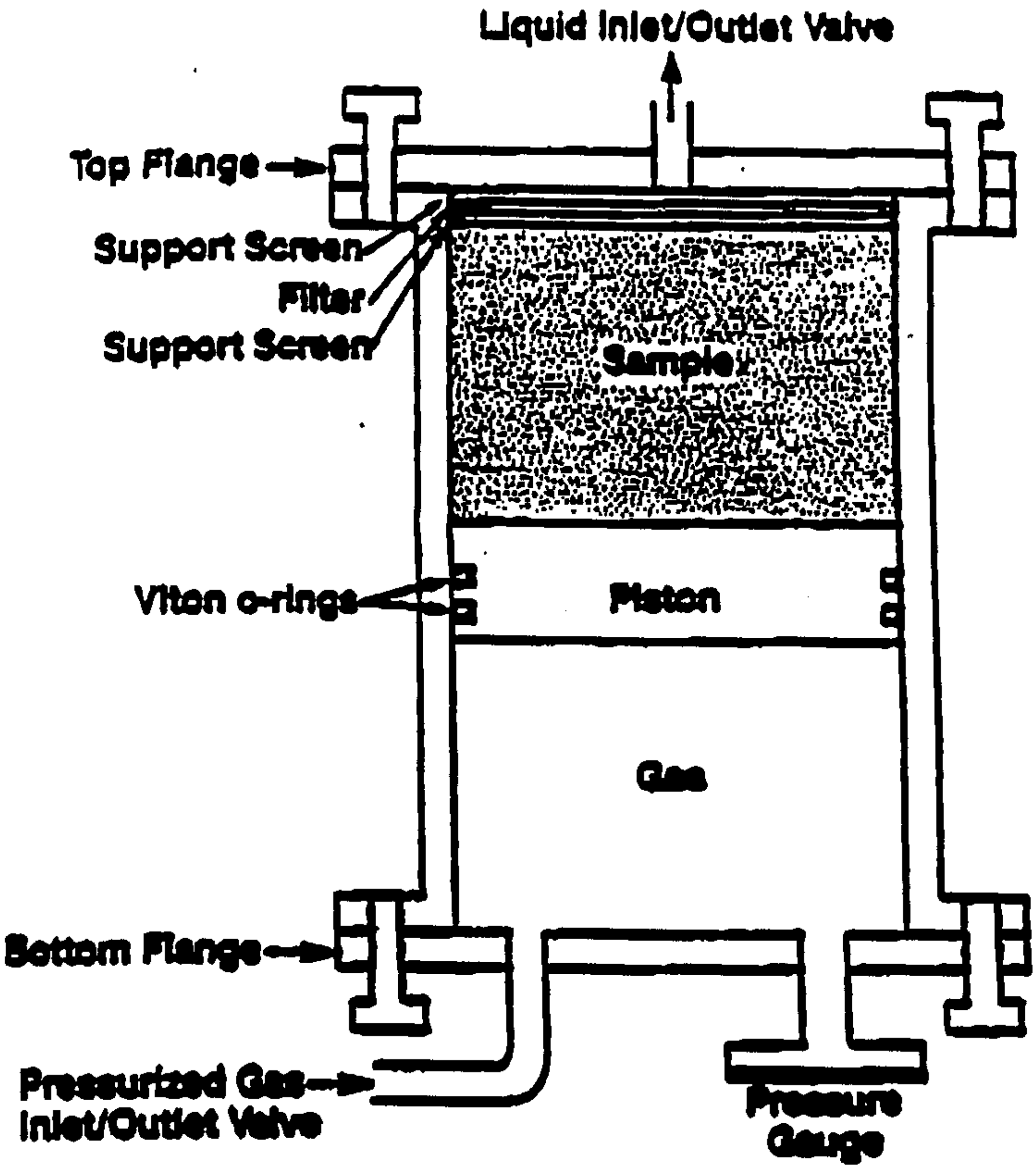
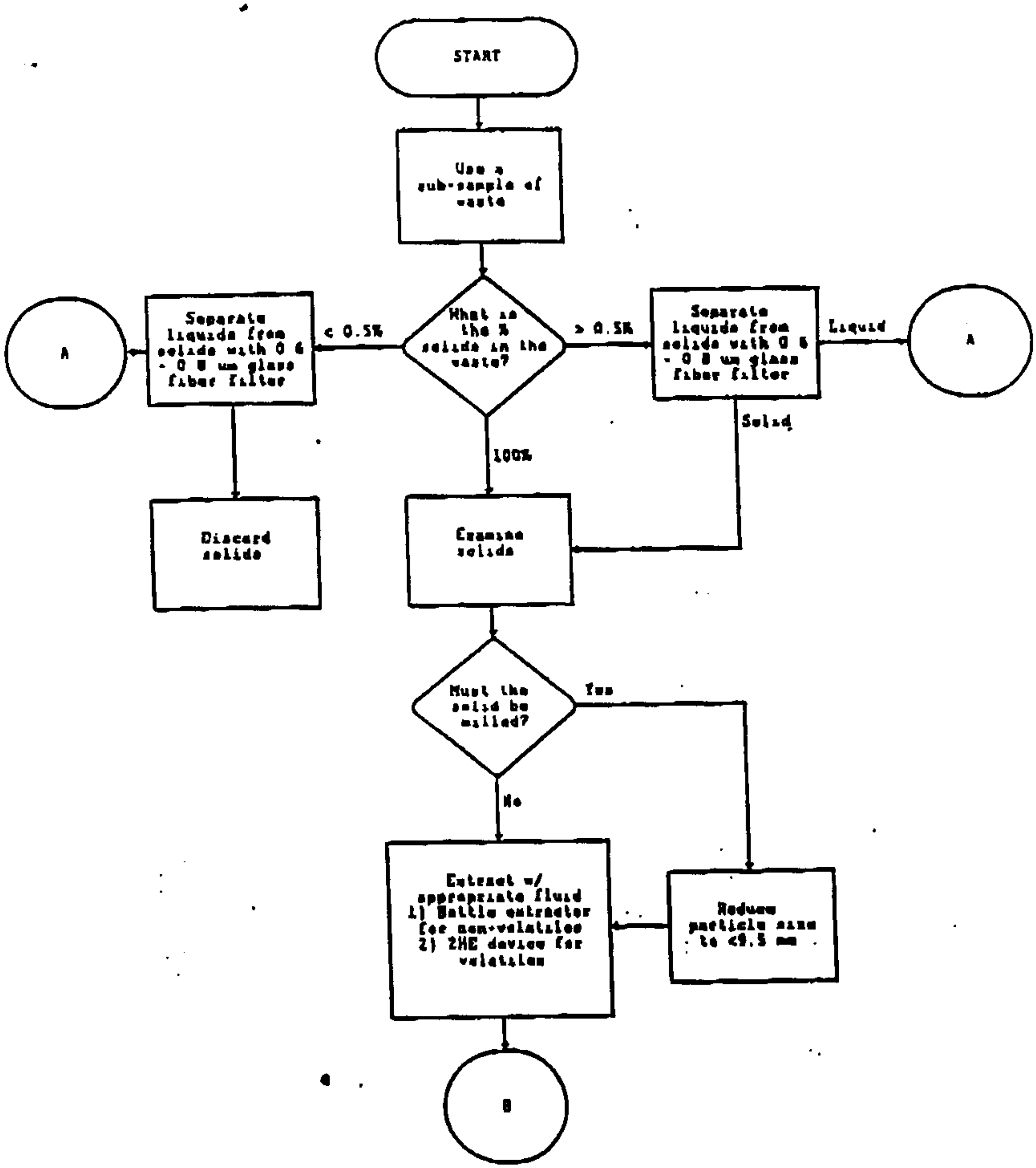
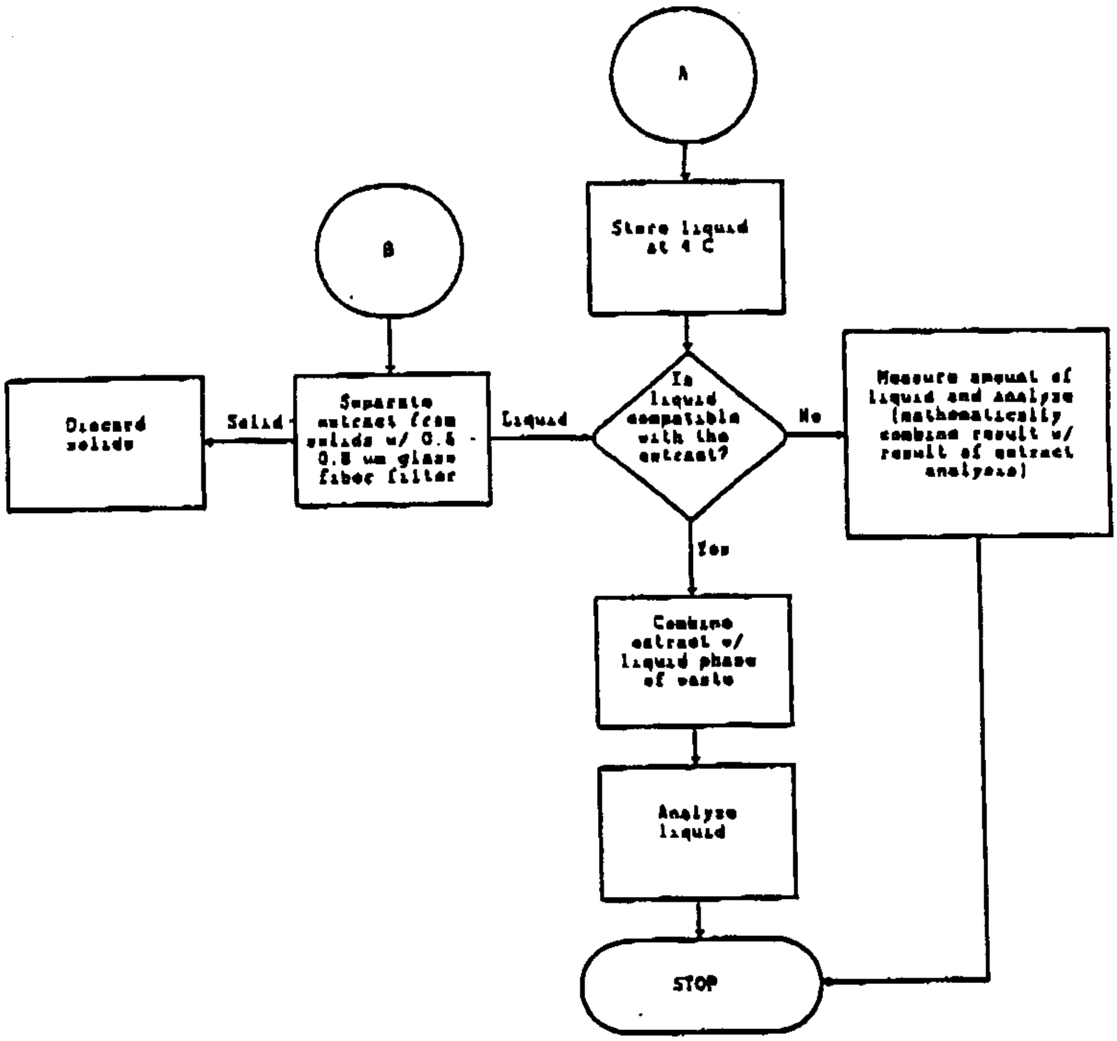


Figure 2. Zero-Headspace Extractor (ZHE)

SYNTHETIC PRECIPITATION LEACHING PROCEDURE




A
Store liquid at 4 C
B
Separate extract from solids w/ 0.6 - 0.8 um glass fiber filter
Solid
Discard solids
Liquid
Is liquid compatible with the extract?
No
Measure amount of liquid and analyze (mathematically combine result w/ result of extract analyses)
Yes
Combine extract w/ liquid phase of waste
Analyze liquid
STOP

Attachment 2

November 1998

STEELMAKING SLAG: A SAFE AND VALUABLE PRODUCT

Executive Summary of Steelmaking Slag Risk Assessment Reports

Steelmaking slag is an environmentally safe product with a wide range of valuable uses. Risk assessments developed during 1998 demonstrate that the three kinds of slag produced by two types of steelmaking processes[1/] pose essentially no threat to human health or the environment when used in a variety of residential, agricultural, industrial and construction applications. The reports address potential exposures to metals and other chemical constituents in blast furnace ("BF"), basic oxygen furnace ("BOF"), and electric arc furnace ("EAF") slags, respectively.

Project Scope

The risk assessments are based on data derived from representative samples of slag collected during 1995 and 1996 at 11 BF, 17 BOF, and 45 EAF mills in active operation. The slag samples were collected pursuant to a specific technical protocol and processed and analyzed by a single certified lab using U.S. Environmental Protection Agency ("EPA") approved analytical methods. A broad array of data were collected by the lab, including: (1) total concentrations of major and trace metal constituents; (2) Toxicity Characteristic Leaching Potential ("TCLP") of certain metals; (3) other parameters (*e.g.*, pH); (4) American Society for Testing Materials ("ASTM") distilled water leachate tests for certain metals; (5) bioaccessibility of certain metals; and (6) particle size distribution.

A group of environmental scientists and toxicologists then examined the following uses of steelmaking slag in the risk assessments:

- Aggregate in bituminous mixes such as: pavement surfaces, bases, surface treatments, seal coats, slurry coats, and cold patch
- Concrete aggregate and as an ingredient in cement
- Anti-skid aggregate
- Surfacing of stabilized shoulders, banks and other select material
- Bank stabilization
- Gabions and riprap
- Aggregate base courses and sub-bases
- Unpaved driveways, surface roads, and walkways
- Railroad ballast
- Neutralization of mine drainage and industrial discharge

1/ Steel is produced in two basic ways: (1) at integrated mills where molten blast furnace iron is processed in a basic oxygen furnace; or (2) by remelting scrap steel in an electric arc furnace.

- Agricultural uses, such as soil remineralization and conditioning, pH supplement/liming agent, and fertilizer
- Controlled, granular fills, such as those for unpaved parking and storage areas, pipe and tank backfill, berm construction, and other industrial and construction activity
- At steel mills as construction aggregate or a fluxing agent
- Landfill daily cover material
- Landscape aggregate
- Trench aggregate/drain fields
- Sand blast grit
- Roofing granules
- Bulk filler (*e.g.*, in paints, plastics, adhesives)
- Mineral wool (home and appliance insulation)
- Fill

Nine generic exposure scenarios were generated from these uses by grouping together similar applications. The risk assessments quantified potential exposures to slag constituents for residential populations, farmers, and construction, maintenance, and industrial workers. In addition, potential impacts to groundwater and surface water were evaluated based on potential leaching of metals and other slag constituents under both acidic and neutral conditions.

The Risk Assessment Process

The risk calculations utilized the conservative "standard default" exposure parameters that EPA and most state agencies use for assessing potential worst-case exposures. The risk assessments also incorporated information from the peer-reviewed scientific literature to quantify potential exposure. Moreover, while steel slag often is mixed with other materials, such as in asphalt and cement, the risk assessments conservatively assumed that pure slag would be used in each application. Through reliance on conservative and worst-case exposure assumptions, especially with regard to exposure duration and frequency, the risk assessments ensure that potential slag exposures are not underestimated. Hence, the relatively low risk and hazard estimates presented in the reports most likely are overstated.

Monte Carlo analysis was employed to address inhalation exposures to manganese in EAF and BOF slag, and oral (incidental ingestion) exposures to beryllium[2/] in BF slag. Monte Carlo analysis is a mathematical method for assessing uncertainty and variability in the range of human health and environmental risks, and is recommended by EPA for developing more accurate risk estimates.

2/ An addendum to the BF report updates the risk assessment to reflect EPA's revised toxicity information for beryllium. In part, EPA revoked the oral cancer slope factor for beryllium due to a lack of scientific evidence. Accordingly, beryllium in slag is not considered to be potentially carcinogenic.

Risk Assessment Conclusions

- Steelmaking slag poses no significant health risks for potentially exposed residential populations, farmers, or maintenance, industrial, and construction workers.

- Metals in steelmaking slag will not leach readily into groundwater or surface water and, therefore, will not impact drinking water quality.

- Steelmaking slag will not impact animals and other terrestrial life in or near areas of application. Metals in steelmaking slag do not bioaccumulate in the food web and are not expected to bioconcentrate in plant tissue.

- Steelmaking slag may be applied safely in aquatic environments such as rivers, lakes and streams without impacting water quality or aquatic life. Such aquatic environments normally provide sufficient dilution (at least 1,000-fold) to protect against possibly elevated pH levels and, in the case of EAF slag, potential concentrations of aluminum and barium. Care should be taken when applying slag in smaller aquatic bodies where low water flow conditions exist, such as wetlands or shallow ditches.

Contact Information

The steelmaking slag risk assessment reports were prepared for Collier, Shannon, Rill & Scott, PLLC ("CSR&S"), on behalf of the Steel Slag Coalition by ChemRisk® (a Service of McLaren/Hart, Inc.). Copies of the reports are available from the Steel Slag Coalition for $500 each by contacting John L. Wittenborn (202-342-8514) or Joseph J. Green (202-342-8849) of CSR&S.

Human Health and Ecological Risk Assessment

McLaren/Hart Project No. 09.0803686

Blast Furnace Slag

April 21, 1998

Prepared for: **Collier, Shannon, Rill and Scott**
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Kurt A. Fehling
Senior Associate Health Scientist

Table 2-1
BF Slag Analytical Data (mg/kg)
BF HERA

SAMPLE NO.	Carbon	Sulfur	Aluminum	Calcium	Iron	Manganese	Silicon	Phosphorous		Magnesium
214	8700	8400	38100	269300	1400	3600	188400	<	100	76800
110F	1900	15100	47100	268900	1600	2600	178600	<	100	56400
204F	1600	10700	44800	280300	2000	1500	176000	<	100	72600
206F	1900	8170	41800	279900	21900	5500	166400	<	100	74600
208F	1200	13300	49800	263500	2000	4600	166800	<	100	79800
212F	2200	3800	31000	258200	105800	18600	124300		1180	66300
216F	300	8000	46500	253700	1700	6000	201400	<	100	62100
218F	1600	12100	38000	311500	10800	4800	152300	<	100	69500
221F	1500	12200	41000	284200	23100	6500	163800		230	72600
223F	2800	9580	33500	250100	9400	7000	175300		210	84500
227F	1500	11600	42100	292800	11200	100	177400	<	100	54700
Total Number of Samples	11	11	11	11	11	11	11		11	11
Distribution Type*	Neither	Normal	Normal	Normal	Neither	Neither	Normal		Neither	Normal
Mean	2291	10268	41245	273855	17355	5527	170064		220	69991
Standard Deviation	2214	3113	5781	18246	30397	4833	19952		322	9395
95% UCL	3501	11970	44405	283826	33966	8168	180967		396	75125
Minimum	300	3800	31000	250100	1400	100	124300		210	54700
Maximum	8700	15100	49800	311500	105800	18600	201400		1180	84500
Detection Frequency	100%	100%	100%	100%	100%	100%	100%		27%	100%
Exposure Point Concentration*	3501	11970	44405	283826	33966	8168	180967		1180	75125

* For metals with lognormal distributions or neither normal nor lognormal, the lognormal 95% UCL is presented. For metals with normal distributions, the normal 95% UCL is presented (Section 2.1.4).

< Indicates constituent was not detected; value is one-half of the detection limit.

M Elevated detection limit due to matrix effects.

P Digested spike recovery fails accuracy criteria; post-digestion spike recovery accepted.

I Estimated concentration due to severe matrix interferences. During the metals analysis using the inductively coupled plasma (ICP), the serial dilution failed to meet the established control limits of 0-10%. The result was flagged with the I qualifier to indicate that a severe physical interference was observed.

R Data reported are based on the Method Detection Limit (MDL). Value is the laboratory MDL.

Z The reported value is less than the EQL and greater than the MDL; the MDL is represented rather than the EQL.

ND No value as this metal was not detected.

Table 2-1
BF Slag Analytical Data (mg/kg)
BF HERA

SAMPLE NO.		Antimony			Arsenic		Barium	Beryllium			Cadmium		Chromium (total)			Chromium(VI)			Cobalt	
214	<	0.25			0.61		310	11		<	0.25		18		<	0.5			4.0	
110F	<	0.5	M,P,I		0.64	I	200	9.1	I	<	0.5	M,I	9.6	I	<	0.5	*		13.0	I
204F	<	2.5	M	<	2.5	M	330	8.6		<	0.5	M	120		<	0.5			3.6	
206F	<	0.25			0.5	R	390	7		<	0.025		45		<	0.5		<	1	
208F	<	2.5	M	<	1.5	M	230	4.1		<	2.5	M	740		<	0.5		<	1	
212F	<	2.5	M	<	0.15	R	180	7.9		<	0.25		19		<	0.5		<	1	
216F	<	0.25			0.65		340	8.8		<	0.25		33		<	0.5			2.3	
218F	<	2.7	M	<	2.7	M	270	8.2		<	0.55	M	25		<	0.55	P,G		2.9	
221F	<	2.5	M	<	2.5	M	260	8.4		<	0.5	M	360		<	0.5			2.0	
223F	<	2.55	M	<	2.55	M	290	9.3		<	0.5	M	60		<	0.5			0.860	
227F	<	2.5			0.6		200	8.1		<	0.015	R	21		<	0.5		<	1	
Total Number of Samples		11			11		11	11			11		11			11			11	
Distribution Type*		Neither			Lognormal		Normal	Neither			Neither		Lognormal			Neither			Neither	
Mean		1.7			1.3		273	8.2			0.53		132			0.5			3.0	
Standard Deviation		1.1			3.5		67	1.7			0.68		226			0.02			3.5	
95% UCL		2.3			1.9		309	9.2			0.90		600			0.5			4.9	
Minimum		ND			0.45		180	4.1			ND		9.6			ND			0.9	
Maximum		ND			2.7		390	11			ND		740			ND			13	
Detection Frequency		0%			45%		100%	100%			0%		100%			0%			64%	
Exposure Point Concentration*		ND			0.65		309	9.2			ND		600			ND			4.9	

Table 2-1
BF Slag Analytical Data (mg/kg)
BF HERA

SAMPLE NO.		Copper			Lead			Molybdenum			Mercury			Nickel			Selenium			Silver	
214	<	1		<	0.15		<	0.25	R	<	0.25	R	<	1			4.8		<	0.5	
110F		13	I		1.4	I	<	0.5	M,I	<	0.025	R	<	0.5	M,I		2.9	I	<	0.5	I
204F		9.2		<	1.5	M		5.0		<	0.025	R		3.4			6.4		<	0.5	
206F	<	1		<	0.15		<	0.25	R	<	0.025	P,*,R	<	1			4.0		<	0.5	
208F		5.3		<	1.5	M	<	0.025	R	<	0.025	R	<	1			5.3		<	2.5	M
212F	<	1		<	0.15		<	0.25	R	<	0.025	R	<	1			2.2		<	0.5	
216F	<	1		<	0.15		<	0.25	R	<	0.025	R	<	1			3.1		<	0.5	
218F		1.7		<	1.6	M	<	0.27	R	<	0.025	R	<	1.1		<	2.7	M	<	0.55	
221F		20		<	1.5	M		1.6		<	0.025	R		3.1		<	2.5	M	<	0.5	
223F		3.9			31		<	0.255	R	<	0.25	R	<	1			6.5		<	0.5	
227F	<	1		<	0.15		<	0.025	R	<	0.025	R	<	1			3.0		<	0.5	
Total Number of Samples		11			11			11			11			11			11			11	
Distribution Type*		Neither			Neither			Neither			Neither			Neither			Lognormal			Neither	
Mean		5.3			3.6			0.79			0.07			1.4			3.9			0.7	
Standard Deviation		6.3			9.1			1.5			0.09			0.94			1.6			0.6	
95% UCL		8.7			8.6			1.6			0.12			1.9			5.1			1.0	
Minimum		1.7			1.4			1.6			ND			3.1			2.2			ND	
Maximum		20			31			5.0			ND			3.4			6.5			ND	
Detection Frequency		55%			27%			18%			0%			18%			82%			0%	
Exposure Point Concentration*		8.7			31			5			ND			3.4			5.1			ND	

Table 2-1
BF Slag Analytical Data (mg/kg)
BF HERA

SAMPLE NO.		Thallium			Tin		Vanadium		Zinc
214	<	5	M	<	1		12		8.9
110F	<	1	M,I	<	2	M,I	16	I	9.4
204F	<	5	M		2.8		61		18
206F	<	5	M	<	1		11		7.8
208F	<	5	M		3.7		320		25
212F	<	5	M	<	1		18		5.1
216F	<	5	M	<	1		18		3.5
218F	<	5.5	M	<	1.1		27		4.6
221F	<	5	M		2.2		49		6.5
223F	<	5	M	<	1		33		130
227F	<	0.5		<	1		31		5.8
Total Number of Samples		11			11		11		11
Distribution Type*		Neither			Neither		Lognormal		Neither
Mean		4.3			1.6		54.2		20.4
Standard Deviation		1.8			0.9		89.5		36.9
95% UCL		5.2			2.1		5.1		40.6
Minimum		ND			2.2		11		3.5
Maximum		ND			3.7		320		130
Detection Frequency		0%			27%		100%		100%
Exposure Point Concentration*		ND			3.7		115.0		40.6

T F-2
BF TCLP Data (mg/L)
BF HERA

SAMPLE NO.		Antimony		Arsenic		Barium		Beryllium		Cadmium			Chromium (total)	
110F	<	0.003		0.0035	R	0.720		0.044		7.60E-04			0.023	
204F	<	0.003		0.0032	R	1.800		0.014		0.001		<	0.005	
206F		0.0071	<	0.002	R	1.400		0.21		0.0054			0.024	
208F	<	0.003		0.0048	R	1.000		0.02		6.30E-04			0.074	
212	<	0.003	<	0.002	R	0.410	<	0.002		0.005			0.17	
214		0.0096	<	0.002	R	0.970		0.019		0.0015			0.22	
216F		0.01	<	0.002	R	0.410		0.025		0.0017			0.047	
218F	<	0.003		0.0047	R	1.100		0.014		0.0012			0.04	
221F	<	0.003	<	0.002	R	1.100		0.022		0.002			0.019	
223F	<	0.003	<	0.002	R	0.910	<	0.002	<	0.0002	R	<	0.005	
227F	<	0.003	<	0.003		1.300		0.0081	<	0.0002	I,R		0.011	I
Total Number of Samples		11		11		11		11		11			11	
Distribution Type*		Neither		Neither		Normal		Lognormal		Lognormal			Lognormal	
Mean		0.005		0.003		1.0		0.03		0.002			0.06	
Standard Deviation		0.003		0.001		0.4		0.06		0.002			0.07	
95% UCL		0.006		0.003		1.2		0.02		0.007			0.27	
Minimum		0.007		0.003		0.41		0.008		0.00063			0.01	
Maximum		0.01		0.0048		1.8		0.21		0.0054			0.2	
Detection Frequency		27%		36%		100%		82%		82%			82%	
Exposure Point Concentration*		0.01		0.005		1.2		0.21**		0.0054**			0.22**	

* For metals with lognormal distributions or neither normal nor lognormal, the lognormal 95% UCL is presented. For metals with normal distributions, the normal 95% UCL is presented (Section 2.1.4).

** The maximum concentration was used as the exposure point concentration when the 95% UCL exceeded the maximum concentration.

< Indicates constituent was not detected; value is one-half of the detection limit.

M Elevated detection limit due to matrix effects.

P Digested spike recovery fails accuracy criteria; post-digestion spike recovery accepted.

I Estimated concentration due to severe matrix interferences. During the metals analysis using the inductively coupled plasma (ICP), the serial dilution failed to meet the established control limits of 0-10%. The result was flagged with the I qualifier to indicate that a severe physical interference was observed.

R Data reported are based on the Method Detection Limit (MDL). Value is the laboratory MDL.

Z The reported value is less than the EQL and greater than the MDL; the MDL is represented rather than the EQL.

-2
BF TCLP Data (mg/L)
BF HERA

SAMPLE NO.		Chromium(VI)			Lead	Manganese		Mercury		Nickel			Selenium			Silver
110F		0.016		<	0.002	13	<	0.0002	<	0.01		<	0.005	M	<	0.005
204F		0.011		<	0.002	11	<	0.0002	<	0.01		<	0.005	M	<	0.005
206F	<	0.005		<	0.002	17	<	0.0002	<	0.01		<	0.010	M	<	0.005
208F		0.025	P,G	<	0.002	37	<	0.0002	<	0.01		<	0.005		<	0.005
212		0.026		<	0.002	44	<	0.0002	<	0.01		<	0.003		<	0.005
214	<	0.005		<	0.002	20	<	0.0002	<	0.01		<	0.005	M	<	0.005
216F		0.01		<	0.002	28	<	0.0002	<	0.01		<	0.005	M	<	0.005
218F	<	0.005		<	0.002	36	<	0.0002	<	0.01		<	0.005	M	<	0.005
221F	<	0.005		<	0.002	14	<	0.0002	<	0.01		<	0.005	M	<	0.005
223F	<	0.005		<	0.002	55	<	0.0002	<	0.01		<	0.005	M	<	0.005
227F	<	0.005		<	0.002	13	<	0.0002	<	0.01	P,J	<	0.013	M,R	<	0.005
Total Number of Samples		11			11	11		11		11			11			11
Distribution Type*		Neither			ND	Normal		ND		ND			Neither			ND
Mean		0.01			0.0015	26		0.0002		0.01			0.006			0.005
Standard Deviation		0.008			0.002	15		0		0.01			0.003			0.005
95% UCL		0.02			0.002	34		0.0002		0.01			0.007			0.005
Minimum		0.01			ND	11		ND		ND			ND			ND
Maximum		0.03			ND	55		ND		ND			ND			ND
Detection Frequency		45%			0%	100%		0%		0%			0%			0%
Exposure Point Concentration*		0.03			ND	34		ND		ND			ND			ND

Table 2-2
BOF TCLP Data (mg/L)
BOF HERA

SAMPLE NO.		Silver		Thallium			Zinc
108	<	0.0050	<	0.001	R		0.041
109	<	0.0050	<	0.001	Z	<	0.0100
200	<	0.0050	<	0.001	Z	<	0.0100
203	<	0.0050	<	0.001	Z	<	0.0100
2050	<	0.0050	<	0.001	R	<	0.0100
207	<	0.0050	<	0.001	R		0.028
209	<	0.0050	<	0.001	Z	<	0.0100
211	<	0.0050	<	0.001	R		0.049
213	<	0.0050	<	0.001	R		0.27
215	<	0.0050	<	0.001	R		0.038
217	<	0.0050	<	0.001	R	<	0.0100
2190	<	0.0050	<	0.001	R	<	0.0100
2200		0.029	<	0.001	R		0.42
2220	<	0.0050	<	0.001	R		0.072
224	<	0.0050	<	0.001	R		0.13
225	<	0.0050	<	0.001	R	<	0.0100
2260	<	0.0050	<	0.001		<	0.0100
Total Number of Samples		17		17			17
Distribution Type		Neither		ND			Neither
Mean		0.0064		0.001			0.07
Standard Deviation*		0.0058		0.000			0.11
95% UCL		0.0089		0.001			0.11
Minimum		0.029		ND			0.03
Maximum		0.03		ND			0.42
Detection Frequency		6%		0%			47%
Exposure Point Concentration		0.03		ND			0.42

Human Health and Ecological Risk Assessment

McLaren/Hart Project No. 09.0803686

Basic Oxygen Furnace Slag

April 21, 1998

Prepared for: **Collier, Shannon, Rill and Scott**
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Table 2-1
BOF Slag Analytical Data (mg/kg)
BOF HERA

SAMPLE NO.	Carbon	Sulfur	Aluminum	Calcium	Iron	Manganese	Silicon.	Phosphorous	Magnesium
108	1700	1900	100	367200	115700	27600	84500	2800	28700
109	1900	2240	12400	360300	119200	27100	86500	5010	33500
200	500	660	11300	258600	229000	46100	50500	3100	62100
203	900	780	2800	312700	218700	24800	51600	2220	54800
207	2900	500	6100	279900	154100	48700	58300	3210	53400
209	1300	660	19100	275400	225800	34600	48100	5720	59300
211	1200	440	6000	269900	215900	33900	47200	3860	57300
213	3200	620	108800	206900	151200	23100	82800	2560	43500
215	4400	980	18800	283300	190500	29500	51300	3310	55100
217	5800	880	15300	311900	176600	33600	53600	3830	66600
224	1600	780	91400	256400	153100	29200	30900	1720	58200
225	1600	1260	19300	290300	217900	34400	36400	2020	51000
2050	4700	5000	29700	275800	126000	12900	114100	470	72000
2190	2300	600	17000	249300	202700	22600	51000	4310	66200
2200	2700	600	21700	217000	215600	65700	59600	4850	62600
2220	4000	530	6900	271400	195200	41500	55200	3070	64800
226-0	3500	480	18600	276000	225900	23200	52500	2290	51300
Total Number of Samples	17	17	17	17	17	17	17	17	17
Distribution Type	Lognormal	Neither	Neither	Lognormal	Lognormal	Lognormal	Neither	Normal	Normal
Mean	2600	1112	23841	280135	184300	32853	59653	3197	55318
Standard Deviation*	1489	1120	29845	41651	40816	12321	20762	1319	11467
95% UCL	3852	1587	36479	299172	201244	39410	68444	3756	60173
Minimum	500	440	100	206900	205956	12900	30900	470	28700
Maximum	5800	5000	108800	367200	229000	65700	114100	5720	72000
Detection Frequency	100%	100%	100%	100%	100%	100%	100%	100%	100%
Exposure Point Concentration	3852	1587	36479	299172	205956	39410	68444	3756	60173

* For metals with lognormal distributions, the lognormal 95% UCL is presented. For metals with normal or neither normal nor lognormal distributions, the normal 95% UCL is presented (Section 2.1.4).

< Indicates constituent was not detected; value is one-half of the detection limit.

M Elevated detection limit due to matrix effects.

P Digested spike recovery fails accuracy criteria; post-digestion spike recovery accepted.

I Estimated concentration due to severe matrix interferences. During the metals analysis using the inductively coupled plasma (ICP), the serial dilution failed to meet the established control limits of 0-10%. The result was flagged with the I qualifier to indicate that a severe physical interference was observed.

R Data reported are based on the Method Detection Limit (MDL). Value is the laboratory MDL.

Z The reported value is less than the Estimated Quantitation Limit (EQL) and greater than the Method Detection Limit (MDL); the MDL is represented rather than the EQL.

ND No data as this metal was not detected.

Table 2-1
BOF Slag Analytical Data (mg/kg)
BOF HERA

?

SAMPLE NO.		Antimony			Arsenic		Barium		Beryllium		Cadmium		Chromium		Chromium(VI)		Cobalt	Copper
108	<	1.25	M	<	0.75	M	28	<	0.25	<	1.25	M	1200	<	0.5		12.0	18
109		3.1		<	1.25	M	51	<	0.25		0.79		1200	<	0.5		1	120
200	<	2.5	M	<	2.5	M	47	<	0.025		15		1500	<	0.5	<	1	30
203		5.1		<	6.5	M	37	<	0.025		11		1400	<	0.5	<	1	35
207		6.9		<	1.5	M	74	<	0.25	<	1.25	M	1500	<	0.5	<	1	23
209	<	1.25	M,I,P	<	1.25	M	39	<	0.25		0.97		1300	<	0.5	<	2.8	30
211	<	1.25	M	<	1.5	M	24	<	0.25	<	1.25	M	1400	<	0.5		2.3	24
213	<	2.5	M	<	1.5	M	260	<	0.25	<	2.5	M	1100	<	0.5		9.3	18
215		4.4		<	1.5	M	57	<	0.25	<	1.25	M	1200	<	0.5	<	1	26
217	<	2.5	M	<	1.5	M	38	<	0.25	<	2.5	M	2000	<	0.5		2.4	21
224		4.2		<	1.5	M	76	<	0.25	<	1.25	M	770	<	0.5		2.3	22
225		8.8		<	1.5	M	64	<	0.25	<	1.25	M	960	<	0.5	<	1	37
2050	<	2.5	M	<	2.5	M	200		5.0	<	0.5	M	440	<	0.5		2.7	12
2190	<	2.5	M	<	2.5	M	72	<	0.25	<	0.5	M	1200	<	0.5		4.1	21
2200	<	2.5	M	<	2.5	M	96	<	0.25	<	0.5	M	1500	<	0.5		12.0	31
2220	<	2.5	M	<	2.5	M	67	<	0.25	<	0.5	M	2000	<	0.5		8.0	27
226-O	<	2.55	M	<	2.55	M	40	<	0.255	<	0.255	M	940	<	0.5	<	1	14
Total Number of Samples		17			17		17		17		17		17		17		17	17
Distribution Type		Neither			Neither		Lognormal		Neither		Neither		Normal		ND		Neither	Lognormal
Mean		3.3			2.1		75		0.5		2.5		1271		0.5		3.8	30
Standard Deviation*		2			1.3		62		1.2		4.1		391		0.0		3.9	24
95% UCL		4.2			2.6		103		0.99		4.2		1,437		0.50		5.5	38
Minimum		3.1			ND		24		5.000		0.79		440		ND		2	12
Maximum		8.8			ND		260		5		15		2000		ND		12	120
Detection Frequency		35%			0%		100%		6%		24%		100%		0%		59%	100%
Exposure Point Concentration		8.8			ND		103		5		15		1,437		ND		5.5	38

Table 2-1
BOF Slag Analytical Data (mg/kg)
BOF HERA

SAMPLE NO.	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Tin	Vanadium	Zinc
108	60	60	0.095 R	4	12	2.6	< 2.5 M	2.7	890	< 0.5
109	6.1	73	< 0.25 Z	5.6	16	< 2.5	< 10 M	3.1	830	39
200	6.3	< 0.25	< 0.025 Z	3	25	4.6	< 25 M	8	800	25
203	7	24	0.05 Z	4.8	19	2.3	< 12.5 M	4.8	1200	8.5
207	200	< 2.5 M	0.065 R	2.1	23	4.8	< 2.5 M	6.2	1700	9.4
209	2.4	0.94	< 0.025 Z	7.7	18.0 I	< 2.5 M	< 5 M	5.0	1100	18
211	18	< 2.5 M	0.071 R	3.5	19	3.1	< 2.5 M	3.9	850	150
213	9.4	< 0.25 R	< 0.025 R	10	< 2.5 M	< 2.5 M	< 5 M	6.2	1100	120
215	57	< 2.5 M	0.1	4.5	17	2.9	< 2.5 M	5.7	760	80
217	4.4	6.4	< 0.025 R	6.1	7.7	< 2.5 M	11	6.6	1400	53
224	110	< 2.5 M	0.065 R	4.1	15	3	< 2.5 M	3.5	560	23
225	330	< 2.5 M	0.07 R	< 1	16	3.4	< 5 M	26	700	55
2050	5.3	1.5	< 0.025 R	3.6	< 2.5 M	< 5 M	< 5 M	4.7	430	33
2190	14	0.76	< 0.025 R	3.9	9.4	< 5 M	11	6.1	940	47
2200	9.5	< 0.025 R	< 0.25 R	10	25	< 5 M	< 5 M	8.4	1100	32
2220	5.2	6	< 0.025 R	5.8	19	100	< 5 M	5.7	1200	38
226-O	4.7	< 1.5	< 0.025 R	3.8	< 2.55 M	< 2.55 M	< 10 M	4.1	1300	59
Total Number of Samples	17	17	17	17	17	17	17	17	17	17
Distribution Type	Neither	Lognormal	Neither	Normal	Normal	Neither	Neither	Lognormal	Normal	Neither
Mean	50	11	0.07	4.9	15	9.1	7.2	6.5	992	46
Standard Deviation*	89	22	0.07	2.5	7.4	23	5.7	5.3	318	39
95% UCL	88	141	0.1	5.95	17.8	19	9.6	8.2	1,127	63
Minimum	2.4	0.760	0.050	2	7.7	2.3	11.0	2.7	430	8.5
Maximum	330	73	0.10	10	25	100	11	26	1700	150
Detection Frequency	100%	47%	41%	94%	82%	53%	12%	100%	100%	94%
Exposure Point Concentration	88	73	0.10	6	17.8	19	11	8.19	1127	63.16

Table 2-2
BOF TCLP Data (mg/L)
BOF HERA

SAMPLE NO.		Antimony		Arsenic		Barium			Beryllium		Cadmium			Chromium	
108	<	0.003	<	0.002	R	0.050		<	0.002	<	0.0003	R	<	0.005	
109	<	0.003	<	0.002	Z	0.060		<	0.002	<	0.0002	Z	<	0.005	
200	<	0.003	<	0.002	Z	0.1		<	0.002	<	0.0002	Z	<	0.005	
203	<	0.003	<	0.002	Z	0.1		<	0.002	<	0.0002	Z	<	0.005	
2050	<	0.003	<	0.002	R	0.080		<	0.002		0.0026		<	0.005	
207	<	0.003		0.0054		0.860		<	0.002	<	0.0003	R	<	0.010	M
209	<	0.003	<	0.002	Z	0.030		<	0.002	<	0.0002	Z	<	0.005	
211	<	0.003	<	0.002	R	0.034		<	0.002	<	0.0003	R	<	0.005	
213	<	0.003	<	0.002	R	4.600		<	0.002		0.0069		<	0.005	
215	<	0.003	<	0.002	R	0.085		<	0.002	<	0.0003	R	<	0.005	
217	<	0.003	<	0.002	R	0.033	R	<	0.002	<	0.0002	R	<	0.005	
2190	<	0.003	<	0.002	R	0.120		<	0.002		0.0014		<	0.005	
2200	<	0.003	<	0.002	R	0.220		<	0.002		0.0095			0.036	
2220	<	0.003	<	0.002	R	0.150		<	0.002		0.0012			0.011	
224	<	0.003	<	0.002	R	0.420		<	0.002	<	0.0015	R		0.044	
225	<	0.003	<	0.002	R	0.110		<	0.002	<	0.0003	R	<	0.010	M
2260	<	0.003	<	0.003		0.065		<	0.002	<	0.0002	R	<	0.005	
Total Number of Samples		17		17		17			17		17			17	
Distribution Type		ND		Neither		Neither			ND		Neither			Neither	
Mean		0.003		0.002		0.41			0.002		0.001			0.01	
Standard Deviation*		0.000		0.001		1.10			0.000		0.003			0.01	
95% UCL		0.003		0.002		0.88			0.002		0.003			0.01	
Minimum		ND		0.005		0.03			ND		0.001			0.01	
Maximum		ND		0.005		4.60			ND		0.010			0.04	
Detection Frequency		0%		6%		100%			0%		29%			18%	
Exposure Point Concentration		ND		0.005		0.88			ND		0.01			0.04	

* For metals with normal or neither normal nor lognormal distributions, the normal 95% UCL is presented (Section 2.1.4).

<

M Elevated detection limit due to matrix effects.

P Digested spike recovery fails accuracy criteria; post-digestion spike recovery accepted.

I Estimated concentration due to severe matrix interferences. During the metals analysis using the inductively coupled plasma (ICP), the serial dilution failed to meet the established control limits of 0-10%. The result was flagged with the I qualifier to indicate that a severe physical interference was observed.

R Data reported are based on the Method Detection Limit (MDL). Value is the laboratory MDL.

Z The reported value is less than the Estimated Quantitation Limit (EQL) and greater than the Method Detection Limit (MDL); the MDL is represented rather than the EQL.

ND No value as this metal was not detected.

Table 2-2
BOF TCLP Data (mg/L)
BOF HERA

SAMPLE NO.		Chromium(VI)			Lead		Manganese		Mercury		Nickel		Selenium	
108	<	0.005		<	0.002		0.012	<	0.0002	<	0.0100	<	0.0025	R
109	<	0.005		<	0.002	<	0.003	<	0.0002	<	0.0100	<	0.0025	Z
200	<	0.005		<	0.002	<	0.003	<	0.0002	<	0.0100	<	0.0025	Z
203	<	0.005		<	0.002	<	0.003	<	0.0002	<	0.0100	<	0.0025	Z
2050	<	0.005		<	0.002		38	<	0.0002	<	0.0100	<	0.0025	R
207	<	0.005			0.0065		41.0	<	0.0002	<	0.0100	<	0.0025	
209	<	0.005		<	0.002	<	0.003		0.00049	<	0.0100	<	0.0025	Z
211	<	0.005		<	0.002	<	0.003	<	0.0002	<	0.0100	<	0.0025	R
213	<	0.005			0.0059		63	<	0.0002		0.033	<	0.0025	R
215	<	0.005		<	0.002		0.021	<	0.0020	<	0.0100	<	0.0025	R
217	<	0.005		<	0.002		0.48	<	0.0002	<	0.0300	<	0.0025	R
2190	<	0.005	P,G	<	0.002		22	<	0.0002	<	0.0100	<	0.0025	R
2200	<	0.005			0.0087		150	<	0.0002		0.028	<	0.0025	R
2220	<	0.005			0.0034		74	<	0.0002	<	0.0100	<	0.0050	M
224	<	0.005			0.0086		64	<	0.0002	<	0.0100	<	0.0025	R
225	<	0.005			0.015		60	<	0.0002	<	0.0100	<	0.0025	R
2260	<	0.005		<	0.002	<	0.003	<	0.0002	<	0.0100	<	0.0025	R
Total Number of Samples		17			17		17		17		17		17	
Distribution Type		ND			Neither		Neither		Neither		Neither		17	
Mean		0.005			0.004		30.15		0.0003		Neither		ND	
Standard Deviation*		0.000			0.004		41.68		0.0004		0.012		0.003	
95% UCL		0.005			0.005		47.80		0.0005		0.007		0.001	
Minimum		ND			0.003		0.0120		0.0005		0.015		0.003	
Maximum		ND			0.015		150.00		0.0005		0.028		ND	
Detection Frequency		0%			35%		71%		6%		0.033		ND	
Exposure Point Concentration		ND			0.015		47.80		0.00049		12%		0%	
											0.033		ND	

Appendix B
Boring Log A3-SB-H3, Test Pit Logs from Subarea H, Analytical Data, and Data Usability Report

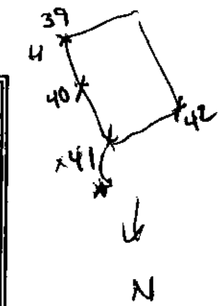
MALCOLM PIRNIE

Project Name: LTV-Suppl. Field Inv.
Project No.: 0848-263-302
Client: LTV
Location: Area 1, SubH

Surface Elev.:
Reference Elev.:
Contractor: SJB
Logged By: JMA

Borehole No.: A1-SB-H3
Date Started: 5/20/98
Date Finished: 5/20/98
Method of Boring: 4 1/4" HSA

Depth (BGS)	Sample No.	Blows (6")	Recovery	Soil Classification	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Samples	Moisture (%)	HNu (ppm) Scan	HNu (ppm) Headspace
0	1	8 20 27 15	1.4		0.7 Dk Brown Silty sand, little silt, trace brick, moist 0.7 Slag, Brick, silt & Sand fill				
2	2	15 24 50/1	1.0		0.3 Dk Brown Siltysand brick fill, moist 0.4 Sandy Slag Fill, light grayish brown 0.3 Bluish gray slag	Composite from 2-4.4' for PCBs			
4	3	7 3 2 1	0.7		0.3 SAME A/A 0.4 Brown ~~ext~~ moist clayey silt, laminated w/ orange & gray mottles	2-4 oz jars			
6	4	1 1 2 2	0		—				
					Advanced spoon to 8' advanced 4 1/4" HSA to 4', Backfilled w/ cuttings Hole stayed open at completion. water 5' bgs				
					4 spoons Augers to 4				

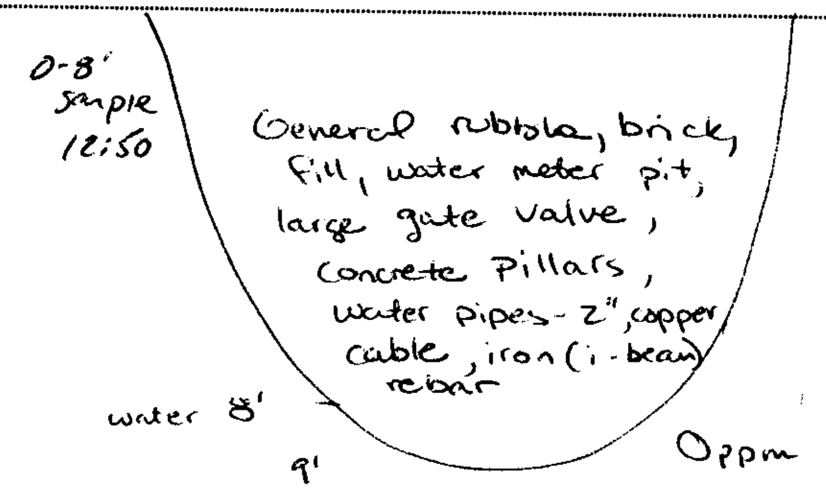


FIELD TEST PIT LOG

Test Pit No.:	A1-TP-39	Project:	LTV Plant, Area I Inv.
Location:	subarea H	Project No:	0002-003-100
Date:	12/10/98	Logged By:	JMA
Excavation Method:	Liebherr 942		

Test Pit Profile

grade



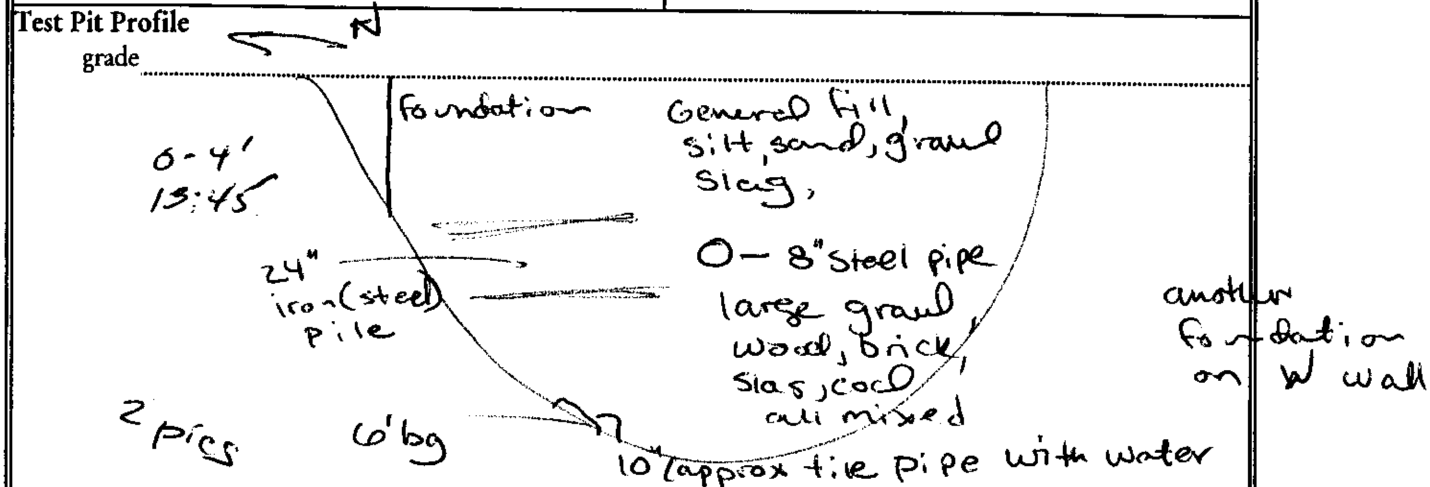
not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-40	Project:	LTV Plant, Area I Inv.
Location:		Project No:	0002-003-100
Date:	12/10/98	Logged By:	JMA
Excavation Method:	Liebher 942		

Test Pit Profile



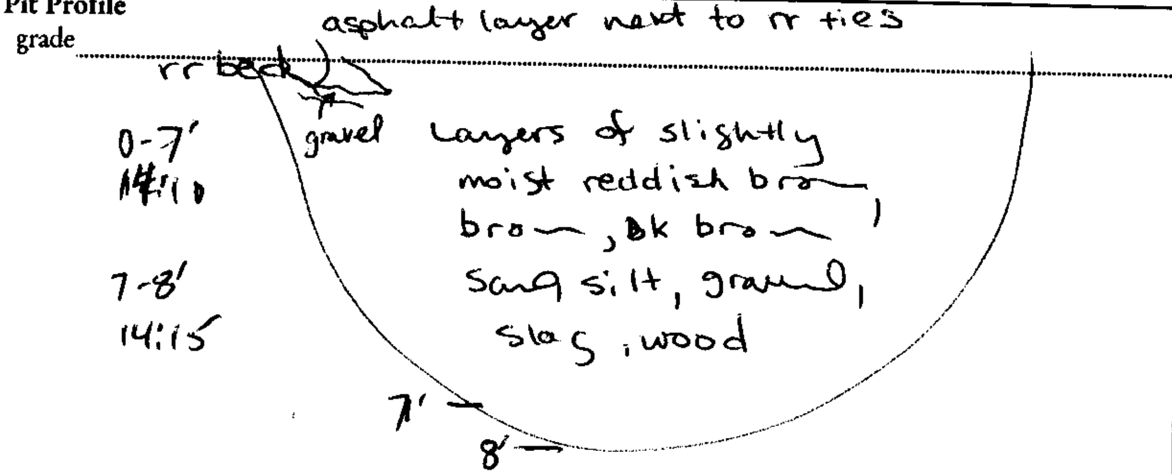
not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-41	Project:	LTV Plant, Area I Inv.
Location:		Project No:	0002-003-100
Date:	12/10/98	Logged By:	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile



not to scale

Depth bgs	Soil Description	Samples– Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-42	Project:	LTV Plant, Area I Inv.
Location:		Project No:	0002-003-100
Date:		Logged By:	JMA
Excavation Method:			

Test Pit Profile

grade

refusal at 1'

43 same

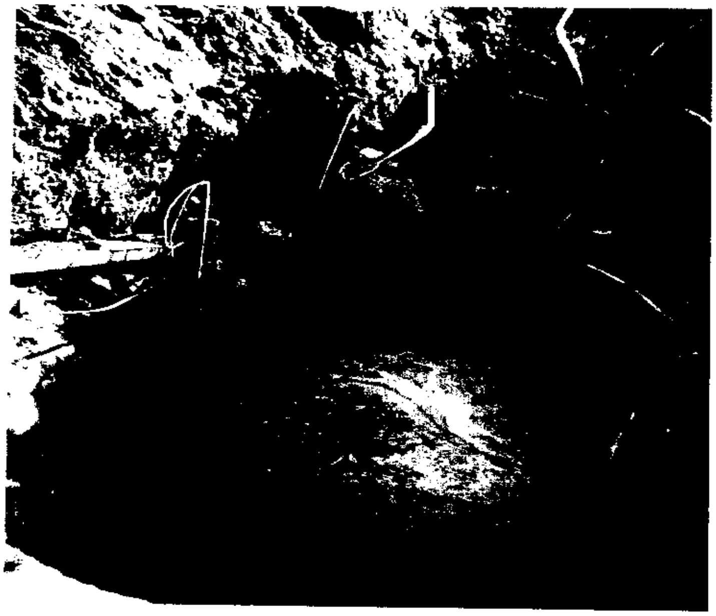
44 same

No Samples

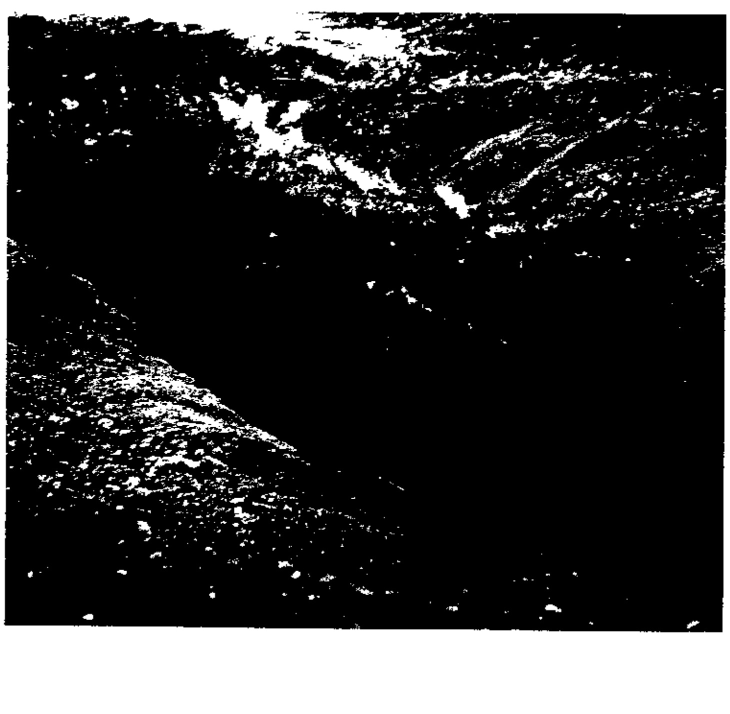
not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

LTV Steel Company - Test Pit Excavation in Area I - Subarea H



A1-TP-39



A1-TP-41

LTV Steel Company - Test Pit Excavation in Area I - Subarea H

A1-TP-40

A1-TP-40

TurnKey Environmental Restoration, LLC

Client Sample ID: Job Number & Lab Sample ID: Sample Date:		A1-SB-H3 A98-1927 A8192701 05/20/98					
Analyte (UG/KG)	RL	Result					
METHOD 8082 - POLYCHLORINATED BIPHENYLS							
Aroclor 1016	40	40	U				
Aroclor 1221	80	80	U				
Aroclor 1232	40	40	U				
Aroclor 1242	40	40	U				
Aroclor 1248	40	40	U				
Aroclor 1254	40	29	J				
Aroclor 1260	40	40	U				
SURROGATES							
Tetrachloro-m-xylene	40-148	66					
Decachlorobiphenyl	58-150	72					

000005

* Indicates Result is Outside QC Limits
NA = Not Applicable

QC ANALYTICAL RESULTS

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		Matrix Spike Blank A98-1927 A8B0378601		Method Blank A98-1927 A8B0378602				
Analyte (UG/KG)	RL	Result		Result				
METHOD 8082 - POLYCHLORINATED BIPHENYLS								
Aroclor 1016	40	40	U	40	U			
Aroclor 1221	80	80	U	80	U			
Aroclor 1232	40	40	U	40	U			
Aroclor 1242	40	40	U	40	U			
Aroclor 1248	40	40	U	40	U			
Aroclor 1254	40	160		40	U			
Aroclor 1260	40	40	U	40	U			
SURROGATES								
Tetrachloro-m-xylene	40-148	95		104				
Decachlorobiphenyl	58-150	96		102				

000006

* Indicates Result is Outside QC Limits
NA = Not Applicable

METHOD 8082 - POLYCHLORINATED BIPHENYLS

Client Sample ID Job No & Lab Sample ID	A1-SB-H3 A98-1927 A8192701				
Sample Date	05/20/98 08:50				
Received Date	05/22/98 12:45				
Extraction Date	05/27/98 16:00				
Analysis Date	06/01/98 12:19				
Extraction HT Met?	YES				
Analytical HT Met?	YES				
Sample Matrix	SOIL LOW				
Dilution Factor	1.0				
Sample wt/vol	30.87 GRAMS				
% Dry	80.92				

000007

NA = Not Applicable

METHOD 8082 - POLYCHLORINATED BIPHENYLS

Client Sample ID Job No & Lab Sample ID	Matrix Spike Blank A98-1927 A8B0378601	Method Blank A98-1927 A8B0378602			
Sample Date					
Received Date					
Extraction Date	05/27/98 16:00	05/27/98 16:00			
Analysis Date	05/29/98 11:15	05/29/98 11:34			
Extraction HT Met?	-	-			
Analytical HT Met?	-	-			
Sample Matrix	SOIL LOW	SOIL LOW			
Dilution Factor	1.0	1.0			
Sample wt/vol	30.62 GRAMS	30.42 GRAMS			
% Dry	100.00	100.00			

000008

NA = Not Applicable

Client Sample ID: Method Blank   Matrix Spike Blank
Lab Sample ID: A8B0378602   A8B0378601

Analyte	Units of Measure	Concentration Blank Spike	Concentration Spike Amount	% Recovery Blank Spike	QC LIMITS
METHOD 8082 - POLYCHLORINATED BIPHENYLS					
Aroclor 1254	UG/KG	162	163	100	67-168

* Indicates Result is outside QC Limits
NC = Not Calculated   ND = Not Calculated

Columbia Analytical Services Inc.

JAN 06 1999

A FULL SERVICE ENVIRONMENTAL LABORATORY

Area I
lead & PCB
results

December 29, 1998

Ms. Jeanne Asquith
Turnkey Environmental Rest.
Key Tower Suite 1350
50 Fountain Plaza
Buffalo, NY 14202

PROJECT:LTV PLANT SITE
Submission #:9812000150

Dear Ms. Asquith

Enclosed are the analytical results of the analyses requested. All data has been reviewed prior to report submission. Should you have any questions please contact me at (716) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Janice Jaeger
Project Chemist

Enc.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director prior to report submittal.

1 Mustard St.• Suite 250 • Rochester, NY 14609 • Tele:(716)288-5380 • Fax:(716)288-8475
65 Ramapo Valley Rd. • Suite 16 • Mahwah, NJ 07430 • Tele:(201)512-3292 • Fax:(201)512-3362

Columbia Analytical Services inc.

Effective 04/01/96

CAS LIST OF QUALIFIERS

(The basis of this proposal are the EPA-CLP Qualifiers)

U - Indicates compound was analyzed for but was not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. For further explanation see case narrative / cover letter.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

N - Spiked sample recovery not within control limits.
(Flag the entire batch - Inorganic analysis only)

* - Duplicate analysis not within control limits.
(Flag the entire batch - Inorganic analysis only)

- Also used to qualify Organics QC data outside limits.

D - Spike diluted out.

S - Reported value determined by Method of Standard Additions. (MSA)

X - As specified in the case narrative.

CAS Lab ID # for State Certifications

NY ID # in Rochester:	10145	NJ ID # in Rochester:	73004
CT ID # in Rochester:	PH0556	RI ID # in Rochester:	158
MA ID # in Rochester:	M-NY032		

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-32 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261420
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	45.2	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	92.4	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-33 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261421
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	40.6	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	82.6	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-34 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261422
Submission #:9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	6.45 U	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	77.5	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-35 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261423
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	55.7	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	89.4	%	12/14/98	1.0

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-36 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261424
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	249	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	88.3	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-37 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261425
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	93.5	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	83.5	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-38 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261426
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	60.0	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	86.3	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP32/33/34/35/36/37/38 COMP

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261427
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	747	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	80.7	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 8082 PCBS
Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-39/40/41 COMP

Date Sampled : 12/10/98 **Order #:** 261428 **Sample Matrix:** SOIL/SEDIMENT
Date Received: 12/10/98 **Submission #:** 9812000150 **Percent Solid:** 88.9

DATE EXTRACTED : 12/14/98
DATE ANALYZED : 12/15/98
ANALYTICAL DILUTION: 1.00

ANALYTE	PQL	RESULT	UNITS
			Dry Weight
PCB 1016	400	450 U	UG/KG
PCB 1221	400	450 U	UG/KG
PCB 1232	400	450 U	UG/KG
PCB 1242	400	450 U	UG/KG
PCB 1248	400	710	UG/KG
PCB 1254	400	450 U	UG/KG
PCB 1260	400	450 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS		
DECACHLOROBIPHENYL	(30 - 150 %)	108	%
TETRACHLORO-META-XYLENE	(30 - 150 %)	104	%

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 8082 PCBS
Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-41 7-8'

Date Sampled : 12/10/98 **Order #:** 261429 **Sample Matrix:** SOIL/SEDIMENT
Date Received: 12/10/98 **Submission #:** 9812000150 **Percent Solid:** 68.6

ANALYTE	PQL	RESULT	UNITS
DATE EXTRACTED : 12/14/98			
DATE ANALYZED : 12/15/98			
ANALYTICAL DILUTION: 1.00			Dry Weight
PCB 1016	400	580 U	UG/KG
PCB 1221	400	580 U	UG/KG
PCB 1232	400	580 U	UG/KG
PCB 1242	400	580 U	UG/KG
PCB 1248	400	580 U	UG/KG
PCB 1254	400	580 U	UG/KG
PCB 1260	400	580 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS	RESULT	UNITS
DECACHLOROBIPHENYL	(30 - 150 %)	110	%
TETRACHLORO-META-XYLENE	(30 - 150 %)	108	%

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 8082 PCBS
Reported: 01/04/99

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled :
Date Received:
Order #: 262135
Submission #:
Sample Matrix: SOIL/SEDIMENT
Percent Solid: 100

ANALYTE		PQL	RESULT	UNITS
DATE EXTRACTED	: 12/14/98			
DATE ANALYZED	: 12/15/98			
ANALYTICAL DILUTION:	1.00			Dry Weight
PCB 1016		400	400 U	UG/KG
PCB 1221		400	400 U	UG/KG
PCB 1232		400	400 U	UG/KG
PCB 1242		400	400 U	UG/KG
PCB 1248		400	400 U	UG/KG
PCB 1254		400	400 U	UG/KG
PCB 1260		400	400 U	UG/KG
		400	400 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS		
DECACHLOROBIPHENYL	(30 - 150 %)	104	%
TETRACHLORO-META-XYLENE	(30 - 150 %)	102	%

COL'MBIA ANALYTICAL SERVICES, INC.
1 Mustard Suite 250, P.O. Box 90859, Rochester, NY 14609-0859
(716) 288-5380 • FAX (716) 288-8475

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

(800) 695-7222

DATE 12/10/98 PAGE 1 OF 2

PROJECT NAME LTV Steel, Plant Site
PROJECT MANAGER/CONTACT Jeanne Asquith
COMPANY/ADDRESS Turnkey Enviro. Restoration
50 Fountain Plaza, Suite 1350 Buffalo, NY 1420?
TEL ( ) ______ FAX ( ) ______
SAMPLER'S SIGNATURE Jeanne M. Asquith

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624	GC/MS SVOA's ☐ 8270A ☐ 625	GC VOA's ☐ 8010/8020 ☐ 601/602	PESTICIDES/PCB's ☐ 8080 ☐ 608	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW)	METALS, DISSOLVED (LIST BELOW)	LEAD Method 6010B	LEAD (*) Method 6010B						PRESERVATION pH < 2.0	pH > 12	Other
AI-TP-32, 0-3"	12/10/98	8:25		Soil	1											1									
AI-TP-32, 3-26"		8:30			1												1								
AI-TP-33, 0-3"		8:55			1											1									
AI-TP-33, 3-25"		9:00			1												1								
AI-TP-34, 0-3"		9:30			1											1									
AI-TP-34, 3-19"		9:50			1												1								
AI-TP-35, 0-3"		10:15			1											1									
AI-TP-35, 3-23"		10:25			1												1								
AI-TP-36, 0-3"		10:35			1											1									
AI-TP-36, 3-23"		10:40			1												1								

RELINQUISHED BY:	RECEIVED BY:
Signature: Jeanne M. Asquith	Signature: Mike Sciandra
Printed Name: Jeanne Asquith	Printed Name: M. Sciandra
Firm: Turnkey E. Rest	Firm: CAS
Date/Time: 12/10/98 2:50	Date/Time: 12-10-98 2:50

RELINQUISHED BY:	RECEIVED BY:
Signature: Mike Sciandra	Signature: Brian Callom
Printed Name: Mike Sciandra	Printed Name: Brian Callom
Firm: CAS	Firm: CAS
Date/Time: 10-12-98 5:05	Date/Time: 12-10-98 5:05 1705

RELINQUISHED BY:	RECEIVED BY:
Signature	Signature
Printed Name	Printed Name
Firm	Firm
Date/Time	Date/Time

TURNAROUND REQUIREMENTS
__ 24 hr. __ 48 hr. __ 5 day
✓ Standard (10-15 working days)
__ Provide Verbal Preliminary Results
✓ Provide FAX Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
__ 1. Routine Report
✓ 2. Routine Rep. w/CASE Narrative
__ 3. EPA Level III Validatable Package
__ 4. N.J. Reduced Deliverables Level IV
__ 5. NY ASP/CLP Deliverables
__ 6. Site specific QC.

INVOICE INFORMATION:
P.O. #: 0002-003-100
Bill To: Jeanne Asquith

SAMPLE RECEIPT:
Shipping Via: CAS
Shipping #: ______
Temperature: 4.1
Submission No: 12-150

SPECIAL INSTRUCTIONS/COMMENTS:
METALS * Make composite of AI-TP-32, 3-26" / AI-TP-33, 3-25" / AI-TP-34, 3-19" / AI-TP-35, 3-23" / AI-TP-36, 3-23" / AI-TP-37, 3-23" / AI-TP-38, 3-28"
ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List

COLUMBIA ANALYTICAL SERVICES, INC.
1 Mustard St., Suite 250, P.O. Box 90859, Rochester, NY 14609-0859
(716) 288-5380 • FAX (716) 288-8475

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

(800) 695-7222

DATE 12/10/98

PROJECT NAME LTV Steel Plant Site
PROJECT MANAGER/CONTACT Jeanne Asquith
COMPANY/ADDRESS Turnkey Envir. Restoration
50 Fountain Plaza, Suite 1350 Buffalo NY 14202
TEL ( ) FAX ( )
SAMPLER'S SIGNATURE Jeanne M. Asquith

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624	GC/MS SVOA's ☐ 8270A ☐ 625	GC VOA's ☐ 8010/8020 ☐ 601/602	PESTICIDES/PCB's ☒ 8082 ☐ 608 **	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW)	METALS, DISSOLVED (LIST BELOW)	LEAD Method 6010B	*LEAD (*) Method 6010B	PCBs, 8082					PRESERVATION pH < 2.0	pH > 12	Other
Al-TP-37, 0-3"	12/10/98	10:50		Soil	1											1									
Al-TP-37, 3-23"		11:05			1												1								
Al-TP-38, 0-3"		11:15			1											1									
Al-TP-38, 3-28"		11:25			1												1								
Al-TP-39, 0-8'		12:50			1				1**																
Al-TP-40, 0-4'		13:45			1				1**																
Al-TP-41, 0-7'		14:10			1				1**																
Al-TP-41, 7-8'		14:15			1													1							

RELINQUISHED BY:	RECEIVED BY:
Signature: Jeanne M. Asquith	Signature: Mike Scanlon
Printed Name: JEANNE M. ASQUITH	Printed Name: m. Kescianolla
Firm: Turnkey E. Rest.	Firm: CAS
Date/Time: 12/10/98 2:50	Date/Time: 12-10-94 2.50

RELINQUISHED BY:	RECEIVED BY:
Signature: Mike Sciandra	Signature: Brian Collar
Printed Name: M Sciandra	Printed Name: Brian Collar
Firm: CAS	Firm: CAS
Date/Time: 10-12-98 5:05	Date/Time: 12-10-98 1705

RELINQUISHED BY:	RECEIVED BY:
Signature	Signature
Printed Name	Printed Name
Firm	Firm
Date/Time	Date/Time

TURNAROUND REQUIREMENTS
__ 24 hr. __ 48 hr. __ 5 day
✓ Standard (10-15 working days)
__ Provide Verbal Preliminary Results
✓ Provide FAX Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
__ 1. Routine Report
✓ 2. Routine Rep. w/CASE Narrative
__ 3. EPA Level III Validatable Package
__ 4. N.J. Reduced Deliverables Level IV
__ 5. NY ASP/CLP Deliverables
__ 6. Site specific QC.

INVOICE INFORMATION:
P.O. #: 0002-003-100
Bill To: Jeanne Asquith

SAMPLE RECEIPT:
Shipping Via: CAS
Shipping #:
Temperature: 4.1
Submission No: 12-150

SPECIAL INSTRUCTIONS/COMMENTS:
METALS * Make Composite of Al-TP-32, 3-26"/ Al-TP-33, 3-25"/ Al-TP-34, 3-19"/ Al-TP-35, 3-23"/ Al-TP-36, 3-23"/ Al-TP-37, 3-23"/ Al-TP-38, 3-28"
ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List
** PCBs Make Composite of Al-TP-39/40/41, 0-7'

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Check Form

Project/Client Turnkey Submission Number 12-150

Cooler received on 12/10/98 and opened on 12/10/98 by OV

1. Were custody seals on outside of cooler? YES NO
   If yes, how many and where? ______
2. Were signature & date correct? YES NO
3. Were custody papers properly filled out (ink, signed, etc)? YES NO
4. Did all bottles arrive in good condition (unbroken)? YES NO
5. Were all bottle labels complete (*i.e.* analysis, preservation, etc)? YES NO
6. Did all bottle labels and tags agree with custody papers? YES NO
7. Were correct bottles used for the tests indicated? YES NO
8. Were VOA vials checked for absence of air bubbles, and noted if so? YES NO
9. Where did the bottles originate? CAS/A CAS/K CAS/S CAS/L CAS/X CAS/J CAS/R
10. Temperature of cooler(s) upon receipt: 4.1 ______ ______ ______ ______

Is the temperature within 4 ± 2° C?:	Yes ☒	Yes ☐	Yes ☐	Yes ☐	Yes ☐
If No, Explain Below	No ☐	No ☐	No ☐	No ☐	No ☐

Date/Time Temperatures Taken: 12/10/98 17:09

Thermometer ID: #139 Circle One: Temp Blank Sample Bottle Cooler Temp.

Explain any discrepancies: ______

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO_3					
2	H_2SO_4					
5-9*	P/PCBs (608 only)					

YES = All samples OK
NO = Samples were preserved at lab as listed
*If pH adjustment is required, use NaOH and/or H_2SO_4

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2				

CLIENT NOTIFICATION: ______

Data Validation Services

120 Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429

QA/QC DATA EVALUATION/USABILITY REPORT

LTV Steel Former Steel Manufacturing Site

This usability report pertains to the analytical results, submitted by Columbia Analytical Services (CAS) and Recra Labnet, for the field sampling investigation conducted by Malcolm Pirnie, Inc. and Turnkey Environmental Restoration, between March 1997 and December, 1998 at areas 1 of the LTV Steel Site.

The analytical reports submitted by the laboratories contain limited summary information, and the conclusions drawn within this report reflect that information only. No review has been performed to verify the reported sample results and quality control parameter values that are provided in the laboratory data reports. Certain of the quality control parameters that may result in qualification of data are not discussed or represented within the reports. Assumptions are also made that statements present in the laboratory case narratives are accurate, and that any outlying quality parameters of concern would have been discussed therein.

The data package summary reports are identified by the laboratories as follows:

CAS Submission Numbers:

9703000297	9703000298	9703000350	9703000390	
9704000146	9705000126	9810000115	9812000150	9812000382

Recra ID Numbers: A98-1106 A98-1174 A98-1209 A98-1597 A98-1927

Those items reviewed at a summary level are

* Laboratory Case Narratives
* Custody documentation for sample collection and laboratory receipt
* Condition/temperatures of samples at receipt
* Holding Times
* Surrogate standard recoveries
* Internal standard recoveries (Recra data only)
* Spiked blank/Laboratory Control Sample recoveries
* Blank contamination
* Accuracy and precision (limited CAS data only)
* Field duplicate correlation

Overall, the data submitted by the laboratories are primarily useable with minor qualification, to determine the presence, absence, and magnitude of environmental contamination in the samples collected from the LTV Steel Site.

This report presents a discussion of QC issues raised by the data review that may have impact on the useability of the reported results.

Field Duplicate Correlation

Field duplicate correlation for aqueous sample A1-MW-M2 showed good correlation for all analytes except selenium (which showed nondetection at, and detection just above, the reporting limit). Selenium reporting results are considered slightly estimated in value.

Holding Times

Some samples were held (under proper conditions) prior to shipment, resulting in a delay between collection and laboratory receipt. Holding times were evaluated from collection, and found to be generally acceptable.

Solids determinations should be performed within five days of sample collection, but were often performed beyond that timeframe, up to twelve days after collection. The variances expected are not likely to be significant.

Ferric iron reported results should be considered estimated, possibly biased low, due to extended holding time.

Surrogate Standard Recoveries

Surrogate standards, which monitor the completeness and accuracy of analyte recoveries from samples, were outside the required limits for volatile analyses of several samples. This can represent matrix effects, and indicate that the reported results for volatile analytes be considered estimated, possiubly biased low. The variance between reported values and actual concentrations for these samples is expected to be less than a factor of three. These samples showed little or no detection of volatile target analytes; reported results are usable for project objectives. Those with outliers are:

A1-SB-J2 8-10, A1-SB-E2 4-6, A1-SB-C2 12-14, and LTV-1

Accuracy and Precision

Matrix spike/duplicate determinations were performed on soil samples A1-TP4, and although not included as part of these sampling delivery groups, matrix spikes/duplicate evaluations were performed on some project samples from other areas. Correlations for organic parameters was generally good.

Evaluation for metals analytes in the matrix spikes and duplicates showed numerous outliers, indicating results for these analytes in associated samples are to be considered estimated. Those showing outlying values in A1-TP4 are matrix spike recoveries for elements antimony, chromium, copper, thallium, zinc, mercury, and cyanide; and the duplicate correlation for vanadium. Results for these elements should be considered estimated in associated samples (those of similar matrix and composition to that spiked).

No sample matrix spike/duplicate summaries were provided with the Recra reports. Therefore matrix effect is not evaluated for the samples. All spiked blank and spiked blank duplicate evaluations, which were performed for all parameters, were acceptable. Batch processing acceptance is shown by spiked blank and control sample recoveries reported with each batch.

Blank Contamination

Due to presence in associated blanks, results for detections of di-n-butylphthalate should be considered contamination. Results can be edited to nondetection at the originally reported value, or at the CRDL, whichever is greater.

Although not detected in blanks, the reported detections of other phthalates and methylene chloride are also suspect as contamination.

The results for organic method blanks were reported in the CAS data reports; those for metals, cyanide, and wet chemistry method blanks were not. Case narrative discussions, where available, made no mention of analyte presence in associated blanks. Recra reports do include method blank results for all analytes.

General

No case narratives were provided for some of the CAS data packages associated with the samples collected in area 1. Therefore, there are no laboratory statements as to acceptability of any associated QC not summarized within the reports.

Some samples were analysed at more than one dilution. Analyte values flagged by the laboratory as "E" are to be replaced by the dilution values for those sample analytes.

The dilution factor of 5, reported for the semivolatile analysis of sample A1-MW-2, was not reflected in the reported detection limits or laboratory flagging for that sample. The detections are well below the proposed action level of 500 ppm for semivolatiles for this project, and the error in reporting, if any, would not change the relative status of the sample.

The custodies pertaining to samples transferred to Recra for the EPA-8015 (methane, ethane, and ethene) analyses do not show relinquishing signatures/dates. Additionally, sample A1-MW-K2 was added to the custody form after transport.

The case narratives for contained some transcription errors, none of serious note.

Signature: Judy V. H[illegible] Date: 4-01-99

Data Validation Services

120 Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429

QA/QC DATA EVALUATION/USABILITY REPORT

LTV Steel Former Steel Manufacturing Site

This usability report pertains to the analytical results, submitted by Columbia Analytical Services (CAS) and Recra Labnet, for the field sampling investigation conducted by Malcolm Pirnie, Inc. and Turnkey Environmental Restoration, between February 1997 and June, 1998 at areas 2, 3, and 4 of the LTV Steel Site.

The analytical reports submitted by the laboratories contain limited summary information, and the conclusions drawn within this report reflect that information only. No review has been performed to verify the reported sample results and quality control parameter values that are provided in the laboratory data reports. Certain of the quality control parameters that may result in qualification of data are not discussed or represented within the reports. Assumptions are also made that statements present in the laboratory case narratives are accurate, and that any outlying quality parameters of concern would have been discussed therein.

The data package summary reports are identified by the laboratories as follows:

CAS Submission Numbers:				
	9702000225	9703000125	9703000171	9703000172
	9703000268	9703000297	9703000367	9703000378
	9704000132	9704000133	9704000146	9705000126
	9805000460	9808000433	9808000434	9810000376
	9810000395	9811000015	9811000242	
Recra ID Numbers:	A98-1084	A98-1106	A98-1132	
	A98-1161	A98-1175	A98-1209	
	A98-1597	A98-1639	A98-1927	A1-SB-H3

Those items reviewed at a summary level are

* Laboratory Case Narratives
* Custody documentation for sample collection and laboratory receipt
* Condition/temperatures of samples at receipt
* Holding Times
* Surrogate standard recoveries
* Internal standard recoveries (Recra data only)
* Spiked blank/Laboratory Control Sample recoveries
* Blank contamination
* Accuracy and precision (limited CAS data only)
* Field duplicate correlation

Overall, the data submitted by the laboratories are primarily useable with minor qualification, to determine the presence, absence, and magnitude of environmental contamination in the samples collected from the LTV Steel Site. There are a few exceptions, for which no useable data is available. They are volatile analytes in SS-14, PAH analytes in A3-SB-31, mercury in some of the surface soil samples, and some of the reactive cyanide and reactive sulfide results.

This report presents a discussion of QC issues raised by the data review that may have impact on the useability of the reported results.

Field Duplicate Correlation

The field duplicate correlation for A3-TP-7 was acceptable for the volatile, PCB, and metal analytes. However, the semivolatile values showed variances for detected analytes of almost an order of magnitude. The sample may have been nonhomogenous. Results for detected semivolatile analytes in samples of similar matrix should be regarded as possibly exhibiting similar variances.

Field duplicate correlation for SS-8 was acceptable for volatiles, semivolatiles, cyanide, and all metals **except** lead. The lead correlation (60 ppm and 3260 ppm) was very poor; reproted results for lead in the surface soil samples should be considered estimated, with possible great variance from actual.

Field duplicate correlation for aqueous sample A4-MW-5 showed good correlation for all analytes except naphthalene (which showed nondetection at, and detection just above, the reporting limit).

Field duplicate correlation for aqueous sample A1-MW-M2 showed good correlation for all analytes except selenium (which showed nondetection at, and detection just above, the reporting limit).

Holding Times

Some samples were held (under proper conditions) prior to shipment, resulting in a delay between collection and laboratory receipt. Holding times were evaluated from collection, and found to be generally acceptable.

Determinations for Reactive Cyanide and Reactive Sulfide should be performed as soon as possible (per protocol). However, those performed for this project were performed well beyond that time, usually eight to eleven days from sample collection, and there is a great potential for possible loss of reactivity. The reported sample results (which showed nondetection) are therefore considered of borderline usability. The exceptions are those in Recra ID# A98-1927, which were run at 21 days after collection, and are not usable. These are samples A3-SB-11, A3-SB-13. A3-SB-16, A3-SB-18, A3-SB-19, and A3-SB-20.

The surface soil samples in CAS No. 9703000378, collected 2/19/97 and 2/21/97, were processed for PCB analytes at 40 days from collection, well beyond the allowable holding time of 14 days from collection. The reported detection limits of 400 ppb are not usable, but due to the persistance of PCBs, it is probable that if the samples contained 10 ppm of PCBs, it would have been detected as being above 400 ppb. The sample SS-10/11 showed detection of Aroclor 1248 at 1 ppm. The actual concentration should be considered significantly higher, possibly above 10 ppm.

The amenable cyanide results for A3-SB-34/35, A3-SB-36/37, and A3-SB-38/39 are likely biased low due to an extended holding time (of 16 days from collection) prior to sample analysis. The pH of these samples was also not run until 13 days from collection, well beyond the required holding time. The pH values are therefore estimated in value.

Solids determinations should be performed within five days of sample collection, but were often performed beyond that timeframe, up to twelve days after collection. The variances expected are not likely to be significant.

Ferric iron reported results should be considered estimated, possibly biased low, due to extended holding time.

Surrogate Standard Recoveries

Surrogate standards, which monitor the completeness and accuracy of analyte recoveries from samples, were outside the required limits for volatile analyses of several samples. This can represent matrix effects. Only one sample, SS-14, produced recoveries sufficiently low as to render the reported data unuseable. The sample reported all nondetection, but sample constituents may not have recovered in the analysis. There is no useable data for the volatile fraction of this sample.

Other outlying recoveries indicate that the reported results for volatile analytes be considered estimated, possiubly biased low. The variance between reported values and actual concentrations for these samples is expected to be less than an order of magnitude. These samples showed little or no detection of volatile target analytes; reported results are usable for project objectives:

A4-MW-2 (5.5'-6'), A4-MW-5 (4.5-5'), A3-SB-4(4-5'), A3-SB-5(4-5'), A3-SB-6(2.5-3'), LTV-1, A2-TP-16(1-4'), A2-TP-17(1-4'), A2-TP-18(1-4'), A2-TP-19/20(1-4'), A2-TP-13/14/15(1-4'). A2-TP-12/11/10(1-4'), A2-TP-7/8/9(1-4'), and all surface soil samples ("SS-") **except** SS-3, SS-4, SS-11, SS-13, and SS-22

Surrogate standard recoveries for the PAH analysis of A3-SB-31 indicate that the results for the nondetected PAH analytes in the sample are unuseable. One surrogate failed to recover at all, and target analytes may behave similarly. The single detected compound, naphthalene, may be present at much higher concentrations than that reported (more than an order of magnitude).

Accuracy and Precision

Matrix spike/duplicate determinations were performed on soil samples A4-MW-2 (5.5-6'), A1-TP-4, SS-3, A2B20911, and A2-TP-13/14/15(1-4').

Organic (volatile, semivolatile, and PCB) accuracy and precision values for the organic parameters were acceptable, not indicating qualification of associated sample results, with the exception of those for the semivolatile analytes of A2-TP-13/14/15(1-4'). The sample was spiked with PAH components, most of which were present in the sample. There were significant variances in matrix spike recoveries and duplicate correlations that can indicate nonhomogeneity, possibly due to the compositing of the sample. This is supported by the metals spike/duplicate evaluation of the sample (discussed below). Results of detected analytes in composited samples should be considered to be an estimation of sample constituency.

The recovery of mercury in SS-3 matrix spike was only 2%, indicating that associated surface soil nondetected values are to be considered unuseable, and detected values considered estimated, possibly biased very low.

Evaluation for metals analytes in the matrix spikes and duplicates showed numerous outliers, indicating results for these analytes in associated samples are to be considered estimated: Associated samples are those of similar matrix and composition to that spiked:

A1-TP-4 matrix spike recoveries for elements antimony, chromium, copper, thallium, zinc, mercury, and cyanide; and the duplicate correlation for vanadium

A4-MW-2 (5.5-6') matrix spike recoveries for arsenic and cyanide

SS-3 matrix spikes for cyanide, antimony, lead, and thallium; and duplicate correlation for copper and selenium

A2B20911 matrix spike recoveries for antimony and arsenic; and the duplicate correlation for calcium

A2-TP-13/14/15(1-4') matrix spike recoveries for cyanide, selenium, lead, silver, chromium, thallium, vanadium, and antimony; additionally, duplicate correlation showed eleven elements with elevated correlation values. Nonhomogeneity of composited sample is suspected.

No matrix spike results were reported for TCLP analyses. No aqueous matrix spike/duplicate evaluations were provided. No sample matrix spike/duplicate summaries were provided with the Recra reports. Therefore matrix effect is not evaluated for the samples. All spiked blank and spiked blank duplicate evaluations were acceptable. Batch processing acceptance is shown by spiked blank and control sample recoveries reported with each batch.

Blank Contamination

Due to presence in associated blanks, results for detections of the following compounds should be considered contamination. Results can be edited to nondetection at the originally reported value, or at the CRDL, whichever is greater.

Di-n-butylphthalate in all samples

Naphthalene in A4-MW-8

Although not detected in blanks, the reported detections of other phthalates and methylene chloride are also suspect as contamination.

The results for organic method blanks were reported in the CAS data reports; those for metals, cyanide, and wet chemistry method blanks were not. Case narrative discussions made no mention of analyte presence in associated blanks. Recra reports do include method blank results for all analytes.

General

Some samples were analysed at more than one dilution. Analyte values flagged by the laboratory as "E" are to be replaced by the dilution values for those sample analytes. Samples A4-SB-45 Soluble and A3-TP-63/63/65 were not run at dilution, and their reported benzene values are considered estimated. The sample values exceeded 60 ppm and 4 ppm, respectively; significant variance is not likely.

The Recra detection limits reported for nondetected volatile and semivolatile analytes in some samples do not properly reflect the dilution factors of the analyses.

Due to elevated cooler temperatures at receipt (8.2 and 8.5 degrees C), the reported results for methane, ethane, and ethene in samples A4-MW-8, A4-MW-1A, A4-MW-7, A3-GW-4, A3-MW-7, A2-MW-5, and A2-P-I should be considered estimated, possibly biased slightly low.

The custodies pertaining to samples transferred to Recra for the EPA-8015 (methane, ethane, and ethene) analyses do not show relinquishing signatures/dates.

Total and amenable cyanide results for A3-SB-31, A3-TP-58, A3-TP-63, and A3-TP-67 are considered estimated, possibly biased significantly low due to the fact that they were not preserved until laboratory receipt.

Tentatively Identified Compounds reported for EPA-8260 analyses in Recra ID# A98-1927 include some compounds identified by name (i.e. naphthalene, etc.). These should also have been flagged by the laboratory as "N" (tentative in identification), and listed with the CAS number.

The case narratives for both laboratories contained some transcription errors, none of serious note.

Raw data was requested and reviewed to confirm the elevated cyanide value for A3-SS-23.

Signature: Judy Harry Date: 3-22-99

Appendix C

Elevated Lead Area - Test Pit Logs, Photographs, and Analytical Data

TURNKEY ENVIRONMENTAL RESTORATION, LLC

FIELD TEST PIT LOG

Test Pit No.:	AI-TP-32	Project:	LTV Plant, Area I Inv.
Location:	at AI-SS-23	Project No:	0002-003-100
Date:	12/10/98	Logged By:	JMA
Excavation Method:	Liebherr 942		

Test Pit Profile

8:25-8:40

grade

8:25 Sample 0-3" AI-TP-32

Sample 3"-26" 8:30 AI-TP-32 3"-26"

Olive brown to brown loam and gravel, loose, coal/coke present

8" — Gray silt size mat'l & gravel, compact

16" — rust colored sand size mat'l & gravel

20" — Dk gray siltsand, and gravel, slight compact

26" — Dk gray sandy silt, ext moist, no laminations, blocky, native

40" — Brown sandy silt, a/a

Dry at completion.

54"

PID in hole 0 ppm

PICT 17

not to scale

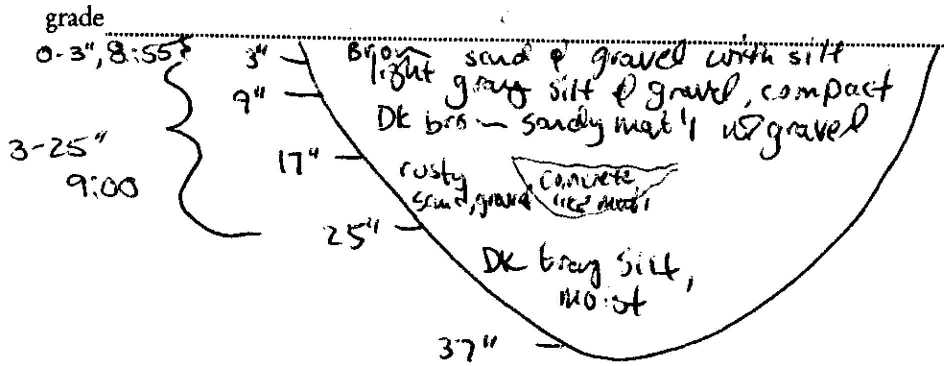
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TURNKEY ENVIRONMENTAL RESTORATION, LLC

FIELD TEST PIT LOG

Test Pit No.:	AI-TP-33	**Project:**	LTV Plant, Area I Inv.
Location:	25' Toward fence from AI-TP-32	**Project No:**	0002-003-100
Date:	12/10/98	**Logged By:**	JMA
Excavation Method:	Liebherr 942		

Test Pit Profile



PID 0 ppm in hole

not to scale

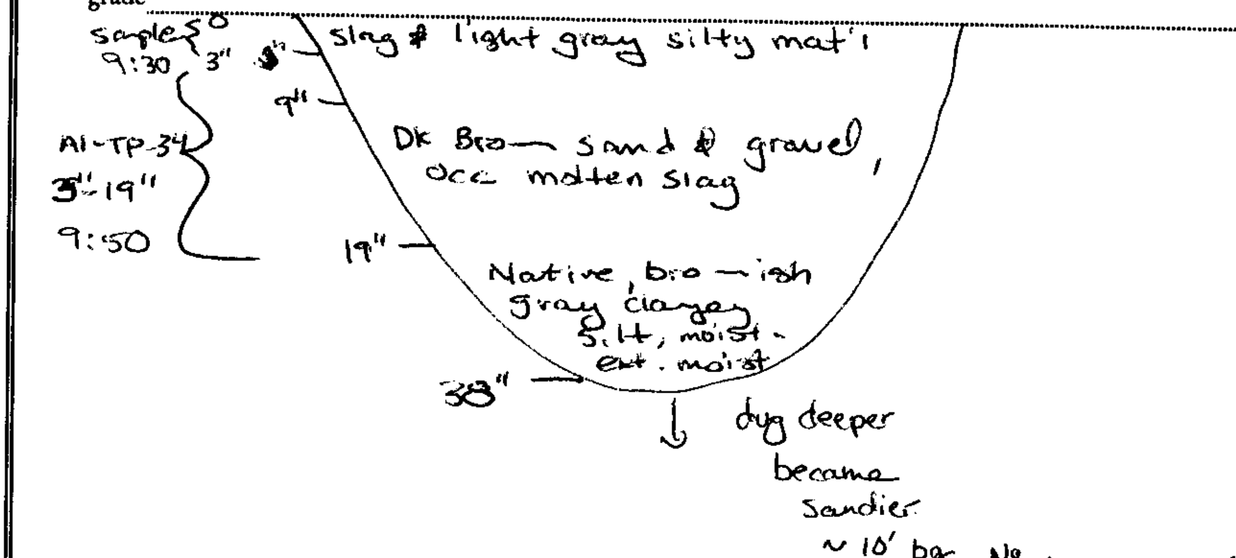
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	AI-TP-34	**Project:**	LTV Plant, Area I Inv.
Location:	25' S of AI-TP-32	**Project No:**	0002-003-100
Date:	12/10/98	**Logged By:**	JMA
Excavation Method:	Liebherr 942		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

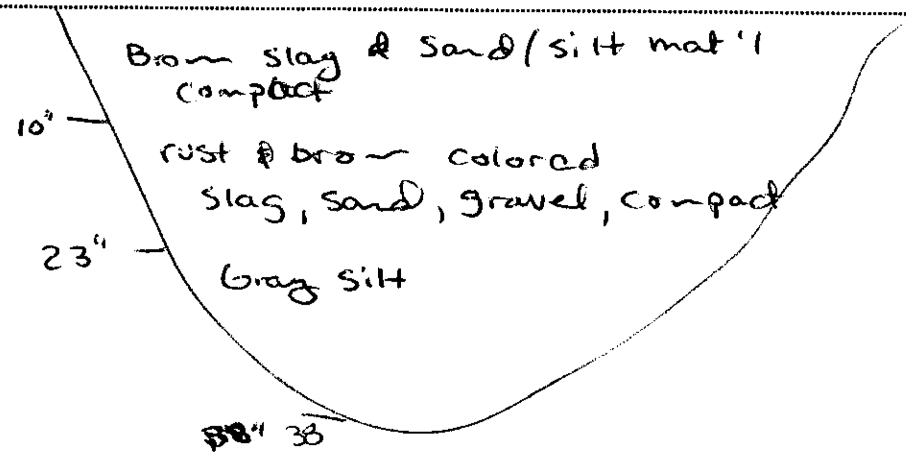
Test Pit No.:	A1-TP-35	Project:	LTV Plant, Area I Inv.
Location:	25' N of A1-TP-32	Project No:	0002-003-100
Date:	12/10/98	Logged By:	JMA
Excavation Method:	Liebherr 942		

Test Pit Profile

grade

Sample 0-3"
10:15

Sample 3"-23"
10:25



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

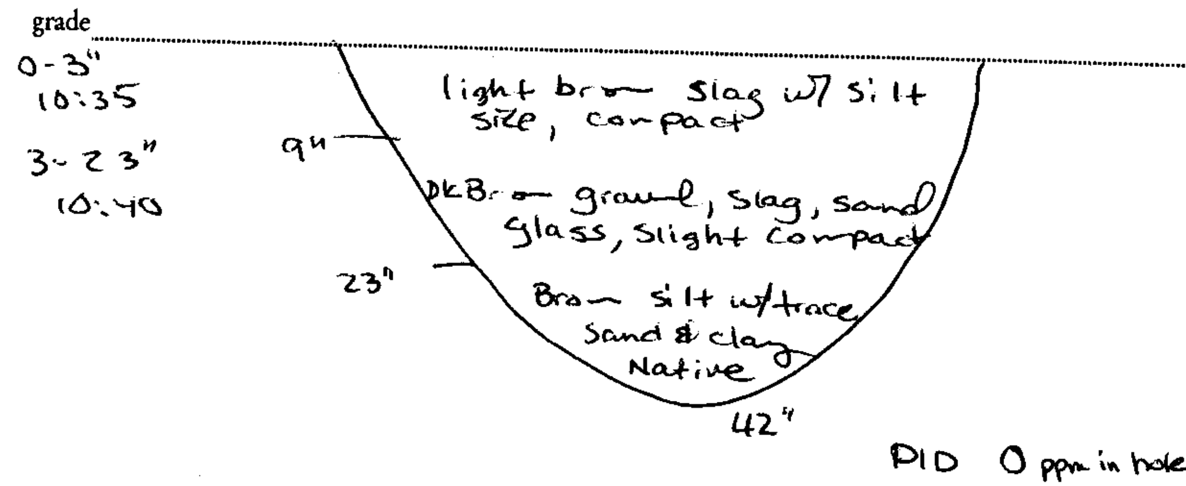
SP 37 ↑S 34 Greg 9:00-10:? 33 32 36 35

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-36	Project:	LTV Plant, Area I Inv.
Location:	25' W of A1-TP-32	Project No:	0002-003-100
Date:	12/10/98	Logged By:	JMA
Excavation Method:			

10:30-

Test Pit Profile



not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

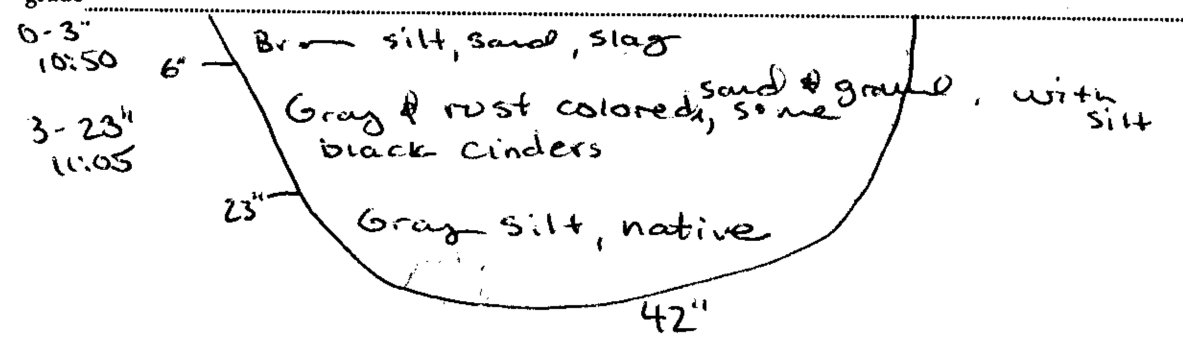
TurnKey Environmental Restoration, LLC

FIELD TEST PIT LOG

Test Pit No.:	AI-TP-37	Project:	LTV Plant, Area I Inv.
Location:	50' S of AI-TP-32	Project No:	0002-003-100
Date:	12/10/98	Logged By:	JMA
Excavation Method:	Liebherr 942		

Test Pit Profile

grade



PID 0 ppm in hole

not to scale

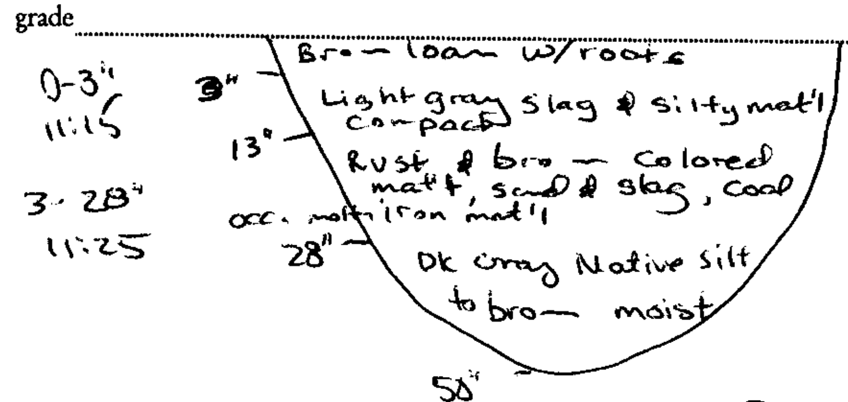
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	Al-TP-38	Project:	LTV Plant, Area I Inv.
Location:	50' N of Al-TP-32	Project No:	0002-003-100
Date:	12/10/98	Logged By:	JMA
Excavation Method:	Liebherr 942		

Test Pit Profile

grade .... 11:10 - 11:30

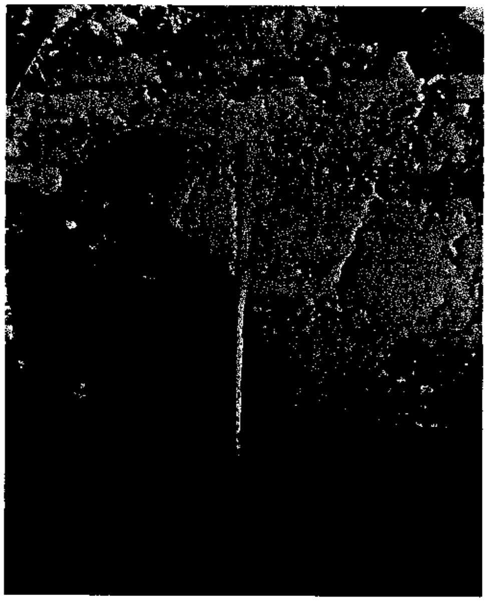


PID 0 ppm in hole

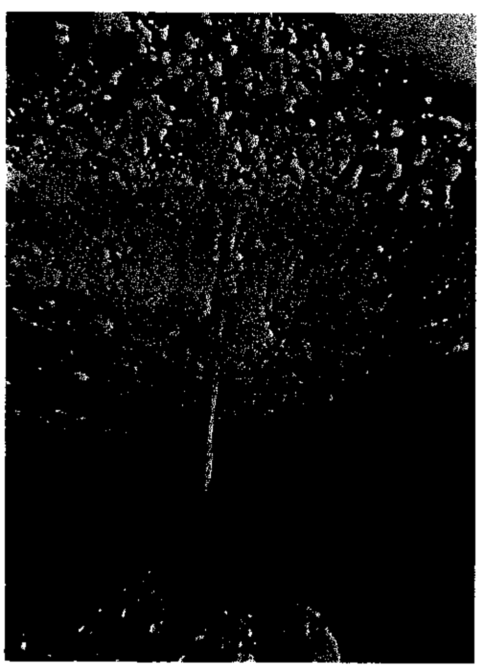
not to scale

Depth bgs	Soil Description	Samples- Depth	Comments include Water entering pit w/depth

LTV STEEL COMPANY
AREA I - ELEVATED LEAD SUBAREA
DECEMBER INVESTIGATION

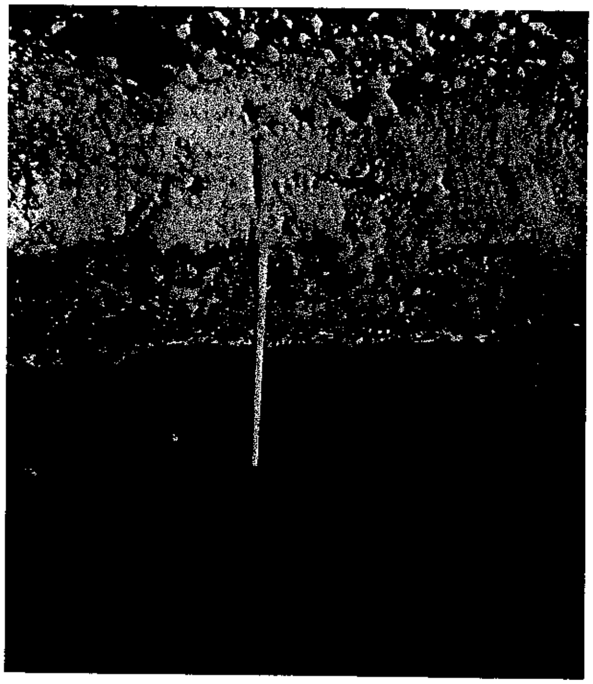


A1-TP-32

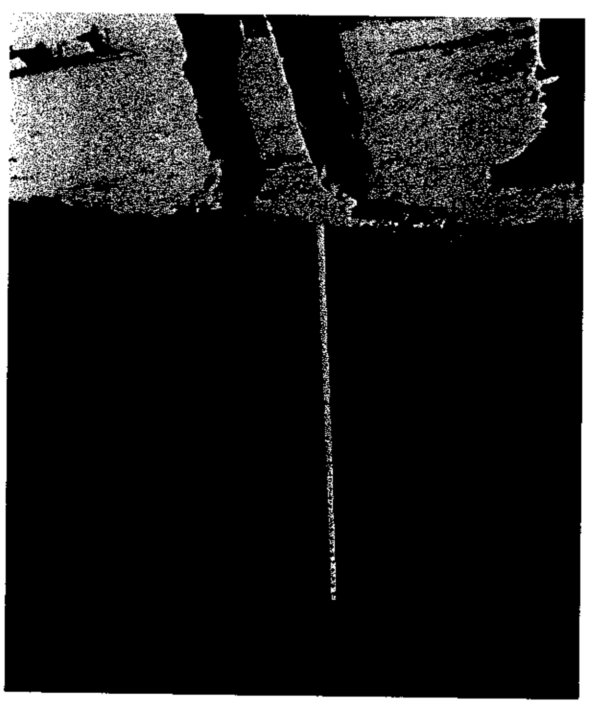


A1-TP-33

LTV STEEL COMPANY
AREA I - ELEVATED LEAD SUBAREA
DECEMBER INVESTIGATION

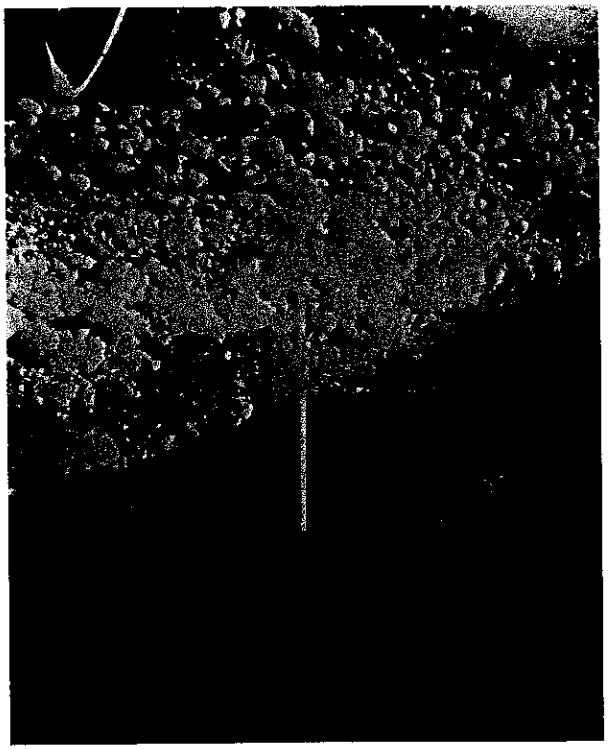


A1-TP-34

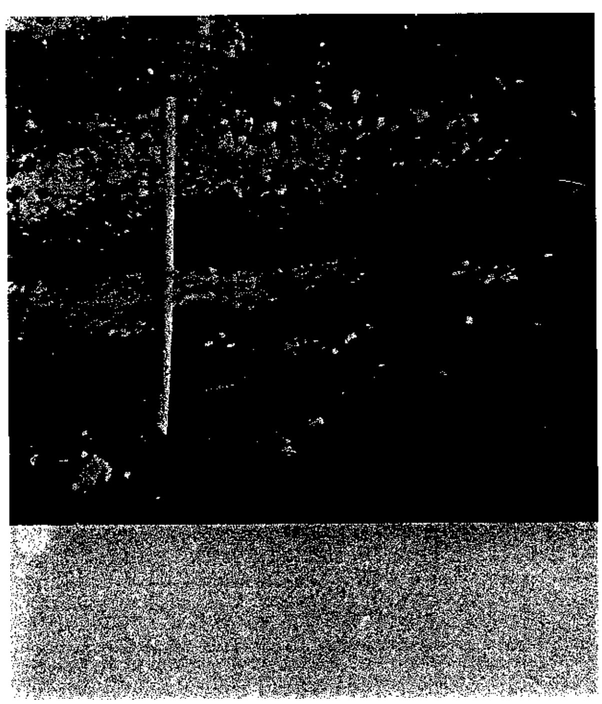


A1-TP-35

LTV STEEL COMPANY
AREA I - ELEVATED LEAD SUBAREA
DECEMBER INVESTIGATION

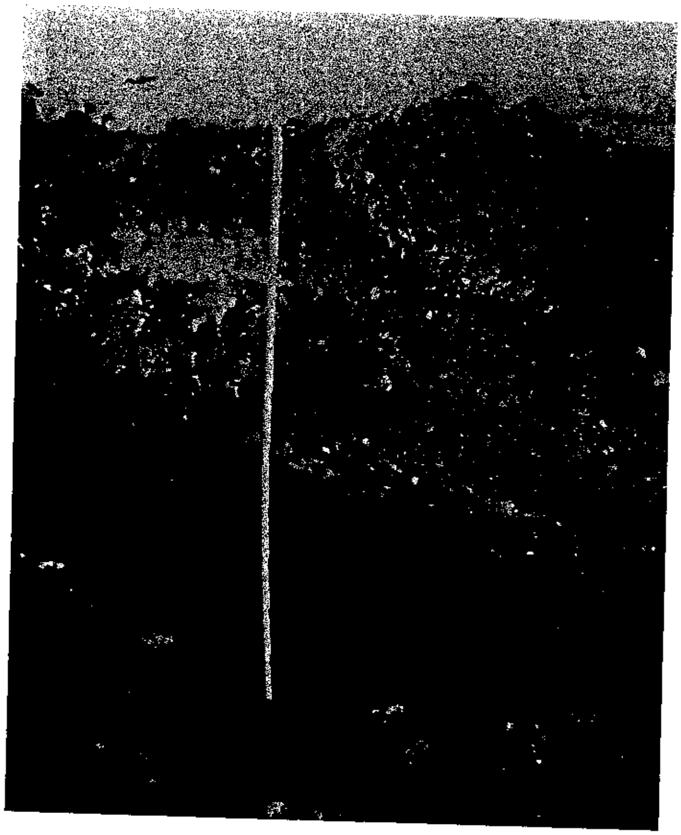


A1-TP-36



A1-TP-37

LTV STEEL COMPANY
AREA I - ELEVATED LEAD SUBAREA
DECEMBER INVESTIGATION



A1-TP-38

Columbia Analytical Services Inc.

JAN 06 1999

A FULL SERVICE ENVIRONMENTAL LABORATORY

Area I
lead & PCB
results

December 29, 1998

Ms. Jeanne Asquith
Turnkey Environmental Rest.
Key Tower Suite 1350
50 Fountain Plaza
Buffalo, NY 14202

PROJECT:LTV PLANT SITE
Submission #:9812000150

Dear Ms. Asquith

Enclosed are the analytical results of the analyses requested. All data has been reviewed prior to report submission. Should you have any questions please contact me at (716) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Janice Jaeger
Project Chemist

Enc.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director prior to report submittal.

1 Mustard St. • Suite 250 • Rochester, NY 14609 • Tele:(716)288-5380 • Fax:(716)288-8475
65 Ramapo Valley Rd. • Suite 16 • Mahwah, NJ 07430 • Tele:(201)512-3292 • Fax:(201)512-3362

Columbia Analytical Services Inc.

Effective 04/01/96

CAS LIST OF QUALIFIERS

(The basis of this proposal are the EPA-CLP Qualifiers)

U - Indicates compound was analyzed for but was not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. For further explanation see case narrative / cover letter.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

N - Spiked sample recovery not within control limits.
(Flag the entire batch - Inorganic analysis only)

* - Duplicate analysis not within control limits.
(Flag the entire batch - Inorganic analysis only)

- Also used to qualify Organics QC data outside limits.

D - Spike diluted out.

S - Reported value determined by Method of Standard Additions. (MSA)

X - As specified in the case narrative.

CAS Lab ID # for State Certifications

NY ID # in Rochester:	10145	NJ ID # in Rochester:	73004
CT ID # in Rochester:	PH0556	RI ID # in Rochester:	158
MA ID # in Rochester:	M-NY032		

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-32 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261420
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	45.2	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	92.4	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-33 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261421
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	40.6	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	82.6	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-34 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98
Order #: 261422
Submission #: 9812000150
Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	6.45 U	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	77.5	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-35 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98
Order #: 261423
Submission #: 9812000150
Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	55.7	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	89.4	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-36 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98
Order #: 261424
Submission #: 9812000150
Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	249	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	88.3	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-37 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261425
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	93.5	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	83.5	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-38 0-3"

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 261426
Submission #: 9812000150

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	60.0	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	86.3	%	12/14/98	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP32/33/34/35/36/37/38 COMP

Date Sampled : 12/10/98
Date Received: 12/10/98
Order #: 261427
Submission #:9812000150
Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
LEAD	5.00	747	MG/KG	12/28/98	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	80.7	%	12/14/98	1.0

EXTRACTABLE ORGANICS
METHOD 8082 PCBS
Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-39/40/41 COMP

Date Sampled : 12/10/98 **Order #:** 261428 **Sample Matrix:** SOIL/SEDIMENT
Date Received: 12/10/98 **Submission #:** 9812000150 **Percent Solid:** 88.9

ANALYTE	PQL	RESULT	UNITS
DATE EXTRACTED : 12/14/98			
DATE ANALYZED : 12/15/98			
ANALYTICAL DILUTION: 1.00			Dry Weight
PCB 1016	400	450 U	UG/KG
PCB 1221	400	450 U	UG/KG
PCB 1232	400	450 U	UG/KG
PCB 1242	400	710	UG/KG
PCB 1248	400	450 U	UG/KG
PCB 1254	400	450 U	UG/KG
PCB 1260	400	450 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS		
DECACHLOROBIPHENYL	(30 - 150 %)	108	%
TETRACHLORO-META-XYLENE	(30 - 150 %)	104	%

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 8082 PCBS
Reported: 12/29/98

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP-41 7-8'

Date Sampled : 12/10/98 **Order #:** 261429 **Sample Matrix:** SOIL/SEDIMENT
Date Received: 12/10/98 **Submission #:** 9812000150 **Percent Solid:** 68.6

ANALYTE	PQL	RESULT	UNITS
DATE EXTRACTED : 12/14/98			
DATE ANALYZED : 12/15/98			
ANALYTICAL DILUTION: 1.00			Dry Weight
PCB 1016	400	580 U	UG/KG
PCB 1221	400	580 U	UG/KG
PCB 1232	400	580 U	UG/KG
PCB 1242	400	580 U	UG/KG
PCB 1248	400	580 U	UG/KG
PCB 1254	400	580 U	UG/KG
PCB 1260	400	580 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS		
DECACHLOROBIPHENYL	(30 - 150 %)	110	%
TETRACHLORO-META-XYLENE	(30 - 150 %)	108	%

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 8082 PCBS
Reported: 01/04/99

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled : **Order #:** 262135 **Sample Matrix:** SOIL/SEDIMENT
Date Received: **Submission #:** **Percent Solid:** 100

ANALYTE		PQL	RESULT	UNITS
DATE EXTRACTED	: 12/14/98			
DATE ANALYZED	: 12/15/98			
ANALYTICAL DILUTION:	1.00			Dry Weight
PCB 1016		400	400 U	UG/KG
PCB 1221		400	400 U	UG/KG
PCB 1232		400	400 U	UG/KG
PCB 1242		400	400 U	UG/KG
PCB 1248		400	400 U	UG/KG
PCB 1254		400	400 U	UG/KG
PCB 1260		400	400 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS	RESULT	UNITS
DECACHLOROBIPHENYL	(30 - 150 %)	104	%
TETRACHLORO-META-XYLENE	(30 - 150 %)	102	%

COLUMBIA ANALYTICAL SERVICES, INC.
1 Mustard St., Suite 250, P.O. Box 90859, Rochester, NY 14609-0859
(716) 288-5380 • FAX (716) 288-8475

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

(800) 695-7222

DATE 12/10/98 PAGE 1 OF 2

PROJECT NAME LTV Steel, Plant Site

PROJECT MANAGER/CONTACT Jeanne Asquith

COMPANY/ADDRESS Turnkey Enviro. Restoration
50 Fountain Plaza, Suite 1350 Buffalo, NY 14202

TEL ( ) FAX ( )

SAMPLER'S SIGNATURE Jeanne M. Asquith

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624	GC/MS SVOA's ☐ 8270A ☐ 625	GC VOA's ☐ 8010/8020 ☐ 601/602	PESTICIDES/PCB's ☐ 8080 ☐ 608	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW)	METALS, DISSOLVED (LIST BELOW)	LEAD Method 6010B	LEAD (*) Method 6010B					PRESERVATION pH < 2.0	pH > 12	Other
AI-TP-32, 0-3"	12/10/98	8:25		Soil	1											1								
AI-TP-32, 3-26"		8:30			1												1							
AI-TP-33, 0-3"		8:55			1											1								
AI-TP-33, 3-25"		9:00			1												1							
AI-TP-34, 0-3"		9:30			1											1								
AI-TP-34, 3-19"		9:50			1												1							
AI-TP-35, 0-3"		10:15			1											1								
AI-TP-35, 3-23"		10:25			1												1							
AI-TP-36, 0-3"		10:35			1											1								
AI-TP-36, 3-23"		10:40			1												1							

RELINQUISHED BY:
Signature: Jeanne M. Asquith
Printed Name: JEANNE ASQUITH
Firm: Turnkey E. Rest.
Date/Time: 12/10/98 2:50

RECEIVED BY:
Signature: Mike Sciandra
Printed Name: M. Sciandra
Firm: CAS
Date/Time: 12-10-98 2:50

RELINQUISHED BY:
Signature: Mike Sciandra
Printed Name: mike Sciandra
Firm: CAS
Date/Time: 10-12-98 5:05

RECEIVED BY:
Signature: Brian Cullom
Printed Name: Brian Cullom
Firm: CAS
Date/Time: 12-10-98 5:05 1705

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

TURNAROUND REQUIREMENTS
__ 24 hr. __ 48 hr. __ 5 day
✓ Standard (10-15 working days)
__ Provide Verbal Preliminary Results
✓ Provide FAX Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
__ 1. Routine Report
✓ 2. Routine Rep. w/CASE Narrative
__ 3. EPA Level III Validatable Package
__ 4. N.J. Reduced Deliverables Level IV
__ 5. NY ASP/CLP Deliverables
__ 6. Site specific QC.

INVOICE INFORMATION:
P.O. #: 0002-003-100
Bill To: Jeanne Asquith

SAMPLE RECEIPT:
Shipping Via: CAS
Shipping #:
Temperature: 4.1
Submission No: 12-150

SPECIAL INSTRUCTIONS/COMMENTS:

METALS X Make composite of AI-TP-32, 3-26" / AI-TP-33, 3-25" / AI-TP-34, 3-19" / AI-TP-35, 3-23" / AI-TP-36, 3-23" / AI-TP-37, 3-23" / AI-TP-38, 3-28" /

ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List

COLUMBIA ANALYTICAL SERVICES, INC.
1 Mustard St., Suite 250, P.O. Box 90859, Rochester, NY 14609-0859
(716) 288-5380 • FAX (716) 288-8475

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

(800) 695-7222

DATE 12/10/98

PROJECT NAME LTV Steel Plant Site

PROJECT MANAGER/CONTACT Jeanne Asquith

COMPANY/ADDRESS Turnkey Envir. Restoration
50 Fountain Plaza, Suite 1350 Buffalo NY 14202

TEL ( ) FAX ( )

SAMPLER'S SIGNATURE Jeanne M. Asquith

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624	GC/MS SVOA's ☐ 8270A ☐ 625	GC VOA's ☐ 8010/8020 ☐ 601/602	PESTICIDES/PCB's ☑ 8082 ☐ 608 **	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW)	METALS, DISSOLVED (LIST BELOW)	LEAD Method 6010B	*LEAD (*) Method 6010B	PCBs, 8082					PRESERVATION pH < 2.0	pH > 12	Other
AI-TP-37, 0-3"	12/10/98	10:50		Soil	1											1									
AI-TP-37, 3-23"		11:05			1												1								
AI-TP-38, 0-3"		11:15			1											1									
AI-TP-38, 3-28"		11:25			1												1								
AI-TP-39 0-8'		12:50			1				1**																
AI-TP-40, 0-4'		13:45			1				1**																
AI-TP-41, 0-7'		14:10			1				1**																
AI-TP-41, 7-8'		14:15			1													1							

RELINQUISHED BY:
Signature Jeanne M. Asquith
Printed Name JEANNE M. ASQUITH
Firm Turnkey E. Rest.
Date/Time 12/10/98 2:50

RECEIVED BY:
Signature Mike Sciavella
Printed Name Mike Sciavella
Firm CAS
Date/Time 12-10-98 2:50

RELINQUISHED BY:
Signature Mike Sciavella
Printed Name M Sciavella
Firm CAS
Date/Time 10-12-98 5:05

RECEIVED BY:
Signature Brian Collar
Printed Name Brian Collar
Firm CAS
Date/Time 12-10-98 1705

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

TURNAROUND REQUIREMENTS
__ 24 hr. __ 48 hr. __ 5 day
✓ Standard (10-15 working days)
__ Provide Verbal Preliminary Results
✓ Provide FAX Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
__ 1. Routine Report
✓ 2. Routine Rep. w/CASE Narrative
__ 3. EPA Level III Validatable Package
__ 4. N.J. Reduced Deliverables Level IV
__ 5. NY ASP/CLP Deliverables
__ 6. Site specific QC.

INVOICE INFORMATION:
P.O. #: 0002-003-100
Bill To: Jeanne Asquith

SAMPLE RECEIPT:
Shipping Via: CAS
Shipping #:
Temperature: 4.1
Submission No: 12-150

SPECIAL INSTRUCTIONS/COMMENTS:

METALS * Make Composite of AI-TP-32, 3-26"/AI-TP-33, 3-25"/AI-TP-34, 3-19"/AI-TP-35, 3-23"/AI-TP-36, 3-23"/AI-TP-37, 3-23"/AI-TP-38, 3-28"

ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List

** PCBs Make Composite of AI-TP-39/40/41, 0-7'

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Check Form

Project/Client Turnkey Submission Number 12-150

Cooler received on 12/10/98 and opened on 12/10/98 by OV

1. Were custody seals on outside of cooler? YES NO
   If yes, how many and where?
2. Were signature & date correct? YES NO
3. Were custody papers properly filled out (ink, signed, etc)? YES NO
4. Did all bottles arrive in good condition (unbroken)? YES NO
5. Were all bottle labels complete (*i.e.* analysis, preservation, etc)? YES NO
6. Did all bottle labels and tags agree with custody papers? YES NO
7. Were correct bottles used for the tests indicated? YES NO
8. Were VOA vials checked for absence of air bubbles, and noted if so? YES NO
9. Where did the bottles originate? CAS/A CAS/K CAS/S CAS/L CAS/X CAS/J CAS/R
10. Temperature of cooler(s) upon receipt: 4.1

Is the temperature within 4 ± 2° C?:	Yes ☒	Yes ☐	Yes ☐	Yes ☐	Yes ☐
If No, Explain Below	No ☐	No ☐	No ☐	No ☐	No ☐

Date/Time Temperatures Taken: 12/10/98 17:09

Thermometer ID: #129 Circle One: Temp Blank Sample Bottle Cooler Temp.

Explain any discrepancies:

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO_3					
2	H_2SO_4					
5-9*	P/PCBs (608 only)					

YES = All samples OK
NO = Samples were preserved at lab as listed
*If pH adjustment is required, use NaOH and/or H_2SO_4

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2				

CLIENT NOTIFICATION:

Columbia Analytical Services inc.

FEB 1 199

A FULL SERVICE ENVIRONMENTAL LABORATORY

January 26, 1999

Ms. Jeanne Asquith
Turnkey Environmental Rest.
Key Tower Suite 1350
50 Fountain Plaza
Buffalo, NY 14202

PROJECT:LTV PLANT SITE
Submission #:9812000382

Dear Ms. Asquith

Enclosed are the analytical results of the analyses requested. All data has been reviewed prior to report submission. Should you have any questions please contact me at (716) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Janice Jaeger
Project Chemist

Enc.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director prior to report submittal.

Columbia Analytical Services Inc.

Effective 04/01/96

CAS LIST OF QUALIFIERS

(The basis of this proposal are the EPA-CLP Qualifiers)

U - Indicates compound was analyzed for but was not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. For further explanation see case narrative / cover letter.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

N - Spiked sample recovery not within control limits.
(Flag the entire batch - Inorganic analysis only)

* - Duplicate analysis not within control limits.
(Flag the entire batch - Inorganic analysis only)

- Also used to qualify Organics QC data outside limits.

D - Spike diluted out.

S - Reported value determined by Method of Standard Additions. (MSA)

X - As specified in the case narrative.

CAS Lab ID # for State Certifications

NY ID # in Rochester:	10145	NJ ID # in Rochester:	73004
CT ID # in Rochester:	PH0556	RI ID # in Rochester:	158
MA ID # in Rochester:	M-NY032		

COLUMBIA ANALYTICAL SERVICES

Reported: 01/26/99

Turnkey Environmental Rest.
Project Reference: LTV PLANT SITE
Client Sample ID : A1-TP32/33/34/35/36/37/38 COMP

Date Sampled : 12/10/98
Date Received: 12/10/98

Order #: 265043
Submission #:9812000382

Sample Matrix: SOIL/SEDIMENT

ANALYTE	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	ANALYTICAL DILUTION
METALS					
ALUMINUM	10.0	12100	MG/KG	01/08/99	1.0
ANTIMONY	6.00	7.43 U	MG/KG	01/05/99	1.0
ARSENIC	1.00	27.9	MG/KG	01/11/99	5.0
BARIUM	2.00	385	MG/KG	01/05/99	1.0
BERYLLIUM	0.500	1.71	MG/KG	01/05/99	1.0
CADMIUM	0.500	10.4	MG/KG	01/08/99	1.0
CALCIUM	50.0	86400	MG/KG	01/08/99	1.0
CHROMIUM	1.00	58.1	MG/KG	01/05/99	1.0
COBALT	5.00	15.1	MG/KG	01/05/99	1.0
COPPER	2.00	261	MG/KG	01/05/99	1.0
IRON	10.0	131000	MG/KG	01/08/99	10.0
LEAD	5.00	758	MG/KG	01/05/99	1.0
MAGNESIUM	50.0	9100	MG/KG	01/05/99	1.0
MANGANESE	1.00	2800	MG/KG	01/08/99	1.0
MERCURY	0.0500	0.700	MG/KG	01/06/99	1.0
NICKEL	4.00	67.2	MG/KG	01/05/99	1.0
POTASSIUM	200	872	MG/KG	01/08/99	1.0
SELENIUM	3.00	18.6 U	MG/KG	01/11/99	5.0
SILVER	1.00	6.52	MG/KG	01/05/99	1.0
SODIUM	50.0	62.0 U	MG/KG	01/05/99	1.0
THALLIUM	1.00	2.16	MG/KG	01/05/99	1.0
VANADIUM	5.00	14.0	MG/KG	01/05/99	1.0
ZINC	1.00	777	MG/KG	01/08/99	1.0
WET CHEMISTRY					
PERCENT SOLIDS	1.0	80.7	%	01/04/99	1.0

COL' 3IA ANALYTICAL SERVICES, INC.
1 Mustard St., Suite 250, P.O. Box 90859, Rochester, NY 14609-0859
(716) 288-5380 • FAX (716) 288-8475

CHAIN OI USTODY/LABORATORY ANALYSIS REQUE FORM

(800) 695-7222

DATE 12/10/98 PAGE 1 OF 2

PROJECT NAME LTV Steel, Plant Site
PROJECT MANAGER/CONTACT Jeanne Asquith
COMPANY/ADDRESS Turnkey Enviro. Restoration
50 Fountain Plaza, Site 1350 Buffalo, NY 14202
TEL ( ) FAX ( )
SAMPLER'S SIGNATURE Jeanne M. Asquith

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624	GC/MS SVOA's ☐ 8270A ☐ 625	GC VOA's ☐ 8010/8020 ☐ 601/602	PESTICIDES/PCB's ☐ 8080 ☐ 608	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW)	METALS, DISSOLVED (LIST BELOW)	LEAD Method 6010B	LEAD (*) Method 6010B	PRESERVATION pH < 2.0	pH > 12	Other
AI-TP-32, 0-3"	12/10/98	8:25		Soil	1											1				
AI-TP-32, 3-26"		8:30			1												1			
AI-TP-33, 0-3"		8:55			1											1				
AI-TP-33, 3-25"		9:00			1												1			
AI-TP-34, 0-3"		9:30			1											1				
AI-TP-34, 3-19"		9:50			1												1			
AI-TP-35, 0-3"		10:15			1											1				
AI-TP-35, 3-23"		10:25			1												1			
AI-TP-36, 0-3"		10:35			1											1				
AI-TP-36, 3-23"		10:40			1												1			

RELINQUISHED BY:
Signature Jeanne M. Asquith
Printed Name Jeanne Asquith
Firm Turnkey E. Rest.
Date/Time 12/10/98 2:50

RECEIVED BY:
Signature Mike [illegible]
Printed Name m Scandura
Firm CAS
Date/Time 12-10-98 2:50

RELINQUISHED BY:
Signature Mike Scandura
Printed Name mike Scandura
Firm CAS
Date/Time 12-12-98 5:05

RECEIVED BY:
Signature Brian Collins
Printed Name Brian Collins
Firm CAS
Date/Time 12-10-98 5:05

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

TURNAROUND REQUIREMENTS
__ 24 hr. __ 48 hr. __ 5 day
✓ Standard (10-15 working days)
__ Provide Verbal Preliminary Results
✓ Provide FAX Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
__ 1. Routine Report
✓ 2. Routine Rep. w/CASE Narrative
__ 3. EPA Level III Validatable Package
__ 4. N.J. Reduced Deliverables Level IV
__ 5. NY ASP/CLP Deliverables
__ 6. Site specific QC.

INVOICE INFORMATION:
P.O. #: 0002-003-100
Bill To: ~~Jeanne Asquith~~

SAMPLE RECEIPT:
Shipping Via: CAS
Shipping #:
Temperature: 4.1
Submission No: 12-150

SPECIAL INSTRUCTIONS/COMMENTS:
METALS X (*) Make composite of AI-TP-32, 3-26" / AI-TP-33, 3-25" / AI-TP-34, 3-19" / AI-TP-35, 3-23" / AI-TP-36, 3-23" / AI-TP-37, 3-23" / AI-TP-38, 3-28"
ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List
Analyze for TAL Metals as per Jeanne Asquith

65 RAMAPO VALLEY ROAD
MAHWAH, NJ 07430
201-512-3292
FAX 201-512-3362
309 WEST RIDLEY AVE.
RIDLEY PARK, PA 19078
610-521-3083
FAX 610-521-4589

COL' 3IA ANALYTICAL SERVICES, INC.
1 Mustard St., Suite 250, P.O. Box 90859, Rochester, NY 14609-0859
(716) 288-5380 • FAX (716) 288-8475

CHAIN OI USTODY/LABORATORY ANALYSIS REQUE . FORM

(800) 695-7222

DATE 12/10/98 PAGE 2 OF 2

PROJECT NAME LTV Steel Plant Site
PROJECT MANAGER/CONTACT Jeanne Asquith
COMPANY/ADDRESS Turnkey Envir. Restoration
50 Fountain Plaza, Suite 1350 Buffalo, NY 14202
TEL ( ) FAX ( )
SAMPLER'S SIGNATURE Jeanne M. Asquith

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624	GC/MS SVOA's ☐ 8270A ☐ 625	GC VOA's ☐ 8010/8020 ☐ 601/602	PESTICIDES/PCB's ☑ 8082 ☐ 608 **	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW)	METALS, DISSOLVED (LIST BELOW)	LEAD Method 6010B	*LEAD (*) Method 6010B	PCBs, 8082					pH < 2.0	pH > 12	Other
AI-TP-37, 0-3"	12/10/98	10:50		Soil	1											1									
AI-TP-37, 3-23"		11:05			1												1								
AI-TP-38, 0-3"		11:15			1											1									
AI-TP-38, 3-28"		11:25			1												1								
AI-TP-39, 0-8'		12:50			1				1**																
AI-TP-40, 0-4'		13:45			1				1**																
AI-TP-41, 0-7'		14:10			1				1**																
AI-TP-41, 7-8'		14:15			1													1							

RELINQUISHED BY:
Signature Jeanne M. Asquith
Printed Name JEANNE M. ASQUITH
Firm Turnkey E. Rest.
Date/Time 12/10/98 2:50

RECEIVED BY:
Signature Mike Scannella
Printed Name Mike Scannella
Firm CAS
Date/Time 12-10-98 2:50

RELINQUISHED BY:
Signature Mike Scannella
Printed Name M. Scannella
Firm CAS
Date/Time 12-10-98 5:05

RECEIVED BY:
Signature Brian Callen
Printed Name Brian Callen
Firm CAS
Date/Time 12-10-98 17:05

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

TURNAROUND REQUIREMENTS
__ 24 hr. __ 48 hr. __ 5 day
✓ Standard (10-15 working days)
__ Provide Verbal Preliminary Results
✓ Provide FAX Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
__ 1. Routine Report
✓ 2. Routine Rep. w/CASE Narrative
__ 3. EPA Level III Validatable Package
__ 4. N.J. Reduced Deliverables Level IV
__ 5. NY ASP/CLP Deliverables
__ 6. Site specific QC.

INVOICE INFORMATION:
P.O. #: 0002-003-100
Bill To: Jeanne Asquith

SAMPLE RECEIPT:
Shipping Via: CAS
Shipping #:
Temperature: 4.1
Submission No: 12-150

SPECIAL INSTRUCTIONS/COMMENTS:

METALS * Make [illegible] AI-TP-37, 3-23"/AI-TP-38, 3-25"/AI-TP-38, 3-28"/
ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List AI-TP-38, 3-28"/AI-TP-37, 3-23"/
** PCBs Make Composite of AI-TP-39/40/41, 0-7' AI-TP-37, 3-23'/AI-TP-38, 3-28"

65 RAMAPO VALLEY ROAD
MAHWAH, NJ 07430
201-512-3292
FAX 201-512-3362

309 WEST RIDLEY AVE.
RIDLEY PARK, PA 19078
610-521-3083
FAX 610-521-4589

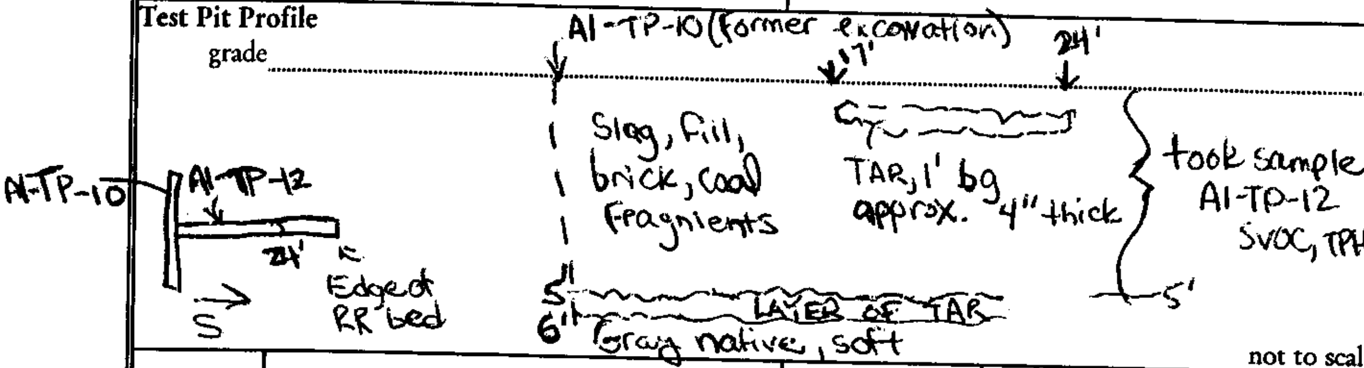
Appendix D

Subareas L & K Test Pit Logs, and Analytical Data

FIELD TEST PIT LOG

Test Pit No.:	Al-TP-12 (at Al-TP-10)	Project:	ITV Plant Site Invest - Area 4 Invest.
Location:	Area 1, South from TP-10	Project No:	0002-003-100
Date:	10/6/98	Logged By:	JMA
Excavation Method:	Liebherr 932 Backhoe		

Test Pit Profile



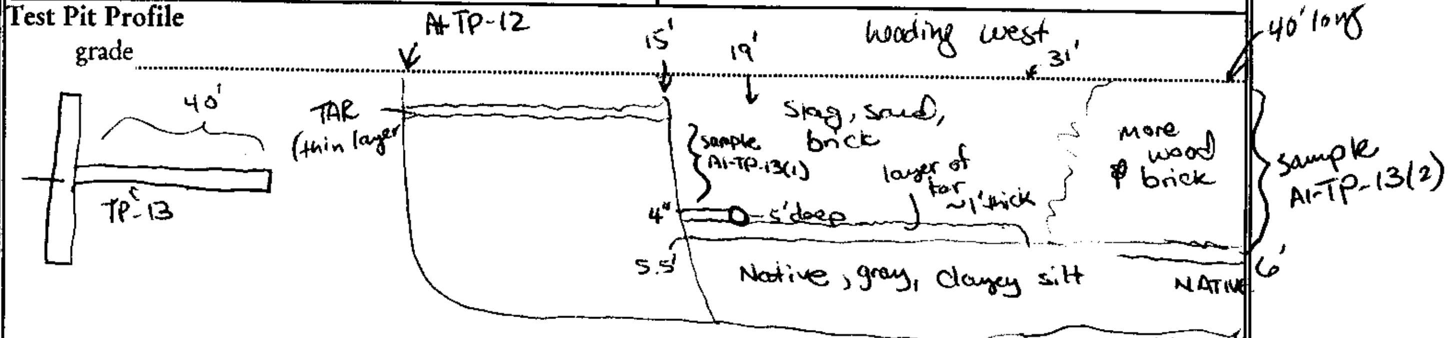
not to scale

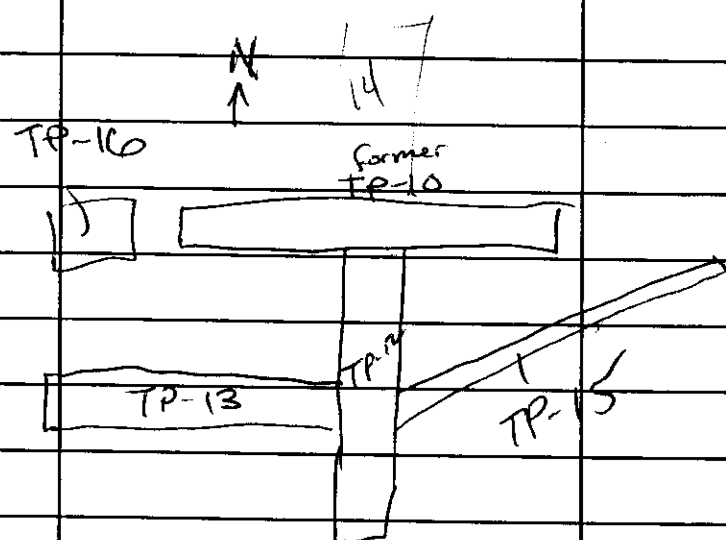
Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-13	Project: A-1 Invest. of Silbara L
Location: Area 1, near gate, W of TP-12	Project No: 0002-003-100
Date: 10/6/98	Logged By: JMA
Excavation Method: L 932	

Test Pit Profile



Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth
			

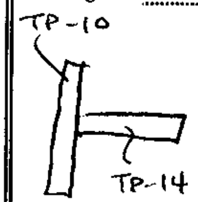
FIELD TEST PIT LOG

Test Pit No.: A1-TP-14
Location: North of TP-10
Date: 10/6/98
Excavation Method: Liebherr 932

Project: LTV Steel - Area 1
Project No: 0002-003-100
Logged By: JMA

Test Pit Profile

grade



Hit Building foundation ~ 3' N of int. w/ TP-10

Building foundation ~ 3' ~~deep~~ below grade

no tar

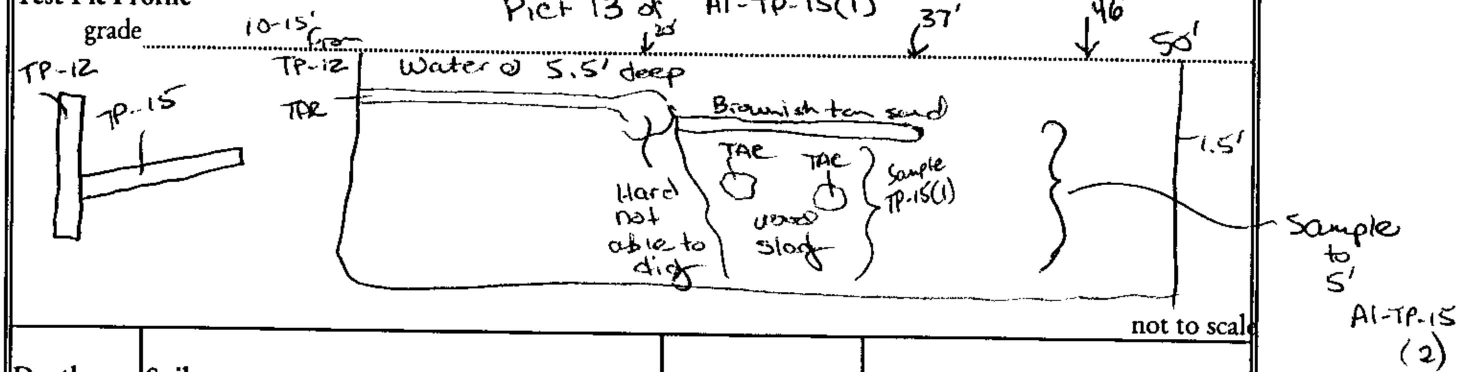
not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: Al - TP-15	**Project:** LTV Steel Plant, Subarea L Invest.
Location: East of TP-12	**Project No:** 8002-003-100
Date: 10/6/98	**Logged By:** JMA
Excavation Method: Liebherr 932	

Test Pit Profile



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-16	**Project:**	LTV Plat Site Area 1 Inv.
Location:		**Project No:**	0002-003-100
Date:	10/6/98	**Logged By:**	JKA
Excavation Method:	Liebherr 932		

Test Pit Profile

West end of TP-10

grade 10 long

No evidence of
Contamination

to ~4' deep

not to scale

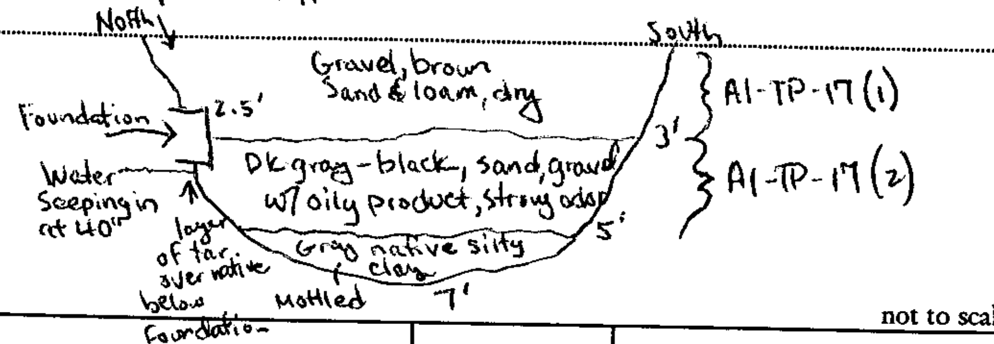
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-17	**Project:**	LTV Steel - Area 1 Inv. of Subarea L
Location:	at A1-TP-2	**Project No:**	0002-003-100
Date:	10/6/98	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



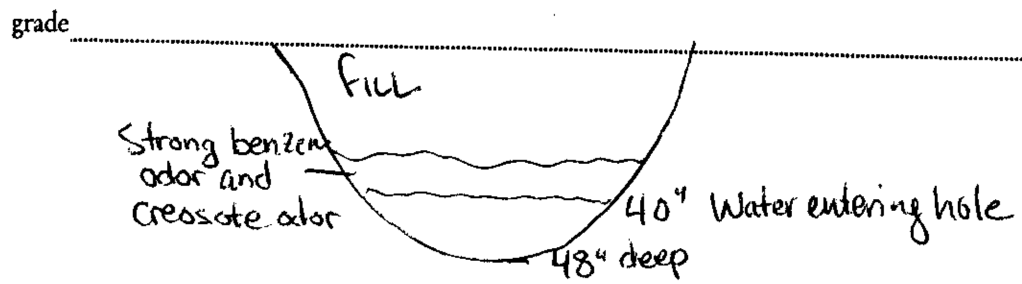
not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth
	Test pit 41' West of TP-17		
	Same as TP-17 FILL	2'	
		oily, tar	product
		Water seeping in	@ 40"
	Test pit 89' West of TP-17		
	Same as TP-17 FILL	2'	
		oily, tar	Product
		Water seeping in	@ 40"

FIELD TEST PIT LOG

Test Pit No.: Al-TP-18	**Project:** LTV Plant Site, Subsurf. Invest.
Location: Upgradient of Al-P-2, 130' W of Al-TP-17	**Project No:** 0002-008-100
Date: 10/6/98	**Logged By:** JMA
Excavation Method: Liebherr 932	

Test Pit Profile



not to scale

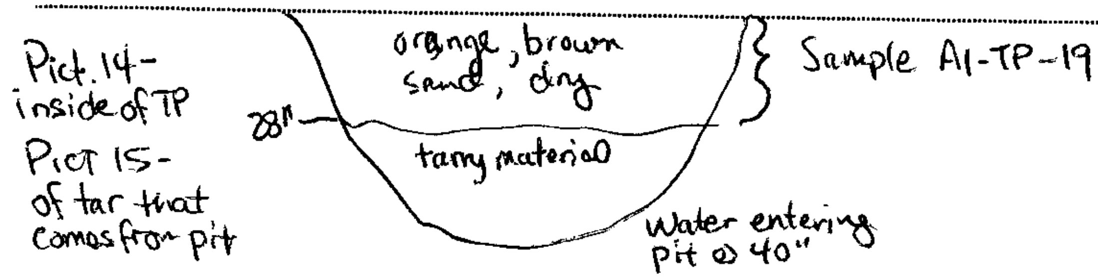
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-19	**Project:** LTV Steel, Subareal Invest
Location: Upgrad. of A1-P-2, 176' W of TP-17	**Project No:** 0002-003-100
Date: 10/6/98	**Logged By:** JMA
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

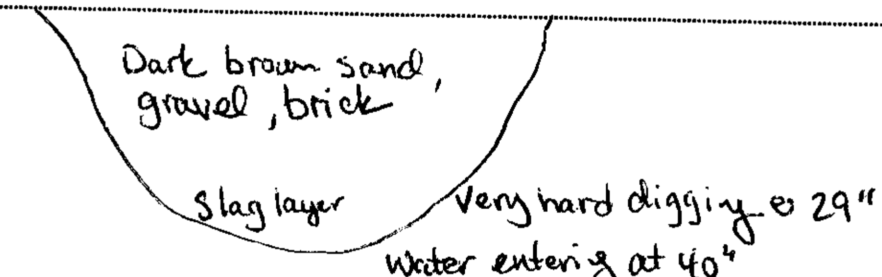
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-20	Project: EVSteel, Subarea L Invest.
Location: 220' West of A1-TP-17	Project No: 0002-003-100
Date: 10/6/98	Logged By: BMA
Excavation Method: Liebherr 932	

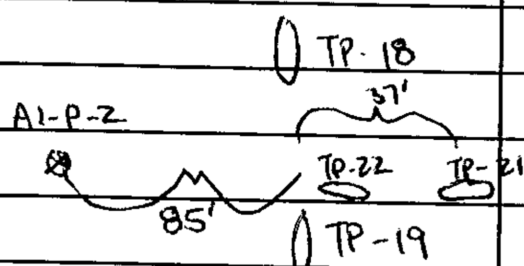
Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

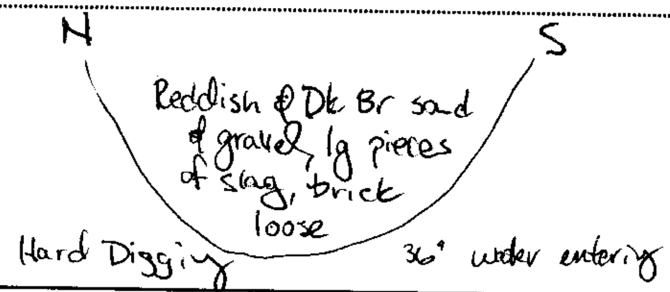


FIELD TEST PIT LOG

Test Pit No.:	N-TP-21	**Project:**	LTV Steel Plant, Invest. of Subarea L
Location:	Btwn TP-18 & 19, 37' S of TP18,	**Project No:**	0002-003-100
Date:	10/6/98	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



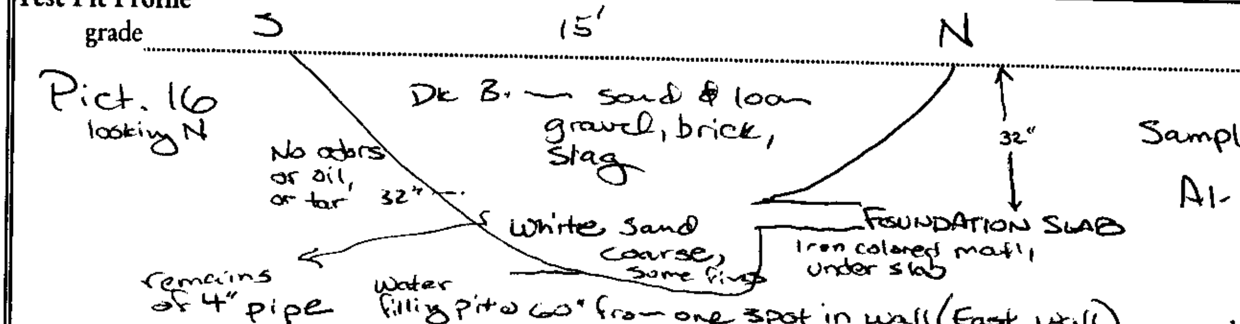
not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: AI-TP-22	**Project:** LTV Steel, [illegible] L Inv.
Location: BTWN 18 & 19, just S of line (5')	**Project No:** 0002-003-100
Date: 10/6/98	**Logged By:** JMA
Excavation Method: Liebherr 932	

Test Pit Profile



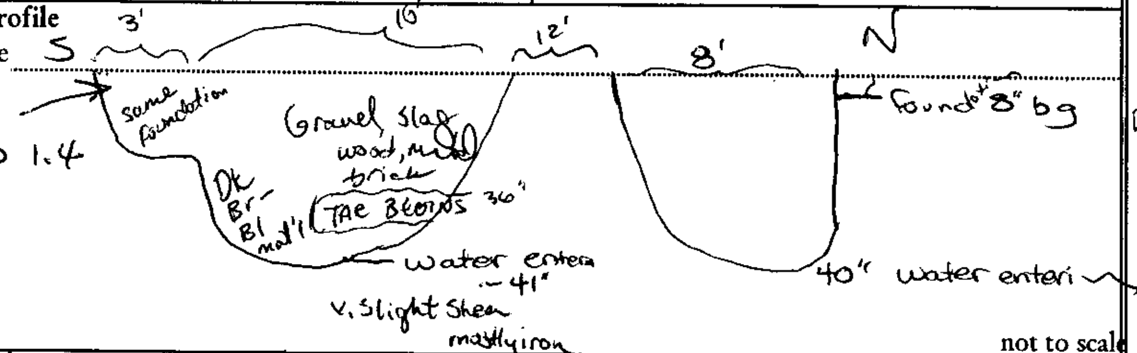
Sample to 4'
AI-TP-22
took one
jar of
white
mat'l
for pH

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

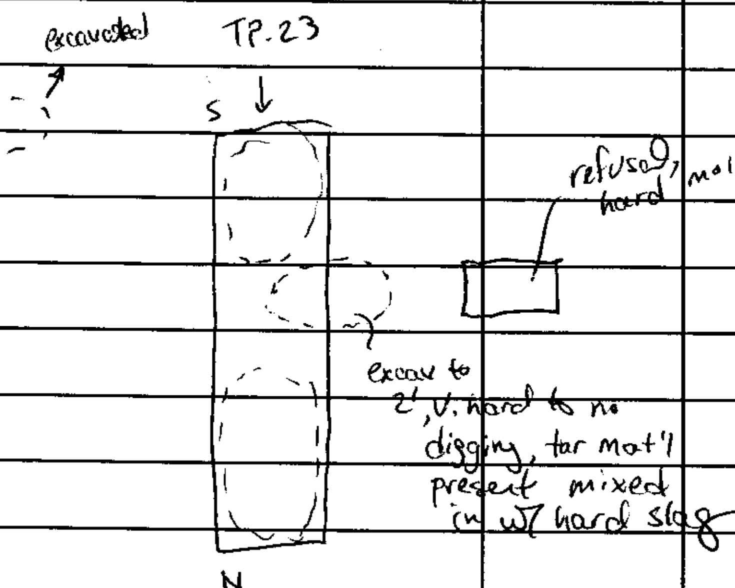
Test Pit No.: A1-TP-23	Project: LTV Plant Site Area I Inv.
Location: Approx 10' E of TP-17	Project No: 0002-003-100
Date: 10/6/98	Logged By: JWS
Excavation Method: Liebherr 932	

Test Pit Profile



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

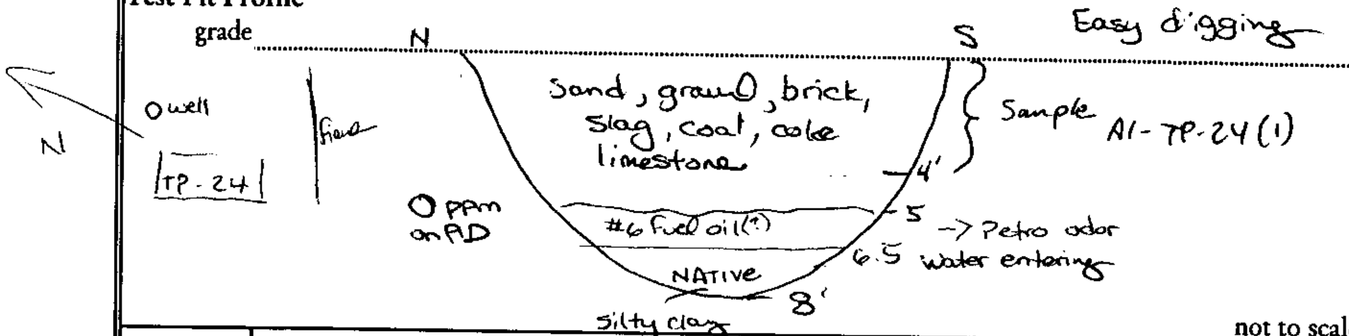


2:00

FIELD TEST PIT LOG

Test Pit No.: AI-TP-24	**Project:** AI Invest of Subarea K
Location: Near AI-MW-K2 (Southwest of well)	**Project No:** 0902-003-100
Date: 10/6/98	**Logged By:** JMA
Excavation Method: Liebherr 932	

Test Pit Profile



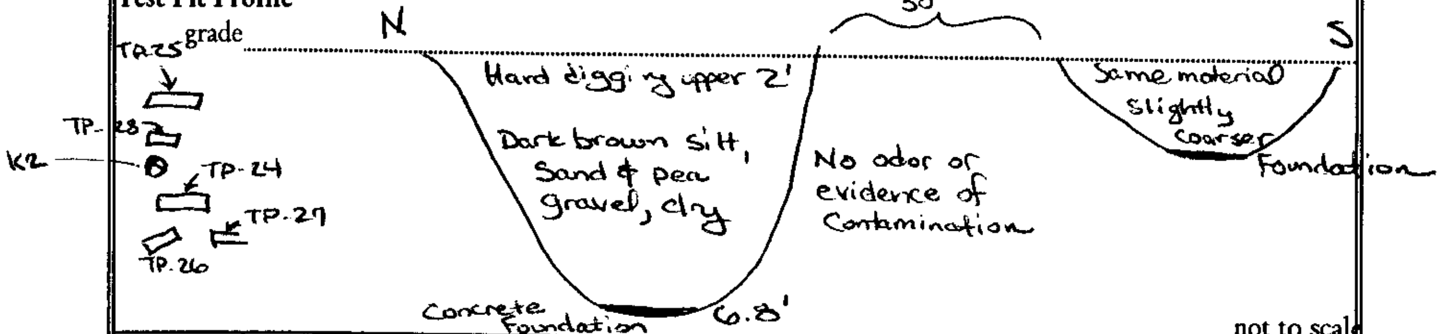
not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-25	**Project:**	Area 1 Invest. of Subarea K
Location:	~50' E of K2 (A1-MW-K2)	**Project No:**	0002-003-100
Date:	10/6/98	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile



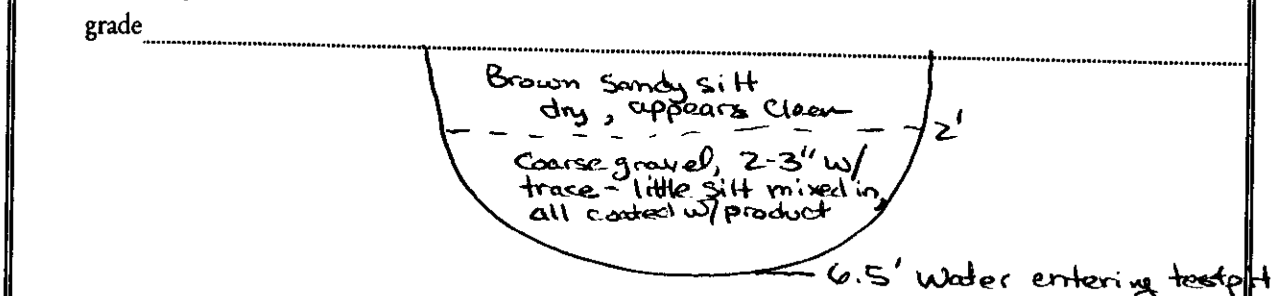
not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	AI-TP-26	Project:	LTV Steel, Areal Inv. of S. Tar area
Location:	~25' W of AI-TP-24	Project No:	0002-003-100
Date:	10/6/98	Logged By:	SMA
Excavation Method:	Liebherr 932		

Test Pit Profile



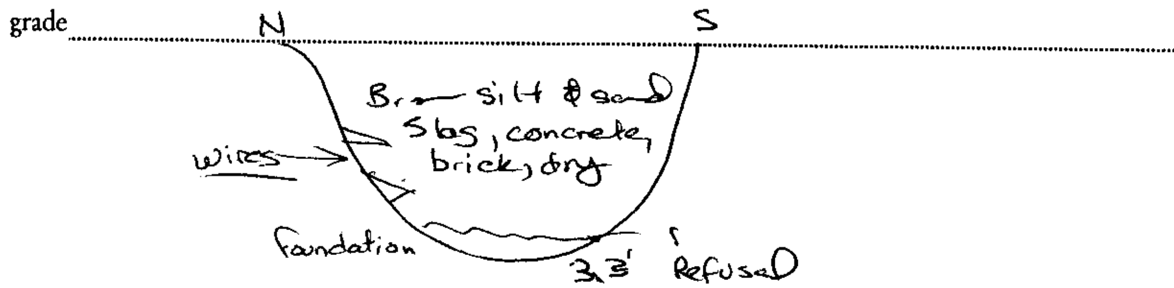
not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: AI-TP-27	**Project:** US Steel, AI Inv of Subarea K
Location: 50' S of AI-TP-26 (100' SW of [illegible])	**Project No:** 0002-003-100
Date: 10/6/98	**Logged By:** JMA
Excavation Method: Liebherr 932	

Test Pit Profile



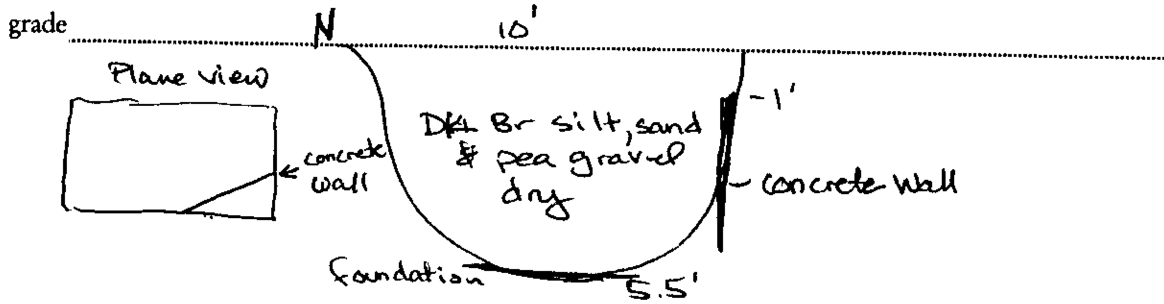
not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: Al - TP - 28	Project: LTV Steel Al Inv. of Subarea K
Location: 26' E of K2 btwn K2 & TP25	Project No: 0002-003-100
Date: 10/6/98	Logged By: JMA
Excavation Method: Liebherr 932	

Test Pit Profile



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	Al-TP-29	**Project:**	LTV Steel AI Inv. of Subarea K
Location:		**Project No:**	0002-003-100
Date:	10/6/98	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

TP-26
TP-30 40'
TP-29

refused at
1.5', too hard to dig
w/ backhoe

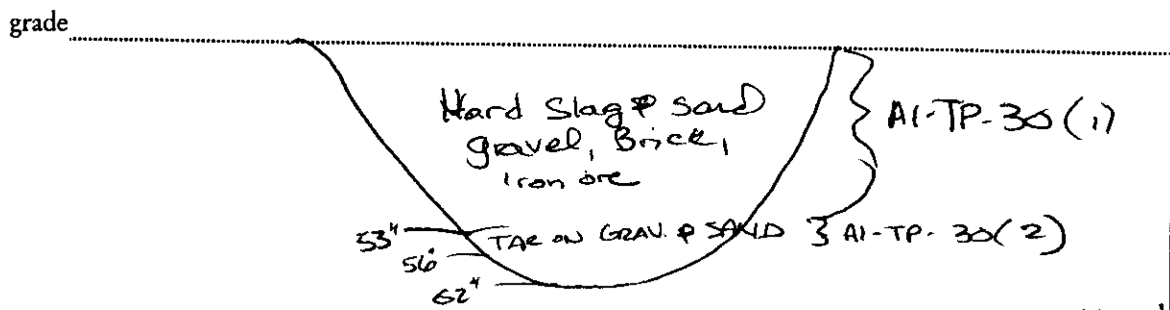
not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: AI-TP-30	**Project:** LTV Plant A-1 inv. of Subarea K
Location: See AI-TP-29	**Project No:** 0002-003-100
Date: 10/6/98	**Logged By:** JMA
Excavation Method: Liebherr 932	

Test Pit Profile



not to scale

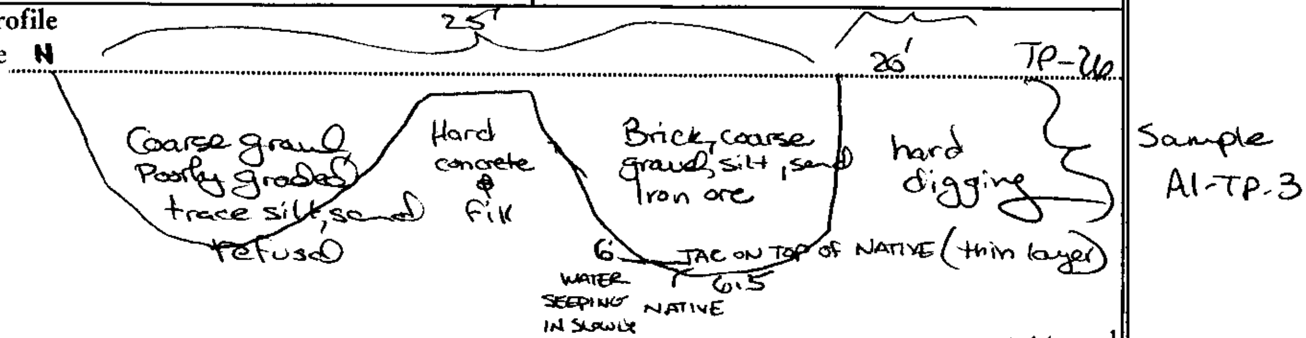
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-31	**Project:**	LTV Area I Inv of Subarea K
Location:	20'	**Project No:**	0002-003-100
Date:	10/6/98	**Logged By:**	SNA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

Columbia Analytical Services Inc.

A FULL SERVICE ENVIRONME[

Area I
Subarea
K & L
Testpit Inv.

October 14, 1998

Ms. Jeanne Asquith
Turnkey Environmental Rest.
Key Tower Suite 1350
50 Fountain Plaza
Buffalo, NY 14202

PROJECT:LTV STEEL - AREA 1 PLANT SITE
Submission #:9810000115

Dear Ms. Asquith:

Enclosed are the analytical results of the analyses requested. The analytical data was provided to you on 10/13/98 per a Facsimile transmittal. All data has been reviewed prior to report submission.

Should you have any questions please contact me at (716) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Janice Jaeger
Project Chemist

Enc.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director prior to report submittal.

Columbia Analytical Services Inc.

Effective 04/01/96

CAS LIST OF QUALIFIERS

(The basis of this proposal are the EPA-CLP Qualifiers)

U - Indicates compound was analyzed for but was not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. For further explanation see case narrative / cover letter.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

N - Spiked sample recovery not within control limits.
(Flag the entire batch - Inorganic analysis only)

* - Duplicate analysis not within control limits.
(Flag the entire batch - Inorganic analysis only)

- Also used to qualify Organics QC data outside limits.

D - Spike diluted out.

S - Reported value determined by Method of Standard Additions. (MSA)

X - As specified in the case narrative.

CAS Lab ID # for State Certifications

NY ID # in Rochester:	10145	NJ ID # in Rochester:	73004
CT ID # in Rochester:	PH0556	RI ID # in Rochester:	158
MA ID # in Rochester:	M-NY032		

ANALYTICAL REPORT SUMMARY

Reported: 10/14/98

Turnkey Environmental Rest.

LTV STEEL - AREA 1 PLANT SITE

SUBMISSION #: 9810000115

ORDER NUMBER			245269	245270	245271	245272
SAMPLE ID:			A1-TP-12	A1-TP-13 (1)	A1-TP-13 (2)	A1-TP-15 (1)
DATE SAMPLED:	Dry Weight		10/06/98	10/06/98	10/06/98	10/06/98
DATE RECEIVED:	Units	PQL	10/07/98	10/07/98	10/07/98	10/07/98
PERCENT SOLIDS	%	1.00	89.1	84.8	83.2	84.2
TOTAL PETROLEUM HYDROCARB	MG/KG	33.0	296	67.0	73.2	271

ANALYTICAL REPORT SUMMARY

Reported: 10/14/98

Turnkey Environmental Rest.

LTV STEEL - AREA 1 PLANT SITE

SUBMISSION #: 9810000115

ORDER NUMBER		245269	245270	245271	245272
SAMPLE ID:		A1-TP-12	A1-TP-13 (1)	A1-TP-13 (2)	A1-TP-15 (1)
DATE SAMPLED:		10/06/98	10/06/98	10/06/98	10/06/98
DATE RECEIVED:		10/07/98	10/07/98	10/07/98	10/07/98
PERCENT SOLIDS	%	10/13/98	10/13/98	10/13/98	10/13/98
TOTAL PETROLEUM HYDROCARB	MG/KG	10/12/98	10/12/98	10/12/98	10/12/98

ANALYTICAL REPORT SUMMARY
METHOD 8270C SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

	PQL				
ORDER NUMBER		245269	245270	245271	245272
SAMPLE ID:		A1-TP-12	A1-TP-13 (1)	A1-TP-13 (2)	A1-TP-15 (1)
DATE SAMPLED:		10/06/1998	10/06/1998	10/06/1998	10/06/1998
DATE RECEIVED:	PQL	10/07/1998	10/07/1998	10/07/1998	10/07/1998
DATE EXTRACTED:		10/12/98	10/12/98	10/12/98	10/12/98
DATE ANALYZED:		10/12/98	10/12/98	10/13/98	10/12/98
DILUTION:		10.00	10.00	1.00	20.00
PERCENT SOLID (%):		89.1	84.8	83.2	84.2
ACENAPHTHENE	330	3700 U	3900 U	400 U	7800
ACENAPHTHYLENE	330	13000	6500	1100	78000
ANTHRACENE	330	12000	6500	670	68000
BENZO(A)ANTHRACENE	330	26000	13000	1700	94000
BENZO(A)PYRENE	330	30000	14000	2200	100000
BENZO(B)FLUORANTHENE	330	33000	12000	2000	130000
BENZO(G,H,I)PERYLENE	330	17000	8300	1100	46000
BENZO(K)FLUORANTHENE	330	25000	17000	2400	75000
BENZYL ALCOHOL	330	3700 U	3900 U	400 U	7800 U
BUTYL BENZYL PHTHALATE	330	3700 U	3900 U	400 U	7800 U
DI-N-BUTYLPHTHALATE	330	3700 U	3900 U	400 U	7800 U
CARBAZOLE	330	3700 U	3900 U	400 U	18000
INDENO(1,2,3-CD)PYRENE	330	19000	8600	1200	55000
4-CHLOROANILINE	330	3700 U	3900 U	400 U	7800 U
BIS(-2-CHLOROETHOXY)METHANE	330	3700 U	3900 U	400 U	7800 U
BIS(2-CHLOROETHYL)ETHER	330	3700 U	3900 U	400 U	7800 U
2-CHLORONAPHTHALENE	330	3700 U	3900 U	400 U	7800 U
2-CHLOROPHENOL	670	7500 U	7900 U	810 U	16000 U
2,2'-OXYBIS(1-CHLOROPROPANE)	330	3700 U	3900 U	400 U	7800 U
CHRYSENE	330	26000	12000	1700	84000
DIBENZO(A,H)ANTHRACENE	330	7100	3900 U	490	23000
DIBENZOFURAN	330	3700 U	3900 U	400 U	32000
1,2-DICHLOROBENZENE	330	3700 U	3900 U	400 U	7800 U
1,3-DICHLOROBENZENE	330	3700 U	3900 U	400 U	7800 U
1,4-DICHLOROBENZENE	330	3700 U	3900 U	400 U	7800 U
3,3'-DICHLOROBENZIDINE	330	3700 U	3900 U	400 U	7800 U
2,4-DICHLOROPHENOL	670	7500 U	7900 U	810 U	16000 U
DIETHYLPHTHALATE	330	3700 U	3900 U	400 U	7800 U
DIMETHYL PHTHALATE	330	3700 U	3900 U	400 U	7800 U
2,4-DIMETHYLPHENOL	670	7500 U	7900 U	810 U	16000 U
2,4-DINITROPHENOL	1300	15000 U	15000 U	1600 U	31000 U
2,4-DINITROTOLUENE	330	3700 U	3900 U	400 U	7800 U
2,6-DINITROTOLUENE	330	3700 U	3900 U	400 U	7800 U
BIS(2-ETHYLHEXYL)PHTHALATE	330	3700 U	3900 U	400 U	7800 U
FLUORANTHENE	330	62000	37000	4200	210000
FLUORENE	330	4300	3900 U	400 U	57000
HEXACHLOROBENZENE	330	3700 U	3900 U	400 U	7800 U
HEXACHLOROBUTADIENE	330	3700 U	3900 U	400 U	7800 U
HEXACHLOROCYCLOPENTADIENE	330	3700 U	3900 U	400 U	7800 U
HEXACHLOROETHANE	330	3700 U	3900 U	400 U	7800 U
ISOPHORONE	330	3700 U	3900 U	400 U	7800 U
2-METHYLNAPHTHALENE	670	7500 U	7900 U	810 U	16000 U

COLUMBIA ANALYTICAL SERVICES

ANALYTICAL REPORT SUMMARY
METHOD 8270C SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

	PQL				
ORDER NUMBER		245269	245270	245271	245272
SAMPLE ID:		A1-TP-12	A1-TP-13 (1)	A1-TP-13 (2)	A1-TP-15 (1)
DATE SAMPLED:		10/06/1998	10/06/1998	10/06/1998	10/06/1998
DATE RECEIVED:		10/07/1998	10/07/1998	10/07/1998	10/07/1998
DATE EXTRACTED:		10/12/98	10/12/98	10/12/98	10/12/98
DATE ANALYZED:		10/12/98	10/12/98	10/13/98	10/12/98
DILUTION:		10.00	10.00	1.00	20.00
PERCENT SOLID (%):		89.1	84.8	83.2	84.2
2-METHYLPHENOL	670	7500 U	7900 U	810 U	16000 U
4,6-DINITRO-2-METHYLPHENOL	1300	15000 U	15000 U	1600 U	31000 U
4-CHLORO-3-METHYLPHENOL	670	7500 U	7900 U	810 U	16000 U
4-METHYLPHENOL	670	7500 U	7900 U	810 U	16000 U
NAPHTHALENE	330	3700 U	3900 U	400 U	130000
2-NITROANILINE	330	3700 U	3900 U	400 U	7800 U
3-NITROANILINE	330	3700 U	3900 U	400 U	7800 U
4-NITROANILINE	330	3700 U	3900 U	400 U	7800 U
NITROBENZENE	330	3700 U	3900 U	400 U	7800 U
2-NITROPHENOL	670	7500 U	7900 U	400 U	7800 U
4-NITROPHENOL	1300	15000 U	15000 U	810 U	16000 U
N-NITROSODIMETHYLAMINE	330	3700 U	3900 U	1600 U	31000 U
N-NITROSODIPHENYLAMINE	330	3700 U	3900 U	400 U	7800 U
DI-N-OCTYL PHTHALATE	330	3700 U	3900 U	400 U	7800 U
PENTACHLOROPHENOL	1300	15000 U	15000 U	400 U	7800 U
PHENANTHRENE	330	36000	24000	1600 U	31000 U
PHENOL	670	7500 U	7900 U	2300	180000
4-BROMOPHENYL-PHENYLETHER	330	3700 U	3900 U	810 U	16000 U
4-CHLOROPHENYL-PHENYLETHER	330	3700 U	3900 U	400 U	7800 U
N-NITROSO-DI-N-PROPYLAMINE	330	3700 U	3900 U	400 U	7800 U
PYRENE	330	39000	21000	400 U	7800 U
1,2,4-TRICHLOROBENZENE	330	3700 U	3900 U	2600	140000
2,4,5-TRICHLOROPHENOL	670	7500 U	7900 U	400 U	7800 U
2,4,6-TRICHLOROPHENOL	670	7500 U	7900 U	810 U	16000 U
				810 U	16000 U

SURROGATE RECOVERIES	LIMITS				
TERPHENYL-d14	18 - 137	102	96	66	D
NITROBENZENE-d5	23 - 120	89	85	70	D
PHENOL-d6	24 - 113	90	88	66	D
2-FLUOROBIPHENYL	30 - 115	103	103	74	D
2-FLUOROPHENOL	25 - 121	86	85	60	D
2,4,6-TRIBROMOPHENOL	19 - 122	94	94	76	D

ANALYTICAL REPORT SUMMARY
Reported: 10/14/98

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

ORDER NUMBER			245274	245276	245277	245278
SAMPLE ID:			A1-TP-15 (2)	A1-TP-17 (1)	A1-TP-17 (2)	A1-TP-19
DATE SAMPLED:	Dry Weight		10/06/98	10/06/98	10/06/98	10/06/98
DATE RECEIVED:	Units	PQL	10/07/98	10/07/98	10/07/98	10/07/98
PERCENT SOLIDS	%	1.00	88.0	84.1	78.0	92.0
TOTAL PETROLEUM HYDROCARB	MG/KG	33.0	691	39.2 U	1710	167

COLUMBIA ANALYTICAL SERVICES

ANALYTICAL REPORT SUMMARY

Reported: 10/14/98

Turnkey Environmental Rest.

LTV STEEL - AREA 1 PLANT SITE

SUBMISSION #: 9810000115

ORDER NUMBER		245274	245276	245277	245278
SAMPLE ID:		A1-TP-15 (2)	A1-TP-17 (1)	A1-TP-17 (2)	A1-TP-19
DATE SAMPLED:		10/06/98	10/06/98	10/06/98	10/06/98
DATE RECEIVED:		10/07/98	10/07/98	10/07/98	10/07/98
PERCENT SOLIDS	%	10/13/98	10/13/98	10/13/98	10/13/98
TOTAL PETROLEUM HYDROCARB	MG/KG	10/12/98	10/12/98	10/12/98	10/12/98

ANALYTICAL REPORT SUMMARY
METHOD 8270C SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

ORDER NUMBER		245274	245276	245277	245278
SAMPLE ID:		A1-TP-15 (2)	A1-TP-17 (1)	A1-TP-17 (2)	A1-TP-19
DATE SAMPLED:		10/06/1998	10/06/1998	10/06/1998	10/06/1998
DATE RECEIVED:	PQL	10/07/1998	10/07/1998	10/07/1998	10/07/1998
DATE EXTRACTED:		10/12/98	10/12/98	10/12/98	10/12/98
DATE ANALYZED:		10/12/98	10/13/98	10/13/98	10/12/98
DILUTION:		10.00	1.00	500.00	10.00
PERCENT SOLID (%):		88.0	84.1	78.0	92.0
ACENAPHTHENE	330	3800 U	390 U	350000	3600 U
ACENAPHTHYLENE	330	7800	1500	1900000	12000
ANTHRACENE	330	4700	820	920000	14000
BENZO(A)ANTHRACENE	330	9300	810	790000	14000
BENZO(A)PYRENE	330	11000	840	860000	15000
BENZO(B)FLUORANTHENE	330	11000	740	760000	14000
BENZO(G,H,I)PERYLENE	330	6800	390 U	330000	5500
BENZO(K)FLUORANTHENE	330	13000	940	770000	15000
BENZYL ALCOHOL	330	3800 U	390 U	210000 U	3600 U
BUTYL BENZYL PHTHALATE	330	3800 U	390 U	210000 U	3600 U
DI-N-BUTYLPHTHALATE	330	3800 U	390 U	210000 U	3600 U
CARBAZOLE	330	3800 U	500	620000	4600
INDENO(1,2,3-CD)PYRENE	330	7800	400	380000	6600
4-CHLOROANILINE	330	3800 U	390 U	210000 U	3600 U
BIS(-2-CHLOROETHOXY)METHANE	330	3800 U	390 U	210000 U	3600 U
BIS(2-CHLOROETHYL)ETHER	330	3800 U	390 U	210000 U	3600 U
2-CHLORONAPHTHALENE	330	3800 U	390 U	210000 U	3600 U
2-CHLOROPHENOL	670	7600 U	800 U	430000 U	7300 U
2,2'-OXYBIS(1-CHLOROPROPANE)	330	3800 U	390 U	210000 U	3600 U
CHRYSENE	330	9100	690	690000	13000
DIBENZO(A,H)ANTHRACENE	330	3800 U	390 U	210000 U	3600 U
DIBENZOFURAN	330	3800 U	830	1100000	6300
1,2-DICHLOROBENZENE	330	3800 U	390 U	210000 U	3600 U
1,3-DICHLOROBENZENE	330	3800 U	390 U	210000 U	3600 U
1,4-DICHLOROBENZENE	330	3800 U	390 U	210000 U	3600 U
3,3'-DICHLOROBENZIDINE	330	3800 U	390 U	210000 U	3600 U
2,4-DICHLOROPHENOL	670	7600 U	800 U	430000 U	7300 U
DIETHYLPHTHALATE	330	3800 U	390 U	210000 U	3600 U
DIMETHYL PHTHALATE	330	3800 U	390 U	210000 U	3600 U
2,4-DIMETHYLPHENOL	670	7600 U	800 U	430000 U	7300 U
2,4-DINITROPHENOL	1300	15000 U	1500 U	830000 U	14000 U
2,4-DINITROTOLUENE	330	3800 U	390 U	210000 U	3600 U
2,6-DINITROTOLUENE	330	3800 U	390 U	210000 U	3600 U
BIS(2-ETHYLHEXYL)PHTHALATE	330	3800 U	390 U	210000 U	3600 U
FLUORANTHENE	330	24000	2900	2600000	42000
FLUORENE	330	3800 U	1300	1500000	15000
HEXACHLOROBENZENE	330	3800 U	390 U	210000 U	3600 U
HEXACHLOROBUTADIENE	330	3800 U	390 U	210000 U	3600 U
.EXACHLOROCYCLOPENTADIENE	330	3800 U	390 U	210000 U	3600 U
HEXACHLOROETHANE	330	3800 U	390 U	210000 U	3600 U
ISOPHORONE	330	3800 U	390 U	210000 U	3600 U
2-METHYLNAPHTHALENE	670	7600 U	800 U	1200000	7300 U

ANALYTICAL REPORT SUMMARY
METHOD 8270C SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

ORDER NUMBER	PQL	245274	245276	245277	245278
SAMPLE ID:		A1-TP-15 (2)	A1-TP-17 (1)	A1-TP-17 (2)	A1-TP-19
DATE SAMPLED:		10/06/1998	10/06/1998	10/06/1998	10/06/1998
DATE RECEIVED:		10/07/1998	10/07/1998	10/07/1998	10/07/1998
DATE EXTRACTED:		10/12/98	10/12/98	10/12/98	10/12/98
DATE ANALYZED:		10/12/98	10/13/98	10/13/98	10/12/98
DILUTION:		10.00	1.00	500.00	10.00
PERCENT SOLID (%):		88.0	84.1	78.0	92.0
2-METHYLPHENOL	670	7600 U	800 U	430000 U	7300 U
4,6-DINITRO-2-METHYLPHENOL	1300	15000 U	1500 U	830000 U	14000 U
4-CHLORO-3-METHYLPHENOL	670	7600 U	800 U	430000 U	7300 U
4-METHYLPHENOL	670	7600 U	800 U	430000 U	7300 U
NAPHTHALENE	330	3800 U	3400	6000000	3600 U
2-NITROANILINE	330	3800 U	390 U	210000 U	3600 U
3-NITROANILINE	330	3800 U	390 U	210000 U	3600 U
4-NITROANILINE	330	3800 U	390 U	210000 U	3600 U
NITROBENZENE	330	3800 U	390 U	210000 U	3600 U
2-NITROPHENOL	670	7600 U	800 U	430000 U	3600 U
4-NITROPHENOL	1300	15000 U	1500 U	830000 U	7300 U
N-NITROSODIMETHYLAMINE	330	3800 U	390 U	210000 U	14000 U
N-NITROSODIPHENYLAMINE	330	3800 U	390 U	210000 U	3600 U
DI-N-OCTYL PHTHALATE	330	3800 U	390 U	210000 U	3600 U
PENTACHLOROPHENOL	1300	15000 U	1500 U	830000 U	14000 U
PHENANTHRENE	330	14000	3400	3300000	43000
PHENOL	670	7600 U	800 U	430000 U	7300 U
4-BROMOPHENYL-PHENYLETHER	330	3800 U	390 U	210000 U	3600 U
4-CHLOROPHENYL-PHENYLETHER	330	3800 U	390 U	210000 U	3600 U
N-NITROSO-DI-N-PROPYLAMINE	330	3800 U	390 U	210000 U	3600 U
PYRENE	330	15000	1400	1300000	23000
1,2,4-TRICHLOROBENZENE	330	3800 U	390 U	210000 U	3600 U
2,4,5-TRICHLOROPHENOL	670	7600 U	800 U	430000 U	7300 U
2,4,6-TRICHLOROPHENOL	670	7600 U	800 U	430000 U	7300 U

SURROGATE RECOVERIES	LIMITS				
TERPHENYL-d14	18 - 137	105	46	D	97
NITROBENZENE-d5	23 - 120	92	54	D	63
PHENOL-d6	24 - 113	97	48	D	76
2-FLUOROBIPHENYL	30 - 115	113	62	D	114
2-FLUOROPHENOL	25 - 121	92	43	D	59
2,4,6-TRIBROMOPHENOL	19 - 122	107	49	D	96

ANALYTICAL REPORT SUMMARY

Reported: 10/14/98

Turnkey Environmental Rest.

LTV STEEL - AREA 1 PLANT SITE

SUBMISSION #: 9810000115

ORDER NUMBER SAMPLE ID: DATE SAMPLED: DATE RECEIVED:	Dry Weight Units	PQL	245279 A1-TP-22 10/06/98 10/07/98	245280 A1-TP-30 (1) 10/06/98 10/07/98	245281 A1-TP-24 (1) 10/06/98 10/07/98	245282 A1-TP-30 (2) 10/06/98 10/07/98
PERCENT SOLIDS	%	1.00	76.7	84.9	84.9	90.1
TOTAL PETROLEUM HYDROCARB	MG/KG	33.0	43.0 U	392	823	62300

COLUMBIA ANALYTICAL SERVICES

ANALYTICAL REPORT SUMMARY
METHOD 8270C SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

	PQL				
ORDER NUMBER		245279	245280	245281	245282
SAMPLE ID:		A1-TP-22	A1-TP-30 (1)	A1-TP-24 (1)	A1-TP-30 (2)
DATE SAMPLED:		10/06/1998	10/06/1998	10/06/1998	10/06/1998
DATE RECEIVED:		10/07/1998	10/07/1998	10/07/1998	10/07/1998
DATE EXTRACTED:		10/12/98	10/12/98	10/12/98	10/12/98
DATE ANALYZED:		10/13/98	10/13/98	10/12/98	10/12/98
DILUTION:		1.00	1.00	20.00	50.00
PERCENT SOLID (%):		76.7	84.9	84.9	90.1
ACENAPHTHENE	330	430 U	390 U	7800 U	18000 U
ACENAPHTHYLENE	330	430 U	390 U	7800 U	65000
ANTHRACENE	330	430 U	390 U	7800 U	33000
BENZO(A)ANTHRACENE	330	430 U	660	8100	31000
BENZO(A)PYRENE	330	800	850	9900	31000
BENZO(B)FLUORANTHENE	330	700	790	8700	30000
BENZO(G,H,I)PERYLENE	330	510	420	7800 U	22000
BENZO(K)FLUORANTHENE	330	780	1100	9700	18000 U
BENZYL ALCOHOL	330	430 U	390 U	7800 U	32000
BUTYL BENZYL PHTHALATE	330	430 U	390 U	7800 U	18000 U
DI-N-BUTYLPHTHALATE	330	430 U	390 U	7800 U	18000 U
CARBAZOLE	330	430 U	390 U	7800 U	18000 U
INDENO(1,2,3-CD)PYRENE	330	550	440	7800 U	19000
4-CHLOROANILINE	330	430 U	390 U	7800 U	18000 U
BIS(-2-CHLOROETHOXY)METHANE	330	430 U	390 U	7800 U	18000 U
BIS(2-CHLOROETHYL)ETHER	330	430 U	390 U	7800 U	18000 U
2-CHLORONAPHTHALENE	330	430 U	390 U	7800 U	18000 U
2-CHLOROPHENOL	670	870 U	790 U	16000 U	18000 U
2,2'-OXYBIS(1-CHLOROPROPANE)	330	430 U	390 U	7800 U	37000 U
CHRYSENE	330	460	750	8200	18000 U
DIBENZO(A,H)ANTHRACENE	330	430 U	390 U	7800 U	31000
DIBENZOFURAN	330	430 U	390 U	7800 U	18000 U
1,2-DICHLOROBENZENE	330	430 U	390 U	7800 U	37000
1,3-DICHLOROBENZENE	330	430 U	390 U	7800 U	18000 U
1,4-DICHLOROBENZENE	330	430 U	390 U	7800 U	18000 U
3,3'-DICHLOROBENZIDINE	330	430 U	390 U	7800 U	18000 U
2,4-DICHLOROPHENOL	670	870 U	790 U	16000 U	18000 U
DIETHYLPHTHALATE	330	430 U	390 U	7800 U	37000 U
DIMETHYL PHTHALATE	330	430 U	390 U	7800 U	18000 U
2,4-DIMETHYLPHENOL	670	870 U	790 U	16000 U	18000 U
2,4-DINITROPHENOL	1300	1700 U	1500 U	31000 U	37000 U
2,4-DINITROTOLUENE	330	430 U	390 U	7800 U	72000 U
2,6-DINITROTOLUENE	330	430 U	390 U	7800 U	18000 U
BIS(2-ETHYLHEXYL)PHTHALATE	330	430 U	390 U	7800 U	18000 U
FLUORANTHENE	330	900	1500	27000	18000 U
FLUORENE	330	430 U	390 U	7800 U	84000
HEXACHLOROBENZENE	330	430 U	390 U	7800 U	57000
HEXACHLOROBUTADIENE	330	430 U	390 U	7800 U	18000 U
HEXACHLOROCYCLOPENTADIENE	330	430 U	390 U	7800 U	18000 U
HEXACHLOROETHANE	330	430 U	390 U	7800 U	18000 U
ISOPHORONE	330	430 U	390 U	7800 U	18000 U
2-METHYLNAPHTHALENE	670	870 U	790 U	16000 U	73000

ANALYTICAL REPORT SUMMARY
METHOD 8270C SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

	PQL				
ORDER NUMBER		245279	245280	245281	245282
SAMPLE ID:		A1-TP-22	A1-TP-30 (1)	A1-TP-24 (1)	A1-TP-30 (2)
DATE SAMPLED:		10/06/1998	10/06/1998	10/06/1998	10/06/1998
DATE RECEIVED:	PQL	10/07/1998	10/07/1998	10/07/1998	10/07/1998
DATE EXTRACTED:		10/12/98	10/12/98	10/12/98	10/12/98
DATE ANALYZED:		10/13/98	10/13/98	10/12/98	10/12/98
DILUTION:		1.00	1.00	20.00	50.00
PERCENT SOLID (%):		76.7	84.9	84.9	90.1
2-METHYLPHENOL	670	870 U	790 U	16000 U	37000 U
4,6-DINITRO-2-METHYLPHENOL	1300	1700 U	1500 U	31000 U	72000 U
4-CHLORO-3-METHYLPHENOL	670	870 U	790 U	16000 U	37000 U
4-METHYLPHENOL	670	870 U	790 U	16000 U	37000 U
NAPHTHALENE	330	430 U	390 U	13000	240000
2-NITROANILINE	330	430 U	390 U	7800 U	18000 U
3-NITROANILINE	330	430 U	390 U	7800 U	18000 U
4-NITROANILINE	330	430 U	390 U	7800 U	18000 U
NITROBENZENE	330	430 U	390 U	7800 U	18000 U
2-NITROPHENOL	670	870 U	790 U	16000 U	37000 U
4-NITROPHENOL	1300	1700 U	1500 U	31000 U	72000 U
N-NITROSODIMETHYLAMINE	330	430 U	390 U	7800 U	18000 U
N-NITROSODIPHENYLAMINE	330	430 U	390 U	7800 U	18000 U
DI-N-OCTYL PHTHALATE	330	430 U	390 U	7800 U	18000 U
PENTACHLOROPHENOL	1300	1700 U	1500 U	31000 U	72000 U
PHENANTHRENE	330	430 U	1000	21000	140000
PHENOL	670	870 U	790 U	16000 U	37000 U
4-BROMOPHENYL-PHENYLETHER	330	430 U	390 U	7800 U	18000 U
4-CHLOROPHENYL-PHENYLETHER	330	430 U	390 U	7800 U	18000 U
N-NITROSO-DI-N-PROPYLAMINE	330	430 U	390 U	7800 U	18000 U
PYRENE	330	570	1100	15000	63000
1,2,4-TRICHLOROBENZENE	330	430 U	390 U	7800 U	18000 U
2,4,5-TRICHLOROPHENOL	670	870 U	790 U	16000 U	37000 U
2,4,6-TRICHLOROPHENOL	670	870 U	790 U	16000 U	37000 U

SURROGATE RECOVERIES	LIMITS				
TERPHENYL-d14	18 - 137	55	50	D	D
NITROBENZENE-d5	23 - 120	63	61	D	D
PHENOL-d6	24 - 113	61	52	D	D
2-FLUOROBIPHENYL	30 - 115	73	66	D	D
2-FLUOROPHENOL	25 - 121	56	29	D	D
2,4,6-TRIBROMOPHENOL	19 - 122	68	47	D	D

ANALYTICAL REPORT SUMMARY
Reported: 10/14/98

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

ORDER NUMBER		245279	245280	245281	245282
SAMPLE ID:		A1-TP-22	A1-TP-30 (1)	A1-TP-24 (1)	A1-TP-30 (2)
DATE SAMPLED:		10/06/98	10/06/98	10/06/98	10/06/98
DATE RECEIVED:		10/07/98	10/07/98	10/07/98	10/07/98
PERCENT SOLIDS	%	10/13/98	10/13/98	10/13/98	10/13/98
TOTAL PETROLEUM HYDROCARB	MG/KG	10/12/98	10/12/98	10/12/98	10/12/98

COLUMBIA ANALYTICAL SERVICES

ANALYTICAL REPORT SUMMARY
METHOD 8270C SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

ORDER NUMBER		245279	245280	245281	245282
SAMPLE ID:		A1-TP-22	A1-TP-30 (1)	A1-TP-24 (1)	A1-TP-30 (2)
DATE SAMPLED:		10/06/1998	10/06/1998	10/06/1998	10/06/1998
DATE RECEIVED:	PQL	10/07/1998	10/07/1998	10/07/1998	10/07/1998
DATE EXTRACTED:		10/12/98	10/12/98	10/12/98	10/12/98
DATE ANALYZED:		10/13/98	10/13/98	10/12/98	10/12/98
DILUTION:		1.00	1.00	20.00	50.00
PERCENT SOLID (%):		76.7	84.9	84.9	90.1
ACENAPHTHENE	330	430 U	390 U	7800 U	18000 U
ACENAPHTHYLENE	330	430 U	390 U	7800 U	65000
ANTHRACENE	330	430 U	390 U	7800 U	33000
BENZO(A)ANTHRACENE	330	430 U	660	8100	31000
BENZO(A)PYRENE	330	800	850	9900	30000
BENZO(B)FLUORANTHENE	330	700	790	8700	22000
BENZO(G,H,I)PERYLENE	330	510	420	7800 U	18000 U
BENZO(K)FLUORANTHENE	330	780	1100	9700	32000
BENZYL ALCOHOL	330	430 U	390 U	7800 U	18000 U
BUTYL BENZYL PHTHALATE	330	430 U	390 U	7800 U	18000 U
DI-N-BUTYLPHTHALATE	330	430 U	390 U	7800 U	18000 U
CARBAZOLE	330	430 U	390 U	7800 U	19000
INDENO(1,2,3-CD)PYRENE	330	550	440	7800 U	18000 U
4-CHLOROANILINE	330	430 U	390 U	7800 U	18000 U
BIS(-2-CHLOROETHOXY)METHANE	330	430 U	390 U	7800 U	18000 U
BIS(2-CHLOROETHYL)ETHER	330	430 U	390 U	7800 U	18000 U
2-CHLORONAPHTHALENE	330	430 U	390 U	7800 U	18000 U
2-CHLOROPHENOL	670	870 U	790 U	16000 U	37000 U
2,2'-OXYBIS(1-CHLOROPROPANE)	330	430 U	390 U	7800 U	18000 U
CHRYSENE	330	460	750	8200	31000
DIBENZO(A,H)ANTHRACENE	330	430 U	390 U	7800 U	18000 U
DIBENZOFURAN	330	430 U	390 U	7800 U	37000
1,2-DICHLOROBENZENE	330	430 U	390 U	7800 U	18000 U
1,3-DICHLOROBENZENE	330	430 U	390 U	7800 U	18000 U
1,4-DICHLOROBENZENE	330	430 U	390 U	7800 U	18000 U
3,3'-DICHLOROBENZIDINE	330	430 U	390 U	7800 U	18000 U
2,4-DICHLOROPHENOL	670	870 U	790 U	16000 U	37000 U
DIETHYLPHTHALATE	330	430 U	390 U	7800 U	18000 U
DIMETHYL PHTHALATE	330	430 U	390 U	7800 U	18000 U
2,4-DIMETHYLPHENOL	670	870 U	790 U	16000 U	37000 U
2,4-DINITROPHENOL	1300	1700 U	1500 U	31000 U	72000 U
2,4-DINITROTOLUENE	330	430 U	390 U	7800 U	18000 U
2,6-DINITROTOLUENE	330	430 U	390 U	7800 U	18000 U
BIS(2-ETHYLHEXYL)PHTHALATE	330	430 U	390 U	7800 U	18000 U
FLUORANTHENE	330	900	1500	27000	84000
FLUORENE	330	430 U	390 U	7800 U	57000
HEXACHLOROBENZENE	330	430 U	390 U	7800 U	18000 U
HEXACHLOROBUTADIENE	330	430 U	390 U	7800 U	18000 U
HEXACHLOROCYCLOPENTADIENE	330	430 U	390 U	7800 U	18000 U
HEXACHLOROETHANE	330	430 U	390 U	7800 U	18000 U
ISOPHORONE	330	430 U	390 U	7800 U	18000 U
2-METHYLNAPHTHALENE	670	870 U	790 U	16000 U	73000

ANALYTICAL REPORT SUMMARY

Reported: 10/14/98

Dry Weight Reported Units = UG/G

Turnkey Environmental Rest.

LTV STEEL - AREA 1 PLANT SITE

SUBMISSION #: 9810000115

ORDER NUMBER			245283
SAMPLE ID:			A1-TP-31
DATE SAMPLED:			10/06/98
DATE RECEIVED:		PQL	10/07/98
PERCENT SOLIDS	%	1.00	89.0
TOTAL PETROLEUM HYDROCARB	MG/KG	33.0	1010

ANALYTICAL REPORT SUMMARY

Reported: 10/14/98

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

ORDER NUMBER		245283
SAMPLE ID:		A1-TP-31
DATE SAMPLED:		10/06/98
DATE RECEIVED:		10/07/98
PERCENT SOLIDS	%	10/13/98
TOTAL PETROLEUM HYDROCARB	MG/KG	10/12/98

COLUMBIA ANALYTICAL SERVICES

ANALYTICAL REPORT SUMMARY
METHOD 8270C SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

ORDER NUMBER		245283	
SAMPLE ID:		A1-TP-31	
DATE SAMPLED:		10/06/1998	
DATE RECEIVED:	PQL	10/07/1998	
DATE EXTRACTED:		10/12/98	
DATE ANALYZED:		10/13/98	
DILUTION:		1.00	
PERCENT SOLID (%):		89.0	
ACENAPHTHENE	330	370	U
ACENAPHTHYLENE	330	370	U
ANTHRACENE	330	370	U
BENZO(A)ANTHRACENE	330	640	
BENZO(A)PYRENE	330	830	
BENZO(B)FLUORANTHENE	330	1100	
BENZO(G,H,I)PERYLENE	330	510	
BENZO(K)FLUORANTHENE	330	1100	
BENZYL ALCOHOL	330	370	U
BUTYL BENZYL PHTHALATE	330	370	U
DI-N-BUTYLPHTHALATE	330	370	U
CARBAZOLE	330	370	U
INDENO(1,2,3-CD)PYRENE	330	520	
4-CHLOROANILINE	330	370	U
BIS(-2-CHLOROETHOXY)METHANE	330	370	U
BIS(2-CHLOROETHYL)ETHER	330	370	U
2-CHLORONAPHTHALENE	330	370	U
2-CHLOROPHENOL	670	750	U
2,2'-OXYBIS(1-CHLOROPROPANE)	330	370	U
CHRYSENE	330	870	
DIBENZO(A,H)ANTHRACENE	330	370	U
DIBENZOFURAN	330	370	U
1,2-DICHLOROBENZENE	330	370	U
1,3-DICHLOROBENZENE	330	370	U
1,4-DICHLOROBENZENE	330	370	U
3,3'-DICHLOROBENZIDINE	330	370	U
2,4-DICHLOROPHENOL	670	750	U
DIETHYLPHTHALATE	330	370	U
DIMETHYL PHTHALATE	330	370	U
2,4-DIMETHYLPHENOL	670	750	U
2,4-DINITROPHENOL	1300	1500	U
2,4-DINITROTOLUENE	330	370	U
2,6-DINITROTOLUENE	330	370	U
BIS(2-ETHYLHEXYL)PHTHALATE	330	370	U
FLUORANTHENE	330	1600	
FLUORENE	330	370	U
HEXACHLOROBENZENE	330	370	U
HEXACHLOROBUTADIENE	330	370	U
HEXACHLOROCYCLOPENTADIENE	330	370	U
HEXACHLOROETHANE	330	370	U
ISOPHORONE	330	370	U
2-METHYLNAPHTHALENE	670	750	U

ANALYTICAL REPORT SUMMARY
METHOD 8270C SEMIVOLATILES
DRY WEIGHT REPORTED UNITS: UG/KG

Turnkey Environmental Rest.
LTV STEEL - AREA 1 PLANT SITE
SUBMISSION #: 9810000115

	PQL	
ORDER NUMBER		245283
SAMPLE ID:		A1-TP-31
DATE SAMPLED:		10/06/1998
DATE RECEIVED:		10/07/1998
DATE EXTRACTED:		10/12/98
DATE ANALYZED:		10/13/98
DILUTION:		1.00
PERCENT SOLID (%):		89.0
2-METHYLPHENOL	670	750 U
4,6-DINITRO-2-METHYLPHENOL	1300	1500 U
4-CHLORO-3-METHYLPHENOL	670	750 U
4-METHYLPHENOL	670	750 U
NAPHTHALENE	330	370 U
2-NITROANILINE	330	370 U
3-NITROANILINE	330	370 U
4-NITROANILINE	330	370 U
NITROBENZENE	330	370 U
2-NITROPHENOL	670	750 U
4-NITROPHENOL	1300	1500 U
N-NITROSODIMETHYLAMINE	330	370 U
N-NITROSODIPHENYLAMINE	330	370 U
DI-N-OCTYL PHTHALATE	330	370 U
PENTACHLOROPHENOL	1300	1500 U
PHENANTHRENE	330	850
PHENOL	670	750 U
4-BROMOPHENYL-PHENYLETHER	330	370 U
4-CHLOROPHENYL-PHENYLETHER	330	370 U
N-NITROSO-DI-N-PROPYLAMINE	330	370 U
PYRENE	330	1200
1,2,4-TRICHLOROBENZENE	330	370 U
2,4,5-TRICHLOROPHENOL	670	750 U
2,4,6-TRICHLOROPHENOL	670	750 U

SURROGATE RECOVERIES	LIMITS	
TERPHENYL-d14	18 - 137	70
NITROBENZENE-d5	23 - 120	66
PHENOL-d6	24 - 113	65
2-FLUOROBIPHENYL	30 - 115	78
2-FLUOROPHENOL	25 - 121	58
2,4,6-TRIBROMOPHENOL	19 - 122	54

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 8270C SEMIVOLATILES
Reported: 10/14/98

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled : **Order #:** 246399 **Sample Matrix:** SOIL/SEDIMENT
Date Received: **Submission #:** **Percent Solid:** 100

ANALYTE	PQL	RESULT	UNITS
DATE EXTRACTED : 10/12/98			
DATE ANALYZED : 10/12/98			
ANALYTICAL DILUTION: 1.00			Dry Weight
ACENAPHTHENE	330	330 U	UG/KG
ACENAPHTHYLENE	330	330 U	UG/KG
ANTHRACENE	330	330 U	UG/KG
BENZO(A)ANTHRACENE	330	330 U	UG/KG
BENZO(A)PYRENE	330	330 U	UG/KG
BENZO(B)FLUORANTHENE	330	330 U	UG/KG
BENZO(G,H,I)PERYLENE	330	330 U	UG/KG
BENZO(K)FLUORANTHENE	330	330 U	UG/KG
BENZYL ALCOHOL	330	330 U	UG/KG
BUTYL BENZYL PHTHALATE	330	330 U	UG/KG
DI-N-BUTYLPHTHALATE	330	330 U	UG/KG
CARBAZOLE	330	330 U	UG/KG
INDENO(1,2,3-CD)PYRENE	330	330 U	UG/KG
4-CHLOROANILINE	330	330 U	UG/KG
BIS(-2-CHLOROETHOXY)METHANE	330	330 U	UG/KG
BIS(2-CHLOROETHYL)ETHER	330	330 U	UG/KG
2-CHLORONAPHTHALENE	330	330 U	UG/KG
2-CHLOROPHENOL	670	670 U	UG/KG
2,2'-OXYBIS(1-CHLOROPROPANE)	330	330 U	UG/KG
CHRYSENE	330	330 U	UG/KG
DIBENZO(A,H)ANTHRACENE	330	330 U	UG/KG
DIBENZOFURAN	330	330 U	UG/KG
1,3-DICHLOROBENZENE	330	330 U	UG/KG
1,2-DICHLOROBENZENE	330	330 U	UG/KG
1,4-DICHLOROBENZENE	330	330 U	UG/KG
3,3'-DICHLOROBENZIDINE	330	330 U	UG/KG
2,4-DICHLOROPHENOL	670	670 U	UG/KG
DIETHYLPHTHALATE	330	330 U	UG/KG
DIMETHYL PHTHALATE	330	330 U	UG/KG
2,4-DIMETHYLPHENOL	670	670 U	UG/KG
2,4-DINITROPHENOL	1300	1300 U	UG/KG
2,4-DINITROTOLUENE	330	330 U	UG/KG
2,6-DINITROTOLUENE	330	330 U	UG/KG
BIS(2-ETHYLHEXYL)PHTHALATE	330	330 U	UG/KG
FLUORANTHENE	330	330 U	UG/KG
FLUORENE	330	330 U	UG/KG
HEXACHLOROBENZENE	330	330 U	UG/KG
HEXACHLOROBUTADIENE	330	330 U	UG/KG
HEXACHLOROCYCLOPENTADIENE	330	330 U	UG/KG
HEXACHLOROETHANE	330	330 U	UG/KG
ISOPHORONE	330	330 U	UG/KG
2-METHYLNAPHTHALENE	670	670 U	UG/KG
4,6-DINITRO-2-METHYLPHENOL	1300	1300 U	UG/KG
4-CHLORO-3-METHYLPHENOL	670	670 U	UG/KG

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 8270C SEMIVOLATILES
Reported: 10/14/98

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled :
Date Received:
Order #: 246399
Submission #:
Sample Matrix: SOIL/SEDIMENT
Percent Solid: 100

ANALYTE	PQL	RESULT	UNITS
DATE EXTRACTED : 10/12/98			
DATE ANALYZED : 10/12/98			
ANALYTICAL DILUTION: 1.00			
			Dry Weight
2-METHYLPHENOL	670	670 U	UG/KG
4-METHYLPHENOL	670	670 U	UG/KG
NAPHTHALENE	330	330 U	UG/KG
2-NITROANILINE	330	330 U	UG/KG
3-NITROANILINE	330	330 U	UG/KG
4-NITROANILINE	330	330 U	UG/KG
NITROBENZENE	330	330 U	UG/KG
2-NITROPHENOL	330	330 U	UG/KG
4-NITROPHENOL	670	670 U	UG/KG
N-NITROSODIMETHYLAMINE	1300	1300 U	UG/KG
N-NITROSODIPHENYLAMINE	330	330 U	UG/KG
DI-N-OCTYL PHTHALATE	330	330 U	UG/KG
PENTACHLOROPHENOL	330	330 U	UG/KG
PHENANTHRENE	1300	1300 U	UG/KG
PHENOL	330	330 U	UG/KG
4-BROMOPHENYL-PHENYLETHER	670	670 U	UG/KG
4-CHLOROPHENYL-PHENYLETHER	330	330 U	UG/KG
N-NITROSO-DI-N-PROPYLAMINE	330	330 U	UG/KG
PYRENE	330	330 U	UG/KG
1,2,4-TRICHLOROBENZENE	330	330 U	UG/KG
2,4,6-TRICHLOROPHENOL	330	330 U	UG/KG
2,4,5-TRICHLOROPHENOL	670	670 U	UG/KG
	670	670 U	UG/KG

SURROGATE RECOVERIES	QC LIMITS		
TERPHENYL-d14	(18 - 137 %)	59	%
NITROBENZENE-d5	(23 - 120 %)	80	%
PHENOL-d6	(24 - 113 %)	71	%
2-FLUOROBIPHENYL	(30 - 115 %)	79	%
2-FLUOROPHENOL	(25 - 121 %)	63	%
2,4,6-TRIBROMOPHENOL	(19 - 122 %)	81	%

COLUMBIA ANALYTICAL SERVICES, INC.
1 Mustard St., Suite 250, Rochester, NY 14609-6925
(716) 288-5380 • FAX (716) 288-8475

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FOR

(800) 695-7222

DATE 10/6/98 PAGE 1 OF 2

PROJECT NAME LTV Steel - Area 1 Plant Site
PROJECT MANAGER/CONTACT Jeanne Asquith
COMPANY/ADDRESS Turnkey Environmental Restoration
50 Fountain Plaza - Suite 1350 Buff. NY
TEL (716) 856-0635 FAX ( )
SAMPLER'S SIGNATURE Jeanne M. Asquith

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	FOR OFFICE USE ONLY LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	~~GC/MS VOA's~~ BTEX* ☑ 8260 ☐ 624 ☐ 95-1	GC/MS SVOA's TCL list as per J. Asquith ☑ 8270 ☐ 625 ☐ 95-2	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES/PCB's ☐ 8081 ☐ 608 ☐ 95-3	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW)	METALS, DISSOLVED (LIST BELOW)	TPHs	PRESERVATION pH < 2.0	pH > 12	Other
A1-TP-12	10/6/98	10:00am		SOIL	2		1									1			
A1-TP-13(1)		10:20			2		1									1			
A1-TP-13(2)		10:20			2		1									1			
A1-TP-15(1)		11:15			2		1									1			
A1-TP-15(2)		11:00			2		1									1			
A1-TP-17(1)		12:20			2		1									1			
A1-TP-17(2)		12:15			3	1	1									1			
A1-TP-19		12:00			2		1									1			
A1-TP-22		13:30			2		1									1			
A1-TP-30(1)		15:35			2		1									1			

RELINQUISHED BY:
Signature Jeanne Asquith
Printed Name JEANNE ASQUITH
Firm Turnkey Env. Restor.
Date/Time 10/6/98 8:05am

RECEIVED BY:
Signature Carol Tuck
Printed Name CAROL TUCK
Firm
Date/Time 10-6-98 8:05

RELINQUISHED BY:
Signature Carol Tuck
Printed Name CAROL TUCK
Firm
Date/Time 10-6-98 11:00

RECEIVED BY:
Signature Mike Scandle
Printed Name Mike Sciandra
Firm CAS
Date/Time 10-6-98 11:00

RELINQUISHED BY:
Signature Mike Scandle
Printed Name Mike Sciandra
Firm CAS
Date/Time 10/7/98 1:30

RECEIVED BY:
Signature Tom Hastings
Printed Name Tom Hastings
Firm
Date/Time 10/7/98 13:30

TURNAROUND REQUIREMENTS
__ 24 hr. __ 48 hr. ✓ 5 day
__ Standard (10-15 working days)
__ Provide Verbal Preliminary Results
__ Provide FAX Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
__ 1. Routine Report
✓ 2. Routine Rep. w/CASE Narrative
__ 3. EPA Level III Validatable Package
__ 4. N.J. Reduced Deliverables Level IV
__ 5. NY ASP/CLP Deliverables
__ 6. Site specific QC.

INVOICE INFORMATION:
P.O. #:
Bill To: Turnkey
Jeanne

SAMPLE RECEIPT:
Shipping Via:
Shipping #:
Temperature:
Submission No: 10-115

SPECIAL INSTRUCTIONS/COMMENTS: * Please hold until authorization from Turnkey - do not analyze as per Tom Forbes TMJ 10/

METALS

ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List

JA 10/21/98

COLUMBIA ANALYTICAL SERVICES, INC.
1 Mustard St., Suite 250, Rochester, NY 14609-6925
(716) 288-5380 • FAX (716) 288-8475

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

(800) 695-7222

DATE 10/6/98 PAGE 2 OF 2

PROJECT NAME LTV Steel - Area I Plant Site
PROJECT MANAGER/CONTACT Jeanne Asquith
COMPANY/ADDRESS Turnkey Environmental Restoration
50 Fountain Plaza - Suite 1350
TEL (716) 856-0635 FAX ( )
SAMPLER'S SIGNATURE Jeanne M. Asquith

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	FOR OFFICE USE ONLY LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624 ☐ 95-1	GC/MS SVOA's ☑ 8270 ☐ 625 ☐ 95-2 TCL-asphalt, J. Asquith (by 1/9/?)	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES/PCB's ☐ 8081 ☐ 608 ☐ 95-3	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW)	METALS, DISSOLVED (LIST BELOW)	TPH							PRESERVATION pH < 2.0	pH > 12	Other
Al-TP-24(1)	10/6/98	14:15		Soil	2		1									1									
Al-TP-30(2)	↓	15:40		↓	2		1									1									
Al-TP-31	↓	16:05		↓	2		1									1									

RELINQUISHED BY:
Signature Jeanne Asquith
Printed Name JEANNE ASQUITH
Firm Turnkey Env. Rest.
Date/Time 10/6/98 8:05am

RECEIVED BY:
Signature Carol Tuck
Printed Name CAROL TUCK
Firm
Date/Time 10-6-98 8:05

RELINQUISHED BY:
Signature Carol Tuck
Printed Name CAROL TUCK
Firm
Date/Time 10-6-98 11:00

RECEIVED BY:
Signature Mike Sciandra
Printed Name Mike Sciandra
Firm CAS
Date/Time 10-6-98 11:00

RELINQUISHED BY:
Signature Mike Sciandra
Printed Name M Sciandra
Firm CAS
Date/Time ~~10-6-98 1:30~~ 10/7/98

RECEIVED BY:
Signature Tom Hastings
Printed Name Tom Hastings
Firm
Date/Time 10/7/98 13:30

TURNAROUND REQUIREMENTS
__ 24 hr. __ 48 hr. ✓ 5 day
__ Standard (10-15 working days)
__ Provide Verbal Preliminary Results
__ Provide FAX Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
__ 1. Routine Report
✓ 2. Routine Rep. w/CASE Narrative
__ 3. EPA Level III Validatable Package
__ 4. N.J. Reduced Deliverables Level IV
__ 5. NY ASP/CLP Deliverables
__ 6. Site specific QC.

INVOICE INFORMATION:
P.O. #:
Bill To: Turnkey
Jeanne

SAMPLE RECEIPT:
Shipping Via:
Shipping #:
Temperature:
Submission No:

SPECIAL INSTRUCTIONS/COMMENTS:
METALS
ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List

Appendix E
Monitoring Well Diagrams and Boring Logs from Supplemental Field Investigation

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. Al-MW-1

PROJECT Supp. Field Inv. START DATE 3/17/98 END DATE 3/17/98

PROJECT NO. 0848-263 FIELD GEOLOGIST BCH

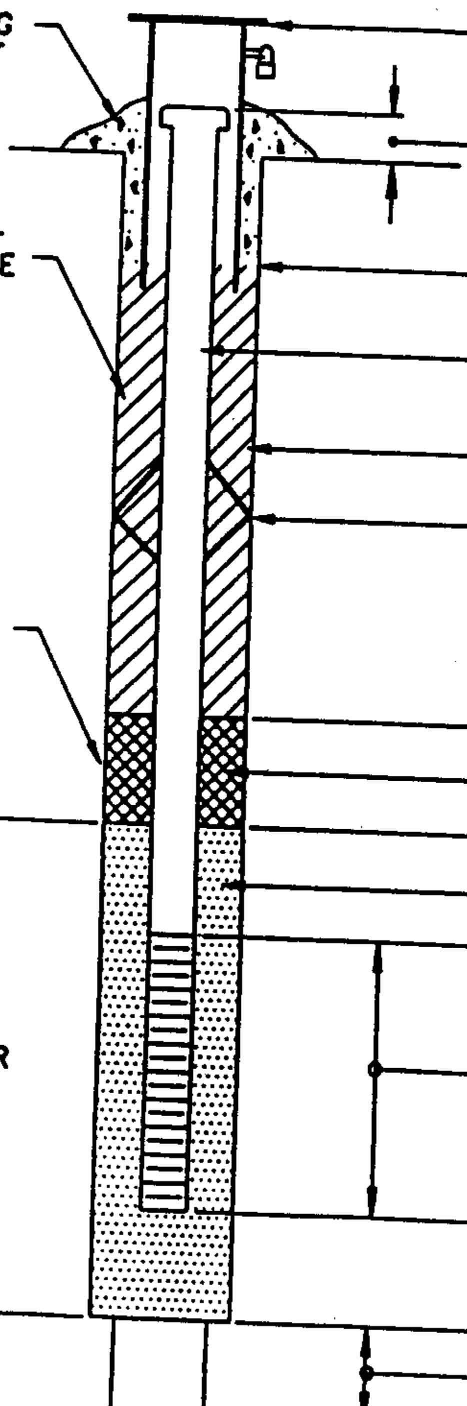
LOCATION Steel Manufacturing Site - Area I

DRILLING CO. SJB Drilling Services

DRILLER(S) Randy Steiner, Tony Jacubzak

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S) Disp. Poly. Bailer



SLOPING CEMENT PAD

CEMENT-BENTONITE GROUT

BENTONITE PELLET SEAL

SAND FILTER PACK

SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING 4", 5'

LOCKED? X YES __ NO

STICK-UP 2.5'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 1.0'

RISER DIAMETER AND MATERIAL 2" sch 40 PVC

BOREHOLE DIAMETER 8.25"

DEPTH TO CENTRALIZERS NA

DEPTH 3.0'

PELLET SIZE Chips

DEPTH 5.0'

SAND SIZE Morie 0

DEPTH 7.0'

SCREEN DIAMETER, SLOT SIZE, AND MATERIAL 2", 0.010, sch 40 PVC

DEPTH 17.0'

DEPTH 17.0'

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 17.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. Al-MW-2

PROJECT Supp. Field Inv. START DATE 3/17/98 END DATE 3/17/98

PROJECT NO. 0848-263 FIELD GEOLOGIST BCH

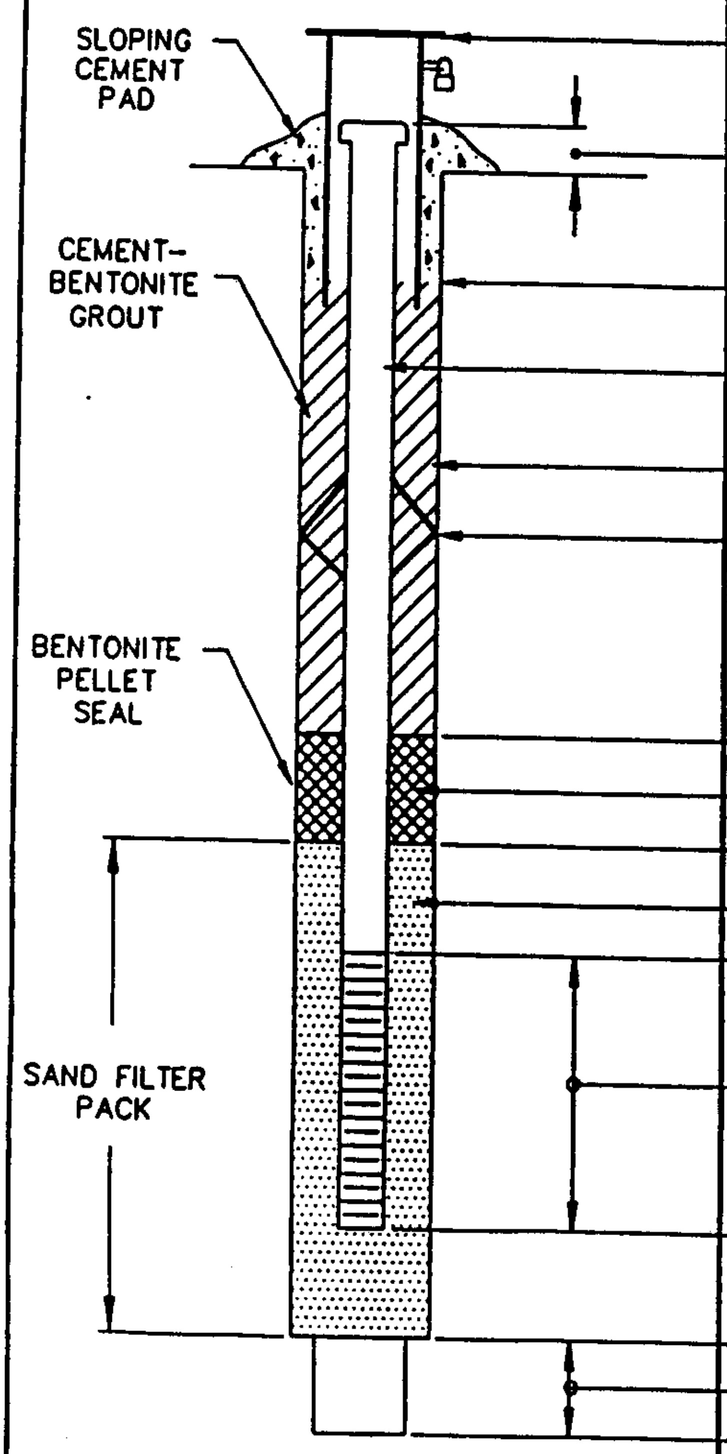
LOCATION Steel Manufacturing Site - Area I

DRILLING CO. SJB Drilling Service

DRILLER(S) Randy Steiner, Tony Jacubzak

DRILLING METHOD(S) 4¼" HSA

DEVELOPMENT METHOD(S) Disp. Poly. Bailer



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING 4", 5'

LOCKED? X YES __ NO

STICK-UP 2.5'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 1.0'

RISER DIAMETER AND MATERIAL 2" PVC sch 40

BOREHOLE DIAMETER 8.25"

DEPTH TO CENTRALIZERS NA

DEPTH 3.0'

PELLET SIZE chips

DEPTH 5.0'

SAND SIZE Morie 0

DEPTH 6.0'

SCREEN DIAMETER, SLOT SIZE, AND MATERIAL 2", 0.010, PVC sch 40

DEPTH 11.0'

DEPTH 11.0'

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 11.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. A1-MW-3

PROJECT Supp. Field Inv. START DATE 3/17/98 END DATE 3/17/98

PROJECT NO. 0848-263 FIELD GEOLOGIST BCH

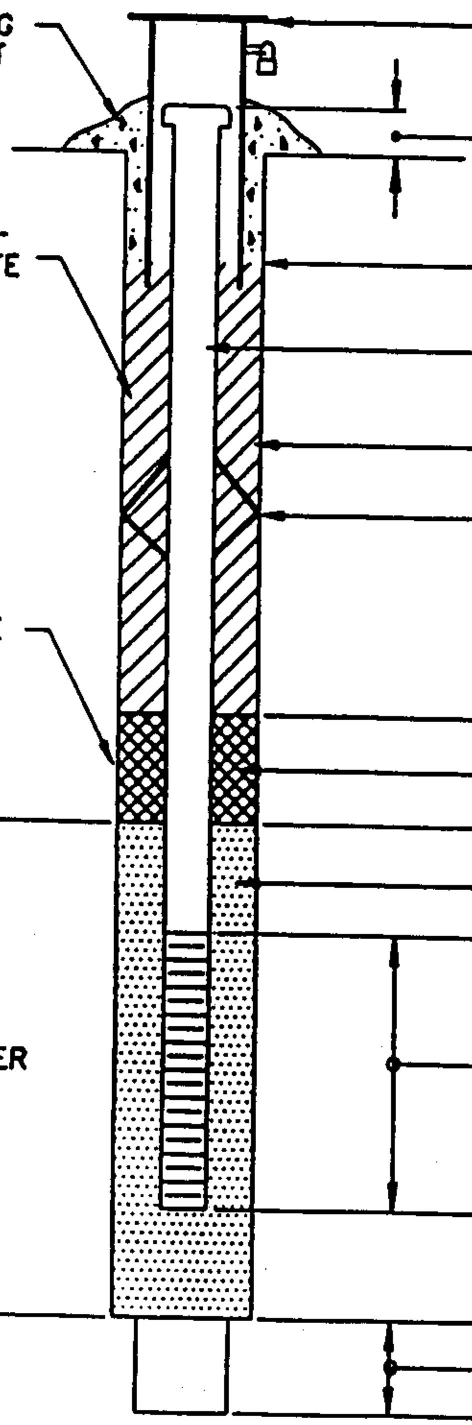
LOCATION Steel Manufacturing Site - Area I

DRILLING CO. SJB Drilling Services

DRILLER(S) Randy Steiner, Tony Jacubzak

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S) Disp. Poly. Bailer



SLOPING CEMENT PAD

CEMENT-BENTONITE GROUT

BENTONITE PELLET SEAL

SAND FILTER PACK

SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING 4", 5'

LOCKED? X YES __ NO

STICK-UP 2.5'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 2.0'

RISER DIAMETER AND MATERIAL 2" sch 40 PVC

BOREHOLE DIAMETER 8.25"

DEPTH TO CENTRALIZERS NA

DEPTH 9.0'

PELLET SIZE chips

DEPTH 12.0'

SAND SIZE Morie 0

DEPTH 13.0'

SCREEN DIAMETER, SLOT SIZE, AND MATERIAL 2", 0.010, sch 40 PVC

DEPTH 23.0'

DEPTH 23.0'

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 23.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 06-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. Al-P-1

PROJECT Supp. Field Inv. START DATE 3/16/98 END DATE 3/16/98

PROJECT NO. 0848-263 FIELD GEOLOGIST BCH

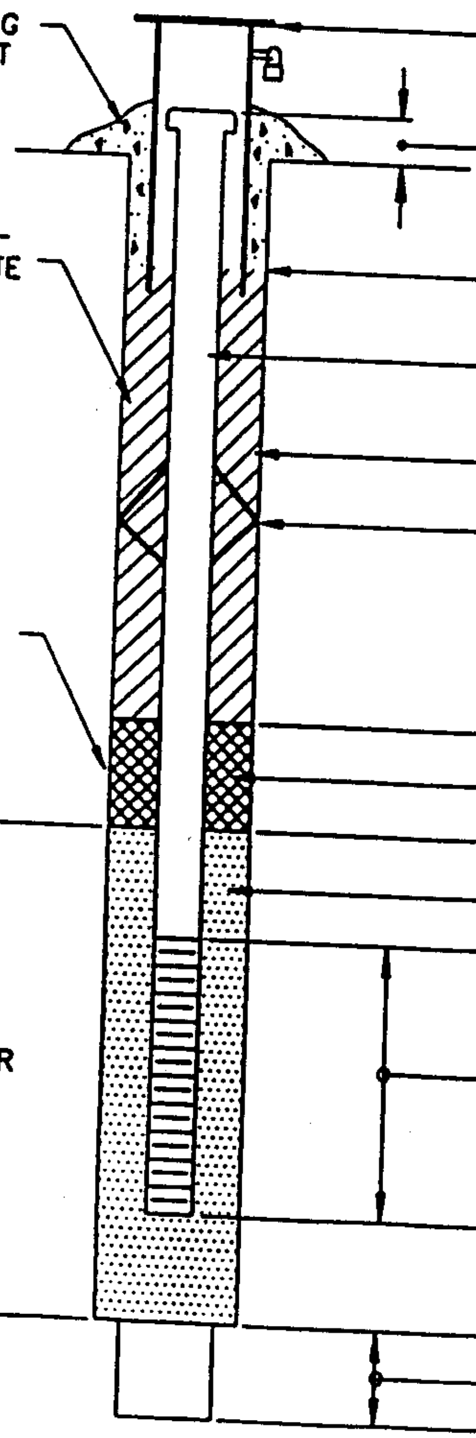
LOCATION Steel Manufacturing Site - Area I

DRILLING CO. SJB Drilling Service

DRILLER(S) Randy Steiner, Tony Jacubzak

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S) Disp. Poly. Bailer



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES __ NO J-Plug

STICK-UP 2.5'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 0.0'

RISER DIAMETER AND MATERIAL 2" PVC sch 40

BOREHOLE DIAMETER 8.25"

DEPTH TO CENTRALIZERS NA

DEPTH 6.0'

PELLET SIZE Chips

DEPTH 8.0'

SAND SIZE Morie 0

DEPTH 10.0'

SCREEN DIAMETER, SLOT SIZE, AND MATERIAL 2", 0.010, PVC sch 40

DEPTH 15.0'

DEPTH 15.0'

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 15.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

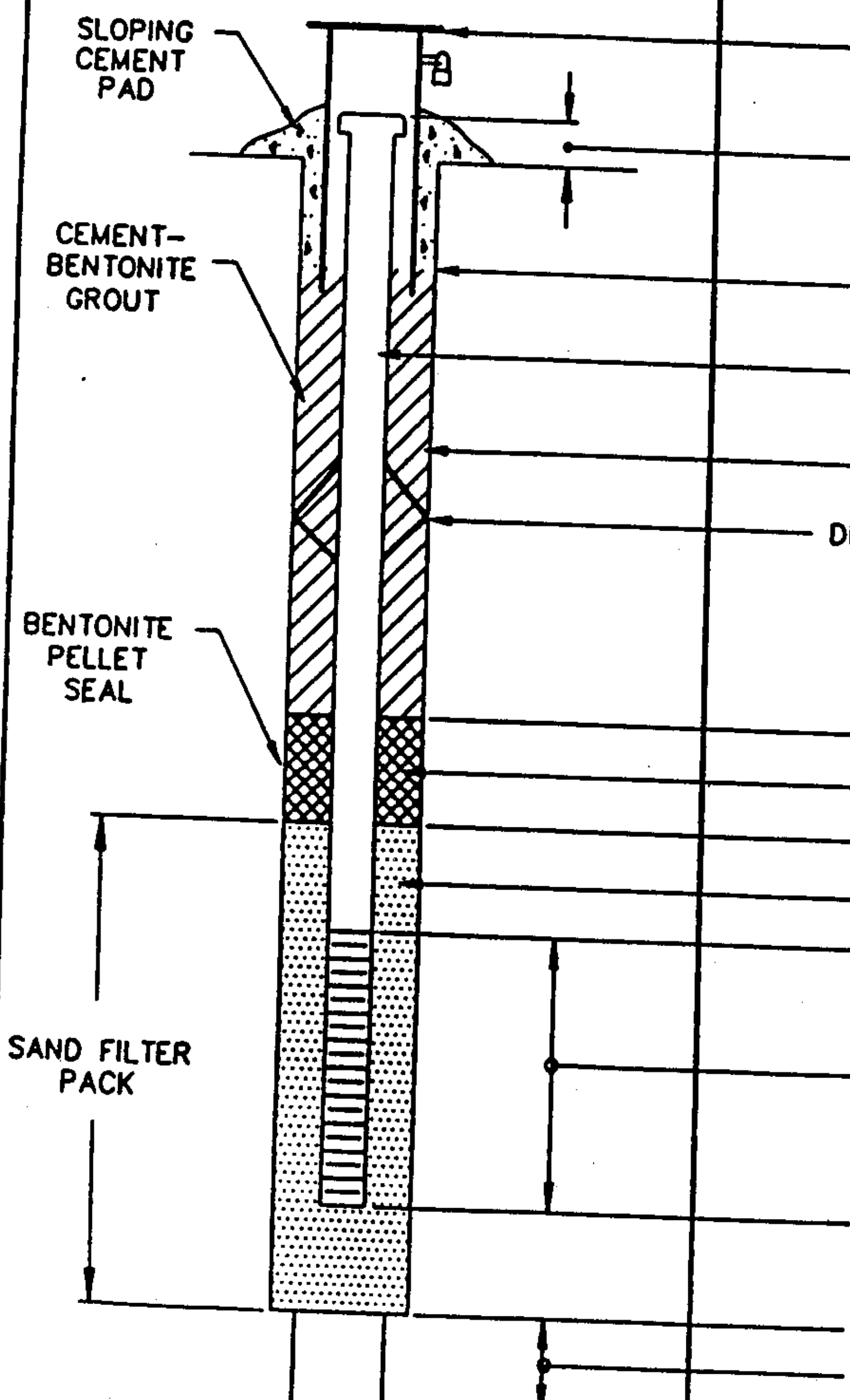
OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. Al-P-2

PROJECT Supp. Field Inv. START DATE 3/16/98 END DATE 3/16/98	DRILLING CO. SJB Drilling Services
PROJECT NO. 0848-263 FIELD GEOLOGIST BCH	DRILLER(S) Randy Steiner, Tony Jacubzak
	DRILLING METHOD(S) 4¼" HSA
LOCATION Steel Manufacturing Site - Area I	DEVELOPMENT METHOD(S) Disp. Poly. Bailer



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES __ NO J-plug

STICK-UP 2.5'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 0.0'

RISER DIAMETER AND MATERIAL 2" PVC sch 40

BOREHOLE DIAMETER 8.25"

DEPTH TO CENTRALIZERS NA

DEPTH 1.0'

PELLET SIZE Chips

DEPTH 2.0'

SAND SIZE Morie 0

DEPTH 3.0'

SCREEN DIAMETER, SLOT SIZE, AND MATERIAL 2", 0.010, PVC sch 40

DEPTH 8.0'

DEPTH 8.0'

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 8.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9 J-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. AI-P-3

PROJECT Supp. Field Inv. START DATE 3/18/98 END DATE 3/18/98

PROJECT NO. 0848-263 FIELD GEOLOGIST BCH

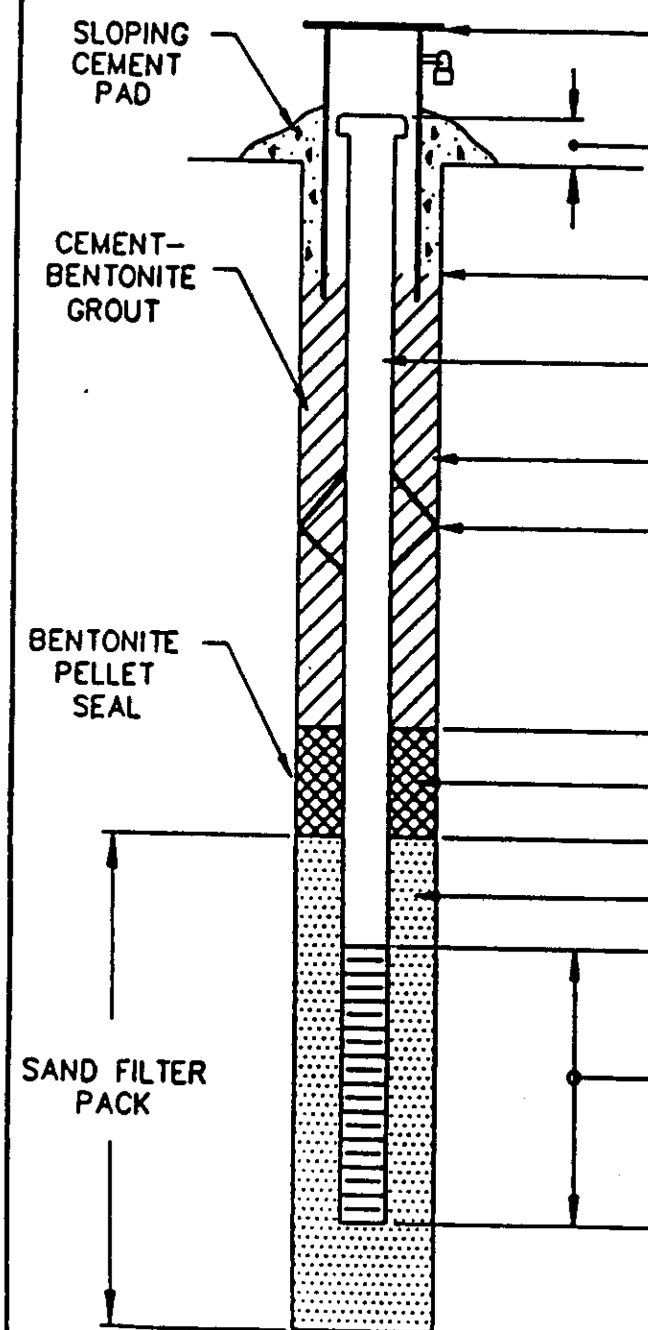
LOCATION Steel Manufacturing Site - Area I

DRILLING CO. SJB Drilling Services

DRILLER(S) Randy Steiner, Tony Jacubzak

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S) Disp. Poly. Bailer



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES ___ NO J-Plug

STICK-UP 2.5'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 0.0'

RISER DIAMETER AND MATERIAL 2" sch 40 PVC

BOREHOLE DIAMETER 8.25"

DEPTH TO CENTRALIZERS NA

DEPTH 3.0'

PELLET SIZE Chips

DEPTH 5.0'

SAND SIZE Morie 0

DEPTH 6.0'

SCREEN DIAMETER, SLOT SIZE, AND MATERIAL 2", 0.010, sch 40 PVC

DEPTH 11.0'

DEPTH 11.0'

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 11.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

OMWSHEET.DWG 9-20-90

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. Al-P-4

PROJECT Supp. Field Inv. START DATE 3/18/98 END DATE 3/18/98

PROJECT NO. 0848-263 FIELD GEOLOGIST BCH

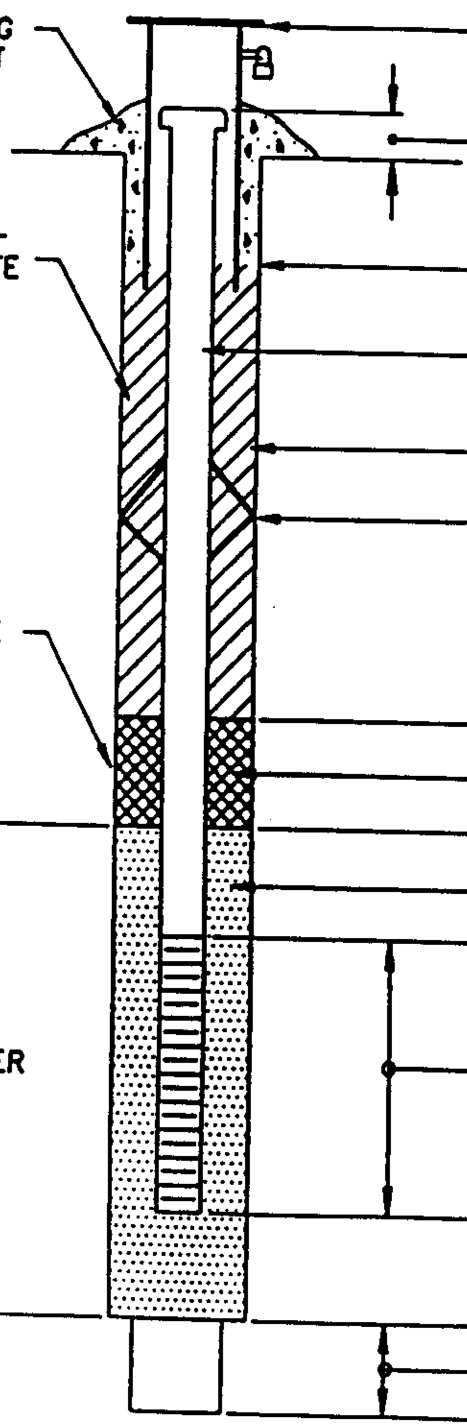
LOCATION Steel Manufacturing Site - Area I

DRILLING CO. SJB Drilling Services

DRILLER(S) Randy Steiner, Tony Jacubzak

DRILLING METHOD(S) 4¼" HSA

DEVELOPMENT METHOD(S) Disp. Poly. Bailer



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING NA

LOCKED? X YES __ NO J-Plug

STICK-UP 2.5'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 0.0'

RISER DIAMETER AND MATERIAL 2" PVC sch 40

BOREHOLE DIAMETER 8.25"

DEPTH TO CENTRALIZERS NA

DEPTH 2.0'

PELLET SIZE Chips

DEPTH 4.0'

SAND SIZE Morie 0

DEPTH 5.0'

SCREEN DIAMETER, SLOT SIZE, AND MATERIAL 2", 0.010, PVC sch40

DEPTH 15.0'

DEPTH 15.0'

BACKFILL MATERIAL NA

BOTTOM OF BOREHOLE 15.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

MWSHEET.DWG 9-20-90

FIELD BOREHOLE LOG

MALCOLM PIRNIE

Project Name: Supplimental Field Inv.	Surface Elev.:	Borehole No.: A1-MW-1	
Project No.: 0848-263	Reference Elev.:	Date Started: 3 /17/98	
Client: LTV Steel / Hanna Furnace Corp.	Contractor: SJB	Date Finished: 3 /17/98	
Location: Steel Manufacturing Site	Logged By: BCH	Method of Boring: 4¼" HSA	

Depth (BGS)	Sample No.	Blows (6")	Recovery	Soil Classification	Description and Remarks start: 9:50 end: 11:42 Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Samples	Moisture (%)	HNu (ppm) Scan	HNu (ppm) Headspace	
0		NA			augered to 5.0'					
		↓			FILL in cuttings					
4										
5		2	1.2		0.2 FILL - DK brown f. SAND and GRAVEL					5.5
		2			w/ slag, moist					NATIVE
6		2			1.0 DK grey CLAY and SILT, Fe stained					
		3			dess. dense, moist					
		WH	1.4		0.4 Same A/A, moist					
		1			0.3 same A/A, some PEAT w/ CLAY, moist					
8		2			0.7 DK grey CLAY and SILT, Fe stained dess.					
		4			moist, dense					
9		WH	1.5		0.5 Same A/A					
		1			0.1 Black Peat					
10		2			0.9 DK grey CLAY and SILT, dense, Fe Stained					
		3			dess. moist (stained lens @ 11') (water table?)					∇
11		1	1.3		0.4 Same A/A					
		2			0.2 DK grey f. SAND and GRAVEL, med. rounded GRAVEL, wet					
12		3			0.3 DK grey CLAY and SILT, Fe stained dess. moist					
		2			0.4 DK grey f. SAND and GRAVEL, med. rounded GRAVEL, wet					
13		3	1.1		0.2 DK grey CLAY and SILT, Fe stained dess.					
		4			0.9 DK grey f. SAND and GRAVEL w/ med rounded					
14		4			GRAVEL					
		5								
15		3	1.0		0.4 Same A/A, wet					
		3			0.5 DK brown f. SAND and SILT, occ. > 0.5" angular					
16		2			GRAVEL, wet					
		7								
					augered to 17.0'					
					Screen: 7.0 - 17.0 (10')					
					Sand: 5.0 - 17.0 (12')					
					Bentonite Pellets: 3.0 - 5.0 (2')					
					Bentonite grout: 0.0 - 3.0 (3')					
					Cement 0.0 - 1.0 (1')					
					Pro. Casing -2.5 - 2.5 (5')					
					riser: -2.5 - 7.0 (9.5')					

FIELD BOREHOLE LOG

MALCOLM PIRNIE

Project Name: Supplimental Field Inv.
Project No.: 0848-263
Client: LTV Steel / Hanna Furnace Corp.
Location: Steel Manufacturing Site

Surface Elev.:
Reference Elev.:
Contractor: SJB
Logged By: KCH

Borehole No.: A1-MW-2
Date Started: 3/17/98
Date Finished: 3/17/98
Method of Boring: 4¼" HSA

Depth (BGS)	Sample No.	Blows (6")	Recovery	Soil Classification	Description and Remarks start: 11:48 end: 13:41 Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Samples	Moisture (%)	HNu (ppm) Scan	HNu (ppm) Headspace
0		NA			augered 3.0'				
		↓			Cuttings - DK brown f. SAND and SILT w/ med rounded				
2					GRAVEL, moist.				
					FILL				
3		10	1.3		0.2 DK Brown f. SAND and GRAVEL, Some SILT				
		11			0.6 angular GRAVEL same A/A, Brown/tan				
4		12			0.7 DK Brown f. SAND and SILT w/ some				
		11			rounded GRAVEL, moist				
5		11	1.5		FILL - Lt grey to DK Brown f. SAND and SILT				
		21			w/ angular Slag, sulfur odor, moist -				
6		23			wet, dense				
		17							
7		1	0.9		FILL - Black f. SAND and SILT, tr. dk grey				
		1			CLAY, slag, organic odor, wet				
8		2			wood fragments				
		2			FILL				
9		2	1.2		Black f. SAND and GRAVEL, Some SILT,				
		3			tr. rounded GRAVEL, organic odor,				
10		15			sheen on spoon, dense, wet				
		18			wood fragments				
					augered to 11.0'				
					screen: 6.0 - 11.0 (5')				
					riser: -2.5 - 6.0 (8.5')				
					sand: 5.0 - 11.0 (6')				
					Bentonite Pellets: 3.0 - 5.0 (2')				
					Bentonite Grout: 0.0 - 3.0 (3')				
					Cement: 0.0 - 1.0 (1')				
					Pro. Casing: -2.5 - 2.5 (5')				

FIELD BOREHOLE LOG

MALCOLM PIRNIE

Project Name: Supplimental Field Inv.	Surface Elev.:	Borehole No.: AI-MW-3	
Project No.: 0848-263	Reference Elev.:	Date Started: 3/17/98	
Client: LTV Steel / Hanna Furnace Corp.	Contractor: SJB	Date Finished: 3/17/98	
Location: Steel Manufacturing Site	Logged By: BCH	Method of Boring: 4 1/4" HSA	

start: 13:48
end: 16:17

Depth (BGS)	Sample No.	Blows (6"	Recovery	Soil Classification	Description and Remarks — Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Samples	Moisture (%)	HNu (ppm) Scan	HNu (ppm) Headspace
0		NA			augered 3.0'				
2		↓							
3		8	1.1		FILL- DK brown / DK grey f. SAND and GRAVEL w/ SLAG, bricks, moist, dense				
		7							
4		6							
		5							
5		6	0.5		FILL- Lt grey Slag w/ f. SAND and GRAVEL, moist				
		5							
6		6							
		9							
7		3	0.8		Same A/A, moist-wet				
		3							
8		3							
		3							
9		3	0.9		Same A/A, moist-wet				
		3							
10		2							
		3							
11		1	0.0		no recovery				
		2							
12		1							
		WH							
13		1	0.4		Lt grey Slag w/ tr. f. SAND and GRAVEL, wet				
		2							
14		2							
		1							
15		WH	0.0		no recovery, wet				
		2							
16		2							
		1							
17		WH	1.9		DK grey f. SAND and SILT, tr. CLAY w/ Fe stained dess. (0.2') occ. Peat lens (Fluvial deposit) grading to f. SAND w/ tr. Peat., wet				
		1							
18		1							
		1							

17.0
NATIVE

FIELD BOREHOLE LOG

MALCOLM PIRNIE

Project Name: Supplimental Field Inv.	Surface Elev.:	Borehole No.: A1-MW-3
Project No.: 0848-263	Reference Elev.:	Date Started: 3/17/98
Client: LTV Steel / Hanna Furnace Corp.	Contractor: SJB	Date Finished: 3/17/98
Location: Steel Manufacturing Site	Logged By: BCH	Method of Boring: 4 1/4" HSA

Depth (BGS)	Sample No.	Blows (6"	Recovery	Soil Classification	Description and Remarks Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Samples	Moisture (%)	HNu (ppm) Scan	HNu (ppm) Headspace
19		WH	1.7		Same A/A moist - wet				
		1			f. SAND and SILT				
20		WH							
		2							
21		WH	1.8		Dk gray f. SAND, tr. SILT, wet				
		WH							
22		WH							
		1							
					augered to 23.0'				
					screen: 13.0 - 23.0 (10')				
					Sand: 12.0 - 23.0 (11')				
					Bentonite Pellets: 9.0 - 12.0 (3')				
					riser: -2.5 - 13.0 (15.5)				
					Bentonite Grout: 0.0 - 9.0 (9.0')				
					Cement: 0.0 - 2.0 (2')				
					Pro. Casing: -2.5 - 2.5 (5')				

FIELD BOREHOLE LOG

MALCOLM PIRNIE

Project Name:	Supplimental Field Inv.	Surface Elev.:		Borehole No.:	A1-P-1
Project No.:	0848-263	Reference Elev.:		Date Started:	3/16/98
Client:	LTV Steel / Hanna Furnace Corp.	Contractor:	SJB	Date Finished:	3/16/98
Location:	Steel Manufacturing Site	Logged By:	BCH	Method of Boring:	4 1/4" HSA

Depth (BGS)	Sample No.	Blows (6")	Recovery	Soil Classification	Description and Remarks Start: 11:42 end: 14:00 Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Samples	Moisture (%)	HNu (ppm) Scan	HNu (ppm) Headspace
0		NA			augered 3.0'				
2		↓							
3		6	1.6		FILL - Black, dk grey f. SAND, coarse Slag,				
		9			furnace brick, wood, dense, moist,				
4		15			tr. coke				
		14							
5		6	1.0		FILL - same A/A, moist, dense				
		19							
6		14							
		13							
7		6	1.1		FILL - same A/A, piece of metal, dense, moist				
		11							
8		14							
		13							
9		4	0.8		FILL - same A/A, furnace brick				
		7							
10		7							
		10							
11		4	1.0		0.2 Black f. SAND and GRAVEL (Slag?), wet				
		5			0.8 DK Grey CLAY and SILT w/ Fe stained diss				
12		2			Some black organic SILT, slight sheen on				
		2			spoon				
13		4	1.3		0.3 Black f. SAND and SILT, sheen, wet				
		11			1.0 Lt. grey SLAG				
14		13							
		20							
					augered to 15.0'				
					screen: 10.0 - 15.0' (5')				
					Sand: 8.0 - 15.0' (7')				
					riser: -2.5 - 10.0' (12.5')				
					bentonite pellets: 6.0 - 8.0 (2.0)				
					bentonite grout: 0.0 - 6.0 (6.0)				
					cement: 0.0 - 1.0 (1.0)				
					locked J-plug (1)				

11.5 NATIVE?

FIELD BOREHOLE LOG

MALCOLM PIRNIE

Project Name: Supplimental Field Inv.	Surface Elev.:	Borehole No.: A1-P-2
Project No.: 0848-263	Reference Elev.:	Date Started: 3/16/98
Client: LTV Steel / Hanna Furnace Corp.	Contractor: SJB	Date Finished: 3/16/98
Location: Steel Manufacturing Site	Logged By: JCH	Method of Boring: 4¼" HSA

Depth (BGS)	Sample No.	Blows (6")	Recovery	Soil Classification	Description and Remarks start: 14:30 end: 15:30 Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Samples	Moisture (%)	HNu (ppm) Scan	HNu (ppm) Headspace
0		NA			augered to 3.0'				
2		↓							
3		18	1.2		FILL - 0.2 Dk Brown f. SAND and rounded GRAVEL				
		19			0.4 Black f. SAND and SILT, med. GRAVEL, organic odor				
4		23			0.6 DK grey SLAG w/ f. SAND, wet				
		12			dense				
5		5	0.0		No recovery				
		3			Sl. Sheen on spoon, wet				
6		3			organic odor				
		5							
7		4	1.4		0.2 Black f. SAND and SILT, creosote odor,				
		4			sheen, wet				
8		5			1.2 DK grey CLAY and SILT w/ Fe stained dess.				
		10			dense, moist				

7.5 NATIVE

augered to 8.0'
screen: 3.0 - 8.0 (5')
riser: -2.5 - 3.0 (5.5')
sand: 2.0 - 8.0 (6')
Bentonite pellets: 1.0-2.0 (1')
Bentonite Grout: 0.0 - 1.0 (1')
locked J-plug (1)

MALCOLM PIRNIE

FIELD BOREHOLE LOG

Project Name: Supplimental Field Inv.
Project No.: 0848-263
Client: LTV Steel / Hanna Furnace Corp.
Location: Steel Manufacturing Site

Surface Elev.:
Reference Elev.:
Contractor: SJB
Logged By: BCH

Borehole No.: A1-P-3
Date Started: 3/18/98
Date Finished: 3/18/98
Method of Boring: 4 1/4" HSA

start: 10:45
end: 12:00

Depth (BGS)	Sample No.	Blows (6")	Recovery	Soil Classification	Description and Remarks (Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics)	Samples	Moisture (%)	HNu (ppm) Scan	HNu (ppm) Headspace
0		NA			augered 3.0'				
2		↓							
					FILL				
3		7	1.5		0.2 Lt grey concrete				
		5			1.3 DK brown/black f. SAND and GRAVEL,				
4		4			med sized slag, Fe stained, some				
		2			dk brown CLAY, moist				
5		2	1.2		FILL - DK brown CLAY and SILT w/ Black				
		1			angular slag, coal, tr. Fe fragments,				
6		WH			Moist				
		WH							
7		3	0.0		no recovery - wet				
		2							
8		1							
		2							
9		WH	1.5		0.2 Black Peat, wet				
		3			1.3 DK grey CLAY and SILT, Fe stained dess.,				
10		2			dense, moist				
		2							

9.0
NATIVE

augered to 11.0'
screen: 6.0 - 11.0 (5')
sand: 5.0 - 11.0 (6')
riser: -2.5 - 6 (8.5')
Bentonite Pellets: 3.0 - 5.0 (2')
Bentonite Grout: 0.0 - 3.0 (3')
J-plug w/ lock

FIELD BOREHOLE LOG

MALCOLM PIRNIE

Project Name:	Supplimental Field Inv.	Surface Elev.:		Borehole No.:	A1-P-4
Project No.:	0848-263	Reference Elev.:		Date Started:	3/18/98
Client:	LTV Steel / Hanna Furnace Corp.	Contractor:	SJB	Date Finished:	3/18/98
Location:	Steel Manufacturing Site	Logged By:	BCH	Method of Boring:	4 1/4" HSA

Depth (BGS)	Sample No.	Blows (6")	Recovery	Soil Classification	Description and Remarks (start: 9:05 end: 10:40) Density/Consistency, Color, Plasticity, Soil Types, Texture, Fabric, Bedding, Moisture, Other Characteristics	Samples	Moisture (%)	HNu (ppm) Scan	HNu (ppm) Headspace
0		NA			augered 3.0'				
2									
					FILL				
3		30	1.5		0.1 DK brown f. SAND and GRAVEL (rounded), moist				
		27			1.0 DK greenish blue Slag, some f. SAND, sulfur odor, moist				
4		7			0.4 DK brown CLAY and SILT, tr. f. SAND,				
		3			moist				
5		2	1.4		0.1 same A/A				
		2			0.6 same A/A w/ greenish blue Slag				
6		3			0.7 DK ~~brown~~ brown SILT w/ some CLAY, some				
		4			Fe stained dess. - tr. grey SILT and CLAY, moist				
7		1	1.8		0.2 same A/A, moist				
		2			1.6 DK brown CLAY and SILT grading to DK				
8		4			grey CLAY and SILT, Fe stained dess.,				
		5			moist				
9		2	2.0		DK grey CLAY and SILT w/ Fe stained				
		4			dess., moist				
10		4							
		6							
11		1	1.9		0.2 same A/A				
		2			1.7 DK grey f. SAND and SILT, some CLAY				
12		3			Fe stained dess., moist - wet				
		1							
13		WH	1.9		0.6 Same A/A, moist				
		WH			0.5 DK grey f. SAND, some SILT, wet				
14		WH			0.8 DK grey f. SAND and SILT, some CLAY,				
		WH			Fe stained dess., moist - wet				

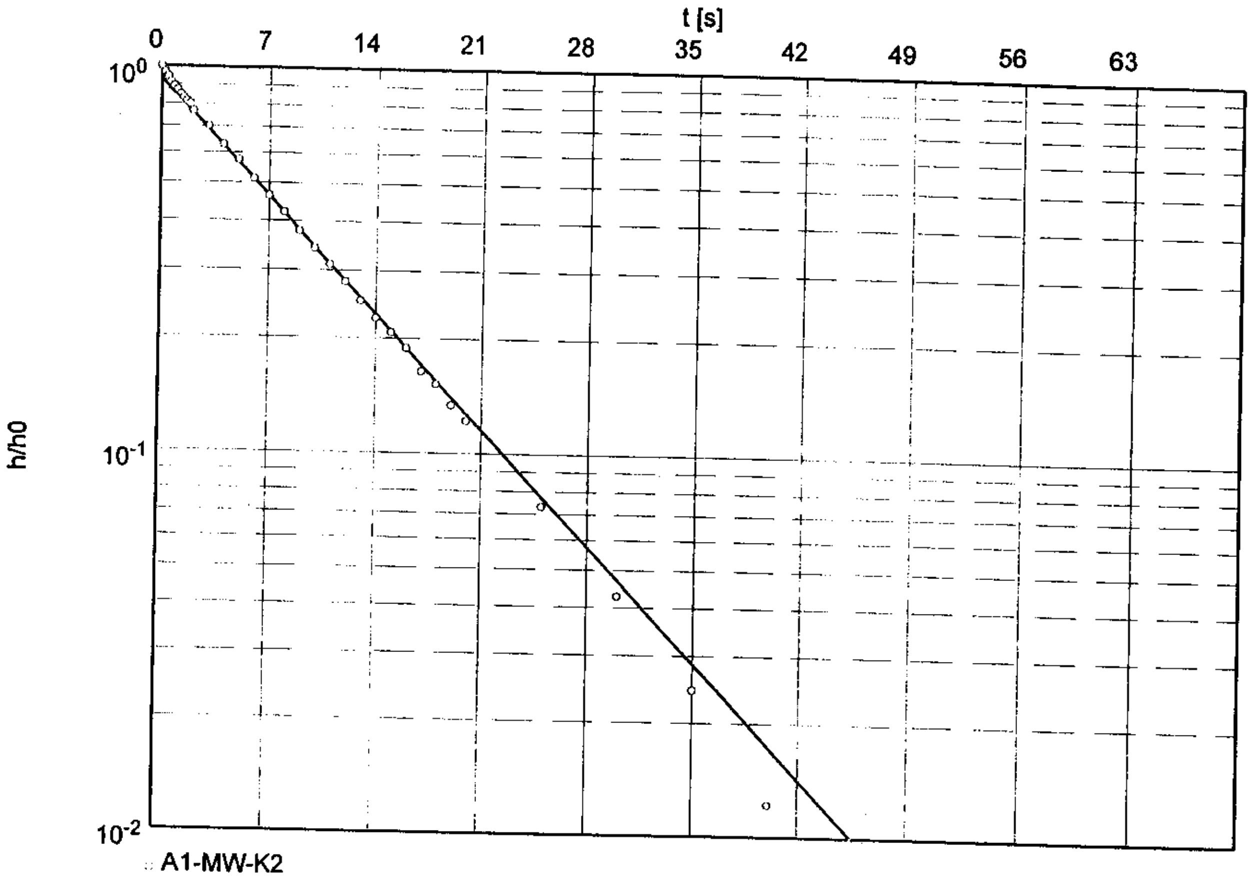
4.0 NATIVE

augered to 15.0
screen: 5.0 - 15.0 (10')
Sand: 4.0 - 15.0 (11')
riser: -2.5 - 5.0 (7.5')
Bentonite Pellets: 2.0 - 4.0 (2')
Bentonite Grout: 0.0 - 2.0 (2')
J-Plug w/ lock

Appendix F
Slug Testing Data and Graphs

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 1 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA — Date: 21.04.1998

Slug Test No.	Test conducted on: March 25, 1998
A1-MW-K2	



Hydraulic conductivity [ft/s]: 9.40×10^{-4}

Hydraulic conductivity [cm/s]: 2.9 E-02

b=6.59 ft
L=5.0 ft
r=0.184 ft
R=0.344 ft

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 2 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA — Date: 21.04.1998

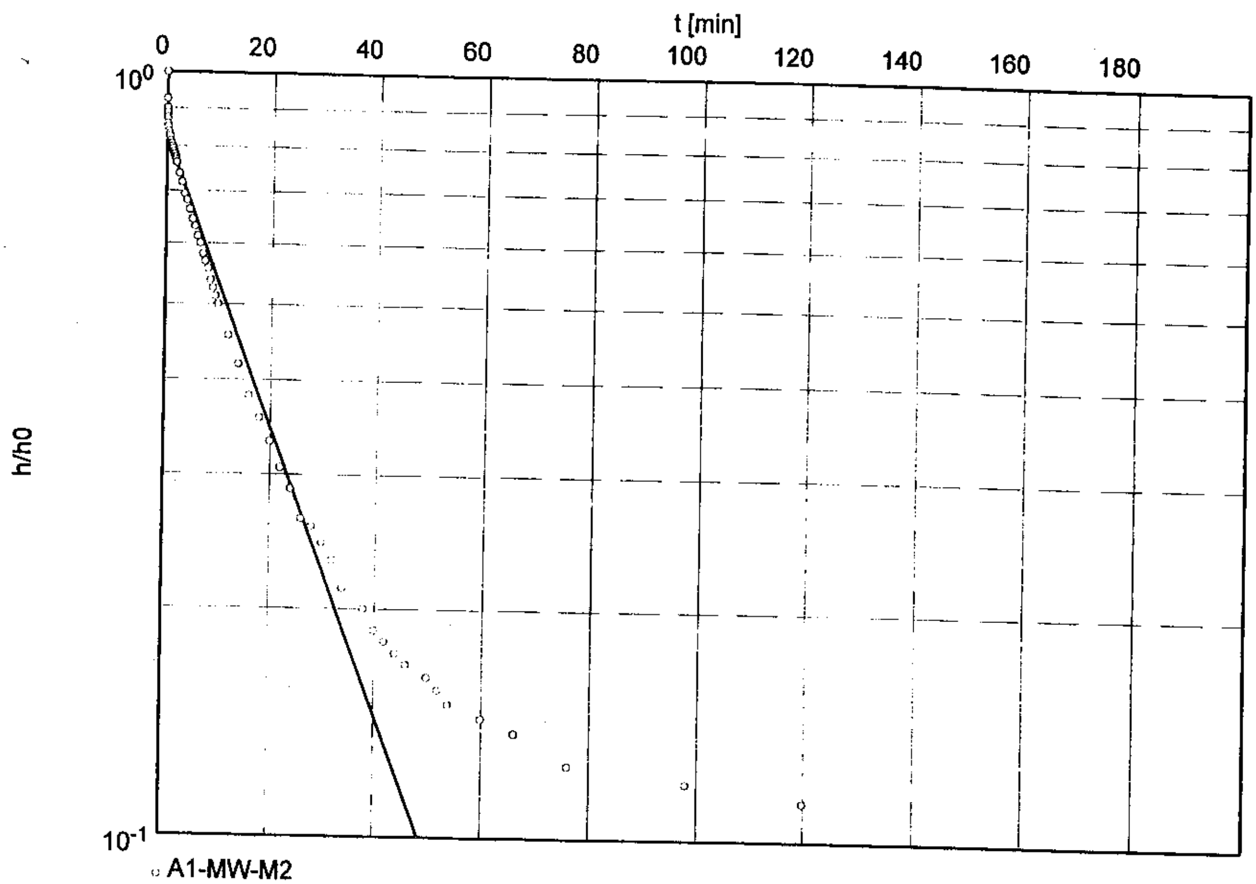
Slug Test No.	Test conducted on: March 25, 1998
A1-MW-K2	A1-MW-K2

Static water level: 6.14 ft below datum

	Pumping test duration [s]	Water level [ft]	Drawdown [ft]
1	0	7.78	1.64
2	0	7.72	1.58
3	0	7.68	1.54
4	1	7.63	1.49
5	1	7.60	1.46
6	1	7.57	1.43
7	1	7.53	1.39
8	1	7.50	1.36
9	2	7.47	1.33
10	2	7.45	1.31
11	2	7.40	1.26
12	3	7.29	1.15
13	4	7.17	1.03
14	5	7.08	0.94
15	6	6.98	0.84
16	7	6.90	0.76
17	8	6.83	0.69
18	9	6.76	0.62
19	10	6.70	0.56
20	11	6.65	0.51
21	12	6.60	0.46
22	13	6.55	0.41
23	14	6.51	0.37
24	15	6.48	0.34
25	16	6.45	0.31
26	17	6.41	0.27
27	18	6.39	0.25
28	19	6.36	0.22
29	20	6.34	0.20
30	25	6.26	0.12
31	30	6.21	0.07
32	35	6.18	0.04
33	40	6.16	0.02
34	50	6.14	0.00

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 1
		Project: Plant Site Supp. Field Inv.
		Evaluated by: JMA — Date: 22.04.1998

Slug Test No.	Test conducted on: April 7, 1998
A1-MW-M2	



Hydraulic conductivity [ft/min]: 8.25×10^{-5}

Hydraulic conductivity [cm/s]: 4.2 E-05

b=7.94 ft
L=5.0 ft
r=0.083 ft
R=0.344 ft

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 2 Project: Plant Site Supp. Field Inv. Evaluated by: JMA Date: 22.04.1998

Slug Test No.	Test conducted on: April 7, 1998
A1-MW-M2	A1-MW-M2

Static water level: 6.86 ft below datum

	Pumping test duration [min]	Water level [ft]	Drawdown [ft]	
1	0.00	8.46	1.60	
2	0.02	8.34	1.48	
3	0.03	8.30	1.44	
4	0.05	8.28	1.42	
5	0.08	8.26	1.40	
6	0.10	8.25	1.39	
7	0.13	8.23	1.37	
8	0.20	8.22	1.36	
9	0.30	8.20	1.34	
10	0.47	8.19	1.33	
11	0.55	8.18	1.32	
12	0.72	8.16	1.30	
13	0.88	8.15	1.29	
14	1.05	8.14	1.28	
15	1.13	8.13	1.27	
16	1.30	8.12	1.26	
17	1.38	8.11	1.25	
18	1.63	8.10	1.24	
19	1.72	8.09	1.23	
20	1.80	8.08	1.22	
21	2.38	8.04	1.18	
22	2.88	8.01	1.15	
23	3.38	7.97	1.11	
24	3.88	7.95	1.09	
25	4.38	7.92	1.06	
26	4.88	7.89	1.03	
27	5.38	7.87	1.01	
28	5.88	7.84	0.98	
29	6.38	7.82	0.96	
30	6.88	7.79	0.93	
31	7.38	7.77	0.91	
32	7.88	7.75	0.89	
33	8.38	7.72	0.86	
34	8.88	7.70	0.84	
35	9.38	7.68	0.82	
36	9.88	7.66	0.80	
37	11.88	7.59	0.73	
38	13.88	7.53	0.67	
39	15.88	7.47	0.61	
40	17.88	7.43	0.57	
41	19.88	7.39	0.53	
42	21.88	7.35	0.49	
43	23.88	7.32	0.46	
44	25.88	7.28	0.42	
45	27.88	7.27	0.41	
46	29.88	7.25	0.39	
47	31.88	7.23	0.37	
48	33.88	7.20	0.34	
49	37.88	7.18	0.32	
50	39.88	7.16	0.30	

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 3 Project: Plant Site Supp. Field Inv. Evaluated by: JMA / Date: 22.04.1998

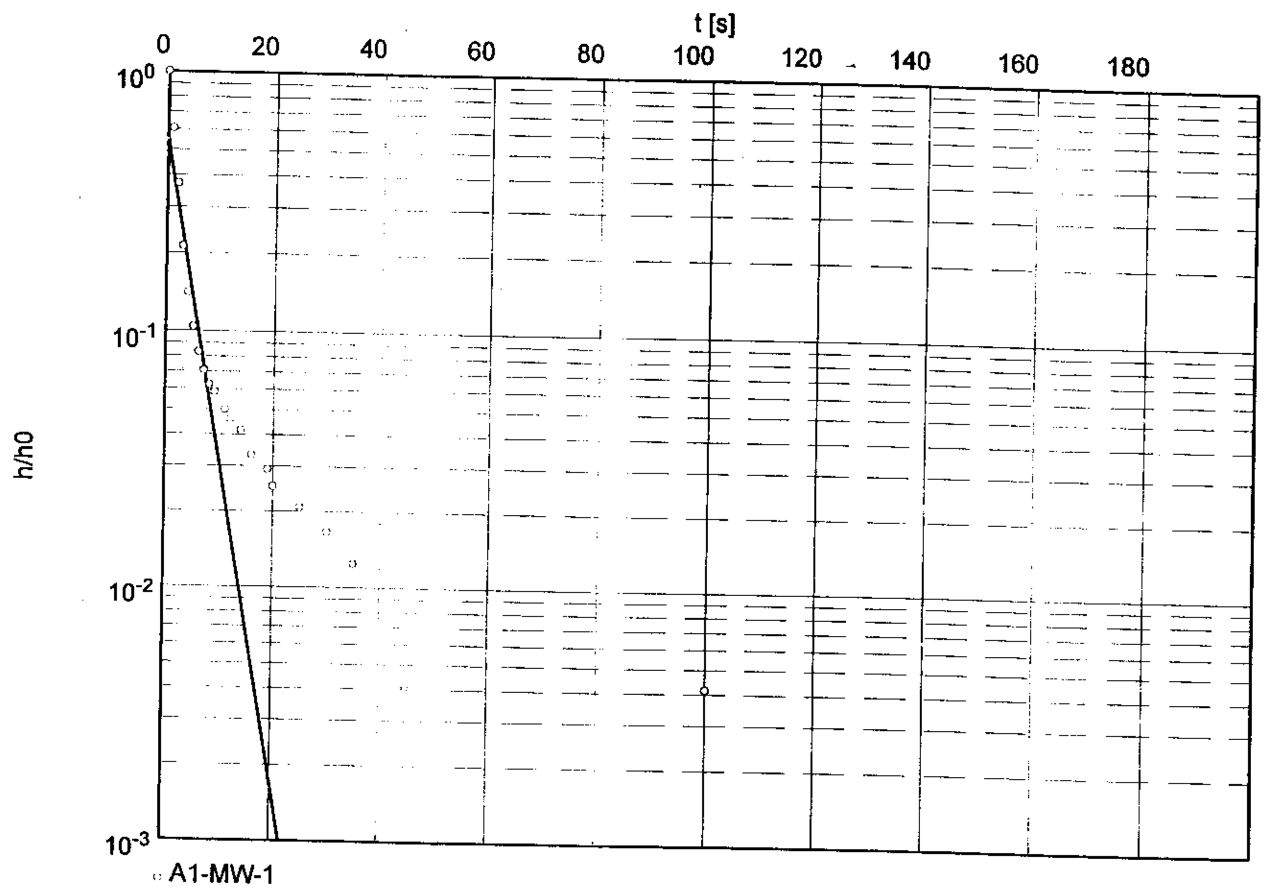
Slug Test No.	Test conducted on: April 7, 1998
A1-MW-M2	A1-MW-M2

Static water level: 6.86 ft below datum

	Pumping test duration [min]	Water level [ft]	Drawdown [ft]	
51	41.88	7.15	0.29	
52	43.88	7.14	0.28	
53	45.88	7.13	0.27	
54	49.88	7.12	0.26	
55	51.88	7.11	0.25	
56	53.88	7.10	0.24	
57	59.88	7.09	0.23	
58	65.88	7.08	0.22	
59	75.88	7.06	0.20	
60	97.88	7.05	0.19	
61	119.88	7.04	0.18	

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 1 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA | Date: 17.04.1998

Slug Test No.	Test conducted on: March 25, 1998
A1-MW-1	



Hydraulic conductivity [ft/s]: 1.55×10^{-3}

Hydraulic conductivity [cm/s]: 4.7 E-02

b=9.84 ft
L=9.84 ft
r=0.184 ft
R=0.344 ft

Malcolm Pirnie, Inc.
40 Centre Drive
Orchard Park, NY 14127
Phone (716) 667-0900

slug/bail test analysis
BOUWER-RICE's method

LTV Steel Invest. Report, Page 2

Project: Plant Site Suppl. Field Inv.

Evaluated by: JMA | Date: 17.04.1998

Slug Test No. A1-MW-1

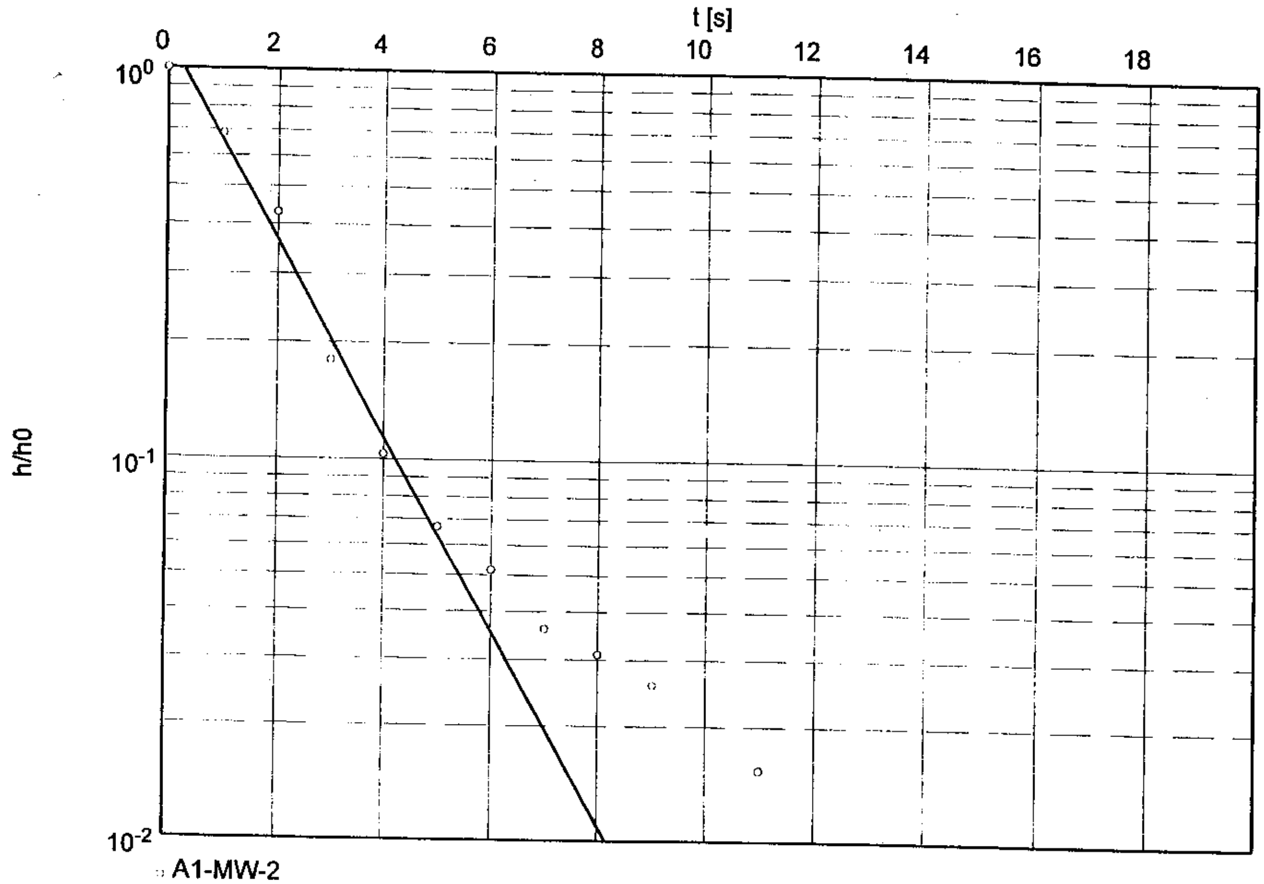
Test conducted on: March 25, 1998

A1-MW-1

Static water level: 9.71 ft below datum

	Pumping test duration [s]	Water level [ft]	Drawdown [ft]	
1	0	12.11	2.40	
2	1	11.16	1.45	
3	2	10.60	0.89	
4	3	10.22	0.51	
5	4	10.05	0.34	
6	5	9.96	0.25	
7	6	9.91	0.20	
8	7	9.88	0.17	
9	8	9.86	0.15	
10	9	9.85	0.14	
11	11	9.83	0.12	
12	12	9.82	0.11	
13	14	9.81	0.10	
14	16	9.79	0.08	
15	19	9.78	0.07	
16	20	9.77	0.06	
17	25	9.76	0.05	
18	30	9.75	0.04	
19	35	9.74	0.03	
20	45	9.72	0.01	
21	65	9.71	0.00	
22	100	9.70	-0.01	

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 1
		Project: Plant Site Suppl. Field Inv.
		Evaluated by: JMA — Date: 21.04.1998
Slug Test No.	Test conducted on: March 25, 1998	
A1-MW-2		



Hydraulic conductivity [ft/s]: 5.07×10^{-3}

Hydraulic conductivity [cm/s]: 1.5 E-01

b=5.16 ft
L=5 ft
r=0.184 ft
R=0.344 ft

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 2 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA — Date: 21.04.1998

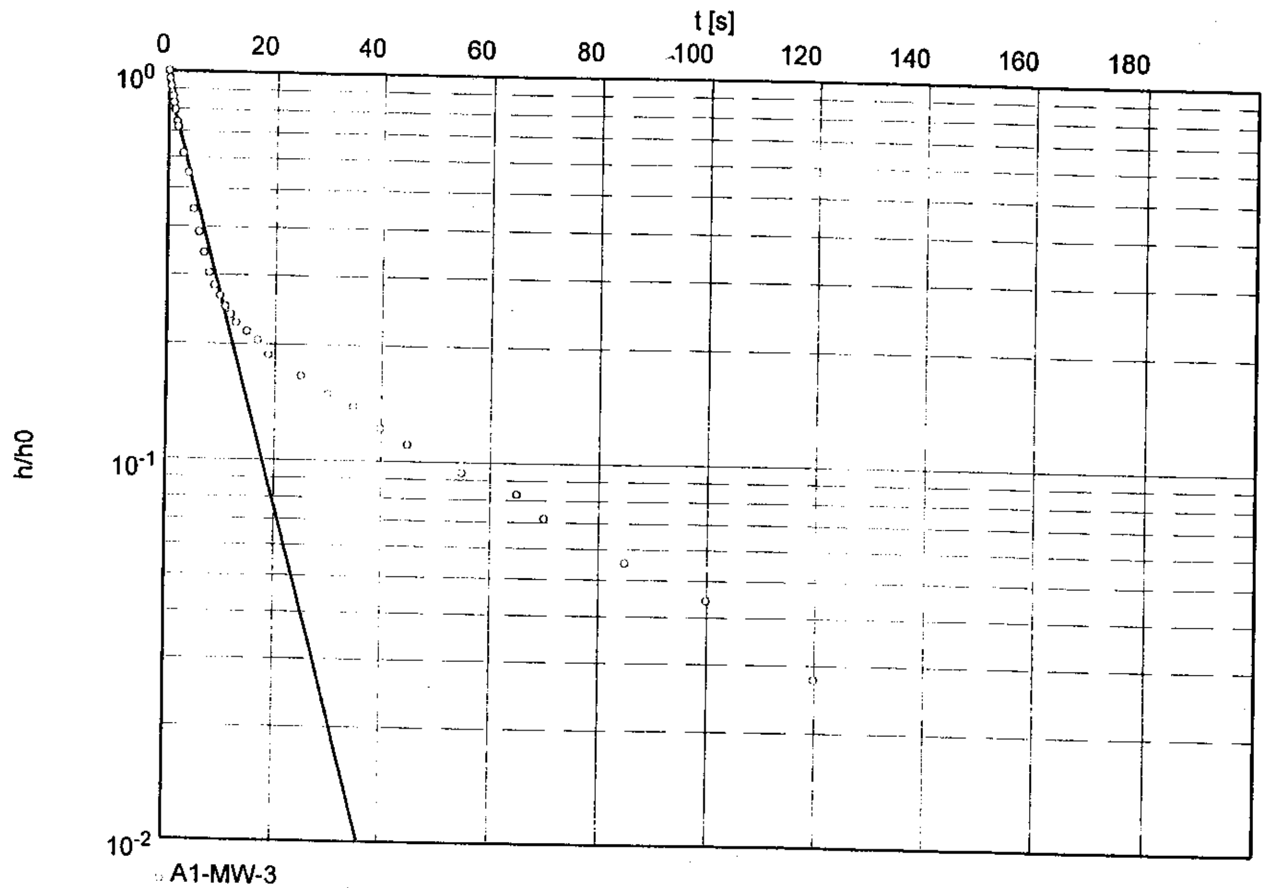
Slug Test No.	Test conducted on: March 25, 1998
A1-MW-2	A1-MW-2

Static water level: 7.50 ft below datum

	Pumping test duration [s]	Water level [ft]	Drawdown [ft]	
1	0	9.44	1.94	
2	1	8.83	1.33	
3	2	8.33	0.83	
4	3	7.85	0.35	
5	4	7.70	0.20	
6	5	7.63	0.13	
7	6	7.60	0.10	
8	7	7.57	0.07	
9	8	7.56	0.06	
10	9	7.55	0.05	
11	11	7.53	0.03	
12	19	7.50	0.00	

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 1 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA / Date: 21.04.1998

Slug Test No.	Test conducted on: March 25, 1998
A1-MW-3	



Hydraulic conductivity [ft/s]: 1.35×10^{-4}

Hydraulic conductivity [cm/s]: 4.1 E-03

b=8.98 ft
L=8.98 ft
r=0.083 ft
R=0.344 ft

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 2 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA — Date: 21.04.1998

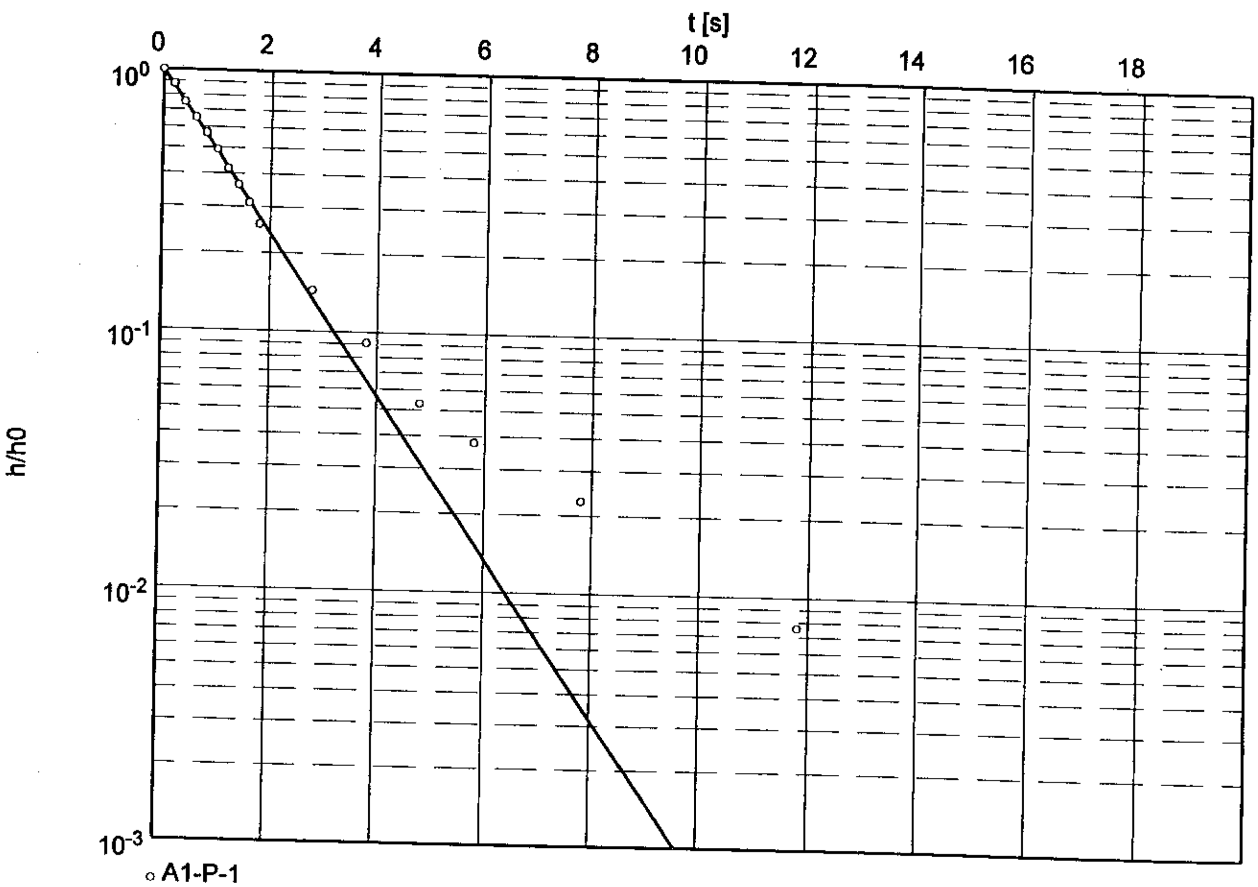
Slug Test No.	Test conducted on: March 25, 1998
A1-MW-3	A1-MW-3

Static water level: 16.69 ft below datum

	Pumping test duration [s]	Water level [ft]	Drawdown [ft]	
1	0	18.50	1.81	
2	0	18.42	1.73	
3	0	18.35	1.66	
4	1	18.28	1.59	
5	1	18.25	1.56	
6	1	18.19	1.50	
7	1	18.13	1.44	
8	2	18.03	1.34	
9	2	17.99	1.30	
10	3	17.80	1.11	
11	4	17.68	0.99	
12	5	17.49	0.80	
13	6	17.39	0.70	
14	7	17.31	0.62	
15	8	17.24	0.55	
16	9	17.20	0.51	
17	10	17.17	0.48	
18	11	17.14	0.45	
19	12	17.12	0.43	
20	13	17.10	0.41	
21	15	17.08	0.39	
22	17	17.06	0.37	
23	19	17.03	0.34	
24	25	16.99	0.30	
25	30	16.96	0.27	
26	35	16.94	0.25	
27	40	16.91	0.22	
28	45	16.89	0.20	
29	55	16.86	0.17	
30	65	16.84	0.15	
31	70	16.82	0.13	
32	85	16.79	0.10	
33	100	16.77	0.08	
34	120	16.74	0.05	

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 1 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA Date: 21.04.1998

Slug Test No.	Test conducted on: March 25, 1998
A1-P-1	



Hydraulic conductivity [ft/s]: 6.92×10^{-3}

Hydraulic conductivity [cm/s]: 2.1 E-01

b=4.4 ft
L=4.4 ft
r=0.184 ft
R=0.344 ft

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 2 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA	Date: 21.04.1998

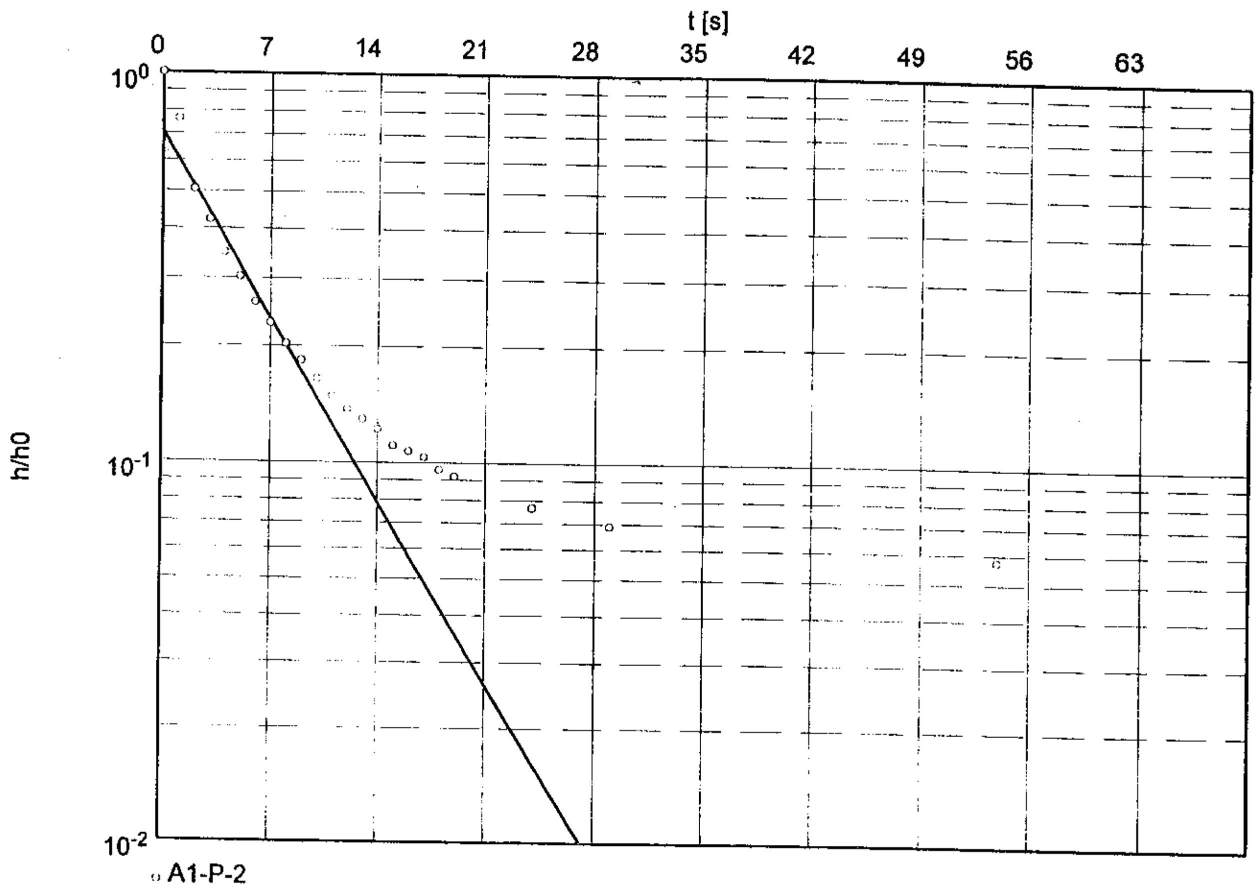
Slug Test No.	Test conducted on: March 25, 1998
A1-P-1	A1-P-1

Static water level: 13.06 ft below datum

	Pumping test duration [s]	Water level [ft]	Drawdown [ft]	
1	0	14.38	1.32	
2	0	14.22	1.16	
3	0	14.05	0.99	
4	1	13.92	0.86	
5	1	13.81	0.75	
6	1	13.71	0.65	
7	1	13.61	0.55	
8	1	13.54	0.48	
9	2	13.47	0.41	
10	2	13.40	0.34	
11	3	13.25	0.19	
12	4	13.18	0.12	
13	5	13.13	0.07	
14	6	13.11	0.05	
15	8	13.09	0.03	
16	12	13.07	0.01	

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 1 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA Date: 21.04.1998

Slug Test No.	Test conducted on: March 25, 1998
A1-P-2	



Hydraulic conductivity [ft/s]: 1.42×10^{-3}

Hydraulic conductivity [cm/s]: 4.3 E-02

b=5.88 ft
L=5 ft
r=0.184 ft
R=0.344 ft

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 2 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA — Date: 21.04.1998

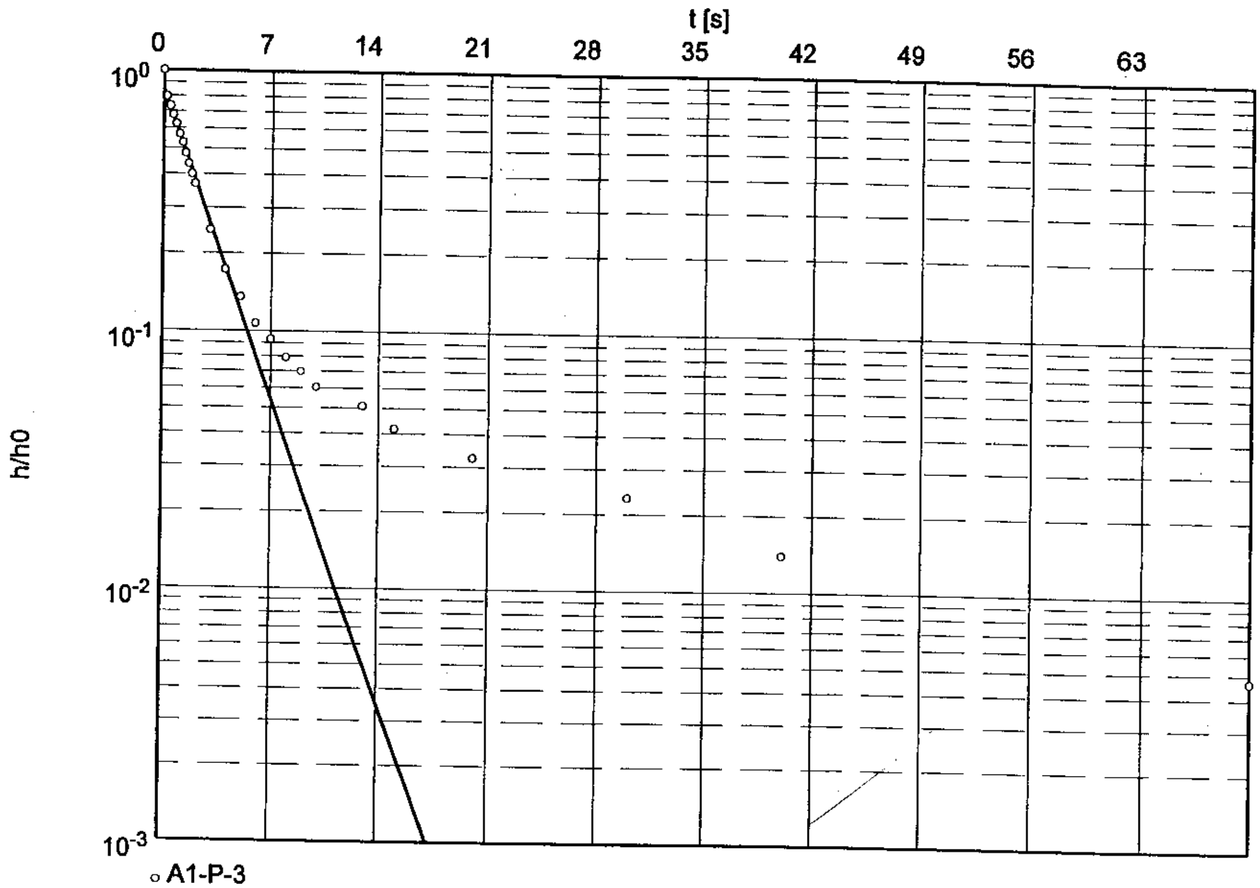
Slug Test No.	Test conducted on: March 25, 1998
A1-P-2	A1-P-2

Static water level: 4.92 ft below datum

	Pumping test duration [s]	Water level [ft]	Drawdown [ft]	
1	0	7.53	2.61	
2	1	6.91	1.99	
3	2	6.24	1.32	
4	3	6.02	1.10	
5	4	5.83	0.91	
6	5	5.71	0.79	
7	6	5.60	0.68	
8	7	5.52	0.60	
9	8	5.45	0.53	
10	9	5.40	0.48	
11	10	5.35	0.43	
12	11	5.31	0.39	
13	12	5.28	0.36	
14	13	5.26	0.34	
15	14	5.24	0.32	
16	15	5.21	0.29	
17	16	5.20	0.28	
18	17	5.19	0.27	
19	18	5.17	0.25	
20	19	5.16	0.24	
21	24	5.12	0.20	
22	29	5.10	0.18	
23	54	5.07	0.15	

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 1 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA — Date: 21.04.1998

Slug Test No.	Test conducted on: March 25, 1998
A1-P-3	



Hydraulic conductivity [ft/s]: 3.58×10^{-3}

Hydraulic conductivity [cm/s]: 1.1 E-01

b=5.49 ft
L=5 ft
r=0.184 ft
R=0.344 ft

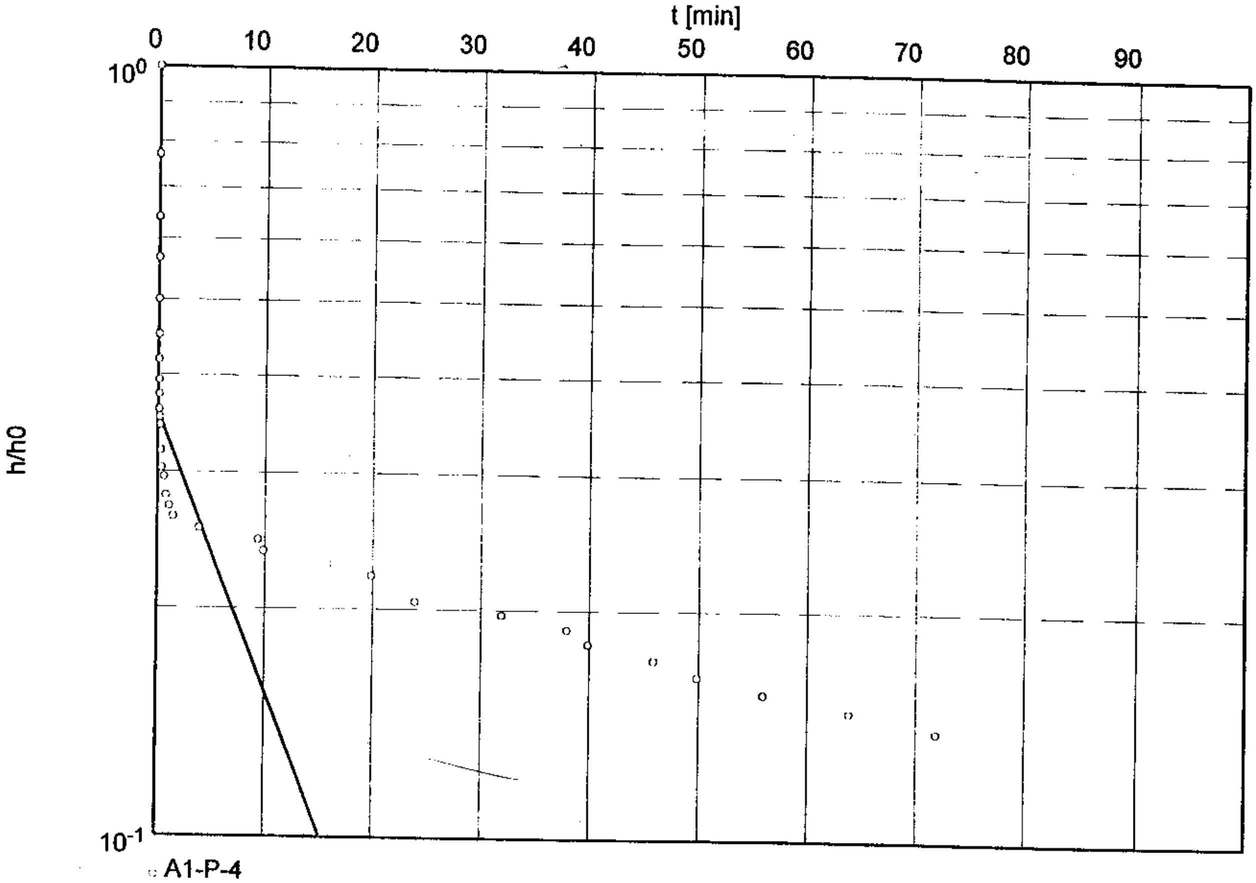
Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Invest. Report, Page 2 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA	Date: 21.04.1998

Slug Test No.	Test conducted on: March 25, 1998
A1-P-3	A1-P-3

Static water level: 8.20 ft below datum

	Pumping test duration [s]	Water level [ft]	Drawdown [ft]	
1	0	10.35	2.15	
2	0	9.91	1.71	
3	0	9.77	1.57	
4	1	9.65	1.45	
5	1	9.54	1.34	
6	1	9.42	1.22	
7	1	9.33	1.13	
8	1	9.23	1.03	
9	2	9.14	0.94	
10	2	9.06	0.86	
11	2	8.99	0.79	
12	3	8.73	0.53	
13	4	8.57	0.37	
14	5	8.49	0.29	
15	6	8.43	0.23	
16	7	8.40	0.20	
17	8	8.37	0.17	
18	9	8.35	0.15	
19	10	8.33	0.13	
20	13	8.31	0.11	
21	15	8.29	0.09	
22	20	8.27	0.07	
23	30	8.25	0.05	
24	40	8.23	0.03	
25	70	8.21	0.01	

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Inv. Report, Page 1 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA — Date: 22.04.1998
Slug Test No.	Test conducted on: April 2, 1998	
A1-P-4		



Hydraulic conductivity [ft/min]: 4.65×10^{-4}

Hydraulic conductivity [cm/s]: 2.4 E-4

b=9.42 ft
L=9.42 ft
r=0.184 ft
R=0.344 ft

Malcolm Pirnie, Inc. 40 Centre Drive Orchard Park, NY 14127 Phone (716) 667-0900	slug/bail test analysis BOUWER-RICE's method	LTV Steel Inv. Report, Page 2 Project: Plant Site Suppl. Field Inv. Evaluated by: JMA — Date: 22.04.1998

Slug Test No.	Test conducted on: April 2, 1998
A1-P-4	A1-P-4

Static water level: 7.95 ft below datum

	Pumping test duration [min]	Water level [ft]	Drawdown [ft]
1	0.00	9.17	1.22
2	0.02	8.89	0.94
3	0.03	8.73	0.78
4	0.05	8.64	0.69
5	0.07	8.56	0.61
6	0.08	8.50	0.55
7	0.10	8.46	0.51
8	0.12	8.43	0.48
9	0.13	8.41	0.46
10	0.15	8.39	0.44
11	0.17	8.38	0.43
12	0.20	8.37	0.42
13	0.28	8.34	0.39
14	0.37	8.32	0.37
15	0.62	8.31	0.36
16	0.78	8.29	0.34
17	1.12	8.28	0.33
18	1.45	8.27	0.32
19	3.87	8.26	0.31
20	9.37	8.25	0.30
21	9.87	8.24	0.29
22	15.87	8.23	0.28
23	19.87	8.22	0.27
24	23.87	8.20	0.25
25	31.87	8.19	0.24
26	37.87	8.18	0.23
27	39.87	8.17	0.22
28	45.87	8.16	0.21
29	49.87	8.15	0.20
30	55.87	8.14	0.19
31	63.87	8.13	0.18
32	71.87	8.12	0.17

Appendix G
Sampling Data Sheets, Laboratory Analytical Reports for Groundwater Sampling, and Data Usability Report

WATER SAMPLING FIELD DATA SHEET (LOW FLOW METHOD)

PROJECT: Plant Site Suppl. Field Inv.
CLIENT: LTV Steel, Donner Hanna
JOB NO.: 0848 - 263

TYPE OF SAMPLE: Groundwater
LOCATION NO.: AI-MW-1
LAB SAMPLE NO.:

WELL DATA:

DATE: 4/9/98
TIME: 14:15

Casing Diameter (inches): 2"
Screened interval (ft. BGS): 7-17
Static Water Level Below TOR (ft.): 10.20
Elev. Top of Well Riser:
Elevation Top of Screen:

Casing Material: PVC
Screen Material: PVC
Bottom Depth(ft): 19.55
Datum Grnd Surface:

LOW FLOW PURGING DATA:

DATE: 4/9/98
Pump Type: Parastaltic
Pumping rate (ml/min): ~500
Is equip. dedicated to location? yes yes no

Water Level @ start.: 10.20
Water Level @completion: 10.30
TIME: Start: 14:23 Finish: 14:38
Field Personnel: JMA/DL

PURGING DATA BY ANOTHER METHOD (if needed):

DATE: 4/9/98
Purge Method: Polyethylene Disposable Bailer
Pumping rate (ml/min): —
Standing Volume(g) 1.6
Vol. Purged(g) 4.5
Was well purged dry? No
Is equip. dedicated to location? yes yes no

Water Level @ start.: 10.20
TIME: Start: 15:03 Finish: 15:14
Well Volumes Purged(g) 2.8
Was well purged below sand pack? No
Field Personnel: JMA/DL

SAMPLING DATA: Low Flow Method

Method same as purging? Y Date 4/9/98
Water Level prior to sampling 10.30
Depth of Sample (ie level of intake) 15 ft bgs
Time : Start 14:39 Finish 14:55
Weather & Temp. (deg F) Rain, 42
Field Personnel JMA/DL

OTHER METHOD Date: 4/9/98

Method: Poly. Disp. Bailer for VOCs
Water Level prior to sampling: 10.33
Depth of Sample: 10.33
Time : Start 15:15 Finish 15:16
Weather & Temp. (deg F) Rain, 42
Field Personnel JMA/DL

PHYSICAL & CHEMICAL DATA

Appearance: Clarity: Clear
Turbidity wtih color: Slight, —
Odor: None
Other:

Appearance: Clarity: Cloudy
Turbidity wtih color: Turbid, brown
Odor: None
Other:

MEASUREMENTS:

	Low Flow		Other Method	
Specific Conductivity (umhos/cm)	732	740	746	
Turbidity (NTU)	20.9	11.8	71000	
pH	7.96	7.97	7.70	
Temp. (deg C)	8.5	8.4	7.7	
Eh (mV)	-193.6	-177.8	—	
Dissolved Oxygen (ppm)	0.45	0.3	—	
Fe^{2+} (mg/L)	—	73	—	

MALCOLM PIRNIE

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: LTV Steel Plant Site, Supplemental Field Invest.

PROJECT NO.: 0848-263

STAFF: JMA / DL

DATE: 4/9/98

WELL NO.: AI-MW-1

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 19.55

(2) CASING INTERNAL DIAMETER (in.): 2"

(3) WATER LEVEL BELOW TOP OF CASING (ft.): 10.2

(4) VOLUME OF WATER IN CASING (gal.): ______

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408\ [(2)^2 \times \{(1) - (3)\}] =$ 1.6 GAL.

10.29

Approx every 5 minutes * Parastaltic Pump Poly. Disp. Bailer

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
14:23	14:27	14:30	14:33	14:36	14:38		1.5g	3g	4.5		
* pH / Eh	8.40 / -220	8.22 / -225	8.07 / 211.7	8.02 / -20[illegible]	8.30 / -204.4		8.3[illegible] / —	7.93 / —	7.82 / —		
CONDUCTIVITY	623	703	718	728	725		716	746	740		
* TEMPERATURE	8.4	8.4	8.4	8.4	8.4		7.5	7.6	7.7		
TURBIDITY	652	91.1	44.1	30	27		>1000	>1000	>1000		
APPEARANCE	slight turbid	clear	clear	clear	→		V. turbid	V. turbid	V. turbid		
* DO	0.7	.55	.45	.4	.35	0.2					

COMMENTS: Low Flow Purging

MALCOLM PIRNIE

WATER SAMPLING FIELD DATA SHEETS

PROJECT: Plant Site Supplement. Field Invest.
CLIENT: LTV Steel / Hanna Furnace
JOB NO.: 0848-263

TYPE OF SAMPLE: Groundwater
LOCATION NO.: A1-MW-2
LAB SAMPLE NO.:

WELL DATA: DATE: 4/2/98 TIME: 15:10

Casing Diameter (inches): 2"
Screened interval (ft. BGS):
Static Water Level Below TOR (ft.): 7.12
Elevation Top of Well Riser:
Elevation Top of Screen:
Casing Material: PVC
Screen Material: PVC
Bottom Depth (ft.): 12.66
Datum Ground Surface:

PURGING DATA: DATE: 4/2/98

Method: Polyethylene Disposable Bailer
TIME: Start: 15:11 Finish: 15:20
Well Volumes Purged:
Pumping Rate (gal/min): –
Standing Volume (Gal.)
Was well purged dry? Yes____ No ✓
Volume Purged (Gal.)
Was well purged below sand pack? Yes____ No____

Is purging equipment dedicated to sample location?
YES ✓ NO____

Well I.D. (inches)	Volume (gal/ft)
2	0.17
4	0.66
6	1.50

Field Personnel: JMM/DR

SAMPLING DATA: DATE: 4/2/98

TIME: Start: 15:22 Finish: 15:28
Method: Poly. Disposable Bailer
Sampler: JMM/DR
Present Water Level (ft.): 7.12
Air Temperature (°F):
Depth of Sample (ft.): 7.12
Weather Conditions:
Is sampling equipment dedicated to sample location?: Yes ✓ No____
Source and type of water used in field for QC purposes: NA

PHYSICAL AND CHEMICAL DATA:

Appearance: Clear NO Turbid Slight Color: Gray
Contains Sediment Slight amt Odor: Petro Other:

PARAMETER	Measurement	
pH	8.95	9.08
Specific Conductivity (umhos/cm)	557	542
Temperature (°C)	7.0	7.2
Turbidity (NTU)	~90	>100
Eh (mV)	-168	-172
DO	1.6	

REMARKS: BTEX, PAHs, Phenol, Cyanide

MALCOLM PIRNIE

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: Plant Site Supplement. Field Invest - LTV Steel

PROJECT NO. : 0848-263

STAFF: JMA / DR

DATE: 4/2/98

WELL NO.: AL-MW-2

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 12.66

(2) CASING INTERNAL DIAMETER (in.): 2"

(3) WATER LEVEL BELOW TOP OF CASING (ft.): 7.12

(4) VOLUME OF WATER IN CASING (gal.):

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ .94 GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	15:11 1st bail	15:16 1g	15:17 2g	15:20 3g							
pH / eH	10.52 / -230	9.72 / -212	9.34 / -184	9.06 / -176							
CONDUCTIVITY	536	520	544	553							
TEMPERATURE	9.5	7.7	7.5	7.4							
TURBIDITY	>100	>100	>100	>100							
APPEARANCE	Cloudy Gray	→	→	→							

DO 1.1

COMMENTS: Sheen, odor

MALCOLM PIRNIE

WATER SAMPLING FIELD DATA SHEETS

PROJECT: Plant Site Supplement. Field Invest.
CLIENT: LTV Steel / Hanna Furnace
JOB NO.: 0848-263

TYPE OF SAMPLE: Groundwater
LOCATION NO.: AI-MW-3
LAB SAMPLE NO.:

WELL DATA: DATE: 4/2/98 TIME: ~~10:58~~ 14:34
Casing Diameter (inches): 2"
Casing Material: PVC
Screened interval (ft. BGS):
Screen Material: PVC
Static Water Level Below TOR (ft.): ~~4.45~~ 16.29
Bottom Depth (ft.): 25.67
Elevation Top of Well Riser:
Datum Ground Surface:
Elevation Top of Screen:

PURGING DATA: DATE: 4/2/98
Method: Polyethylene Disposable Bailer
TIME: Start: 14:36 Finish: 14:50
Well Volumes Purged: 3
Pumping Rate (gal/min): —
Standing Volume (Gal.) 1.59
Was well purged dry? Yes____ No ✓
Volume Purged (Gal.) 4.8
Was well purged below sand pack? Yes____ No____

Is purging equipment dedicated to sample location?
YES ✓ NO____

Well I.D. (inches)	Volume (gal/ft)
2	0.17
4	0.66
6	1.50

Field Personnel: JMA/DR

SAMPLING DATA: DATE: 4/2/98
TIME: Start: 14:53 Finish: 15:00
Method: Poly. Disposable Bailer
Sampler: JMA/DR
Present Water Level (ft.): 16.59
Air Temperature (°F): 45
Depth of Sample (ft.): 16.59
Weather Conditions: Ptly Sunny
Is sampling equipment dedicated to sample location?: Yes ✓ No____
Source and type of water used in field for QC purposes: NA

PHYSICAL AND CHEMICAL DATA:
Appearance: Clear NO Turbid Slight Color: Brown
Contains Sediment Slight Odor: NONE Other:

PARAMETER	Measurement	
pH	7.18	7.16
Specific Conductivity (umhos/cm)	1208	1194
Temperature (°C)	11.0	11.0
Turbidity (NTU)	>100	>100
Eh (mV)	-88	-86
DO	1.45	

REMARKS: BTEX, PAHs, Phenol, Cyanide

MALCOLM PIRNIE

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: Plant Site LTV Steel - Supplement Field Invest.

PROJECT NO. : 0848-263

STAFF: JMD/DR

DATE: 4/2/98

WELL NO.: BE-MW-3

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 25.67

(2) CASING INTERNAL DIAMETER (in.): 2"

(3) WATER LEVEL BELOW TOP OF CASING (ft.): 16.29

(4) VOLUME OF WATER IN CASING (gal.): ______

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408\ [\ (2)^2\ \times \{\ (1) - (3)\ \}\ ] = 1.59$ GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)									
	14:38 1st bail	14:42 1.6	14:46 3.2	14:50 4.8						
pH /eH	7.65 / -32.6	7.36 / -97	7.28 / -95	7.20 / -92						
CONDUCTIVITY	1543	1214	1175	1197						
TEMPERATURE	~~~90~~ 11.4	11.2	11.3	11.3						
TURBIDITY	~90	>100	>100	>100						
APPEARANCE	slight cloudy brown	cloudy brown	→	→						

DO - 2.0 - 1.1

COMMENTS:

WATER SAMPLING FIELD DATA SHEET (LOW FLOW METHOD)

PROJECT: Plant Site Suppl. Field Inv.
CLIENT: LTV Steel, Donner Hanna
JOB NO.: 0848 - 263

TYPE OF SAMPLE: Groundwater
LOCATION NO.: Al-P-1
LAB SAMPLE NO.:

WELL DATA: DATE: 4/9/98 TIME: 11:10
Casing Diameter (inches): 2"
Screened interval (ft. BGS): 10-15
Static Water Level Below TOR (ft.): 13.75
Elev. Top of Well Riser:
Elevation Top of Screen:
Casing Material: PVC
Screen Material: PVC
Bottom Depth(ft): 17.46
Datum Grnd Surface:

LOW FLOW PURGING DATA: DATE: 4/9/98
Pump Type: Parastaltic
Pumping rate (ml/min): ~500
Is equip. dedicated to location? yes yes no
Water Level @ start.: 13.75
Water Level @completion: 13.81
TIME: Start: 11:19 Finish: 11:32
Field Personnel: JWA/DL

PURGING DATA BY ANOTHER METHOD (if needed): DATE: 4/9/98
Purge Method: Polyethylene Disposable Bailer
Pumping rate (ml/min): —
Water Level @ start.: 13.81
TIME: Start: 12:04 Finish: 12:11
Standing Volume(g) .63 Vol. Purged(g) 3 Well Volumes Purged(g) 4.76
Was well purged dry? NO
Was well purged below sand pack? y
Is equip. dedicated to location? yes yes no
Field Personnel: JWA/DL

SAMPLING DATA: Low Flow Method
Method same as purging? y Date 4/9/98
Water Level prior to sampling 13.81
Depth of Sample (ie level of intake) 13 ft bgs
Time : Start 11:33 Finish 11:55
Weather & Temp. (deg F) Cloudy 40
Field Personnel JWA/DL

OTHER METHOD Date: 4/9/98
Method: Poly. Disp. Bailer for VOCs
Water Level prior to sampling: 13.85
Depth of Sample: 13.85
Time : Start 12:12 Finish 12:13
Weather & Temp. (deg F) Cloudy, 40
Field Personnel JWA, DL

PHYSICAL & CHEMICAL DATA
Appearance: Clarity: Clear
Turbidity wtih color: NONE
Odor: Slight Other:

Appearance: Clarity: Cloudy
Turbidity wtih color: Slight
Odor: Slight Other:

MEASUREMENTS:

	Low Flow		Other Method	
Specific Conductivity (umhos/cm)	539	543	542	
Turbidity (NTU)	1.44	0.7	176	
pH	10.64	10.66	10.52	
Temp. (deg C)	7.6	7.2	8.0	
Eh (mV)	-183.5	-138.5	—	
Dissolved Oxygen (ppm)	2.2	2.1	—	
Fe^{2+} (mg/L)	—	0.00	—	

MALCOLM
PIRNIE

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: LTV Steel Plant Site, Supplemental Field Invest.

PROJECT NO.: 0848-263

STAFF: JMA/DL

DATE: 4/9/98

WELL NO.: A1-P-1

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 17.46

(2) CASING INTERNAL DIAMETER (in.): 2"

(3) WATER LEVEL BELOW TOP OF CASING (ft.): 13.75

(4) VOLUME OF WATER IN CASING (gal.): ______

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ .63 GAL.

Approx. every minutes * Parastaltic Pump Poly. Disp. Bailer

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
11:19	11:22	11:25	11:28	11:31			1g	2g	3g		
* pH/Eh	10.87 / -172.5	10.67 / -172.9	10.63 / -176.2	10.62 / -180.2			– / –	10.34 / –	10.37 / –		
CONDUCTIVITY	560	547	541	545			523	534	540		
* TEMPERATURE	7.8	7.6	7.6	7.6			–	8.1	8.1		
TURBIDITY	56.6	8.52	3.74	2.35			65.8	119	242		
APPEARANCE	Clear	→	→	→			Clear	Slight cloudy	→		
* DO	2.2	2.0	1.85	1.8							

COMMENTS: Low Flow Purging

WATER SAMPLING FIELD DATA SHEET (LOW FLOW METHOD)

PROJECT: Plant Site Suppl. Field Inv.
CLIENT: LTV Steel, Donner Hanna
JOB NO.: 0848 - 263

TYPE OF SAMPLE: Groundwater
LOCATION NO.: AI-P-2
LAB SAMPLE NO.:

WELL DATA:
DATE: 4/9/98
TIME: 9:21
Casing Diameter (inches): 2"
Screened interval (ft. BGS): 3-8
Static Water Level Below TOR (ft.): 5.10
Elev. Top of Well Riser:
Elevation Top of Screen:
Casing Material: PVC
Screen Material: PVC
Bottom Depth(ft): 10.80
Datum Grnd Surface:

LOW FLOW PURGING DATA:
DATE: 4/9/98
Pump Type: Parastaltic
Pumping rate (ml/min): ~500
Is equip. dedicated to location? yes yes no
Water Level @ start.: 5.10
Water Level @completion: 5.21
TIME: Start: 9:44 Finish: 10:07
Field Personnel: JMA/DL

PURGING DATA BY ANOTHER METHOD (if needed):
DATE: 4/9/98
Purge Method: Polyethylene Disposable Bailer
Pumping rate (ml/min): —
Water Level @ start.: 5.10
TIME: Start: 10:40 Finish: 10:49
Standing Volume(g) .97 Vol. Purged(g) 3
Well Volumes Purged(g) 3.09
Was well purged dry? NO
Was well purged below sand pack? NO
Is equip. dedicated to location? yes yes no
Field Personnel: JMA/DL

SAMPLING DATA: Low Flow Method
Method same as purging? Y Date 4/9/98
Water Level prior to sampling 5.21
Depth of Sample (ie level of intake) 6 ft bgs
Time : Start 10:08 Finish 10:25
Weather & Temp. (deg F) Cloudy, 40
Field Personnel JMA/DL

OTHER METHOD Date: 4/9/98
Method: Poly. Disp. Bailer for VOC
Water Level prior to sampling: 5.21
Depth of Sample: 5.21
Time : Start 10:50 Finish 10:51
Weather & Temp. (deg F) Cloudy, 40
Field Personnel JMA, DL

PHYSICAL & CHEMICAL DATA
Appearance: Clarity: Clear
Turbidity wtih color: NONE
Odor: Slight
Other:

Appearance: Clarity: Cloudy
Turbidity wtih color: V. turbid
Odor: Slight
Other:

MEASUREMENTS:

	Low Flow		Other Method	
Specific Conductivity (umhos/cm)	712	710	677	
Turbidity (NTU)	1.25	1.44	>1000	
pH	11.65	11.65	11.69	
Temp. (deg C)	9.6	7.4	7.5	
Eh (mV)	-148.6	-151.2	-156	
Dissolved Oxygen (ppm)	1.1	0.7	—	
Fe^{2+} (mg/L)	—	.03	—	

MALCOLM PIRNIE

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: LTV Steel Plant Site, Supplemental Field Invest.

PROJECT NO.: 0848-263

STAFF: JMA/DL

DATE: 4/9/98

WELL NO.: A1-P-Z

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 10.80

(2) CASING INTERNAL DIAMETER (in.): 2"

(3) WATER LEVEL BELOW TOP OF CASING (ft.): 5.10

(4) VOLUME OF WATER IN CASING (gal.): ____

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408\,[(2)^2 \times \{(1) - (3)\}] =$ .97 GAL.

Approx. every minutes * Parastaltic Pump Poly. Disp. Bailer

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
9:44	9:49	9:54	10:00	10:03	10:06		1g	2g	3g		
* pH/Eh	11.58/-30*	11.60/-80*	11.61/-120*	11.61/-134.9	11.63/-140.8		11.77/-135	11.77/-144	11.77/-151.2		
CONDUCTIVITY	791	719	711	720	718		702	699	761		
* TEMPERATURE	9.4	9.5	9.5	9.6	9.6		7.7	7.8	7.7		
TURBIDITY	6.37	2.94	2.13	1.47	1.34		484	831	1000		
APPEARANCE	Clear	→	→	→	→		Br. turbi	→	→		
* DO	1.0	0.8	0.7	0.6	0.6						

COMMENTS: Low Flow Purging
* Not Stable

WATER SAMPLING FIELD DATA SHEET (LOW FLOW METHOD)

PROJECT: Plant Site Suppl. Field Inv.
CLIENT: LTV Steel, Donner Hanna
JOB NO.: 0848 - 263

TYPE OF SAMPLE: Groundwater
LOCATION NO.: AI-P-3
LAB SAMPLE NO.:

WELL DATA: DATE: 4/8/98 TIME: 13:30

Casing Diameter (inches): 2"
Screened interval (ft. BGS): 6-11
Static Water Level Below TOR (ft.): 8.24
Elev. Top of Well Riser:
Elevation Top of Screen:
Casing Material: PVC
Screen Material: PVC
Bottom Depth(ft): 13.69
Datum Grnd Surface:

LOW FLOW PURGING DATA: DATE: 4/8/98

Pump Type: Parastaltic
Pumping rate (ml/min): ~500
Is equip. dedicated to location? yes no — yes
Water Level @ start.: 8.24
Water Level @completion: 8.31
TIME: Start: 13:36 Finish: 13:47
Field Personnel: JMA/BCH

PURGING DATA BY ANOTHER METHOD (if needed): DATE: 4/8/98

Purge Method: Polyethylene Disposable Bailer
Pumping rate (ml/min): —
Standing Volume(g) .93 Vol. Purged(g) 3
Was well purged dry? NO
Is equip. dedicated to location? yes no — yes
Water Level @ start.: 8.25
TIME: Start: 14:09 Finish: 14:14
Well Volumes Purged(g) 3.23
Was well purged below sand pack? NO
Field Personnel: JMA/BCH

SAMPLING DATA: Low Flow Method

Method same as purging? y Date 4/8/98
Water Level prior to sampling 8.31 btor
Depth of Sample (ie level of intake) 9 ft bgs
Time : Start 13:48 Finish 13:59
Weather & Temp. (deg F) Cloudy, rain, 48
Field Personnel JMA/BCH

OTHER METHOD Date: 4/8/98

Method: Poly. Disp. Bailer for VOCs
Water Level prior to sampling: 8.31
Depth of Sample: 8.31
Time : Start 14:15 Finish 14:16
Weather & Temp. (deg F) Cloudy, rain, 48
Field Personnel JMA/BCH

PHYSICAL & CHEMICAL DATA

Appearance: Clarity: Clear
Turbidity wtih color: NONE
Odor: NONE Other:

Appearance: Clarity: Cloudy
Turbidity wtih color: V. turbid
Odor: NONE Other:

MEASUREMENTS:

	Low Flow		Other Method	
Specific Conductivity (umhos/cm)	472	472	473	
Turbidity (NTU)	1.3	0.97	1000	
pH	7.56	7.54	7.52	
Temp. (deg C)	8.0	7.8	8.6	
Eh (mV)	+42.4	+41.0	+37.8	
Dissolved Oxygen (ppm)	.35	0.3	—	
Fe^{2+} (mg/L)	—	.03	—	

MALCOLM PIRNIE

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: LTV Steel Plant Site, Supplemental Field Invest.

PROJECT NO.: 0848-263

STAFF: JMA

DATE: 4/8/98

WELL NO.: AI-P-3

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 13.69

(2) CASING INTERNAL DIAMETER (in.): 2"

(3) WATER LEVEL BELOW TOP OF CASING (ft.): 8.24

(4) VOLUME OF WATER IN CASING (gal.): ____

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

13.69
8.24
5.45
.17
3815
545
.9265

$V = 0.0408 [(2)^2 \times \{(1) - (3)\}] =$ .93 GAL.

Approx. every minutes * Parastaltic Pump Poly. Disp. Bailer

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
13:36	13:41	13:44	13:47		1g	2g	3g				
* pH/Eh	7.60/441.7	7.54/+43.7	7.52/+43.5		7.65/438.3	7.63/439.6	7.57/440.3				
CONDUCTIVITY	477	467	470		477	476	470				
* TEMPERATURE	8.0	8.3	7.8		8.2	8.1	7.8				
TURBIDITY	32.9	6.45	2.34		563	1000	641				
APPEARANCE	Clear	→	→								
* DO	0.8	.45	.35								

COMMENTS: Low Flow Purging

WATER SAMPLING FIELD DATA SHEET (LOW FLOW METHOD)

PROJECT: Plant Site Suppl. Field Inv.
CLIENT: LTV Steel, Donner Hanna
JOB NO.: 0848 - 263

TYPE OF SAMPLE: Groundwater
LOCATION NO.: AI-P-4
LAB SAMPLE NO.:

WELL DATA:
DATE: 4/8/98
TIME: 11:20
Casing Diameter (inches): 2"
Screened interval (ft. BGS): 5-15
Static Water Level Below TOR (ft.): 8.91
Elev. Top of Well Riser:
Elevation Top of Screen:
Casing Material: PVC
Screen Material: PVC
Bottom Depth(ft): 17.37
Datum Grnd Surface:

LOW FLOW PURGING DATA:
DATE: 4/8/98
Pump Type: Parestaltic
Pumping rate (ml/min): ~ 200 ml/min
Is equip. dedicated to location? yes yes no
Water Level @ start.: 8.91
Water Level @completion: 9.91
TIME: Start: 11:26 Finish 11:44
Field Personnel: JMA/BCH

PURGING DATA BY ANOTHER METHOD (if needed):
Purge Method: Polyethylene Disposable Bailer
Pumping rate (ml/min): –
Standing Volume(g) 1.44
Vol. Purged(g) 1.5
Was well purged dry? y
Is equip. dedicated to location? yes yes no
DATE: 4/8/98
Water Level @ start.:
TIME: Start: 13:06 Finish: 13:14
Well Volumes Purged(g) 1.04
Was well purged below sand pack? y
Field Personnel: JMA/BCH

SAMPLING DATA: Low Flow Method
Method same as purging? y Date 4/8/98
Water Level prior to sampling 10.35
Depth of Sample (ie level of intake) 14' bgs
Time : Start 11:45 Finish 12:22
Weather & Temp. (deg F) Cloudy, 48°F
Field Personnel JMA/BCH

OTHER METHOD Date: 4/8/98
Method: Poly. Disp. Bailer
Water Level prior to sampling: 15.00
Depth of Sample: 15.00
Time : Start 13:14 Finish 13:15
Weather & Temp. (deg F) Cloudy w/rain 48°F
Field Personnel JMA/BCH

PHYSICAL & CHEMICAL DATA

Low Flow:
Appearance: Clarity: Clear
Turbidity wtih color: No, None
Odor: None
Other: –

Other Method:
Appearance: Clarity: Cloudy
Turbidity wtih color: turbid, brown
Odor: –
Other: –

MEASUREMENTS:

	Low Flow		Other Method	
Specific Conductivity (umhos/cm)	862	831	883	
Turbidity (NTU)	5.10	6.43	1000	
pH	6.61	6.57	6.71	
Temp. (deg C)	9.1	9.5	9.5	
Eh (mV)	+42.6	+59.3	–	
Dissolved Oxygen (ppm)	2.75	2.7	–	
Fe^{2+} (mg/L)	–	0.12	–	

VERY SLOW RECHARGE

MALCOLM PIRNIE

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: LTV Steel Plant Site, Supplemental Field Invest.

PROJECT NO.: 0848-263

STAFF: JMA/BCH

DATE: 4/8/98

WELL NO.: AI-P-4

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 17.37

(2) CASING INTERNAL DIAMETER (in.): 2"

(3) WATER LEVEL BELOW TOP OF CASING (ft.): 8.91

(4) VOLUME OF WATER IN CASING (gal.): ____

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408 [(2)^2 \times \{ (1) - (3) \}] =$ 1.44 GAL.

Approx. every minutes * Parastaltic Pump Poly. Disp. Bailer Bls

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
11:26	11:31	11:35	11:39	11:42			1.5				
* pH/Eh	6.71* +0.5*	6.7 +20.6	6.73 +31.1	6.7 +35.5			7.05 +57				
CONDUCTIVITY	848	827	834	835			918				
* TEMPERATURE	9.4	9.2	9.2	9.1			10.2				
TURBIDITY	42.3	19.7	12.2	10.5			431				
APPEARANCE	clear	→	→	→			sl. turbid				

* DO ~~Fe~~ 2.7

COMMENTS: Low Flow Purging
* Not stable

MALCOLM PIRNIE

WATER SAMPLING FIELD DATA SHEETS

PROJECT: Plant Site Supplement. Field Invest.
CLIENT: LTV Steel / Hanna Furnace
JOB NO.: 0848-263

TYPE OF SAMPLE: Groundwater
LOCATION NO.: AI-MW-A2
LAB SAMPLE NO.:

WELL DATA: DATE: 4/2/98 TIME: 14:33
Casing Diameter (inches): 2"
Casing Material: PVC
Screened interval (ft. BGS):
Screen Material: PVC
Static Water Level Below TOR (ft.): 11.73
Bottom Depth (ft.): 18.80
Elevation Top of Well Riser:
Datum Ground Surface:
Elevation Top of Screen:

PURGING DATA: DATE: 4/2/98
Method: Polyethylene Disposable Bailer
TIME: Start: 13:46 Finish: 13:54
Well Volumes Purged: 3
Pumping Rate (gal/min): —
Standing Volume (Gal.) 1.2
Was well purged dry? Yes___ No ✓
Volume Purged (Gal.) 3.6
Was well purged below sand pack? Yes___ No___

Is purging equipment dedicated to sample location?
YES ✓ NO___

Well I.D. (inches)	Volume (gal/ft)
2	0.17
4	0.66
6	1.50

Field Personnel: JMA/DR

SAMPLING DATA: DATE: 4/2/98
Method: Poly. Disposable Bailer
TIME: Start: 13:56 Finish: 14:03
Present Water Level (ft.): 11.73
Sampler: JMA/DR
Depth of Sample (ft.): 11.73
Air Temperature (°F): 45
Weather Conditions: Cloudy
Is sampling equipment dedicated to sample location? : Yes ✓ No___
Source and type of water used in field for QC purposes: NA

PHYSICAL AND CHEMICAL DATA:
Appearance: Clear yes Turbid NO
Color: clear
Contains Sediment NO
Odor: Slight
Other: Oil Drops

PARAMETER	Measurement	
pH	12.27	12.32
Specific Conductivity (umhos/cm)	1164	1232
Temperature (°C)	9.9	9.8
Turbidity (NTU)	~20	~20
Eh (mV)	-337	-334
DO	1.25	

REMARKS: BTEX, PAHs, Phenol, Cyanide

MALCOLM PIRNIE

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: LTV Steel - Supplement. Field Invest. - Plant Site

PROJECT NO. : 0848-263

STAFF: JMA / DR

DATE: 4/2/98

WELL NO.: A1-MW-12

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 18.80

(2) CASING INTERNAL DIAMETER (in.): 2"

(3) WATER LEVEL BELOW TOP OF CASING (ft.): 11.73

(4) VOLUME OF WATER IN CASING (gal.): ______

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$V = 0.0408\ [\ (2)^2\ \times \{ (1) - (3) \}\ ]\ =$ 1.2 GAL.

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	11:46 1.2	1:49 2.4	1:52 3.6								
pH / eH	12.22 / -322	12.34 / -324	12.30 / -321								
CONDUCTIVITY	1143	1213	1162								
TEMPERATURE	10.6	10.3	10.2								
TURBIDITY	—	—	—								
APPEARANCE	Brown w/oil drops	→	→								
DO	—										

COMMENTS:

WATER SAMPLING FIELD DATA SHEET (LOW FLOW METHOD)

PROJECT: Plant Site Suppl. Field Inv.
CLIENT: LTV Steel, Donner Hanna
JOB NO.: 0848 - 263

TYPE OF SAMPLE: Groundwater
LOCATION NO.: AI-MW-K2
LAB SAMPLE NO.:

WELL DATA: DATE: 4/8/98 TIME: 14:31
Casing Diameter (inches): 2"
Screened interval (ft. BGS): 6-11
Static Water Level Below TOR (ft.): 6.15
Elev. Top of Well Riser:
Elevation Top of Screen:
Casing Material: PVC
Screen Material: PVC
Bottom Depth(ft): 12.73
Datum Grnd Surface:

LOW FLOW PURGING DATA: DATE: 4/8/98
Pump Type: Parestaltic
Pumping rate (ml/min): ~500
Is equip. dedicated to location? yes yes no
Water Level @ start.: 6.15
Water Level @completion: 6.35
TIME: Start: 14:35 Finish: 14:47
Field Personnel: JMA/BCH

PURGING DATA BY ANOTHER METHOD (if needed): DATE: 4/8/98
Purge Method: Polyethylene Disposable Bailer
Pumping rate (ml/min): —
Water Level @ start.: 6.16
TIME: Start: 15:04 Finish: 15:14
Standing Volume(g) 1.1 Vol. Purged(g) 3 Well Volumes Purged(g) 2.73
Was well purged dry? NO Was well purged below sand pack? NO
Is equip. dedicated to location? yes yes no Field Personnel: JMA/BCH

SAMPLING DATA: Low Flow Method
Method same as purging? y Date 4/8/98
Water Level prior to sampling 6.35
Depth of Sample (ie level of intake) 9 ft bgs
Time : Start 14:48 Finish 15:02
Weather & Temp. (deg F) RAIN, 45
Field Personnel JMA, BCH

OTHER METHOD Date: 4/8/98
Method: Poly. Disp. Bailer for VOCs
Water Level prior to sampling: 6.16
Depth of Sample: 6.16
Time : Start 15:14 Finish 15:15
Weather & Temp. (deg F) RAIN, 45
Field Personnel JMA /BCH

PHYSICAL & CHEMICAL DATA
Appearance: Clarity: Clear
Turbidity wtih color: NONE
Odor: Strong Other:

Appearance: Clarity: Cloudy
Turbidity wtih color: turbid
Odor: Strong Other:

MEASUREMENTS:

	Low Flow		Other Method	
Specific Conductivity (umhos/cm)	655	627	620	
Turbidity (NTU)	4.95	4.95	478	
pH	6.56	6.66	7.17	
Temp. (deg C)	7.7	7.7	7.9	
Eh (mV)	-141.5	-148.1	-113.4	
Dissolved Oxygen (ppm)	0	0	—	
Fe^{2+} (mg/L)	—	>3	—	

MALCOLM PIRNIE

WELL DEVELOPMENT / PURGING LOG

PROJECT TITLE: LTV Steel Plant Site, Supplemental Field Invest.

PROJECT NO.: 0848-263

STAFF: JMA

DATE: 4/8/98

WELL NO.: A1-MW-12

(1) TOTAL CASING AND SCREEN LENGTH (ft.): 12.73

(2) CASING INTERNAL DIAMETER (in.): 2"

(3) WATER LEVEL BELOW TOP OF CASING (ft.): 6.15 6.16

(4) VOLUME OF WATER IN CASING (gal.):

WELL I.D.	VOL. GAL/DAY
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

12.73
6.15
6.58
.17
4606
658
1.1186

V = 0.0408 [$(2)^2$ x { (1) - (3) }] = 1.1 GAL.

Approx. every minutes * Parastaltic Pump Poly. Disp. Bailer

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
14:35	14:39	14:42	14:45	14:47		1g	2g	3g			
* pH / Eh	6.47 / -105	6.46 / -125	6.49 / -130.8	6.53 / -135.2		7.10 / -100	7.13 / -110	7.11 / -107.9			
CONDUCTIVITY	740	747	709	690		637	638	635			
* TEMPERATURE	8.3	7.8	7.8	7.7		7.8	7.8	7.6			
TURBIDITY	71.1	15.0	9.52	6.83		>1000	712	681			
APPEARANCE	slight brown	clear	clear	clear		Brown w/ Boom	→	→			
* DO	.4	.35	0.15	0.1							

COMMENTS: Low Flow Purging

RECRA
LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

April 23, 1998

Mr. Kent McManus
Malcolm Pirnie, Inc.
40 Center Drive
Buffalo, NY 14209

RE: Analytical Results

Dear Mr. McManus:

Please find enclosed analytical results concerning the samples recently submitted by your firm. The pertinent information regarding these analyses is listed below:

Quote #: NY98-124
Project Name: LTV - South Buffalo
Matrix: Aqueous
Samples Received: 04/03/98
Sample Date: 04/02/98

If you have any questions concerning these data, please contact Mr. James E. Stadelmaier, Program Manager, at (716) 691-2600 and refer to the I.D. number listed below. It has been our pleasure to provide Malcolm Pirnie, Inc. with environmental testing services. We look forward to serving you in the future.

Sincerely,

RECRA LABNET, INC.

J Stadelmaier

James E. Stadelmaier
Program Manager KEK for

JES/amk
Enclosure

I.D. #A98-1106
#NY8A7779

This report contains 36 pages, which are individually numbered.

ANALYTICAL RESULTS

Prepared For:

Malcolm Pirnie, Inc.
40 Centre Drive
Buffalo, NY 14209

Prepared By:

Recra LabNet, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14228-2298

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method numbers presented refer to the following U.S. Environmental Protection Agency reference:

*"Test Methods For Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, September 1994, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

Comments pertain to data on one or all pages of this report.

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Organic and Inorganic Data Comment Pages.

VOLATILE DATA

Samples A1-MW-A2 and A2-MW-8 were analyzed utilizing a dilution factor of five due to sample foaming.

Sample A2-MW-12 was initially analyzed utilizing a dilution factor of ten. A further dilution of forty was required. All surrogate compounds were diluted out in the dilution of forty.

METALS/WATER QUALITY DATA

No deviations from the protocol were encountered during the analyses.

ORGANIC DATA COMMENT PAGE

Laboratory Name: Recra Labnet, Inc.

USEPA Defined Organic Data Qualifiers:

U - Indicates compound was analyzed for but not detected.

J - Indicates an estimate value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

T - This flag is used when the analyte is found in the associated TCLP extraction blank as well as in the sample.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.

P - This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a "P".

A - This flag indicates that a TIC is a suspected aldol-condensation product.

INORGANIC DATA COMMENT PAGE

Laboratory Name: Recra Labnet, Inc.

USEPA Defined Inorganic Data Qualifiers:

B	-	Indicates a value greater than or equal to the instrument detection limit, but less than the contract required detection limit.
U	-	Indicates element was analyzed for but not detected. Report with the detection limit value (e.g., 100).
N	-	Indicates spike sample recovery is not within the control limits.
K	-	Indicates the post digestion spike recovery is not within the control limits.
*	-	Indicates duplicate analysis is not within the control limits.
S	-	Indicates value determined by the Method of Standard Addition.
+	-	Indicates the correlation coefficient for the Method of Standard Addition is less than 0.995.
M	-	Indicates duplicate injection results exceeded control limits.
W	-	Post digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50 % of spike absorbance.
E	-	Indicates a value estimated or not reported due to the presence of interference.

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		A1-MW-2 A98-1106 A8110607 04/02/98	A1-MW-3 A98-1106 A8110606 04/02/98	A1-MW-A2 A98-1106 A8110605 04/02/98	A2-MW-12 A98-1106 A8110603 04/02/98	A2-MW-13 A98-1106 A8110604 04/02/98
Analyte (UG/L)	RL	Result	Result	Result	Result	Result
METHOD 8260 - VOLATILE ORGANICS						
Benzene	5	5 U	5 U	5 U	41	5 U
Ethylbenzene	5	2 J	5 U	5 U	42	1 J
Toluene	5	5 U	5 U	7	86	2 J
Total Xylenes	15	1 J	15 U	14 J	140	2 J
INTERNAL STANDARDS						
Chlorobenzene-D5	50-200	93	96	117	98	124
1,4-Difluorobenzene	50-200	111	106	116	95	119
1,4-Dichlorobenzene-D4	50-200	91	91	108	104	108
SURROGATES						
Toluene-D8	84-115	114	106	97	97	98
p-Bromofluorobenzene	78-110	102	98	97	102	94
1,2-Dichloroethane-D4	81-125	106	110	107	108	109

000004

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		A2-MW-6 A98-1106 A8110602 04/02/98	A2-MW-8 A98-1106 A8110601 04/02/98			
Analyte (UG/L)	RL	Result	Result			
METHOD 8260 - VOLATILE ORGANICS						
Benzene	5	240	170			
Ethylbenzene	5	11	5 U			
Toluene	5	38	5 U			
Total Xylenes	15	36	15 U			
INTERNAL STANDARDS						
Chlorobenzene-D5	50-200	87	98			
1,4-Difluorobenzene	50-200	84	98			
1,4-Dichlorobenzene-D4	50-200	82	92			
SURROGATES						
Toluene-D8	84-115	96	96			
p-Bromofluorobenzene	78-110	95	99			
1,2-Dichloroethane-D4	81-125	110	108			

000005

* Indicates Result is Outside QC Limits
NA = Not Appli[illegible]

QC ANALYTICAL RESULTS

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		Matrix Spike Blank A98-1106 A8110609		Matrix Spike Blank A98-1106 A8110611		Matrix Spike Blank A98-1106 A8110614		Matrix Spike Blk Dup A98-1106 A8110612		Trip Blank A98-1106 A8110608 04/02/98	
Analyte (UG/L)	RL	Result		Result		Result		Result		Result	
METHOD 8260 - VOLATILE ORGANICS											
Benzene	5	55		49		51		48		5	U
Ethylbenzene	5	5	U	1	J	5	U	5	U	5	U
Toluene	5	58		45		45		45		5	U
Total Xylenes	15	15	U	15	U	15	U	15	U	15	U
INTERNAL STANDARDS											
Chlorobenzene-D5	50-200	76		112		100		107		69	
1,4-Difluorobenzene	50-200	78		111		98		107		74	
1,4-Dichlorobenzene-D4	50-200	75		100		92		94		61	
SURROGATES											
Toluene-D8	84-115	107		97		96		98		108	
p-Bromofluorobenzene	78-110	99		96		94		94		94	
1,2-Dichloroethane-D4	81-125	123		109		109		109		122	

000006

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		VBLK23 A98-1106 A8110613		VBLK24 A98-1106 A8110615		VBLK75 A98-1106 A8110610			
Analyte (UG/L)	RL	Result		Result		Result			
METHOD 8260 - VOLATILE ORGANICS									
Benzene	5	5	U	5	U	5	U		
Ethylbenzene	5	5	U	5	U	5	U		
Toluene	5	5	U	5	U	5	U		
Total Xylenes	15	15	U	15	U	15	U		
INTERNAL STANDARDS									
Chlorobenzene-D5	50-200	99		88		72			
1,4-Difluorobenzene	50-200	99		89		79			
1,4-Dichlorobenzene-D4	50-200	90		82		69			
SURROGATES									
Toluene-D8	84-115	98		96		108			
p-Bromofluorobenzene	78-110	96		95		99			
1,2-Dichloroethane-D4	81-125	112		110		122			

000007

* Indicates Result is Outside QC Limits
NA = Not Appli e

METHOD 8260 - VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	A1-MW-2 A98-1106 A8110607	A1-MW-3 A98-1106 A8110606	A1-MW-A2 A98-1106 A8110605	A2-MW-12 A98-1106 A8110603	A2-MW-13 A98-1106 A8110604
Sample Date	04/02/98 15:22	04/02/98 14:53	04/02/98 13:56	04/02/98 11:14	04/02/98 11:46
Received Date	04/03/98 11:10	04/03/98 11:10	04/03/98 11:10	04/03/98 11:10	04/03/98 11:10
Extraction Date	-	-	-	-	-
Analysis Date	04/09/98 21:56	04/09/98 21:23	04/11/98 01:30	04/11/98 00:23	04/11/98 00:57
Extraction HT Met?	-	-	-	-	-
Analytical HT Met?	YES	YES	YES	YES	YES
Sample Matrix	WATER	WATER	WATER	WATER	WATER
Dilution Factor	1.0	1.0	5.0	1.0	1.0
Sample wt/vol	0.005 LITERS	0.005 LITERS	0.005 LITERS	0.005 LITERS	0.005 LITERS
% Dry					

000008

NA = Not Applicable

METHOD 8260 - VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	A2-MW-6 A98-1106 A8110602	A2-MW-8 A98-1106 A8110601			
Sample Date	04/02/98 10:36	04/02/98 09:55			
Received Date	04/03/98 11:10	04/03/98 11:10			
Extraction Date	-	-			
Analysis Date	04/11/98 14:36	04/10/98 23:49			
Extraction HT Met?	-	-			
Analytical HT Met?	YES	YES			
Sample Matrix	WATER	WATER			
Dilution Factor	2.0	5.0			
Sample wt/vol	0.005 LITERS	0.005 LITERS			
% Dry					

000009

NA = Not Applir 'e

METHOD 8260 - VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	Matrix Spike Blank A98-1106 A8110609	Matrix Spike Blank A98-1106 A8110611	Matrix Spike Blank A98-1106 A8110614	Matrix Spike Blk Dup A98-1106 A8110612	Trip Blank A98-1106 A8110608
Sample Date					04/02/98
Received Date					04/03/98 11:10
Extraction Date	-	-	-	-	-
Analysis Date	04/09/98 15:24	04/10/98 21:33	04/11/98 10:32	04/10/98 22:07	04/09/98 17:02
Extraction HT Met?	-	-	-	-	-
Analytical HT Met?	-	-	-	-	YES
Sample Matrix	WATER	WATER	WATER	WATER	WATER
Dilution Factor	1.0	1.0	1.0	1.0	1.0
Sample wt/vol	0.005 LITERS	0.005 LITERS	0.005 LITERS	0.005 LITERS	0.005 LITERS
% Dry					

000010

NA = Not Applicable

METHOD 8260 - VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	VBLK23 A98-1106 A8110613	VBLK24 A98-1106 A8110615	VBLK75 A98-1106 A8110610		
Sample Date					
Received Date					
Extraction Date	-	-	-		
Analysis Date	04/10/98 23:15	04/11/98 12:21	04/09/98 14:48		
Extraction HT Met?	-	-	-		
Analytical HT Met?	-	-	-		
Sample Matrix	WATER	WATER	WATER		
Dilution Factor	1.0	1.0	1.0		
Sample wt/vol	0.005 LITERS	0.005 LITERS	0.005 LITERS		
% Dry					

000011

NA = Not Applir 'e

Client Sample ID: VBLK23
Lab Sample ID: A8110613

Matrix Spike Blank
A8110611

Matrix Spike Blk Dup
A8110612

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			%	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg	RPD	RPD	REC.
METHOD 8260 - VOLATILE ORGANICS											
Benzene	UG/L	48.7	48.4	50	50	97	97	97	0	21.0	79-132
Toluene	UG/L	45.4	45.0	50	50	91	90	91	1	21.0	73-132

000012

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Calculated

Client Sample ID: VBLK24
Lab Sample ID: A8110615

Matrix Spike Blank
A8110614

Analyte	Units of Measure	Concentration Blank Spike	Concentration Spike Amount	% Recovery Blank Spike	QC LIMITS
METHOD 8260 - VOLATILE ORGANICS					
Benzene	UG/L	51.0	50	102	79-132
Toluene	UG/L	45.1	50	90	73-132

000013

* Indicates Result is outside QC Limits
NC = Not Calcul ND = Not Calculated

Client Sample ID: VBLK75
Lab Sample ID: A8110610

Matrix Spike Blank
A8110609

Analyte	Units of Measure	Concentration Blank Spike	Concentration Spike Amount	% Recovery Blank Spike	QC LIMITS
METHOD 8260 - VOLATILE ORGANICS					
Benzene	UG/L	54.7	50	110	79-132
Toluene	UG/L	58.5	50	117	73-132

000014

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Calculated

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		A1-MW-2 A98-1106 A8110607 04/02/98		A1-MW-3 A98-1106 A8110606 04/02/98		A1-MW-A2 A98-1106 A8110605 04/02/98		A2-MW-12 A98-1106 A8110603 04/02/98		A2-MW-12dl A98-1106 A8110603DL 04/02/98	
Analyte (UG/L)	RL	Result		Result		Result		Result		Result	
METHOD 8270-HSL PAH'S + PHENOL											
Acenaphthene	10	15		10	U	4	J	300		320	D
Acenaphthylene	10	10	U	10	U	10	U	190		190	D
Anthracene	10	10	U	10	U	10	U	73		80	U
Benzo(a)anthracene	10	10	U	10	U	10	U	38		80	U
Benzo(b)fluoranthene	10	10	U	10	U	10	U	46		80	U
Benzo(k)fluoranthene	10	10	U	10	U	10	U	20	U	80	U
Benzo(ghi)perylene	10	10	U	10	U	10	U	20	U	80	U
Benzo(a)pyrene	10	10	U	10	U	10	U	26		80	U
Chrysene	10	10	U	10	U	10	U	31		80	U
Dibenzo(a,h)anthracene	10	10	U	10	U	10	U	20	U	80	U
Fluoranthene	10	10	U	10	U	10	U	150		140	D
Fluorene	10	24		10	U	6	J	210		200	D
Indeno(1,2,3-cd)pyrene	10	10	U	10	U	10	U	20	U	80	U
2-Methylnaphthalene	10	120		10	U	21		370		390	D
Naphthalene	10	66		10	U	9	J	2400	E	3200	D
Phenanthrene	10	40		10	U	8	J	320		370	D
Pyrene	10	10	U	10	U	10	U	93		86	D
Phenol	10	10	U	10	U	2	J	20	U	80	U
INTERNAL STANDARDS											
1,4-Dichlorobenzene-D4	50-200	96		74		90		85		81	
Naphthalene-D8	50-200	98		77		90		87		81	
Acenaphthene-D10	50-200	98		77		99		85		75	
Phenanthrene-D10	50-200	99		77		90		90		79	
Chrysene-D12	50-200	107		87		92		94		82	
Perylene-D12	50-200	88		72		75		76		66	
SURROGATES											
Nitrobenzene-D5	23-114	71		67		65		56		0	*
Terphenyl	38-141	85		68		75		84		0	*
2-Fluorobiphenyl	43-116	98		78		78		90		0	*
2-Fluorophenol	21-105	28		41		40		20	*	0	*
Phenol-D5	10-105	23		30		31		16		0	*
2,4,6-Tribromophenol	39-135	86		83		85		50		0	*

000015

* Indicates Result is Outside QC Limits
NA = Not Appli- 'e

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		A2-MW-13 / A98-1106 A8110604 / 04/02/98		A2-MW-6 / A98-1106 A8110602 / 04/02/98		A2-MW-8 / A98-1106 A8110601 / 04/02/98			
Analyte (UG/L)	RL	Result		Result		Result			
METHOD 8270-HSL PAH'S + PHENOL									
Acenaphthene	10	10	U	NA		29			
Acenaphthylene	10	10	U	NA		10	U		
Anthracene	10	10	U	NA		10	U		
Benzo(a)anthracene	10	10	U	NA		10	U		
Benzo(b)fluoranthene	10	10	U	NA		10	U		
Benzo(k)fluoranthene	10	10	U	NA		10	U		
Benzo(ghi)perylene	10	10	U	NA		10	U		
Benzo(a)pyrene	10	10	U	NA		10	U		
Chrysene	10	10	U	NA		10	U		
Dibenzo(a,h)anthracene	10	10	U	NA		10	U		
Fluoranthene	10	11		NA		10	U		
Fluorene	10	10	U	NA		10	U		
Indeno(1,2,3-cd)pyrene	10	10	U	NA		10	U		
2-Methylnaphthalene	10	10	U	NA		10	U		
Naphthalene	10	10	U	NA		22			
Phenanthrene	10	10	U	NA		10			
Pyrene	10	10	U	NA		10	U		
Phenol	10	10	U	NA		10	U		
INTERNAL STANDARDS									
1,4-Dichlorobenzene-D4	50-200	72		NA		73			
Naphthalene-D8	50-200	75		NA		74			
Acenaphthene-D10	50-200	74		NA		87			
Phenanthrene-D10	50-200	73		NA		74			
Chrysene-D12	50-200	83		NA		78			
Perylene-D12	50-200	69		NA		70			
SURROGATES									
Nitrobenzene-D5	23-114	65		NA		72			
Terphenyl	38-141	75		NA		81			
2-Fluorobiphenyl	43-116	90		NA		90			
2-Fluorophenol	21-105	34		NA		35			
Phenol-D5	10-105	26		NA		28			
2,4,6-Tribromophenol	39-135	88		NA		101			

Analyte (UG/L)	RL	Result	Result	Result		
METHOD 8270 - TCL SEMI-VOLATILE ORGANICS						
Acenaphthene	10	NA	400	NA		
Acenaphthylene	10	NA	170	NA		
Anthracene	10	NA	270	NA		
Benzo(a)anthracene	10	NA	240	NA		
Benzo(b)fluoranthene	10	NA	320	NA		

000016

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		A2-MW-13 A98-1106 A8110604 04/02/98	A2-MW-6 A98-1106 A8110602 04/02/98	A2-MW-8 A98-1106 A8110601 04/02/98		
Analyte (UG/L)	RL	Result	Result	Result		
METHOD 8270 - TCL SEMI-VOLATILE ORGANICS						
Benzo(k)fluoranthene	10	NA	160	NA		
Benzo(ghi)perylene	10	NA	130	NA		
Benzo(a)pyrene	10	NA	280	NA		
Benzoic acid	50	NA	50 U	NA		
Benzyl alcohol	20	NA	40 U	NA		
Bis(2-chloroethoxy) methane	10	NA	40 U	NA		
Bis(2-chloroethyl) ether	10	NA	20 U	NA		
Bis(2-chloroisopropyl) ether	10	NA	20 U	NA		
Bis(2-ethylhexyl) phthalate	10	NA	20 U	NA		
4-Bromophenyl phenyl ether	10	NA	38 U	NA		
Butyl benzyl phthalate	10	NA	20 U	NA		
4-Chloroaniline	10	NA	20 U	NA		
4-Chloro-3-methylphenol	10	NA	40 U	NA		
2-Chloronaphthalene	10	NA	20 U	NA		
2-Chlorophenol	10	NA	40 U	NA		
4-Chlorodiphenylether	1	NA	40 U	NA		
Chrysene	10	NA	260	NA		
Dibenzo(a,h)anthracene	10	NA	20 U	NA		
Dibenzofuran	10	NA	290	NA		
Di-n-butyl phthalate	10	NA	20 U	NA		
1,2-Dichlorobenzene	10	NA	20 U	NA		
1,3-Dichlorobenzene	10	NA	20 U	NA		
1,4-Dichlorobenzene	10	NA	20 U	NA		
3,3'-Dichlorobenzidine	20	NA	20 U	NA		
2,4-Dichlorophenol	10	NA	40 U	NA		
Diethyl phthalate	10	NA	20 U	NA		
2,4-Dimethylphenol	1	NA	150	NA		
Dimethyl phthalate	10	NA	20 U	NA		
4,6-Dinitro-2-methylphenol	50	NA	50 U	NA		
2,4-Dinitrophenol	50	NA	50 U	NA		
2,4-Dinitrotoluene	10	NA	20 U	NA		
2,6-Dinitrotoluene	10	NA	20 U	NA		
Di-n-octyl phthalate	10	NA	20 U	NA		
Fluoranthene	10	NA	660	NA		
Fluorene	10	NA	340	NA		
Hexachlorobenzene	10	NA	20 U	NA		
Hexachlorobutadiene	10	NA	10 U	NA		
Hexachlorocyclopentadiene	10	NA	20 U	NA		
Hexachloroethane	10	NA	20 U	NA		
Indeno(1,2,3-cd)pyrene	10	NA	140	NA		
Isophorone	10	NA	20 U	NA		
2-Methylnaphthalene	10	NA	82	NA		

000017

* Indicates Result is Outside QC Limits
NA = Not Applic e

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		A2-MW-13 / A98-1106 A8110604 / 04/02/98	A2-MW-6 / A98-1106 A8110602 / 04/02/98	A2-MW-8 / A98-1106 A8110601 / 04/02/98		
Analyte (UG/L)	RL	Result	Result	Result		
METHOD 8270 - TCL SEMI-VOLATILE ORGANICS						
2-Methylphenol	10	NA	77	NA		
4-Methylphenol	10	NA	30 J	NA		
Naphthalene	10	NA	1300	NA		
2-Nitroaniline	50	NA	50 U	NA		
3-Nitroaniline	50	NA	50 U	NA		
4-Nitroaniline	50	NA	50 U	NA		
Nitrobenzene	10	NA	20 U	NA		
2-Nitrophenol	10	NA	40 U	NA		
4-Nitrophenol	50	NA	50 U	NA		
N-nitrosodiphenylamine	10	NA	20 U	NA		
N-Nitroso-Di-n-propylamine	10	NA	20 U	NA		
Pentachlorophenol	50	NA	50 U	NA		
Phenanthrene	10	NA	680	NA		
Phenol	10	NA	20 U	NA		
Pyrene	10	NA	460	NA		
1,2,4-Trichlorobenzene	10	NA	20 U	NA		
2,4,5-Trichlorophenol	25	NA	40 U	NA		
2,4,6-Trichlorophenol	10	NA	40 U	NA		
INTERNAL STANDARDS						
1,4-Dichlorobenzene-D4	50-200	NA	80	NA		
Naphthalene-D8	50-200	NA	81	NA		
Acenaphthene-D10	50-200	NA	84	NA		
Phenanthrene-D10	50-200	NA	91	NA		
Chrysene-D12	50-200	NA	94	NA		
Perylene-D12	50-200	NA	80	NA		
SURROGATES						
Nitrobenzene-D5	23-114	NA	53	NA		
Terphenyl	38-141	NA	87	NA		
2-Fluorobiphenyl	43-116	NA	91	NA		
2-Fluorophenol	21-105	NA	18 *	NA		
Phenol-D5	10-105	NA	16	NA		
2,4,6-Tribromophenol	39-135	NA	68	NA		

000018

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		Matrix Spike Blank A98-1106 A8B0230701		SBLK18 A98-1106 A8B0230703				
Analyte (UG/L)	RL	Result		Result				
METHOD 8270-HSL PAH'S + PHENOL								
Acenaphthene	10	70		10	U			
Acenaphthylene	10	10	U	10	U			
Anthracene	10	10	U	10	U			
Benzo(a)anthracene	10	10	U	10	U			
Benzo(b)fluoranthene	10	10	U	10	U			
Benzo(k)fluoranthene	10	10	U	10	U			
Benzo(ghi)perylene	10	10	U	10	U			
Benzo(a)pyrene	10	10	U	10	U			
Chrysene	10	10	U	10	U			
Dibenzo(a,h)anthracene	10	10	U	10	U			
Fluoranthene	10	10	U	10	U			
Fluorene	10	10	U	10	U			
Indeno(1,2,3-cd)pyrene	10	10	U	10	U			
2-Methylnaphthalene	10	10	U	10	U			
Naphthalene	10	10	U	10	U			
Phenanthrene	10	10	U	10	U			
Pyrene	10	80		10	U			
Phenol	10	25		10	U			
INTERNAL STANDARDS								
1,4-Dichlorobenzene-D4	50-200	71		69				
Naphthalene-D8	50-200	72		70				
Acenaphthene-D10	50-200	73		70				
Phenanthrene-D10	50-200	72		67				
Chrysene-D12	50-200	77		73				
Perylene-D12	50-200	67		63				
SURROGATES								
Nitrobenzene-D5	23-114	62		68				
Terphenyl	38-141	76		78				
2-Fluorobiphenyl	43-116	69		79				
2-Fluorophenol	21-105	32		37				
Phenol-D5	10-105	26		25				
2,4,6-Tribromophenol	39-135	79		78				

Analyte (UG/L)	RL	Result		Result				
METHOD 8270 - TCL SEMI-VOLATILE ORGANICS								
Acenaphthene	10	70		10	U			
Acenaphthylene	10	10	U	10	U			
Anthracene	10	10	U	10	U			
Benzo(a)anthracene	10	10	U	10	U			
Benzo(b)fluoranthene	10	10	U	10	U			

000019

* Indicates Result is Outside QC Limits
NA = Not Applir ə

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		Matrix Spike Blank A98-1106 A8B0230701		SBLK18 A98-1106 A8B0230703				
Analyte (UG/L)	RL	Result		Result				
METHOD 8270 - TCL SEMI-VOLATILE ORGANICS								
Benzo(k)fluoranthene	10	10	U	10	U			
Benzo(ghi)perylene	10	10	U	10	U			
Benzo(a)pyrene	10	10	U	10	U			
Benzoic acid	50	50	U	50	U			
Benzyl alcohol	20	20	U	20	U			
Bis(2-chloroethoxy) methane	10	10	U	10	U			
Bis(2-chloroethyl) ether	10	10	U	10	U			
Bis(2-chloroisopropyl) ether	10	10	U	10	U			
Bis(2-ethylhexyl) phthalate	10	10	U	10	U			
4-Bromophenyl phenyl ether	10	10	U	10	U			
Butyl benzyl phthalate	10	10	U	10	U			
4-Chloroaniline	10	10	U	10	U			
4-Chloro-3-methylphenol	10	82		10	U			
2-Chloronaphthalene	10	10	U	10	U			
2-Chlorophenol	10	58		10	U			
4-Chlorodiphenylether	1	4	U	4	U			
Chrysene	10	10	U	10	U			
Dibenzo(a,h)anthracene	10	10	U	10	U			
Dibenzofuran	10	10	U	10	U			
Di-n-butyl phthalate	10	3	J	10	U			
1,2-Dichlorobenzene	10	10	U	10	U			
1,3-Dichlorobenzene	10	10	U	10	U			
1,4-Dichlorobenzene	10	42		10	U			
3,3'-Dichlorobenzidine	20	20	U	20	U			
2,4-Dichlorophenol	10	10	U	10	U			
Diethyl phthalate	10	10	U	10	U			
2,4-Dimethylphenol	1	4	U	4	U			
Dimethyl phthalate	10	10	U	10	U			
4,6-Dinitro-2-methylphenol	50	50	U	50	U			
2,4-Dinitrophenol	50	50	U	50	U			
2,4-Dinitrotoluene	10	90		10	U			
2,6-Dinitrotoluene	10	10	U	10	U			
Di-n-octyl phthalate	10	10	U	10	U			
Fluoranthene	10	10	U	10	U			
Fluorene	10	10	U	10	U			
Hexachlorobenzene	10	10	U	10	U			
Hexachlorobutadiene	10	10	U	10	U			
Hexachlorocyclopentadiene	10	10	U	10	U			
Hexachloroethane	10	10	U	10	U			
Indeno(1,2,3-cd)pyrene	10	10	U	10	U			
Isophorone	10	10	U	10	U			
2-Methylnaphthalene	10	10	U	10	U			

000020

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: Job Number & Lab Sample ID: Sample Date:		Matrix Spike Blank A98-1106 A8B0230701		SBLK18 A98-1106 A8B0230703				
Analyte (UG/L)	RL	Result		Result				
METHOD 8270 - TCL SEMI-VOLATILE ORGANICS								
2-Methylphenol	10	10	U	10	U			
4-Methylphenol	10	10	U	10	U			
Naphthalene	10	10	U	10	U			
2-Nitroaniline	50	50	U	50	U			
3-Nitroaniline	50	50	U	50	U			
4-Nitroaniline	50	50	U	50	U			
Nitrobenzene	10	10	U	10	U			
2-Nitrophenol	10	10	U	10	U			
4-Nitrophenol	50	29	J	50	U			
N-nitrosodiphenylamine	10	10	U	10	U			
N-Nitroso-Di-n-propylamine	10	66		10	U			
Pentachlorophenol	50	73		50	U			
Phenanthrene	10	10	U	10	U			
Phenol	10	25		10	U			
Pyrene	10	80		10	U			
1,2,4-Trichlorobenzene	10	50		10	U			
2,4,5-Trichlorophenol	25	25	U	25	U			
2,4,6-Trichlorophenol	10	10	U	10	U			
INTERNAL STANDARDS								
1,4-Dichlorobenzene-D4	50-200	71		69				
Naphthalene-D8	50-200	72		70				
Acenaphthene-D10	50-200	73		70				
Phenanthrene-D10	50-200	72		67				
Chrysene-D12	50-200	77		73				
Perylene-D12	50-200	67		63				
SURROGATES								
Nitrobenzene-D5	23-114	62		68				
Terphenyl	38-141	76		78				
2-Fluorobiphenyl	43-116	69		79				
2-Fluorophenol	21-105	32		37				
Phenol-D5	10-105	26		25				
2,4,6-Tribromophenol	39-135	79		78				

000021

* Indicates Result is Outside QC Limits
NA = Not Applic 'e

METHOD 8270-HSL PAH'S + PHENOL

Client Sample ID Job No & Lab Sample ID	A1-MW-2 A98-1106 A8110607	A1-MW-3 A98-1106 A8110606	A1-MW-A2 A98-1106 A8110605	A2-MW-12 A98-1106 A8110603	A2-MW-12dl A98-1106 A8110603DL
Sample Date	04/02/98 15:22	04/02/98 14:53	04/02/98 13:56	04/02/98 11:14	04/02/98 11:14
Received Date	04/03/98 11:10	04/03/98 11:10	04/03/98 11:10	04/03/98 11:10	04/03/98 11:10
Extraction Date	04/06/98 16:00	04/06/98 16:00	04/06/98 16:00	04/06/98 16:00	04/06/98 16:00
Analysis Date	04/15/98 17:10	04/14/98 16:15	04/16/98 20:49	04/15/98 18:49	04/16/98 20:01
Extraction HT Met?	YES	YES	YES	YES	YES
Analytical HT Met?	YES	YES	YES	YES	YES
Sample Matrix	WATER	WATER	WATER	WATER	WATER
Dilution Factor	5.0	1.0	1.0	10.0	40.0
Sample wt/vol	1.0 LITERS	1.0 LITERS	1.0 LITERS	1.0 LITERS	1.0 LITERS
% Dry					

000022

NA = Not Applicable

METHOD 8270-HSL PAH'S + PHENOL

Client Sample ID Job No & Lab Sample ID	A2-MW-13 A98-1106 A8110604	A2-MW-6 A98-1106 A8110602	A2-MW-8 A98-1106 A8110601		
Sample Date	04/02/98 11:46	NA	04/02/98 09:55		
Received Date	04/03/98 11:10		04/03/98 11:10		
Extraction Date	04/06/98 16:00		04/06/98 16:00		
Analysis Date	04/14/98 17:04		04/14/98 17:53		
Extraction HT Met?	YES		YES		
Analytical HT Met?	YES		YES		
Sample Matrix	WATER		WATER		
Dilution Factor	5.0		5.0		
Sample wt/vol	1.0 LITERS		1.0 LITERS		
% Dry					

METHOD 8270 - TCL SEMI-VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	A2-MW-13 A98-1106 A8110604	A2-MW-6 A98-1106 A8110602	A2-MW-8 A98-1106 A8110601		
Sample Date	NA	04/02/98 10:36	NA		
Received Date		04/03/98 11:10			
Extraction Date		04/06/98 16:00			
Analysis Date		04/15/98 19:39			
Extraction HT Met?		YES			
Analytical HT Met?		YES			
Sample Matrix		WATER			
Dilution Factor		10.0			
Sample wt/vol		1.0 LITERS			
% Dry					

000023

NA = Not Applic

METHOD 8270-HSL PAH'S + PHENOL

Client Sample ID Job No & Lab Sample ID	Matrix Spike Blank A98-1106 A8B0230701	SBLK18 A98-1106 A8B0230703			
Sample Date					
Received Date					
Extraction Date	04/06/98 16:00	04/06/98 16:00			
Analysis Date	04/14/98 14:37	04/14/98 15:26			
Extraction HT Met?	-	-			
Analytical HT Met?	-	-			
Sample Matrix	WATER	WATER			
Dilution Factor	1.0	1.0			
Sample wt/vol	1.0 LITERS	1.0 LITERS			
% Dry					

METHOD 8270 - TCL SEMI-VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	Matrix Spike Blank A98-1106 A8B0230701	SBLK18 A98-1106 A8B0230703			
Sample Date					
Received Date					
Extraction Date	04/06/98 16:00	04/06/98 16:00			
Analysis Date	04/14/98 14:37	04/14/98 15:26			
Extraction HT Met?	-	-			
Analytical HT Met?	-	-			
Sample Matrix	WATER	WATER			
Dilution Factor	1.0	1.0			
Sample wt/vol	1.0 LITERS	1.0 LITERS			
% Dry					

000024

NA = Not Applicable

Client Sample ID: SBLK18
Lab Sample ID: A8B0230703

Matrix Spike Blank
A8B0230701

Analyte	Units of Measure	Concentration Blank Spike	Concentration Spike Amount	% Recovery Blank Spike	QC LIMITS
METHOD 8270 - TCL SEMI-VOLATILE ORGANICS					
Phenol	UG/L	25.1	100	25	8-105
2-Chlorophenol	UG/L	57.5	100	58	24-105
1,4-Dichlorobenzene	UG/L	42.1	100	42	10-105
N-Nitroso-Di-n-propylamine	UG/L	66.3	100	66	25-110
1,2,4-Trichlorobenzene	UG/L	49.6	100	50	16-105
4-Chloro-3-methylphenol	UG/L	82.1	100	82	39-120
Acenaphthene	UG/L	69.9	100	70	28-105
4-Nitrophenol	UG/L	28.9	100	29	7-105
2,4-Dinitrotoluene	UG/L	90.1	100	90	44-108
Pentachlorophenol	UG/L	73.1	100	73	9-118
Pyrene	UG/L	79.8	100	80	40-131
METHOD 8270-HSL PAH'S + PHENOL					
Phenol	UG/L	25.1	100	25	8-105
Acenaphthene	UG/L	69.9	100	70	28-105
Pyrene	UG/L	79.8	100	80	40-131

000025

* Indicates Result is outside QC Limits
NC = Not Calcul d ND = Not Calculated

ANALYTICAL RESULTS

		Client Sample ID: Job Number & Lab Sample ID: Sample Date:	A2-MW-12 A98-1106 A8110603 04/02/98	A2-MW-13 A98-1106 A8110604 04/02/98	A2-MW-6 A98-1106 A8110602 04/02/98	A2-MW-8 A98-1106 A8110601 04/02/98	
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	
TOTAL NATURAL ATTENUATION METALS							
Arsenic - Total	MG/L	0.0030	0.0049	0.038	0.11	0.010	
Chromium - Total	MG/L	0.0020	0.0033	0.016	0.017	0.013	
Copper - Total	MG/L	0.0020	0.0065	0.032	0.039	0.020	
Lead - Total	MG/L	0.0025	0.011	0.23	0.059	0.024	
Zinc - Total	MG/L	0.0010	0.089	0.35	0.12	0.12	

000026

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Matrix Spike Blank A98-1106 A8B0230101	Matrix Spike Blk Dup A98-1106 A8B0230102	Method Blank A98-1106 A8B0230103		
Analyte	UNITS OF MEASURE	RL	Result	Result	Result		
TOTAL NATURAL ATTENUATION METALS							
Lead - Total	MG/L	0.0025	1.0	0.99	0.0025 U		
Chromium - Total	MG/L	0.0020	0.38	0.37	0.0020 U		
Zinc - Total	MG/L	0.0010	0.96	0.96	0.0055		
Arsenic - Total	MG/L	0.0030	4.0	3.9	0.0030 U		
Copper - Total	MG/L	0.0020	0.49	0.49	0.0020 U		

000027

* Indicates Result is Outside QC Limits
NA = Not Applic

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8110603	A2-MW-12	MG/L	Arsenic - Total	6010	1.00	04/02/98 11:14	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Chromium - Total	6010	1.00	04/02/98 11:14	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Copper - Total	6010	1.00	04/02/98 11:14	04/03 11:10	NA	NA	04/18	Yes	WATER
		MG/L	Lead - Total	6010	1.00	04/02/98 11:14	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Zinc - Total	6010	1.00	04/02/98 11:14	04/03 11:10	NA	NA	04/10	Yes	WATER
A8110604	A2-MW-13	MG/L	Arsenic - Total	6010	1.00	04/02/98 11:46	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Chromium - Total	6010	1.00	04/02/98 11:46	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Copper - Total	6010	1.00	04/02/98 11:46	04/03 11:10	NA	NA	04/18	Yes	WATER
		MG/L	Lead - Total	6010	1.00	04/02/98 11:46	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Zinc - Total	6010	1.00	04/02/98 11:46	04/03 11:10	NA	NA	04/10	Yes	WATER
A8110602	A2-MW-6	MG/L	Arsenic - Total	6010	1.00	04/02/98 10:36	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Chromium - Total	6010	1.00	04/02/98 10:36	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Copper - Total	6010	1.00	04/02/98 10:36	04/03 11:10	NA	NA	04/18	Yes	WATER
		MG/L	Lead - Total	6010	1.00	04/02/98 10:36	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Zinc - Total	6010	1.00	04/02/98 10:36	04/03 11:10	NA	NA	04/10	Yes	WATER
A8110601	A2-MW-8	MG/L	Arsenic - Total	6010	1.00	04/02/98 09:55	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Chromium - Total	6010	1.00	04/02/98 09:55	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Copper - Total	6010	1.00	04/02/98 09:55	04/03 11:10	NA	NA	04/18	Yes	WATER
		MG/L	Lead - Total	6010	1.00	04/02/98 09:55	04/03 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Zinc - Total	6010	1.00	04/02/98 09:55	04/03 11:10	NA	NA	04/10	Yes	WATER

000028

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicable

MALCOLM PIRNIE INC
QC CHRONOLOGY

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8B0230101	Matrix Spike Blank	MG/L	Arsenic - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Chromium - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Copper - Total	6010	1.00		- 11:10	NA	NA	04/18	Yes	WATER
		MG/L	Lead - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Zinc - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
A8B0230102	Matrix Spike Blk Dup	MG/L	Arsenic - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Chromium - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Copper - Total	6010	1.00		- 11:10	NA	NA	04/18	Yes	WATER
		MG/L	Lead - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Zinc - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
A8B0230103	Method Blank	MG/L	Arsenic - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Chromium - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Copper - Total	6010	1.00		- 11:10	NA	NA	04/18	Yes	WATER
		MG/L	Lead - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER
		MG/L	Zinc - Total	6010	1.00		- 11:10	NA	NA	04/10	Yes	WATER

000029

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applir e

Client Sample ID: Method Blank
Lab Sample ID: A8B0230103

Matrix Spike Blank
A8B0230101

Matrix Spike Blk Dup
A8B0230102

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
TOTAL NATURAL ATTENUATION METALS											
TOTAL ARSENIC	MG/L	3.9	3.9	4.0	4.0	99	98	99	0.	20.0	80-120
TOTAL CHROMIUM	MG/L	0.37	0.37	0.40	0.40	93	93	93	0.	20.0	80-120
TOTAL COPPER	MG/L	0.48	0.48	0.50	0.50	97	97	97	0.	20.0	80-120
TOTAL LEAD	MG/L	1.0	0.99	1.0	1.0	100	99	100	1	20.0	80-120
TOTAL ZINC	MG/L	0.95	0.95	1.0	1.0	95	95	95	0.	20.0	80-120

000030

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Calculated

ANALYTICAL RESULTS

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			A1-MW-2 A98-1106 A8110607 04/02/98	A1-MW-3 A98-1106 A8110606 04/02/98	A1-MW-A2 A98-1106 A8110605 04/02/98		
Analyte	UNITS OF MEASURE	RL	Result	Result	Result		
WET CHEMISTRY ANALYSIS							
Cyanide - Total	MG/L	0.010	0.010 U	0.010 U	0.010 U		

000031

* Indicates Result is Outside QC Limits
NA = Not Applic

QC ANALYTICAL RESULTS

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Matrix Spike Blank A98-1106 A8B0251503	Matrix Spike Blk Dup A98-1106 A8B0251504	Method Blank(PBLK__) A98-1106 A8B0251501		
Analyte	UNITS OF MEASURE	RL	Result	Result	Result		
WET CHEMISTRY ANALYSIS							
Cyanide - Total	MG/L	0.010	0.10	0.10	0.010 U		

* Indicates Result is Outside QC Limits
NA = Not Applicable

Date: 04/23/98 13:35
Jobno: A98-1106

MALCOLM PIRNIE INC
SAMPLE CHRONOLOGY

Rept: AN0369

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8110607	A1-MW-2	MG/L	Cyanide - Total	9010	1.00	04/02/98 15:22	04/03 11:10	NA	NA	04/13	Yes	WATER
A8110606	A1-MW-3	MG/L	Cyanide - Total	9010	1.00	04/02/98 14:53	04/03 11:10	NA	NA	04/13	Yes	WATER
A8110605	A1-MW-A2	MG/L	Cyanide - Total	9010	1.00	04/02/98 13:56	04/03 11:10	NA	NA	04/13	Yes	WATER

000033

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applic·

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8B0251503	Matrix Spike Blank	MG/L	Cyanide - Total	9010	1.00		- 11:10	NA	NA	04/13	Yes	WATER
A8B0251504	Matrix Spike Blk Dup	MG/L	Cyanide - Total	9010	1.00		- 11:10	NA	NA	04/13	Yes	WATER
A8B0251501	Method Blank(PBLK__)	MG/L	Cyanide - Total	9010	1.00		- 11:10	NA	NA	04/13	Yes	WATER

000034

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicable

Client Sample ID: Method Blank(PBLK__) Matrix Spike Blank Matrix Spike Blk Dup
Lab Sample ID: A8B0251501 A8B0251503 A8B0251504

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
WET CHEMISTRY ANALYSIS METHOD 9010 - TOTAL CYANIDE	MG/L	0.10	0.10	0.10	0.10	100	100	100	0	20.0	80-115

000035

* Indicates Result is outside QC Limits
NC = Not Calcul d ND = Not Calculated

RECRA LABNET, a division of Recra Environmental, Inc. *CHAIN OF CUSTODY RECORD*

PROJECT NO: 0848-263

SITE NAME: LTV Steel

SAMPLERS (SIGNATURE): Jeanne Asquith

STATION NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO OF CONTAINERS	40 mL vials BTEX 8260	1 Liter Amber PAH Diesel 8270	16 oz Plastic Metals	1 Liter Amber SVOCs 8270	Plastic, 4oz Cyanide		REMARKS
	4/2/98	9:55		X	A2-MW-8	5	2	2	1				
	↓	10:36		X	A2-MW-6	5	2		1	2			
		11:14		X	A2-MW-12	5	2	2	1				
		~~11:34~~ 11:46 am		X	A2-MW-13	5	2	2	1				
		13:36		X	A1-MW-A2	5	2	2			1		
		14:53		X	A1-MW-3	5	2	2			1		
	↓	5:22		X	A1-MW-2	5	2	2			1		
					TRIP BLANK	2	2						

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
Jeanne Asquith	4/3/98 10:19	Brent Rogers			
RELINQUISHED BY (SIGNATURE)	**DATE/TIME**	**RECEIVED BY (SIGNATURE)**	**RELINQUISHED BY (SIGNATURE)**	**DATE/TIME**	**RECEIVED BY (SIGNATURE)**
Brent Rogers	4-3-98 1110	[illegible signature]			
RELINQUISHED BY (SIGNATURE)	**DATE/TIME**	**RECEIVED FOR LABORATORY BY (SIGNATURE)**	**DATE/TIME**	**REMARKS**	
				cools 4/3°C	

Distribution: Original accompanies shipment copy to coordinator field files

000036

RECRA
LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Mr. Kent McManus
Malcolm Pirnie, Inc.
40 Center Drive
Buffalo, NY 14219

May 4, 1998

RE: Analytical Results

Dear Mr. McManus:

Please find enclosed analytical results concerning the samples recently submitted by your firm. The pertinent information regarding these analyses is listed below:

Quote #:	NY98-124
Project Name:	LTV - South Buffalo
Matrix:	Aqueous
Samples Received:	04/09/98
Sample Date:	04/08/98

If you have any questions concerning these data, please contact me at (716) 691-2600 and refer to the I.D. number listed below. It has been our pleasure to provide Malcolm Pirnie, Inc. with environmental testing services. We look forward to serving you in the future.

Sincerely,

RECRA LABNET, INC.

James E. Stadelmaier

James E. Stadelmaier
Program Manager

JES/ltb
Enclosure

I.D. #A98-1175
#NY8A7779

This report contains 42 pages, which are individually numbered.

ANALYTICAL RESULTS

Prepared For:

Malcolm Pirnie, Inc.
40 Centre Drive
Buffalo, NY 14209

Prepared By:

Recra LabNet, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14228-2298

METHODOLOGY

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data tables. The method numbers presented refer to the following U.S. Environmental Protection Agency references:

- "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, September 1994, U.S. Environmental Protection Agency Office of Solid Waste.
- 40 CFR PART 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants", United States Environmental Protection Agency.

COMMENTS

Comments pertain to data on one or all pages of this report.

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Organic and Inorganic Data Comment Pages.

METHOD 8270 DATA

No deviations from protocol were encountered during the analytical procedures.

METHOD 8260 DATA

No deviations from protocol were encountered during the analytical procedures.

METALS DATA

No deviations from protocol were encountered during the analytical procedures.

ORGANIC DATA COMMENT PAGE

Laboratory Name: Recra Labnet, Inc.

USEPA Defined Organic Data Qualifiers:

U - Indicates compound was analyzed for but not detected.

J - Indicates an estimate value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

T - This flag is used when the analyte is found in the associated TCLP extraction blank as well as in the sample.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.

P - This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a "P".

A - This flag indicates that a TIC is a suspected aldol-condensation product.

WET CHEMISTRY DATA

No deviations from protocol were encountered during the analytical procedures.

ANALYTICAL RESULTS

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		A1-MW-K2 A98-1175 A8117505 04/08/98		A1-P-3 A98-1175 A8117504 04/08/98		A1-P-4 A98-1175 A8117503 04/08/98		A2-MW-3 A98-1175 A8117501 04/08/98		A2-MW-4 A98-1175 A8117502 04/08/98	
Analyte (UG/L)	RL	Result		Result		Result		Result		Result	
METHOD 8270-HSL PAH'S + PHENOL											
Acenaphthene	10	3	J	10	U	10	U	10	U	10	U
Acenaphthylene	10	10	U	10	U	10	U	10	U	10	U
Anthracene	10	10	U	10	U	10	U	10	U	10	U
Benzo(a)anthracene	10	10	U	10	U	10	U	10	U	10	U
Benzo(b)fluoranthene	10	10	U	10	U	10	U	10	U	10	U
Benzo(k)fluoranthene	10	10	U	10	U	10	U	10	U	10	U
Benzo(ghi)perylene	10	10	U	10	U	10	U	10	U	10	U
Benzo(a)pyrene	10	10	U	10	U	10	U	10	U	10	U
Chrysene	10	10	U	10	U	10	U	10	U	10	U
Dibenzo(a,h)anthracene	10	10	U	10	U	10	U	10	U	10	U
Fluoranthene	10	10	U	10	U	10	U	10	U	10	U
Fluorene	10	5	J	10	U	10	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	10	10	U	10	U	10	U	10	U	10	U
2-Methylnaphthalene	10	4	J	10	U	10	U	10	U	10	U
Naphthalene	10	10	U	10	U	10	U	10	U	10	U
Phenanthrene	10	10	U	10	U	10	U	10	U	10	U
Pyrene	10	10	U	10	U	10	U	10	U	10	U
Phenol	10	10	U	10	U	10	U	10	U	10	U
INTERNAL STANDARDS											
1,4-Dichlorobenzene-D4	50-200	87		76		72		73		72	
Naphthalene-D8	50-200	92		86		80		81		80	
Acenaphthene-D10	50-200	97		87		87		82		82	
Phenanthrene-D10	50-200	109		80		81		75		77	
Chrysene-D12	50-200	121		94		85		75		76	
Perylene-D12	50-200	99		81		72		69		71	
SURROGATES											
Nitrobenzene-D5	23-114	53		60		66		58		67	
Terphenyl	38-141	75		78		82		77		81	
2-Fluorobiphenyl	43-116	76		80		73		63		69	
2-Fluorophenol	21-105	27		31		35		33		34	
Phenol-D5	10-105	18		22		25		22		22	
2,4,6-Tribromophenol	39-135	69		74		65		60		63	

000005

* Indicates Result is Outside QC Limits
NA = Not Applicable

INORGANIC DATA COMMENT PAGE

Laboratory Name: Recra Labnet, Inc.

USEPA Defined Inorganic Data Qualifiers:

B - Indicates a value greater than or equal to the instrument detection limit, but less than the contract required detection limit.

U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g., 100).

N - Indicates spike sample recovery is not within the control limits.

K - Indicates the post digestion spike recovery is not within the control limits.

* - Indicates duplicate analysis is not within the control limits.

S - Indicates value determined by the Method of Standard Addition.

+ - Indicates the correlation coefficient for the Method of Standard Addition is less than 0.995.

M - Indicates duplicate injection results exceeded control limits.

W - Post digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50 % of spike absorbance.

E - Indicates a value estimated or not reported due to the presence of interference.

METHOD 8270-HSL PAH'S + PHENOL

Client Sample ID / Job No & Lab Sample ID	A1-MW-K2 A98-1175 A8117505	A1-P-3 A98-1175 A8117504	A1-P-4 A98-1175 A8117503	A2-MW-3 A98-1175 A8117501	A2-MW-4 A98-1175 A8117502
Sample Date	04/08/98 14:48	04/08/98 13:48	04/08/98 11:45	04/08/98 09:42	04/08/98 10:41
Received Date	04/09/98 11:00	04/09/98 11:00	04/09/98 11:00	04/09/98 11:00	04/09/98 11:00
Extraction Date	04/13/98 16:00	04/13/98 16:00	04/13/98 16:00	04/13/98 16:00	04/13/98 16:00
Analysis Date	04/24/98 16:08	04/24/98 15:36	04/24/98 15:05	04/24/98 14:02	04/24/98 14:33
Extraction HT Met?	YES	YES	YES	YES	YES
Analytical HT Met?	YES	YES	YES	YES	YES
Sample Matrix	WATER	WATER	WATER	WATER	WATER
Dilution Factor	1.0	1.0	1.0	1.0	1.0
Sample wt/vol	1.0 LITERS	1.0 LITERS	1.0 LITERS	1.0 LITERS	1.0 LITERS
% Dry					

000007

NA = Not Applicable

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		Matrix Spike Blank A98-1175 A8B0249301		Matrix Spike Blk Dup A98-1175 A8B0249302		Method Blank A98-1175 A8B0249303			
Analyte (UG/L)	RL	Result		Result		Result			
METHOD 8270-HSL PAH'S + PHENOL									
Acenaphthene	10	84		73		10	U		
Acenaphthylene	10	10	U	10	U	10	U		
Anthracene	10	10	U	10	U	10	U		
Benzo(a)anthracene	10	10	U	10	U	10	U		
Benzo(b)fluoranthene	10	10	U	10	U	10	U		
Benzo(k)fluoranthene	10	10	U	10	U	10	U		
Benzo(ghi)perylene	10	10	U	10	U	10	U		
Benzo(a)pyrene	10	10	U	10	U	10	U		
Chrysene	10	10	U	10	U	10	U		
Dibenzo(a,h)anthracene	10	10	U	10	U	10	U		
Fluoranthene	10	10	U	10	U	10	U		
Fluorene	10	10	U	10	U	10	U		
Indeno(1,2,3-cd)pyrene	10	10	U	10	U	10	U		
2-Methylnaphthalene	10	10	U	10	U	10	U		
Naphthalene	10	10	U	10	U	10	U		
Phenanthrene	10	10	U	10	U	10	U		
Pyrene	10	84		80		10	U		
Phenol	10	32		29		10	U		
INTERNAL STANDARDS									
1,4-Dichlorobenzene-D4	50-200	62		77		84			
Naphthalene-D8	50-200	73		84		93			
Acenaphthene-D10	50-200	68		85		93			
Phenanthrene-D10	50-200	62		71		76			
Chrysene-D12	50-200	66		73		73			
Perylene-D12	50-200	50		60		70			
SURROGATES									
Nitrobenzene-D5	23-114	86		74		58			
Terphenyl	38-141	99		91		80			
2-Fluorobiphenyl	43-116	95		73		54			
2-Fluorophenol	21-105	47		42		32			
Phenol-D5	10-105	32		29		22			
2,4,6-Tribromophenol	39-135	82		70		53			

000006

* Indicates Result is Outside QC Limits
NA = Not Applic'' e

METHOD 8270-HSL PAH'S + PHENOL

Client Sample ID Job No & Lab Sample ID	Matrix Spike Blank A98-1175 A8B0249301	Matrix Spike Blk Dup A98-1175 A8B0249302	Method Blank A98-1175 A8B0249303		
Sample Date					
Received Date					
Extraction Date	04/13/98 16:00	04/13/98 16:00	04/13/98 16:00		
Analysis Date	04/24/98 12:28	04/24/98 12:59	04/24/98 13:31		
Extraction HT Met?	-	-	-		
Analytical HT Met?	-	-	-		
Sample Matrix	WATER	WATER	WATER		
Dilution Factor	1.0	1.0	1.0		
Sample wt/vol	1.0 LITERS	1.0 LITERS	1.0 LITERS		
% Dry					

000008

NA = Not Applicable

Client Sample ID: Method Blank
Lab Sample ID: A8B0249303

Matrix Spike Blank
A8B0249301

Matrix Spike Blk Dup
A8B0249302

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			%	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg	RPD	RPD	REC.
METHOD 8270-HSL PAH'S + PHENOL											
Phenol	UG/L	32.2	29.2	100	100	32	29	31	10	35.0	8-105
Acenaphthene	UG/L	84.3	73.2	100	100	84	73	79	14	35.0	28-105
Pyrene	UG/L	83.6	79.9	100	100	84	80	82	5	35.0	40-131

000009

* Indicates Result is outside QC Limits
NC = Not Calcul [illegible]d ND = Not Calculated

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		A1-MW-K2 A98-1175 A8117505 04/08/98		A1-P-3 A98-1175 A8117504 04/08/98		A1-P-4 A98-1175 A8117503 04/08/98		A2-MW-3 A98-1175 A8117501 04/08/98		A2-MW-4 A98-1175 A8117502 04/08/98	
Analyte (UG/L)	RL	Result		Result		Result		Result		Result	
METHOD 8260 - VOLATILE ORGANICS											
Benzene	5	5	U	5	U	5	U	5	U	5	U
Ethylbenzene	5	5	U	5	U	5	U	5	U	5	U
Toluene	5	5	U	5	U	5	U	5	U	5	U
Total Xylenes	15	15	U	15	U	15	U	15	U	15	U
INTERNAL STANDARDS											
Chlorobenzene-D5	50-200	78		79		83		84		82	
1,4-Difluorobenzene	50-200	79		78		80		83		80	
1,4-Dichlorobenzene-D4	50-200	78		74		75		79		77	
SURROGATES											
Toluene-D8	84-115	89		88		90		90		89	
p-Bromofluorobenzene	78-110	103		100		99		104		101	
1,2-Dichloroethane-D4	81-125	104		109		106		108		111	

000010

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: Job Number & Lab Sample ID: Sample Date:		MSB24 A98-1175 A8117508		MSB25 A98-1175 A8117511		MSBD24 A98-1175 A8117509		MSBD25 A98-1175 A8117512		Trip Blank A98-1175 A8117506 04/08/98	
Analyte (UG/L)	RL	Result		Result		Result		Result		Result	
METHOD 8260 - VOLATILE ORGANICS											
Benzene	5	51		54		51		51		5	U
Ethylbenzene	5	5	U	5	U	5	U	5	U	5	U
Toluene	5	45		46		46		45		5	U
Total Xylenes	15	15	U	15	U	15	U	15	U	15	U
INTERNAL STANDARDS											
Chlorobenzene-D5	50-200	100		100		97		94		86	
1,4-Difluorobenzene	50-200	98		101		94		95		83	
1,4-Dichlorobenzene-D4	50-200	92		90		90		84		86	
SURROGATES											
Toluene-D8	84-115	96		93		96		92		95	
p-Bromofluorobenzene	78-110	94		98		96		97		104	
1,2-Dichloroethane-D4	81-125	109		110		111		112		111	

000011

* Indicates Result is Outside QC Limits
NA = Not Applir ''e

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		VBLK24 A98-1175 A8117507		VBLK25 A98-1175 A8117510				
Analyte (UG/L)	RL	Result		Result				
METHOD 8260 - VOLATILE ORGANICS								
Benzene	5	5	U	5	U			
Ethylbenzene	5	5	U	5	U			
Toluene	5	5	U	5	U			
Total Xylenes	15	15	U	15	U			
INTERNAL STANDARDS								
Chlorobenzene-D5	50-200	88		84				
1,4-Difluorobenzene	50-200	89		86				
1,4-Dichlorobenzene-D4	50-200	82		81				
SURROGATES								
Toluene-D8	84-115	96		91				
p-Bromofluorobenzene	78-110	95		106				
1,2-Dichloroethane-D4	81-125	110		111				

000012

* Indicates Result is Outside QC Limits
NA = Not Applicable

METHOD 8260 - VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	A1-MW-K2 A98-1175 A8117505	A1-P-3 A98-1175 A8117504	A1-P-4 A98-1175 A8117503	A2-MW-3 A98-1175 A8117501	A2-MW-4 A98-1175 A8117502
Sample Date	04/08/98 14:48	04/08/98 13:48	04/08/98 11:45	04/08/98 09:42	04/08/98 10:41
Received Date	04/09/98 11:00	04/09/98 11:00	04/09/98 11:00	04/09/98 11:00	04/09/98 11:00
Extraction Date	-	-	-	-	-
Analysis Date	04/13/98 19:14	04/13/98 18:40	04/13/98 18:07	04/13/98 14:45	04/13/98 15:19
Extraction HT Met?	-	-	-	-	-
Analytical HT Met?	YES	YES	YES	YES	YES
Sample Matrix	WATER	WATER	WATER	WATER	WATER
Dilution Factor	1.0	1.0	1.0	1.0	1.0
Sample wt/vol	0.005 LITERS	0.005 LITERS	0.005 LITERS	0.005 LITERS	0.005 LITERS
% Dry					

000013

NA = Not Applic-''e

METHOD 8260 - VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	MSB24 A98-1175 A8117508	MSB25 A98-1175 A8117511	MSBD24 A98-1175 A8117509	MSBD25 A98-1175 A8117512	Trip Blank A98-1175 A8117506
Sample Date					04/08/98
Received Date					04/09/98 11:00
Extraction Date	-	-	-	-	-
Analysis Date	04/11/98 10:32	04/13/98 10:41	04/11/98 11:12	04/13/98 11:19	04/11/98 14:02
Extraction HT Met?	-	-	-	-	-
Analytical HT Met?	-	-	-	-	YES
Sample Matrix	WATER	WATER	WATER	WATER	WATER
Dilution Factor	1.0	1.0	1.0	1.0	1.0
Sample wt/vol	0.005 LITERS	0.005 LITERS	0.005 LITERS	0.005 LITERS	0.005 LITERS
% Dry					

000014

NA = Not Applicable

METHOD 8260 - VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	VBLK24 A98-1175 A8117507	VBLK25 A98-1175 A8117510			
Sample Date					
Received Date					
Extraction Date	-	-			
Analysis Date	04/11/98 12:21	04/13/98 12:26			
Extraction HT Met?	-	-			
Analytical HT Met?	-	-			
Sample Matrix	WATER	WATER			
Dilution Factor	1.0	1.0			
Sample wt/vol	0.005 LITERS	0.005 LITERS			
% Dry					

000015

Client Sample ID: VBLK24 MSB24 MSBD24
Lab Sample ID: A8117507 A8117508 A8117509

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			%	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg	RPD	RPD	REC.
METHOD 8260 - VOLATILE ORGANICS											
Benzene	UG/L	51.0	51.0	50	50	102	102	102	0	21.0	79-132
Toluene	UG/L	45.1	46.5	50	50	90	93	92	3	21.0	73-132

000016

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Calculated

Client Sample ID: VBLK25 MSB25 MSBD25
Lab Sample ID: A8117510 A8117511 A8117512

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
METHOD 8260 - VOLATILE ORGANICS											
Benzene	UG/L	54.3	50.8	50	50	109	102	106	7	21.0	79-132
Toluene	UG/L	46.4	45.0	50	50	93	90	92	3	21.0	73-132

000017

* Indicates Result is outside QC Limits
NC = Not Calcul d ND = Not Calculated

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			A1-MW-K2 A98-1175 A8117505 04/08/98	A1-P-3 A98-1175 A8117504 04/08/98	A1-P-4 A98-1175 A8117503 04/08/98	A2-MW-3 A98-1175 A8117501 04/08/98	A2-MW-4 A98-1175 A8117502 04/08/98
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
TOTAL METALS							
Iron - Total	MG/L	0.030	3.4	0.030 U	0.19	0.53	4.1

000018

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Matrix Spike Blank A98-1175 A8B0243401	Matrix Spike Blk Dup A98-1175 A8B0243402	Method Blank A98-1175 A8B0243403		
Analyte	UNITS OF MEASURE	RL	Result	Result	Result		
TOTAL METALS							
Iron - Total	MG/L	0.030	2.2	2.1	0.030 U		

000019

* Indicates Result is Outside QC Limits
NA = Not Applic e

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8117505	A1-MW-K2	MG/L	Iron - Total	6010	1.00	04/08/98 14:48	04/09 11:00	NA	NA	04/24	Yes	WATER
A8117504	A1-P-3	MG/L	Iron - Total	6010	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/24	Yes	WATER
A8117503	A1-P-4	MG/L	Iron - Total	6010	1.00	04/08/98 11:45	04/09 11:00	NA	NA	04/24	Yes	WATER
A8117501	A2-MW-3	MG/L	Iron - Total	6010	1.00	04/08/98 09:42	04/09 11:00	NA	NA	04/24	Yes	WATER
A8117502	A2-MW-4	MG/L	Iron - Total	6010	1.00	04/08/98 10:41	04/09 11:00	NA	NA	04/24	Yes	WATER

000020

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicable

MALCOLM PIRNIE INC
QC CHRONOLOGY

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8B0243401	Matrix Spike Blank	MG/L	Iron - Total	6010	1.00		- 11:00	NA	NA	04/24	Yes	WATER
A8B0243402	Matrix Spike Blk Dup	MG/L	Iron - Total	6010	1.00		- 11:00	NA	NA	04/24	Yes	WATER
A8B0243403	Method Blank	MG/L	Iron - Total	6010	1.00		- 11:00	NA	NA	04/24	Yes	WATER

000021

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applic''e

Client Sample ID: Method Blank
Lab Sample ID: A8B0243403

Matrix Spike Blank
A8B0243401

Matrix Spike Blk Dup
A8B0243402

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
TOTAL METALS ANALYSIS											
TOTAL IRON	MG/L	2.1	2.1	2.0	2.0	109	106	108	2	20.0	80-120

000022

* Indicates Result is outside QC Limits
NC = Not Calculated   ND = Not Calculated

		Client Sample ID:	A1-MW-K2	A1-P-3	A1-P-4	A2-MW-3	A2-MW-4
		Job Number & Lab Sample ID:	A98-1175 A8117505	A98-1175 A8117504	A98-1175 A8117503	A98-1175 A8117501	A98-1175 A8117502
		Sample Date:	04/08/98	04/08/98	04/08/98	04/08/98	04/08/98
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Ammonia	MG/L	0.050	0.58	0.050 U	0.050 U	0.46	0.66
Bicarbonate Alkalinity	MG/L	5.0	213	93.5	189	143	161
Chloride	MG/L	1.0	11.8	5.2	3.8	7.2	14.5
Cyanide - Total	MG/L	0.010	0.027	0.010 U	0.010 U	0.037	0.035
Ferric Iron	MG/L	0	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nitrate-Nitrite	MG/L	0.050	0.050 U	0.56	0.98	0.050 U	0.050 U
Soluble Organic Carbon	MG/L	1.0	9.3	5.7	2.9	4.8	4.8
Sulfate	MG/L	1.0	93.4	118	255	557	544
Sulfide	MG/L	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Total Alkalinity	MG/L	5.0	213	93.5	189	143	161

000023

* Indicates Result is Outside QC Limits
NA = Not Applic 'e

Client Sample ID: Job Number & Lab Sample ID: Sample Date:			A1-P-3 A98-1175 A8117504MD 04/08/98	A1-P-3 A98-1175 A8117504MS 04/08/98	MSB (80.0) A98-1175 A8B0260802	MSBD (80.0) A98-1175 A8B0260803	Matrix Spike Blank A98-1175 A8B0254602
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Ammonia	MG/L	0.050	0.050 U	1.0	NA	NA	NA
Bicarbonate Alkalinity	MG/L	5.0	NA	NA	81.6	81.6	NA
Sulfate	MG/L	1.0	NA	NA	NA	NA	19.9
Total Alkalinity	MG/L	5.0	NA	NA	81.6	81.6	NA

000024

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Matrix Spike Blank A98-1175 A8B0258402	Matrix Spike Blank A98-1175 A8B0262903	Matrix Spike Blank A98-1175 A8B0267202	Matrix Spike Blank A98-1175 A8B0270202	Matrix Spike Blank A98-1175 A8B0274202
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Sulfide	MG/L	1.0	4.3	NA	NA	NA	NA
Cyanide - Total	MG/L	0.010	NA	0.086	NA	NA	NA
Soluble Organic Carbon	MG/L	1.0	NA	NA	9.1	NA	NA
Chloride	MG/L	1.0	NA	NA	NA	19.4	NA
Ammonia	MG/L	0.050	NA	NA	NA	NA	1.0

000025

* Indicates Result is Outside QC Limits
NA = Not Applic e

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Matrix Spike Blank A98-1175 A8B0281402	Matrix Spike Blank A98-1175 A8B0284502	Matrix Spike Blk Dup A98-1175 A8B0254603	Matrix Spike Blk Dup A98-1175 A8B0258403	Matrix Spike Blk Dup A98-1175 A8B0262904
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Nitrate-Nitrite	MG/L	0.050	1.0	NA	NA	NA	NA
Ferric Iron	MG/L	0	NA	4.1	NA	NA	NA
Sulfate	MG/L	1.0	NA	NA	19.0	NA	NA
Sulfide	MG/L	1.0	NA	NA	NA	4.5	NA
Cyanide - Total	MG/L	0.010	NA	NA	NA	NA	0.088

000026

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Matrix Spike Blk Dup A98-1175 A8B0267203	Matrix Spike Blk Dup A98-1175 A8B0270203	Matrix Spike Blk Dup A98-1175 A8B0274203	Matrix Spike Blk Dup A98-1175 A8B0281403	Matrix Spike Blk Dup A98-1175 A8B0284503
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Soluble Organic Carbon	MG/L	1.0	9.1	NA	NA	NA	NA
Chloride	MG/L	1.0	NA	20.0	NA	NA	NA
Ammonia	MG/L	0.050	NA	NA	1.0	NA	NA
Nitrate-Nitrite	MG/L	0.050	NA	NA	NA	1.0	NA
Ferric Iron	MG/L	0	NA	NA	NA	NA	4.1

000027

* Indicates Result is Outside QC Limits
NA = Not Applic

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Method Blank A98-1175 A8B0254604	Method Blank A98-1175 A8B0258404	Method Blank A98-1175 A8B0260804	Method Blank A98-1175 A8B0267204	Method Blank A98-1175 A8B0270204
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Sulfate	MG/L	1.0	1.0 U	NA	NA	NA	NA
Sulfide	MG/L	1.0	NA	1.0 U	NA	NA	NA
Bicarbonate Alkalinity	MG/L	5.0	NA	NA	5.0 U	NA	NA
Soluble Organic Carbon	MG/L	1.0	NA	NA	NA	1.0 U	NA
Chloride	MG/L	1.0	NA	NA	NA	NA	1.0 U
Total Alkalinity	MG/L	5.0	NA	NA	5.0 U	NA	NA

000028

* Indicates Result is Outside QC Limits
NA = Not Applicable

QC ANALYTICAL RESULTS

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Method Blank A98-1175 A8B0274204	Method Blank A98-1175 A8B0281404	Method Blank A98-1175 A8B0284504	Method Blank(PBLK__) A98-1175 A8B0262901	
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	
WET CHEMISTRY ANALYSIS							
Ammonia	MG/L	0.050	0.050 U	NA	NA	NA	
Nitrate-Nitrite	MG/L	0.050	NA	0.050 U	NA	NA	
Ferric Iron	MG/L	0	NA	NA	0.10 U	NA	
Cyanide - Total	MG/L	0.010	NA	NA	NA	0.010 U	

000029

* Indicates Result is Outside QC Limits
NA = Not Applic

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8117505	A1-MW-K2	MG/L	Sulfate	9038	5.00	04/08/98 14:48	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Soluble Organic Carbon	9060	1.00	04/08/98 14:48	04/09 11:00	NA	NA	04/20	Yes	WATER
		MG/L	Cyanide - Total	9010	1.00	04/08/98 14:48	04/09 11:00	NA	NA	04/17	Yes	WATER
		MG/L	Total Alkalinity	310.1	1.00	04/08/98 14:48	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00	04/08/98 14:48	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Sulfide	9030	1.00	04/08/98 14:48	04/09 11:00	NA	NA	04/15	Yes	WATER
		MG/L	Nitrate-Nitrite	353.2	1.00	04/08/98 14:48	04/09 11:00	NA	NA	04/23	Yes	WATER
		MG/L	Ammonia	350.1	1.00	04/08/98 14:48	04/09 11:00	NA	NA	04/21	Yes	WATER
		MG/L	Chloride	9251	1.00	04/08/98 14:48	04/09 11:00	NA	NA	04/20	Yes	WATER
		MG/L	Ferric Iron	3500FE-D	1.00	04/08/98 14:48	04/09 11:00	NA	NA	04/23	No	WATER
A8117504	A1-P-3	MG/L	Sulfate	9038	5.00	04/08/98 13:48	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Soluble Organic Carbon	9060	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/20	Yes	WATER
		MG/L	Cyanide - Total	9010	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/17	Yes	WATER
		MG/L	Total Alkalinity	310.1	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Sulfide	9030	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/15	Yes	WATER
		MG/L	Nitrate-Nitrite	353.2	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/23	Yes	WATER
		MG/L	Ammonia	350.1	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/21	Yes	WATER
		MG/L	Chloride	9251	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/20	Yes	WATER
		MG/L	Ferric Iron	3500FE-D	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/23	No	WATER
A8117503	A1-P-4	MG/L	Sulfate	9038	20.00	04/08/98 11:45	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Soluble Organic Carbon	9060	1.00	04/08/98 11:45	04/09 11:00	NA	NA	04/20	Yes	WATER
		MG/L	Cyanide - Total	9010	1.00	04/08/98 11:45	04/09 11:00	NA	NA	04/17	Yes	WATER
		MG/L	Total Alkalinity	310.1	1.00	04/08/98 11:45	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00	04/08/98 11:45	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Sulfide	9030	1.00	04/08/98 11:45	04/09 11:00	NA	NA	04/15	Yes	WATER
		MG/L	Nitrate-Nitrite	353.2	1.00	04/08/98 11:45	04/09 11:00	NA	NA	04/23	Yes	WATER
		MG/L	Ammonia	350.1	1.00	04/08/98 11:45	04/09 11:00	NA	NA	04/21	Yes	WATER
		MG/L	Chloride	9251	1.00	04/08/98 11:45	04/09 11:00	NA	NA	04/20	Yes	WATER
		MG/L	Ferric Iron	3500FE-D	1.00	04/08/98 11:45	04/09 11:00	NA	NA	04/23	No	WATER
A8117501	A2-MW-3	MG/L	Sulfate	9038	20.00	04/08/98 09:42	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Soluble Organic Carbon	9060	1.00	04/08/98 09:42	04/09 11:00	NA	NA	04/20	Yes	WATER
		MG/L	Cyanide - Total	9010	1.00	04/08/98 09:42	04/09 11:00	NA	NA	04/17	Yes	WATER
		MG/L	Total Alkalinity	310.1	1.00	04/08/98 09:42	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00	04/08/98 09:42	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Sulfide	9030	1.00	04/08/98 09:42	04/09 11:00	NA	NA	04/15	Yes	WATER
		MG/L	Nitrate-Nitrite	353.2	1.00	04/08/98 09:42	04/09 11:00	NA	NA	04/23	Yes	WATER
		MG/L	Ammonia	350.1	1.00	04/08/98 09:42	04/09 11:00	NA	NA	04/21	Yes	WATER
		MG/L	Chloride	9251	1.00	04/08/98 09:42	04/09 11:00	NA	NA	04/20	Yes	WATER
		MG/L	Ferric Iron	3500FE-D	1.00	04/08/98 09:42	04/09 11:00	NA	NA	04/23	No	WATER
A8117502	A2-MW-4	MG/L	Sulfate	9038	20.00	04/08/98 10:41	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Soluble Organic Carbon	9060	1.00	04/08/98 10:41	04/09 11:00	NA	NA	04/20	Yes	WATER
		MG/L	Cyanide - Total	9010	1.00	04/08/98 10:41	04/09 11:00	NA	NA	04/17	Yes	WATER
		MG/L	Total Alkalinity	310.1	1.00	04/08/98 10:41	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00	04/08/98 10:41	04/09 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Sulfide	9030	1.00	04/08/98 10:41	04/09 11:00	NA	NA	04/15	Yes	WATER
		MG/L	Nitrate-Nitrite	353.2	1.00	04/08/98 10:41	04/09 11:00	NA	NA	04/23	Yes	WATER
		MG/L	Ammonia	350.1	1.00	04/08/98 10:41	04/09 11:00	NA	NA	04/21	Yes	WATER

000030

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicable

Date: 04/30/98 12:20
Jobno: A98-1175

MALCOLM PIRNIE INC
SAMPLE CHRONOLOGY

Rept: AN0369

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8117502	A2-MW-4	MG/L	Chloride	9251	1.00	04/08/98 10:41	04/09 11:00	NA	NA	04/20	Yes	WATER
		MG/L	Ferric Iron	3500FE-D	1.00	04/08/98 10:41	04/09 11:00	NA	NA	04/23	No	WATER

000031

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applic

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8117504MD	A1-P-3	MG/L	Ammonia	350.1	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/21	Yes	WATER
A8117504MS	A1-P-3	MG/L	Ammonia	350.1	1.00	04/08/98 13:48	04/09 11:00	NA	NA	04/21	Yes	WATER
A8B0254602	Matrix Spike Blank	MG/L	Sulfate	9038	1.00		- 11:00	NA	NA	04/14	Yes	WATER
A8B0258402	Matrix Spike Blank	MG/L	Sulfide	9030	1.00		- 11:00	NA	NA	04/15	Yes	WATER
A8B0262903	Matrix Spike Blank	MG/L	Cyanide - Total	9010	1.00		- 11:00	NA	NA	04/17	Yes	WATER
A8B0267202	Matrix Spike Blank	MG/L	Soluble Organic Carbon	9060	1.00		- 11:00	NA	NA	04/20	Yes	WATER
A8B0270202	Matrix Spike Blank	MG/L	Chloride	9251	1.00		- 11:00	NA	NA	04/20	Yes	WATER
A8B0274202	Matrix Spike Blank	MG/L	Ammonia	350.1	1.00		- 11:00	NA	NA	04/21	Yes	WATER
A8B0281402	Matrix Spike Blank	MG/L	Nitrate-Nitrite	353.2	1.00		- 11:00	NA	NA	04/23	Yes	WATER
A8B0284502	Matrix Spike Blank	MG/L	Ferric Iron	3500FE-D	1.00		- 11:00	NA	NA	04/23	Yes	WATER
A8B0254603	Matrix Spike Blk Dup	MG/L	Sulfate	9038	1.00		- 11:00	NA	NA	04/14	Yes	WATER
A8B0258403	Matrix Spike Blk Dup	MG/L	Sulfide	9030	1.00		- 11:00	NA	NA	04/15	Yes	WATER
A8B0262904	Matrix Spike Blk Dup	MG/L	Cyanide - Total	9010	1.00		- 11:00	NA	NA	04/17	Yes	WATER
A8B0267203	Matrix Spike Blk Dup	MG/L	Soluble Organic Carbon	9060	1.00		- 11:00	NA	NA	04/20	Yes	WATER
A8B0270203	Matrix Spike Blk Dup	MG/L	Chloride	9251	1.00		- 11:00	NA	NA	04/20	Yes	WATER
A8B0274203	Matrix Spike Blk Dup	MG/L	Ammonia	350.1	1.00		- 11:00	NA	NA	04/21	Yes	WATER
A8B0281403	Matrix Spike Blk Dup	MG/L	Nitrate-Nitrite	353.2	1.00		- 11:00	NA	NA	04/23	Yes	WATER
A8B0284503	Matrix Spike Blk Dup	MG/L	Ferric Iron	3500FE-D	1.00		- 11:00	NA	NA	04/23	Yes	WATER
A8B0260802	MSB (80.0)	MG/L	Total Alkalinity	310.1	1.00		- 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00		- 11:00	NA	NA	04/14	Yes	WATER
A8B0260803	MSBD (80.0)	MG/L	Total Alkalinity	310.1	1.00		- 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00		- 11:00	NA	NA	04/14	Yes	WATER
A8B0254604	Method Blank	MG/L	Sulfate	9038	1.00		- 11:00	NA	NA	04/14	Yes	WATER
A8B0258404	Method Blank	MG/L	Sulfide	9030	1.00		- 11:00	NA	NA	04/15	Yes	WATER
A8B0270204	Method Blank	MG/L	Chloride	9251	1.00		- 11:00	NA	NA	04/20	Yes	WATER
A8B0274204	Method Blank	MG/L	Ammonia	350.1	1.00		- 11:00	NA	NA	04/21	Yes	WATER
A8B0281404	Method Blank	MG/L	Nitrate-Nitrite	353.2	1.00		- 11:00	NA	NA	04/23	Yes	WATER
A8B0284504	Method Blank	MG/L	Ferric Iron	3500FE-D	1.00		- 11:00	NA	NA	04/23	Yes	WATER
A8B0260804	Method Blank	MG/L	Total Alkalinity	310.1	1.00		- 11:00	NA	NA	04/14	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00		- 11:00	NA	NA	04/14	Yes	WATER
A8B0267204	Method Blank	MG/L	Soluble Organic Carbon	9060	1.00		- 11:00	NA	NA	04/20	Yes	WATER
A8B0262901	Method Blank(PBLK__)	MG/L	Cyanide - Total	9010	1.00		- 11:00	NA	NA	04/17	Yes	WATER

000032

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicable

MALCOLM PIRNIE INC
LTV - SOUTH BUFFALO
SAMPLE DATE 04/08/98

Client Sample ID: A1-P-3 A1-P-3
Lab Sample ID: A8117504 A8117504MD

Analyte	Units of Measure	Concentration		Mean	Relative % Difference
		Sample	Duplicate		
WET CHEMISTRY ANALYSIS					
Ammonia	MG/L	0.050 U	0.050 U	NC	NC

000033

NC = Not Calc ted ND = Not Detected

Client Sample ID: A1-P-3 A1-P-3
Lab Sample ID: A8117504 A8117504MS

Analyte	Units of Measure	Concentration Sample	Matrix Spike	Spike Amount	% Recovery MS	QC LIMITS
WET CHEMISTRY ANALYSIS METHOD 350.1 - AMMONIA	MG/L	0	1.0	1.0	100	82-119

000034

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Calculated

Client Sample ID: Method Blank Matrix Spike Blank Matrix Spike Blk Dup
Lab Sample ID: A8B0254604 A8B0254602 A8B0254603

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			%	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg	RPD	RPD	REC.
WET CHEMISTRY ANALYSIS METHOD 9038 - SULFATE	MG/L	19.9	19.0	20.0	20.0	99	95	97	5	20.0	88-113

000035

* Indicates Result is outside QC Limits
NC = Not Calcul ND = Not Calculated

Client Sample ID: Method Blank
Lab Sample ID: A8B0258404

Matrix Spike Blank
A8B0258402

Matrix Spike Blk Dup
A8B0258403

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
WET CHEMISTRY ANALYSIS METHOD 9030 - SULFIDE	MG/L	4.3	4.5	4.5	4.5	95	100	98	4	20.0	85-115

000036

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Calculated

Client Sample ID: Method Blank MSB (80.0) MSBD (80.0)
Lab Sample ID: A8B0260804 A8B0260802 A8B0260803

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			%	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg	RPD	RPD	REC.
WET CHEMISTRY ANALYSIS											
METHOD 310.1 - TOTAL ALKALINITY	MG/L	81.6	81.6	80.0	80.0	102	102	102	0	20.0	85-115
METHOD SM403 - BICARBONATE ALKALINITY	MG/L	81.6	81.6	80.0	80.0	102	102	102	0	20.0	85-115

000037

* Indicates Result is outside QC Limits
NC = Not Calcu' 'd ND = Not Calculated

Client Sample ID: Method Blank
Lab Sample ID: A8B0270204

Matrix Spike Blank
A8B0270202

Matrix Spike Blk Dup
A8B0270203

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			%	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg	RPD	RPD	REC.
WET CHEMISTRY ANALYSIS METHOD 9251 - CHLORIDE	MG/L	19.4	20.0	20.0	20.0	97	100	99	3	20.0	85-115

000038

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Calculated

Client Sample ID: Method Blank
Lab Sample ID: A8B0274204

Matrix Spike Blank
A8B0274202

Matrix Spike Blk Dup
A8B0274203

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
WET CHEMISTRY ANALYSIS METHOD 350.1 - AMMONIA	MG/L	1.0	1.0	1.0	1.0	100	100	100	0	20.0	86-117

* Indicates Result is outside QC Limits
NC = Not Calcu d ND = Not Calculated

Client Sample ID: Method Blank
Lab Sample ID: A8B0281404

Matrix Spike Blank
A8B0281402

Matrix Spike Blk Dup
A8B0281403

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
WET CHEMISTRY ANALYSIS METHOD 353.2 - NITRATE/NITRITE	MG/L	1.0	1.0	1.0	1.0	100	100	100	0	20.0	88-110

000040

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Calculated

Client Sample ID: Method Blank(PBLK__) Matrix Spike Blank Matrix Spike Blk Dup
Lab Sample ID: A8B0262901 A8B0262903 A8B0262904

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			%	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg	RPD	RPD	REC.
WET CHEMISTRY ANALYSIS											
METHOD 9010 - TOTAL CYANIDE	MG/L	0.086	0.088	0.10	0.10	86	88	87	2	20.0	80-115

000041

* Indicates Result is outside QC Limits
NC = Not Calcul ' ND = Not Calculated

RECRA LABNET, a division of Recra Environmental, Inc.

CHAIN OF CUSTODY RECORD

PROJECT NO: 0848-263

SITE NAME: LTV Steel

SAMPLERS (SIGNATURE): Janne Asquith

STATION NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	40 ml VOA 8260 BTEX	1 L Amber glass PAHs Phenol 8270	4 oz plastic T CN	1 L Plastic Sulfide Diss. sulfide	8 oz Plastic Sulfate chloride	4 oz plastic SO4 DOC Carbon	4 oz plastic T Fe	16 oz plastic T Alk Bi Alk	16 oz plastic Nitrate Nitrite Ammonia	REMARKS: 4 oz Plastic Ferric Iron	40 ml VOA Ethane Ethene Methane	16 oz plastic For lab use if needed
	4/8/98	9:42		X	A2-MW-3	16	2	2	1	2	1	1	1	1	1	1	2	1
	↓	10:41		X	A2-MW-4	16	2	2	1	2	1	1	1	1	1	1	2	1
		11:45		X	A1-P-4	16	2	2	1	2	1	1	1	1	1	1	2	1
		13:48		X	A1-P-3	16	2	2	1	2	1	1	1	1	1	1	2	1
		14:48		X	A1-MW-6Z	16	2	2	1	2	1	1	1	1	1	1	2	1

A Received 2 x 40 ml TB

PC 4/9/98

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
Janne M. Asquith	4/9/98 1020	Karen Kerman	Karen Kerman	4/9/98 1100	
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE/TIME	REMARKS
		P. [illegible]	4/9/98 11:00	coolers 3/4/4°C

Distribution: Original accompanies shipment copy to coordinator field files

000042

RECRA
LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

May 18, 1998

Mr. Kent McManus
Malcolm Pirnie, Inc.
40 Center Drive
Buffalo, NY 14219

RE: Analytical Results

Dear Mr. McManus:

Please find enclosed analytical results concerning the samples recently submitted by your firm. The pertinent information regarding these analyses is listed below:

Quote #: NY98-124
Project Name: LTV - South Buffalo
Matrix: Aqueous
Samples Received: 04/09/98
Sample Date: 04/10/98

If you have any questions concerning these data, please contact Mr. James E. Stadelmaier, Program Manager, at (716) 691-2600 and refer to the I.D. number listed below. It has been our pleasure to provide Malcolm Pirnie, Inc. with environmental testing services. We look forward to serving you in the future.

Sincerely,

RECRA LABNET, INC.

James E. Stadelmaier
Program Manager

JES/jmc
Enclosure

I.D. #A98-1209
#NY8A7779

This report contains 35 pages, which are individually numbered.

ANALYTICAL RESULTS

Prepared For:

Malcolm Pirnie, Inc.
40 Centre Drive
Buffalo, NY 14209

Prepared By:

Recra LabNet, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14228-2298

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

* "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, September 1994, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

Comments pertain to data on one or all pages of this report.

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Organic and Inorganic Data Comment Pages.

VOLATILE DATA

No deviations were observed during analyses.

SEMIVOLATILE DATA

Sample A1-P-2 exhibited a surrogate recovery for 2,4,6-Tribromophenol that exceeded QC limits.

METHOD 8015 DATA

Analyses were performed by Recra LabNet Philadelphia.

METALS DATA

No deviations were observed during analyses.

WET CHEMISTRY DATA

All samples were analyzed outside of holding time for Ferric Iron.

ORGANIC DATA COMMENT PAGE

Laboratory Name: Recra Labnet, Inc.

USEPA Defined Organic Data Qualifiers:

U	-	Indicates compound was analyzed for but not detected.
J	-	Indicates an estimate value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
C	-	This flag applies to pesticide results where the identification has been confirmed by GC/MS.
B	-	This flag is used when the analyte is found in the associated blank as well as in the sample.
E	-	This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
D	-	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
T	-	This flag is used when the analyte is found in the associated TCLP extraction blank as well as in the sample.
N	-	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
P	-	This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a "P".
A	-	This flag indicates that a TIC is a suspected aldol-condensation product.

INORGANIC DATA COMMENT PAGE

Laboratory Name: Recra Labnet, Inc.

USEPA Defined Inorganic Data Qualifiers:

B	-	Indicates a value greater than or equal to the instrument detection limit, but less than the contract required detection limit.
U	-	Indicates element was analyzed for but not detected. Report with the detection limit value (e.g., 100).
N	-	Indicates spike sample recovery is not within the control limits.
K	-	Indicates the post digestion spike recovery is not within the control limits.
*	-	Indicates duplicate analysis is not within the control limits.
S	-	Indicates value determined by the Method of Standard Addition.
+	-	Indicates the correlation coefficient for the Method of Standard Addition is less than 0.995.
M	-	Indicates duplicate injection results exceeded control limits.
W	-	Post digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50 % of spike absorbance.
E	-	Indicates a value estimated or not reported due to the presence of interference.

Date: 05/05/98
Time: 20:47:36

ANALYTICAL RESULTS

Rept: AN0353
Page: 1

Client Sample ID: Job Number & Lab Sample ID: Sample Date:		A1-MW-1 A98-1209 A8120903 04/09/98	A1-P-1 A98-1209 A8120902 04/09/98	A1-P-2 A98-1209 A8120901 04/09/98		
Analyte (UG/L)	RL	Result	Result	Result		
METHOD 8260 - VOLATILE ORGANICS						
Benzene	5	5 U	5 U	6		
Ethylbenzene	5	5 U	5 U	5 U		
Toluene	5	5 U	5 U	1 J		
Total Xylenes	15	15 U	15 U	15 U		
INTERNAL STANDARDS						
Chlorobenzene-D5	50-200	92	90	85		
1,4-Difluorobenzene	50-200	89	90	87		
1,4-Dichlorobenzene-D4	50-200	88	82	80		
SURROGATES						
Toluene-D8	84-115	85	87	89		
p-Bromofluorobenzene	78-110	106	99	99		
1,2-Dichloroethane-D4	81-125	106	106	104		

000004

* Indicates Result is Outside QC Limits
NA = Not Appli e

Recra LabNet

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		MSB26 A98-1209 A8120905		MSBD26 A98-1209 A8120906		VBLK26 A98-1209 A8120904			
Analyte (UG/L)	RL	Result		Result		Result			
METHOD 8260 - VOLATILE ORGANICS									
Benzene	5	50		48		5	U		
Ethylbenzene	5	5	U	5	U	5	U		
Toluene	5	42		42		5	U		
Total Xylenes	15	15	U	15	U	15	U		
INTERNAL STANDARDS									
Chlorobenzene-D5	50-200	102		92		88			
1,4-Difluorobenzene	50-200	102		94		88			
1,4-Dichlorobenzene-D4	50-200	91		81		83			
SURROGATES									
Toluene-D8	84-115	88		90		88			
p-Bromofluorobenzene	78-110	101		95		100			
1,2-Dichloroethane-D4	81-125	102		106		107			

000005

* Indicates Result is Outside QC Limits
NA = Not Applicable

METHOD 8260 - VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	A1-MW-1 A98-1209 A8120903	A1-P-1 A98-1209 A8120902	A1-P-2 A98-1209 A8120901		
Sample Date	04/09/98 14:39	04/09/98 11:33	04/09/98 10:08		
Received Date	04/10/98 10:55	04/10/98 10:55	04/10/98 10:55		
Extraction Date	-	-	-		
Analysis Date	04/14/98 02:18	04/14/98 01:45	04/14/98 01:11		
Extraction HT Met?	-	-	-		
Analytical HT Met?	YES	YES	YES		
Sample Matrix	WATER	WATER	WATER		
Dilution Factor	1.0	1.0	1.0		
Sample wt/vol	0.005 LITERS	0.005 LITERS	0.005 LITERS		
% Dry					

000006

NA = Not Appli e

METHOD 8260 - VOLATILE ORGANICS

Client Sample ID Job No & Lab Sample ID	MSB26 A98-1209 A8120905	MSBD26 A98-1209 A8120906	VBLK26 A98-1209 A8120904		
Sample Date					
Received Date					
Extraction Date	-	-	-		
Analysis Date	04/13/98 22:22	04/13/98 22:57	04/14/98 00:03		
Extraction HT Met?	-	-	-		
Analytical HT Met?	-	-	-		
Sample Matrix	WATER	WATER	WATER		
Dilution Factor	1.0	1.0	1.0		
Sample wt/vol	0.005 LITERS	0.005 LITERS	0.005 LITERS		
% Dry					

000007

NA = Not Applicable

SDG: 1132
Client Sample ID: VBLK26 MSB26 MSBD26
Lab Sample ID: A8120904 A8120905 A8120906

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			%	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg	RPD	RPD	REC.
METHOD 8260 - VOLATILE ORGANICS											
Benzene	UG/L	49.7	47.7	50.0	50.0	100	96	98	4	21.0	79-132
Toluene	UG/L	42.2	41.9	50.0	50.0	84	84	84	0	21.0	73-132

000008

* Indicates Result is outside QC Limits
NC = Not Calcula′ ND = Not Calculated

ANALYTICAL RESULTS

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:		A1-MW-1 / A98-1209 A8120903 / 04/09/98		A1-P-1 / A98-1209 A8120902 / 04/09/98		A1-P-2 / A98-1209 A8120901 / 04/09/98			
Analyte (UG/L)	RL	Result		Result		Result			
METHOD 8270-HSL PAH'S + PHENOL									
Acenaphthene	10	10	U	0.8	J	10	U		
Acenaphthylene	10	10	U	10	U	10	U		
Anthracene	10	10	U	1	J	10	U		
Benzo(a)anthracene	10	10	U	10	U	10	U		
Benzo(b)fluoranthene	10	10	U	10	U	10	U		
Benzo(k)fluoranthene	10	10	U	10	U	10	U		
Benzo(ghi)perylene	10	10	U	10	U	10	U		
Benzo(a)pyrene	10	10	U	10	U	10	U		
Chrysene	10	10	U	10	U	10	U		
Dibenzo(a,h)anthracene	10	10	U	10	U	10	U		
Fluoranthene	10	10	U	10	U	10	U		
Fluorene	10	10	U	10	U	10	U		
Indeno(1,2,3-cd)pyrene	10	10	U	10	U	10	U		
2-Methylnaphthalene	10	10	U	10	U	10	U		
Naphthalene	10	1	J	10	U	10	U		
Phenanthrene	10	10	U	10	U	4	J		
Pyrene	10	10	U	1	J	10	U		
Phenol	10	10	U	10	U	10	U		
INTERNAL STANDARDS									
1,4-Dichlorobenzene-D4	50-200	96		90		93			
Naphthalene-D8	50-200	94		92		93			
Acenaphthene-D10	50-200	94		100		99			
Phenanthrene-D10	50-200	91		98		97			
Chrysene-D12	50-200	95		90		108			
Perylene-D12	50-200	101		100		108			
SURROGATES									
Nitrobenzene-D5	23-114	68		67		57			
Terphenyl	38-141	84		90		88			
2-Fluorobiphenyl	43-116	77		78		74			
2-Fluorophenol	21-105	35		39		29			
Phenol-D5	10-105	23		28		21			
2,4,6-Tribromophenol	39-135	118		127		137	*		

000009

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: Job Number & Lab Sample ID: Sample Date:		Matrix Spike Blank A98-1209 A8B0246601		Matrix Spike Blk Dup A98-1209 A8B0246602		Method Blank A98-1209 A8B0246603			
Analyte (UG/L)	RL	Result		Result		Result			
METHOD 8270-HSL PAH'S + PHENOL									
Acenaphthene	10	64		72		10	U		
Acenaphthylene	10	10	U	10	U	10	U		
Anthracene	10	10	U	10	U	10	U		
Benzo(a)anthracene	10	10	U	10	U	10	U		
Benzo(b)fluoranthene	10	10	U	10	U	10	U		
Benzo(k)fluoranthene	10	10	U	10	U	10	U		
Benzo(ghi)perylene	10	10	U	10	U	10	U		
Benzo(a)pyrene	10	10	U	10	U	10	U		
Chrysene	10	10	U	10	U	10	U		
Dibenzo(a,h)anthracene	10	10	U	10	U	10	U		
Fluoranthene	10	10	U	10	U	10	U		
Fluorene	10	10	U	10	U	10	U		
Indeno(1,2,3-cd)pyrene	10	10	U	10	U	10	U		
2-Methylnaphthalene	10	10	U	10	U	10	U		
Naphthalene	10	10	U	10	U	10	U		
Phenanthrene	10	10	U	10	U	10	U		
Pyrene	10	96		97		10	U		
Phenol	10	21		27		10	U		
INTERNAL STANDARDS									
1,4-Dichlorobenzene-D4	50-200	68		62		76			
Naphthalene-D8	50-200	65		68		77			
Acenaphthene-D10	50-200	72		70		80			
Phenanthrene-D10	50-200	77		75		83			
Chrysene-D12	50-200	86		87		90			
Perylene-D12	50-200	85		93		91			
SURROGATES									
Nitrobenzene-D5	23-114	50		58		58			
Terphenyl	38-141	86		98		84			
2-Fluorobiphenyl	43-116	58		81		68			
2-Fluorophenol	21-105	30		38		35			
Phenol-D5	10-105	22		25		26			
2,4,6-Tribromophenol	39-135	115		132		90			

000010

* Indicates Result is Outside QC Limits
NA = Not Applica'

METHOD 8270-HSL PAH'S + PHENOL

Client Sample ID Job No & Lab Sample ID	A1-MW-1 A98-1209 A8120903	A1-P-1 A98-1209 A8120902	A1-P-2 A98-1209 A8120901		
Sample Date	04/09/98 14:39	04/09/98 11:33	04/09/98 10:08		
Received Date	04/10/98 10:55	04/10/98 10:55	04/10/98 10:55		
Extraction Date	04/13/98 07:00	04/13/98 07:00	04/13/98 07:00		
Analysis Date	04/24/98 15:17	04/24/98 11:56	04/24/98 11:15		
Extraction HT Met?	YES	YES	YES		
Analytical HT Met?	YES	YES	YES		
Sample Matrix	WATER	WATER	WATER		
Dilution Factor	1.0	1.0	1.0		
Sample wt/vol	1.0 LITERS	0.92 LITERS	1.0 LITERS		
% Dry					

000011

NA = Not Applicable

MALCOLM PIRNIE INC
QC SAMPLE CHRONOLOGY

METHOD 8270-HSL PAH'S + PHENOL

Client Sample ID Job No & Lab Sample ID	Matrix Spike Blank A98-1209 A8B0246601	Matrix Spike Blk Dup A98-1209 A8B0246602	Method Blank A98-1209 A8B0246603		
Sample Date					
Received Date					
Extraction Date	04/13/98 07:00	04/13/98 07:00	04/13/98 07:00		
Analysis Date	04/23/98 21:24	04/23/98 22:10	04/23/98 20:37		
Extraction HT Met?	-	-	-		
Analytical HT Met?	-	-	-		
Sample Matrix	WATER	WATER	WATER		
Dilution Factor	1.0	1.0	1.0		
Sample wt/vol	1.0 LITERS	1.0 LITERS	1.0 LITERS		
% Dry					

000012

NA = Not Applica''

SDG: 1132
Client Sample ID: Method Blank — Matrix Spike Blank — Matrix Spike Blk Dup
Lab Sample ID: A8B0246603 — A8B0246601 — A8B0246602

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
METHOD 8270-HSL PAH'S + PHENOL											
Phenol	UG/L	21.3	26.8	100	100	21	27	24	25	35.0	8-105
Acenaphthene	UG/L	64.0	72.4	100	100	64	72	68	12	35.0	28-105
Pyrene	UG/L	96.2	97.1	100	100	96	97	97	1	35.0	40-131

000013

* Indicates Result is outside QC Limits
NC = Not Calculated   ND = Not Calculated

ANALYTICAL RESULTS

Client Sample ID:			A1-MW-1	A1-P-1	A1-P-2		
Job Number & Lab Sample ID:			A98-1209 A8120903	A98-1209 A8120902	A98-1209 A8120901		
Sample Date:			04/09/98	04/09/98	04/09/98		
Analyte	UNITS OF MEASURE	RL	Result	Result	Result		
TOTAL METALS							
Iron - Total	MG/L	0.034	4.0	0.066	0.11		

000014

* Indicates Result is Outside QC Limits
NA = Not Applicat

QC ANALYTICAL RESULTS

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Matrix Spike Blank A98-1209 A8B0278901	Matrix Spike Blk Dup A98-1209 A8B0278902	Method Blank A98-1209 A8B0278903		
Analyte	UNITS OF MEASURE	RL	Result	Result	Result		
TOTAL METALS							
Iron - Total	MG/L	0.034	2.1	2.0	0.034 U		

000015

* Indicates Result is Outside QC Limits
NA = Not Applicable

MALCOLM PIRNIE INC
SAMPLE CHRONOLOGY

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8120903	A1-MW-1	MG/L	Iron - Total	6010	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/26	Yes	WATER
A8120902	A1-P-1	MG/L	Iron - Total	6010	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/26	Yes	WATER
A8120901	A1-P-2	MG/L	Iron - Total	6010	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/26	Yes	WATER

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicab

MALCOLM PIRNIE INC
QC CHRONOLOGY

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8B0278901	Matrix Spike Blank	MG/L	Iron - Total	6010	1.00		- 10:55	NA	NA	04/26	Yes	WATER
A8B0278902	Matrix Spike Blk Dup	MG/L	Iron - Total	6010	1.00		- 10:55	NA	NA	04/26	Yes	WATER
A8B0278903	Method Blank	MG/L	Iron - Total	6010	1.00		- 10:55	NA	NA	04/26	Yes	WATER

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicable

SDG: 1132
Client Sample ID: Method Blank | Matrix Spike Blank | Matrix Spike Blk Dup
Lab Sample ID: A8B0278903 | A8B0278901 | A8B0278902

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
TOTAL METALS ANALYSIS											
TOTAL IRON	MG/L	2.0	2.0	2,0	2.0	104	102	103	2	20.0	80-120

000018

* Indicates Result is outside QC Limits
NC = Not Calcula' ND = Not Calculated

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			A1-MW-1 A98-1209 A8120903 04/09/98	A1-P-1 A98-1209 A8120902 04/09/98	A1-P-2 A98-1209 A8120901 04/09/98		
Analyte	UNITS OF MEASURE	RL	Result	Result	Result		
WET CHEMISTRY ANALYSIS							
Ammonia	MG/L	0.050	1.1	0.21	0.27		
Bicarbonate Alkalinity	MG/L	5.0	111	49.7	97.6		
Chloride	MG/L	1.0	36.2	19.9	10.5		
Cyanide - Total	MG/L	0.010	0.010 U	0.010 U	0.010 U		
Ferric Iron	MG/L	0	0.10 U	0.10 U	0.10 U		
Nitrate-Nitrite	MG/L	0.050	0.050 U	0.36	0.050 U		
Soluble Organic Carbon	MG/L	1.0	7.3	5.8	5.7		
Sulfate	MG/L	1.0	190	152	140		
Sulfide	MG/L	1.0	1.0 U	1.0 U	1.0 U		
Sulfide	MG/L	1.0	1.0 U	1.0 U	1.0 U		
Total Alkalinity	MG/L	5.0	111	49.7	97.6		

000019

* Indicates Result is Outside QC Limits
NA = Not Applicable

QC ANALYTICAL RESULTS

Client Sample ID: Job Number & Lab Sample ID: Sample Date:			MSB (80.0) A98-1209 A8B0264502	MSBD (80.0) A98-1209 A8B0264503	Matrix Spike Blank A98-1209 A8B0258402	Matrix Spike Blank A98-1209 A8B0265802	Matrix Spike Blank A98-1209 A8B0267202
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Bicarbonate Alkalinity	MG/L	5.0	77.6	79.6	NA	NA	NA
Sulfide	MG/L	1.0	NA	NA	4.3	NA	NA
Sulfate	MG/L	1.0	NA	NA	NA	19.0	NA
Soluble Organic Carbon	MG/L	1.0	NA	NA	NA	NA	9.1
Total Alkalinity	MG/L	5.0	77.6	79.6	NA	NA	NA
Sulfide	MG/L	1.0	NA	NA	4.3	NA	NA

000020

* Indicates Result is Outside QC Limits
NA = Not Applic`

Recra LabNet

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Matrix Spike Blank A98-1209 A8B0274202	Matrix Spike Blank A98-1209 A8B0275702	Matrix Spike Blank A98-1209 A8B0275903	Matrix Spike Blank A98-1209 A8B0281402	Matrix Spike Blank A98-1209 A8B0284502
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Ammonia	MG/L	0.050	1.0	NA	NA	NA	NA
Chloride	MG/L	1.0	NA	18.2	NA	NA	NA
Cyanide - Total	MG/L	0.010	NA	NA	0.089	NA	NA
Nitrate-Nitrite	MG/L	0.050	NA	NA	NA	1.0	NA
Ferric Iron	MG/L	0	NA	NA	NA	NA	4.1

000021

* Indicates Result is Outside QC Limits
NA = Not Applicable

QC ANALYTICAL RESULTS

		Client Sample ID: Job Number & Lab Sample ID: Sample Date:	Matrix Spike Blk Dup A98-1209 A8B0258403	Matrix Spike Blk Dup A98-1209 A8B0265803	Matrix Spike Blk Dup A98-1209 A8B0267203	Matrix Spike Blk Dup A98-1209 A8B0274203	Matrix Spike Blk Dup A98-1209 A8B0275703
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Sulfide	MG/L	1.0	4.5	NA	NA	NA	NA
Sulfate	MG/L	1.0	NA	20.7	NA	NA	NA
Soluble Organic Carbon	MG/L	1.0	NA	NA	9.1	NA	NA
Ammonia	MG/L	0.050	NA	NA	NA	1.0	NA
Chloride	MG/L	1.0	NA	NA	NA	NA	20.1
Sulfide	MG/L	1.0	4.5	NA	NA	NA	NA

000022

* Indicates Result is Outside QC Limits
NA = Not Applic

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Matrix Spike Blk Dup A98-1209 A8B0275904	Matrix Spike Blk Dup A98-1209 A8B0281403	Matrix Spike Blk Dup A98-1209 A8B0284503	Method Blank A98-1209 A8B0258404	Method Blank A98-1209 A8B0264504
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Cyanide - Total	MG/L	0.010	0.090	NA	NA	NA	NA
Nitrate-Nitrite	MG/L	0.050	NA	1.0	NA	NA	NA
Ferric Iron	MG/L	0	NA	NA	4.1	NA	NA
Sulfide	MG/L	1.0	NA	NA	NA	1.0 U	NA
Bicarbonate Alkalinity	MG/L	5.0	NA	NA	NA	NA	5.0 U
Sulfide	MG/L	1.0	NA	NA	NA	1.0 U	NA
Total Alkalinity	MG/L	5.0	NA	NA	NA	NA	5.0 U

000023

* Indicates Result is Outside QC Limits
NA = Not Applicable

Client Sample ID: / Job Number & Lab Sample ID: / Sample Date:			Method Blank A98-1209 A8B0265804	Method Blank A98-1209 A8B0267204	Method Blank A98-1209 A8B0274204	Method Blank A98-1209 A8B0275704	Method Blank A98-1209 A8B0281404
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	Result
WET CHEMISTRY ANALYSIS							
Sulfate	MG/L	1.0	1.0 U	NA	NA	NA	NA
Soluble Organic Carbon	MG/L	1.0	NA	1.0 U	NA	NA	NA
Ammonia	MG/L	0.050	NA	NA	0.050 U	NA	NA
Chloride	MG/L	1.0	NA	NA	NA	1.0 U	NA
Nitrate-Nitrite	MG/L	0.050	NA	NA	NA	NA	0.050 U

000024

* Indicates Result is Outside QC Limits
NA = Not Applic

Client Sample ID: Job Number & Lab Sample ID: Sample Date:			Method Blank A98-1209 A8B0284504	Method Blank(PBLK__) A98-1209 A8B0275901			
Analyte	UNITS OF MEASURE	RL	Result	Result			
WET CHEMISTRY ANALYSIS							
Ferric Iron	MG/L	0	0.10 U	NA			
Cyanide - Total	MG/L	0.010	NA	0.010 U			

000025

* Indicates Result is Outside QC Limits
NA = Not Applicable

Date: 05/05/98 20:49
Jobno: A98-1209

MALCOLM PIRNIE INC
SAMPLE CHRONOLOGY

Rept: AN0369

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8120903	A1-MW-1	MG/L	Sulfide	9030	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/15	Yes	WATER
		MG/L	Sulfate	9038	5.00	04/09/98 14:39	04/10 10:55	NA	NA	04/17	Yes	WATER
		MG/L	Soluble Organic Carbon	9060	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/20	Yes	WATER
		MG/L	Cyanide - Total	9010	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/22	Yes	WATER
		MG/L	Total Alkalinity	310.1	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/16	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/16	Yes	WATER
		MG/L	Sulfide	9030	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/15	Yes	WATER
		MG/L	Nitrate-Nitrite	353.2	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/23	Yes	WATER
		MG/L	Ammonia	350.1	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/21	Yes	WATER
		MG/L	Chloride	9251	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/22	Yes	WATER
		MG/L	Ferric Iron	3500FE-D	1.00	04/09/98 14:39	04/10 10:55	NA	NA	04/23	No	WATER
A8120902	A1-P-1	MG/L	Sulfide	9030	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/15	Yes	WATER
		MG/L	Sulfate	9038	4.00	04/09/98 11:33	04/10 10:55	NA	NA	04/17	Yes	WATER
		MG/L	Soluble Organic Carbon	9060	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/20	Yes	WATER
		MG/L	Cyanide - Total	9010	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/22	Yes	WATER
		MG/L	Total Alkalinity	310.1	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/16	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/16	Yes	WATER
		MG/L	Sulfide	9030	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/15	Yes	WATER
		MG/L	Nitrate-Nitrite	353.2	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/23	Yes	WATER
		MG/L	Ammonia	350.1	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/21	Yes	WATER
		MG/L	Chloride	9251	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/22	Yes	WATER
		MG/L	Ferric Iron	3500FE-D	1.00	04/09/98 11:33	04/10 10:55	NA	NA	04/23	No	WATER
A8120901	A1-P-2	MG/L	Sulfide	9030	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/15	Yes	WATER
		MG/L	Sulfate	9038	4.00	04/09/98 10:08	04/10 10:55	NA	NA	04/17	Yes	WATER
		MG/L	Soluble Organic Carbon	9060	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/20	Yes	WATER
		MG/L	Cyanide - Total	9010	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/22	Yes	WATER
		MG/L	Total Alkalinity	310.1	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/16	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/16	Yes	WATER
		MG/L	Sulfide	9030	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/15	Yes	WATER
		MG/L	Nitrate-Nitrite	353.2	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/23	Yes	WATER
		MG/L	Ammonia	350.1	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/21	Yes	WATER
		MG/L	Chloride	9251	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/22	Yes	WATER
		MG/L	Ferric Iron	3500FE-D	1.00	04/09/98 10:08	04/10 10:55	NA	NA	04/23	No	WATER

000026

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applic

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8B0258402	Matrix Spike Blank	MG/L	Sulfide	9030	1.00		- 10:55	NA	NA	04/15	Yes	WATER
		MG/L	Sulfide	9030	1.00		- 10:55	NA	NA	04/15	Yes	WATER
A8B0265802	Matrix Spike Blank	MG/L	Sulfate	9038	1.00		- 10:55	NA	NA	04/17	Yes	WATER
A8B0267202	Matrix Spike Blank	MG/L	Soluble Organic Carbon	9060	1.00		- 10:55	NA	NA	04/20	Yes	WATER
A8B0274202	Matrix Spike Blank	MG/L	Ammonia	350.1	1.00		- 10:55	NA	NA	04/21	Yes	WATER
A8B0275702	Matrix Spike Blank	MG/L	Chloride	9251	1.00		- 10:55	NA	NA	04/22	Yes	WATER
A8B0275903	Matrix Spike Blank	MG/L	Cyanide - Total	9010	1.00		- 10:55	NA	NA	04/22	Yes	WATER
A8B0281402	Matrix Spike Blank	MG/L	Nitrate-Nitrite	353.2	1.00		- 10:55	NA	NA	04/23	Yes	WATER
A8B0284502	Matrix Spike Blank	MG/L	Ferric Iron	3500FE-D	1.00		- 10:55	NA	NA	04/23	Yes	WATER
A8B0258403	Matrix Spike Blk Dup	MG/L	Sulfide	9030	1.00		- 10:55	NA	NA	04/15	Yes	WATER
		MG/L	Sulfide	9030	1.00		- 10:55	NA	NA	04/15	Yes	WATER
A8B0265803	Matrix Spike Blk Dup	MG/L	Sulfate	9038	1.00		- 10:55	NA	NA	04/17	Yes	WATER
A8B0267203	Matrix Spike Blk Dup	MG/L	Soluble Organic Carbon	9060	1.00		- 10:55	NA	NA	04/20	Yes	WATER
A8B0274203	Matrix Spike Blk Dup	MG/L	Ammonia	350.1	1.00		- 10:55	NA	NA	04/21	Yes	WATER
A8B0275703	Matrix Spike Blk Dup	MG/L	Chloride	9251	1.00		- 10:55	NA	NA	04/22	Yes	WATER
A8B0275904	Matrix Spike Blk Dup	MG/L	Cyanide - Total	9010	1.00		- 10:55	NA	NA	04/22	Yes	WATER
A8B0281403	Matrix Spike Blk Dup	MG/L	Nitrate-Nitrite	353.2	1.00		- 10:55	NA	NA	04/23	Yes	WATER
A8B0284503	Matrix Spike Blk Dup	MG/L	Ferric Iron	3500FE-D	1.00		- 10:55	NA	NA	04/23	Yes	WATER
A8B0264502	MSB (80.0)	MG/L	Total Alkalinity	310.1	1.00		- 10:55	NA	NA	04/16	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00		- 10:55	NA	NA	04/16	Yes	WATER
A8B0264503	MSBD (80.0)	MG/L	Total Alkalinity	310.1	1.00		- 10:55	NA	NA	04/16	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00		- 10:55	NA	NA	04/16	Yes	WATER
A8B0258404	Method Blank	MG/L	Sulfide	9030	1.00		- 10:55	NA	NA	04/15	Yes	WATER
		MG/L	Sulfide	9030	1.00		- 10:55	NA	NA	04/15	Yes	WATER
A8B0265804	Method Blank	MG/L	Sulfate	9038	1.00		- 10:55	NA	NA	04/17	Yes	WATER
A8B0274204	Method Blank	MG/L	Ammonia	350.1	1.00		- 10:55	NA	NA	04/21	Yes	WATER
A8B0275704	Method Blank	MG/L	Chloride	9251	1.00		- 10:55	NA	NA	04/22	Yes	WATER
A8B0281404	Method Blank	MG/L	Nitrate-Nitrite	353.2	1.00		- 10:55	NA	NA	04/23	Yes	WATER
A8B0284504	Method Blank	MG/L	Ferric Iron	3500FE-D	1.00		- 10:55	NA	NA	04/23	Yes	WATER
A8B0264504	Method Blank	MG/L	Total Alkalinity	310.1	1.00		- 10:55	NA	NA	04/16	Yes	WATER
		MG/L	Bicarbonate Alkalinity	403	1.00		- 10:55	NA	NA	04/16	Yes	WATER
A8B0267204	Method Blank	MG/L	Soluble Organic Carbon	9060	1.00		- 10:55	NA	NA	04/20	Yes	WATER
A8B0275901	Method Blank(PBLK__)	MG/L	Cyanide - Total	9010	1.00		- 10:55	NA	NA	04/22	Yes	WATER

000027

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicable

SDG: 1132
Client Sample ID: Method Blank Matrix Spike Blank Matrix Spike Blk Dup
Lab Sample ID: A8B0258404 A8B0258402 A8B0258403

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
WET CHEMISTRY ANALYSIS											
METHOD 9030 - DISSOLVED SULFIDE	MG/L	4.3	4.5	4.5	4.5	95	100	98	4	20.0	85-115
METHOD 9030 - SULFIDE	MG/L	4.3	4.5	4.5	4.5	95	100	98	4	20.0	85-115

000028

* Indicates Result is outside QC Limits
NC = Not Calculr ᐧ ND = Not Calculated

SDG: 1132
Client Sample ID: Method Blank
Lab Sample ID: A8B0264504

MSB (80.0)
A8B0264502

MSBD (80.0)
A8B0264503

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
WET CHEMISTRY ANALYSIS											
METHOD 310.1 - TOTAL ALKALINITY	MG/L	77.6	79.6	80.0	80.0	97	99	98	2	20.0	85-115
METHOD SM403 - BICARBONATE ALKALINITY	MG/L	77.6	79.6	80.0	80.0	97	99	98	2	20.0	85-115

* Indicates Result is outside QC Limits
NC = Not Calculated   ND = Not Calculated

SDG: 1132
Client Sample ID: Method Blank | Matrix Spike Blank | Matrix Spike Blk Dup
Lab Sample ID: A8B0265804 | A8B0265802 | A8B0265803

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
WET CHEMISTRY ANALYSIS METHOD 9038 - SULFATE	MG/L	19.0	20.7	20.0	20.0	95	103	99	8	20.0	88-113

000030

* Indicates Result is outside QC Limits
NC = Not Calculr ' ND = Not Calculated

SDG: 1132
Client Sample ID: Method Blank
Lab Sample ID: A8B0274204

Matrix Spike Blank
A8B0274202

Matrix Spike Blk Dup
A8B0274203

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
WET CHEMISTRY ANALYSIS METHOD 350.1 - AMMONIA	MG/L	1.0	1.0	1.0	1.0	100	100	100	0	20.0	86-117

000031

* Indicates Result is outside QC Limits
NC = Not Calculated   ND = Not Calculated

SDG: 1132
Client Sample ID: Method Blank | Matrix Spike Blank | Matrix Spike Blk Dup
Lab Sample ID: A8B0275704 | A8B0275702 | A8B0275703

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
WET CHEMISTRY ANALYSIS											
METHOD 9251 - CHLORIDE	MG/L	18.2	20.1	20.0	20.0	91	100	96	10	20.0	85-115

000032

* Indicates Result is outside QC Limits
NC = Not Calcu' d ND = Not Calculated

SDG: 1132
Client Sample ID: Method Blank
Lab Sample ID: A8B0281404

Matrix Spike Blank
A8B0281402

Matrix Spike Blk Dup
A8B0281403

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			% RPD	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg		RPD	REC.
WET CHEMISTRY ANALYSIS METHOD 353.2 - NITRATE/NITRITE	MG/L	1.0	1.0	1.0	1.0	100	100	100	0	20.0	88-110

000033

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Calculated

SDG: 1132
Client Sample ID: Method Blank(PBLK__) Matrix Spike Blank Matrix Spike Blk Dup
Lab Sample ID: A8B0275901 A8B0275903 A8B0275904

Analyte	Units of Measure	Concentration		Spike Amount		% Recovery			%	QC LIMITS	
		Spike Blank	Spike Blank Dup	SB	SBD	SB	SBD	Avg	RPD	RPD	REC.
WET CHEMISTRY ANALYSIS											
METHOD 9010 - TOTAL CYANIDE	MG/L	0.089	0.090	0.10	0.10	89	90	90	1	20.0	80-115

* Indicates Result is outside QC Limits
NC = Not Calcul d ND = Not Calculated

RECRA LABNET, a division of Recra Environmental, Inc. *CHAIN OF CUSTODY RECORD*

PROJECT NO: 0843-263
SITE NAME: GV Steel-Plant Site
SAMPLERS (SIGNATURE): Jeanne Cozzita

STATION NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO OF CONTAINERS	40 ml vial BTEX 8260	1 L Amber glass PAH Phenol-8270	4 oz Plastic T CN	1 L Plastic sulfide/diss sulfide	8 oz plastic Sulfate chloride	4 oz plastic Sol. O&G	4 oz plastic T Fe	16 oz plastic T Alk Bi Alk	16 oz plastic Nitrate Nitrite Ammonia	REMARKS	4 oz plastic Ferric Iron	40 ml vial Ethane/Ethene/Methane	16 oz plastic for labware if needed
	4/9/98	10:08		X	AI-P-2	16	2	2	1	2	1	1	1	1	1		1	2	1
		11:33		X	AI-P-1	16	2	2	1	2	1	1	1	1	1		1	2	1
		14:39		X	AI-MW-1	16	2	2	1	2	1	1	1	1	1		1	2	1
					TRIP BLANK	2	2												

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
Jeanne Cozzita	4/10/98 0900	[signature]	[signature]	4/10/98 08:30	[signature]
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
[signature]	4/10/98 1055	Daniel R 4/10/98 1055			
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE/TIME	REMARKS	
				cool, 4°C	

Distribution: Original accompanies shipment copy to coordinator field files

000035

TURN KEY
ENVIRONMENTAL
RESTORATION, LLC

October 5, 1999

Mr. Peter Buechi, P.E.
NYS Department of Environmental Conservation
Division of Environmental Remediation
270 Michigan Avenue
Buffalo, New York 14203

Re: Former Steel Manufacturing Site – Voluntary Cleanup Project
Area I Addendum 1 Report

Dear Mr. Buechi:

On behalf of LTV Steel Company and The Hanna Furnace Corporation, enclosed for you review are three draft copies of the Voluntary Cleanup Site Assessment Report – Addendum 1. The report summarizes all of the additional sampling information recently gathered for Area I and the gas holder area of Area II as requested by the NYSDEC. Please call us if you have any questions.

Sincerely,

Paul H. Werthman
President

Wayne Gould, LTV
Keith Nagel, LTV
Dale Papajcik, LTV
Ron Werhnyak, Hanna-Furnace
Mike Tomana, Thorpe, Reed, Armstrong
Jack Heintz, Hanna Furnace
Rich Palumbo, Boylan Brown
Cameron O'Connor, NYSDOH – Buffalo
Dr. G. Anders Carlson, NYSDOH– Albany
Andrew English, NYSDEC – Albany
James Harrington, NYSDEC-Albany

VOLUNTARY CLEANUP SITE ASSESSMENT REPORT-ADDENDUM 1
AREA I-REPUBLIC STEEL PLANT PARCEL
&
GAS HOLDER SUBAREA OF AREA II

FORMER STEEL MANUFACTURING SITE
BUFFALO, NY

October 1999

0002-005-200

Prepared for:

LTV Steel Company, Inc.
Cleveland, OH; and

The Hanna Furnace Corporation
Mishawaka, IN

VOLUNTARY CLEANUP SITE ASSESSMENT REPORT-
ADDENDUM 1
AREA I-REPUBLIC STEEL PLANT PARCEL AND GAS HOLDER SUBAREA OF AREA II

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VOLUNTARY CLEANUP SITE ASSESSMENT REPORT-
ADDENDUM 1
AREA I-REPUBLIC STEEL PLANT PARCEL AND GAS HOLDER
SUBAREA OF AREA II

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List of Appendices

1.0 INTRODUCTION

This addendum has been prepared to present additional investigation data collected from Area I and Area II of the Former Steel Manufacturing Site subsequent to the April 1999 revision of the Voluntary Cleanup Site Assessment Reports (References 1 and 2). This additional investigation was undertaken in response to comments by the New York State Department of Environmental Conservation (NYSDEC) on the Site Assessment Report and was generally related to providing additional soil testing in large uncharacterized portions of Area I, in the Gas Holder Subarea of Area II and in the vicinity of eight former underground storage tanks. An investigation plan was approved by the NYSDEC in June 1999.

Following approval of the plan in June, and during a site walkover along the Buffalo River to evaluate potential fish habitats, NYSDEC and TurnKey personnel observed an oil sheen along the bank of the River. The sheen appeared to originate from the sheetpiling wall adjacent to Subarea A. Boring logs from that vicinity were reviewed and it was determined that oil staining of soil/fill above native soil was noted in several borings. Consequently, all boring logs from locations in Area I were reviewed for the evidence of oil staining. Several borings from Subareas B, C, and J were identified as having thin zones of petroleum impacted soil/fill above the native soil interface. As such, additional investigation activities were proposed in a letter to the NYSDEC dated June 25, 1999 to visually confirm the boring log descriptions and to more accurately delineate the nature and extent of the petroleum impacts on subsurface soils.

This addendum contains additional analytical data and visual characterization of the fill and native soil in Area I and the Gas Holder Subarea of Area II from the performance of 159 additional test pits and 9 soil borings and the analysis of soil samples collected from them. A Data Usability Report is currently being performed by Data Validation Services and will be submitted upon completion.

2.0 FIELD OBSERVATIONS

2.1 Background

The initial work on the Former Steel Manufacturing Site began in 1997 during performance of a Phase I Site Assessment by Malcolm Pirnie, Inc. Malcolm Pirnie identified thirteen areas of potential environmental conditions related to the processes or activities performed during former steel plant operations in Area I (ie. Subareas A through M). Subareas A through M were subsequently characterized by approximately 80 borings and test pits including 11 monitoring wells during a Phase II Investigation. Approximately 35 of the 91 acres in Area A previously not sampled or characterized are addressed in this Addendum. This previously uncharacterized acreage was divided into 6 additional subareas labeled Subareas N through S and characterized as described below.

2.2 Subareas N Through S

The NYSDEC-approved investigation and analytical testing plan outlined in Table 2-1 below was used as the basis for characterization of Subareas N through S.

TABLE 2-1

Subarea Designation	Subarea Future or Past Use	Approx. Size of Subarea (acres)	Number Test Pits/Acre	Sample Collection Depths
N	Future Park	5	4	0-3" 3"-Top of Native
O	Ore Storage Yard	7	2	0-Refusal
P	Railroad	6.5	4	0-Top of Native
Q	Casting Yard	9.5	3	0-Top of Native
R	Billet Storage Yard	4.5	2	0-Top of Native
S	Shipping Yard	2.5	4	0-Top of Native

Each test pit performed to characterize Subareas N through S was excavated to either native soil or to refusal. Test pit logs are included as Appendix A and locations are shown on Plate 1. Generally, refusal resulted from encountering compacted molten or cemented slag or a subsurface building foundation or concrete structure. Native soil was encountered in approximately 72 percent of the test pits. Table 2-2 summarizes the excavation details of each test pit and includes the depth to native soil, depth to ground water, consistency of native soil, depth of sample collected, and analyses performed.

Generally, fill consisted of slag, brick, iron ore, limestone, gravel and soil. Occasional large chunks of concrete and railroad ties were encountered, especially in the ore yard. Samples for analytical testing were collected to represent the entire depth of the test pit unless material that appeared to be petroleum-impacted was encountered. One type of fill material that was encountered in many of the test pits was a blue-cemented slag. A discrete sample of this material was collected from a test pit in Subarea P, A1-TP-P2 and analyzed. One additional discrete sample was collected at tank location T5 and analyzed from a tan or whitish sand-chalky fill material encountered.

During excavation of two test pits, one in Subarea P and one in Subarea Q, fill material was encountered that either had an odor or was visually impacted by a black, viscous (apparently) petroleum product. The lateral extent of impacted material in Subarea P, at A1-TP-P2 was determined and since the volume was only approximately 2-cubic yards, was excavated from the test pit and placed on the ground surface to bioremediate. A discrete sample, labeled A1-TP-P2b, was collected and analyzed to compare to SSALs. Material that appeared impacted in Subarea Q, at A1-TP-Q13b, was discretely sampled and analyzed to compare to SSALs. Two additional test pits in Subarea Q (viz. A1-TP-Q27 and A1-TP-Q28) contained a thin layer of impacted soil, as shown on Plate 2, and are associated with the former tank location (i.e. T3) discussed in Section 2.4.

2.3 Gas Holder Subarea in Area II

One large and one small gas holder existed on the approximately 3.5-acre subarea just north of Baraga Street. Only the concrete pads of the gas holders appear to remain below ground surface. The subarea was characterized by a total of thirteen test pits and nine soil borings. Test Pit excavation and soil boring details and an analytical summary is provided in Table 2-3.

To characterize the small gas holder area, one test pit and two soil borings were performed on the concrete pad, and one soil boring was extended through the pad using a roller bit to the soil below the pad. The area around the small pad was investigated by performing one test pit and five soil borings. Two soil borings were extended through the large holder concrete pad using the roller bit technique. Two test pits were excavated to examine the soil above the pad, three test pits were performed on the edges of the pad, and six test pits were performed to characterize the fill in the remainder of the subarea north of Baraga Street. Appendix B contains the test pit and boring logs.

The large gas holder pad appears to have been constructed on top of native soil. Based on split spoon sampling results, no contamination above SSALs was detected beneath or around the concrete pad. The small pad was constructed on fill, however the fill was visually inspected and exhibited no evidence of contaminants. A black material was sampled from two borings (viz. A2-SB-GH3 and A2-SB-GH8) adjacent to the small gas holder and analyzed for SVOCs.

2.4 Former Tank Locations

Historical drawings of the Area I parcel indicate that a number of petroleum storage tanks were maintained at the site. File records indicate that the majority of these tanks existed as above-ground storage tanks located indoors on concrete floors or in basements, and that they were properly drained and scrapped prior to plant demolition. Accordingly, it is unlikely that uncontrolled releases occurred from them. However, approximately seven tanks appear to have been located as outdoor, at-grade or underground storage tanks. Records indicate that these storage tanks were previously removed from the site or closed in-place but there is no documentation regarding possible residual contamination in adjacent soil/fill. These locations, along with the 1000-gallon gasoline tank in Subarea D, were investigated to determine whether historical releases occurred and the extent of impact.

A minimum of one test pit was performed at each location. Prior to excavation, a licensed professional land surveyor staked the locations. The SPCC Plan indicated that tank T2 was closed in place with sand, however the fill port was uncovered, and it was evident that the tank was filled with water. The actual locations of T2 and T3 appear to be different than the file records based on field observations. The T2 tank was observed at location T3 based on dimensions from features uncovered during excavation, (i.e. building corners and rail lines). Similarly, the true location of former tank T3 is at test pit T3a, based upon visual and olfactory evidence of diesel fuel residuals.

Petroleum impacted soil was encountered at tank locations T-2 (actually T3), T-3 (actually T3a), and T-5 (Subarea D). Where impacted soil was encountered, the area was delineated to determine the approximate aerial and vertical extent. Test pits performed during the tank investigations are summarized in Table 2-4 and test pit logs are included as Appendix C. Plate 2 shows the type of contamination encountered, depth to native soil, and thickness of contamination observed.

2.5 Investigation of Phase I/II Impacted Borings

Eight additional locations were selected for inspection to determine the presence of oil staining. At least one boring location from each of Subareas A, B, C, D, and J required a test pit excavation. Subarea D, associated with former tank location T-5, was discussed in Section 2.4.

At each former boring location that was excavated, oil staining was encountered. At most of the locations, the oil coats the grains of slag fill that are just above native soil. Generally, soil borings A1-SB-A3, A1-SB-B1, A1-SB-B2, A1-SB-C1, and A1-SB-J2 contained thin layers less than 0.4 feet thick of oil-coated grains. The oil appeared to be aged and viscous with low mobility (ie., it did not drip or flow). A sample was collected from A1-TP-A3 and analyzed. Additional test pits were performed to delineate the lateral and vertical extent of the petroleum-impacted fill. Table 2-5 contains test pit excavation details. Test pit logs are included as Appendix D.

Plate 2 shows the locations of the borings and test pits, the type of contamination encountered, depth to native soil, and average thickness of petroleum impacted soil/fill. Unless noted, the impacted material is directly overlying native soil. Also shown on Plate 2 are test pits that exhibited evidence of contamination without a leader information box.

3.0 RESULTS

Tables 3-1a through 3-10c summarize the analytical data collected during this investigation. Where a sample concentration exceeds SSALs, the concentration is shaded on the tables.

3.1 Surface Soil/Fill

The only surface samples collected during this investigation were from the Future Park Subarea designated Subarea N. A total of twenty test pits were performed to collect surface samples representing the upper 3-inches of soil/fill in each test pit. The samples were labeled A1-TP-N1, 0-3" through A1-TP-N20, 0-3". Samples were analyzed for Stars List Volatile Organic Compounds (VOCs), Target Compound List (TCL) Semivolatile Organic Compounds (SVOCs), PCBs, arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Analytical results are summarized in Tables 3-1a, 3-1b, 3-1c, and 3-1d. A surface sample was not collected at A1-TP-N14 due to the discovery of impacted soil/fill at this location. Sample results from A1-TP-N14 are discussed in Section 3.2.1.1.

As shown on Tables 3-1a and 3-1b, organic concentrations of all surface soil/fill in Subarea N were less than the SSALs. For inorganic analyses, all surface soil/fill samples were below SSALs except at location A1-TP-N15, where the original sample concentration for lead exceeded the SSAL (Refer to Table 3-1c). Two additional aliquots of that sample were taken from the sample jar at the laboratory and the test was rerun. The reruns are included in Table 3-1c for comparison. As shown in the table, the two rerun results were below the SSAL for lead. PCBs were not detected in any of the samples that were analyzed.

3.2 Subsurface Soil/Fill

3.2.1 Subareas N Through S

Tables 3-2a through 3-7c summarize subsurface soil/fill analytical data from 127 samples collected from Subareas N through S. Samples were analyzed for Stars List Volatile Organic Compounds (VOCs), Target Compound List (TCL) Semivolatile Organic Compounds (SVOCs), arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

3.2.1.1 Organic Compounds

Organic analytical data were less than SSALs for every sample analyzed with the exception of A1-TP-N14. This location, designated Subarea N14 and shown on Plate 2, was delineated by a number of test pits. From review of historical aerial photographs, it appears that this subarea is associated with a sliver of land between two former railroad tracks. Elevated volatile and semivolatile organic constituents at this location may have been associated with a spill from railroad operations. Contaminated soil/fill extends to near the ground surface and primarily contains SVOCs, (especially naphthalene) and VOCs (ie. toluene, xylenes and trimethylbenzenes) in elevated concentrations.

Discrete samples analyzed of the cemented blue slag, the tan sand-chalky material, and impacted soil encountered in A1-TP-P2, and A1-TP-Q13 resulted in concentrations below SSALs.

3.2.1.2 Inorganic Compounds

Concentrations of inorganics exceeded SSALs at the following locations:

Sample Location	SSAL Exceeded
A1-TP-N4	lead
A1-TP-010	chromium
A1-TP-Q2	chromium
A1-TP Q5	chromium
A1-TP-Q14	arsenic
A1-TP-Q18	lead
A1-TP-Q19	lead
A1-TP-S9	mercury

To determine if the elevated concentrations were anomalous, two additional aliquots of each sample were taken from the sample jar at the laboratory and the tests were rerun. The reruns are included in the tables for comparison. The sample-rerun concentrations for A1-TP-O10 and A1-TP-N4 were below the SSALs. The remainder of the sample-rerun concentrations were above SSALs. A work plan to investigate the above-listed six locations exhibiting elevated inorganic concentrations will be submitted as part of the Voluntary Cleanup Work Plan.

3.2.2 Area II Gas Holder Subarea

A total of five composite samples and three discrete samples were collected from the Gas Holder Subarea. Composite samples were analyzed for Stars List VOCs, TCL SVOCs, and the eight RCRA metals. Analytical results are summarized in Tables 3-8. Concentrations were only elevated with respect to SSALs for lead in discrete sample A2-TP-GH4 collected from 5.5 to 6.5 feet below grade. The laboratory analyzed two additional aliquots from the sample jar and the resulting concentrations were less than SSALs indicating that lead is not uniform throughout the layer that was sampled.

3.2.3 Former Tank Locations

Samples were collected and analyzed at eight previous tank locations to confirm field observations of the presence or absence of petroleum-impacted soil/fill. Analytical results, summarized on Table 3-9, indicate that SSALs at A1-TP-T3 were exceeded confirming the field observation of petroleum-impacted soil/fill. Two locations will need to be addressed during site remediation actvities including the area around A1-TP-T3 (Subarea T3) and tank location T5 (Subarea D) shown on Plate 2. Tank locations, T1, T4, T6, T7, and T8 did not contain visibly impacted soil/fill nor concentrations above the SSALs.

Subarea T3 is associated with two former underground diesel fuel tanks that were removed as shown on Plate 2. The contamination in this entire subarea is generally in a thin layer above the native soil. However, at location A1-TP-T3a, a thicker contaminated layer exists which is likely the actual former tank location. Sample A1-TP-T3a was collected from above the contaminated zone to confirm that the soil above the contaminated zone was not impacted.

Subarea D shown on Plate 2 and former tank location T5 was the site of a former underground gasoline tank. Soil and fill in the vicinity has been impacted to a minimum depth of 19 feet and will require remediation. This relatively deep contamination is likely beneath the former tank depth.

3.2.4 Petroleum- Impacted Borings

Excavations were performed at eight additional locations to confirm the presence of petroleum residuals described as "oil stained" in the Phase I/II soil borings. Boring logs described the staining as fuel oil coating the slag or fill material. Test pits excavated at the locations of the borings confirmed that the fuel oil in many of the locations exists as a film on the outside of the slag particles. This was the case, specifically, in Subareas B and C and on the periphery of Subareas A and K. Analytical testing of the petroleum-impacted slag has in every instance (i.e. including Phase I/II results) resulted in concentrations less than SSALs. Each Subarea is discussed separately below.

Subarea A- Three of the Phase I/II borings (A1, A2 and A3) are located in Subarea A near the Buffalo River where the oil sheen is coming from the sheet pile wall. Subarea A is shown on Plate 2. The impacted soil exists in a layer above native soil at approximately 11 feet below grade. Thickness of the impacted zone varies and becomes very thin near the edges. At location A1-TP-A3, a discrete sample of the petroleum-impacted slag was collected. Resulting analytical results do not exceed SSALs.

Subarea B- Two Phase I/II boring logs (B1 and B2) in this subarea indicated the presence of product. One boring log (A1-SB-B2) indicated that a thicker layer of product existed than was observed during the test pit excavation of that boring. Test pits performed in Subarea B demonstrated that the film of oil is present on the fill grains, however the film exists only in a soil/fill layer that did not exceed 0.3 feet. The oil was viscous, aged and did not drip or flow from the soil/fill. The lateral and vertical extent of this material was determined by excavating until no visual contamination was observed. This small zone of material is not in contact with the River, as demonstrated by other testing performed downgradient of this area between the River and Subarea B and included monitoring well A1-MW-3 which contains clean groundwater and visually unimpacted soil, and test pits A1-TP-T7 and A1-TP-B1a which also contain visually unimpacted soil.

Subarea C- One Phase I/II boring log (C1) in this subarea indicated the presence of oil staining. Test pit A1-TP-C1, excavated at the boring location, demonstrated that the film of oil is present on a 0.3 foot layer of slag just above native soil. This layer was extremely difficult to define due to the 11 feet of compacted slag existing above it. The lateral extent is defined by soil boring A1-SB-

C2 and test pit A1-TP-C1a which do not contain the impacted slag fill. Test pit A1-TP-C1a indicates that this material is not in contact with the Buffalo River.

Subareas K and L- Significant work has been performed in these subareas in the past and a remedial plan including excavation and bioremediation was previously developed. One soil boring, A1-SB-J2, exists on the southern edge of Subarea K. This boring log documents a thin oil-stained layer that was confirmed by test pit excavation. As a result, the lateral extent of remediation of Subareas K and L has been increased.

Three new test pits were used to verify that the area south of K and L was not impacted. Those test pits, shown on Plate 1, are labeled A1-TP-J2a, A1-TP-J2d, and A1-TP-J2e. No visual contamination was observed in those three test pits. All three pits were excavated to native soil.

TABLES

Table 2-2 *(pg 1 of 4)*

TEST PIT EXCAVATION DETAILS AND SAMPLING SUMMARY - SUBAREAS N THROUGH S

Area I Investigation[1]
LTV Steel Company

Test Pit Designation[2]	Depth to Native/Refusal	Depth to Water[3]	Description Of Native Soil	Depth of Sample Collected	Analyses Performed	Comments
A1-TP-N1	5		Silt with clay	0-3",3"-5'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N2	5.5		Silt with clay	0-3",3"-5.5'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N3	4.3		Silt with clay	0-3",3"-4.3'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N4	6	6	Sandy Silt	0-3",3"-6'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N5	6		Silt	0-3",3"-6'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N6	6	6	Silt with clay	0-3",3"-6'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N7	5		Silt	0-3",3"-5'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N8	6		Silt	0-3",3"-6'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N9	4.5		Silt	0-3",3"-4.5'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N10	7		Silty Clay	0-3",3"-7'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N11	6		Silt	0-3",3"-6'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N12	7	7.5	Clayey Silt, Silt	0-3",3"-7'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N13	5.5		Refusal	0-3",3"-5.5'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N15	6		Refusal	0-3",3"-6'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N16	6		Silt	0-3",3"-6'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N17	5		Peaty Clayey Silt	0-3",3"-5'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N18	6		Silty Clay	0-3",3"-6'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N19	5		Silt	0-3",3"-5'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N20	6		Silt	0-3",3"-6'	VOCs,SVOCs,8 Metals	Collected 2 samples, surface also analyzed for PCBs.
A1-TP-N14	4		Silt	1.5-8'	VOCs,SVOCs,8 Metals	Impacted from 1.5-8', very strong odor.
A1-TP-N14a	1		Clayey Silt		No sample collected	No impact observed
A1-TP-N14b		8			No sample collected	No impact observed
A1-TP-N14c	5.5		Refusal		No sample collected	No impact observed
A1-TP-O1	5.5		Refusal	0-5.5'	VOCs,SVOCs,8 Metals	None
A1-TP-O2	12		Refusal	0-12'	VOCs,SVOCs,8 Metals	None
A1-TP-O3	5.5		Refusal	0-5.5'	VOCs,SVOCs,8 Metals	None
A1-TP-O4	6.5		Refusal	0-6.5'	VOCs,SVOCs,8 Metals	None
A1-TP-O5	2.5		Refusal		No sample collected	None
A1-TP-O6	6		Refusal	0-6'	VOCs,SVOCs,8 Metals	None
A1-TP-O7	9.5	9.5	Refusal	0-9.5'	VOCs,SVOCs,8 Metals	None

Table 2-2 *(pg 2 of 4)*

TEST PIT EXCAVATION DETAILS AND SAMPLING SUMMARY - SUBAREAS N THROUGH S

Area I Investigation[1]

LTV Steel Company

Test Pit Designation[2]	Depth to Native/Refusal	Depth to Water[3]	Description Of Native Soil	Depth of Sample Collected	Analyses Performed	Comments
A1-TP-O8	5.5		Refusal	0-5.5'	VOCs,SVOCs,8 Metals	None
A1-TP-O9	8.5		Refusal	0-8.5'	VOCs,SVOCs,8 Metals	None
A1-TP-O10	9		Refusal	0-9'	VOCs,SVOCs,8 Metals	None
A1-TP-O11	8.5	8.25	Refusal	0-8.5'	VOCs,SVOCs,8 Metals	None
A1-TP-O12	10.5	10	Refusal	0-10.5'	VOCs,SVOCs,8 Metals	None
A1-TP-O13	6.9		Refusal	0-6.9'	VOCs,SVOCs,8 Metals	None
A1-TP-O14	11	9.8	Refusal	0-11'	VOCs,SVOCs,8 Metals	None
A1-TP-P1	7.5		Silty Sand	0-7.5'	VOCs,SVOCs,8 Metals	None
A1-TP-P2	13	13	Clayey Sandy Silt	0-12'	VOCs,SVOCs,8 Metals	Product material from approx.12-15' w/small lateral extent.
				12-15'	VOCs,SVOCs,8 Metals	Sampled product material, labeled A1-TP-P2b
			SEE COMMENTS		SVOCs	Discrete sample of blue-cemented slag.
A1-TP-P3	13.5	13		0-13.5'	VOCs,SVOCs,8 Metals	None
A1-TP-P4	13	13	Clayey Silt	0-13'	VOCs,SVOCs,8 Metals	None
A1-TP-P5	7.5		Sandy Silt	0-7.5'	VOCs,SVOCs,8 Metals	None
A1-TP-P6	13		Silty Clay	0-13'	VOCs,SVOCs,8 Metals	None
A1-TP-P7	13		Clayey Silt	0-13'	VOCs,SVOCs,8 Metals	None
A1-TP-P8	12.5	12	Silty Clay	0-12.5'	VOCs,SVOCs,8 Metals	None
A1-TP-P9	8		Clayey Silt	0-8'	VOCs,SVOCs,8 Metals	None
A1-TP-T5 *Near A1-TP-P9*			SEE COMMENTS	4-8'	VOCs,SVOCs,8 Metals	Discrete sample of tan sand-chalky material
A1-TP-P10	2.5		Refusal	0-2.5'	VOCs,SVOCs,8 Metals	None
A1-TP-P11	7		Clayey Silt	0-7'	VOCs,SVOCs,8 Metals	None
A1-TP-P12	6.5		Silty Clay	0-6.5'	VOCs,SVOCs,8 Metals	None
A1-TP-P13	6		Silty Clay	0-6'	VOCs,SVOCs,8 Metals	None
A1-TP-P14	5		Clayey Silt	0-5'	VOCs,SVOCs,8 Metals	None
A1-TP-P15	5.5	7	Fine Sand	0-5.5'	VOCs,SVOCs,8 Metals	None
A1-TP-P16	4.5		Silty Clay	0-4.5'	VOCs,SVOCs,8 Metals	None
A1-TP-P17	6.5	5.5	Refusal	0-6.5'	VOCs,SVOCs,8 Metals	None
A1-TP-P18	4		Silty Clay	0-4'	VOCs,SVOCs,8 Metals	None
A1-TP-P19	7	5	Clayey Silt	0-7'	VOCs,SVOCs,8 Metals	None
A1-TP-P20	3.5		Clayey Silt	0-3.5'	VOCs,SVOCs,8 Metals	None

Table 2-2 *(pg 3 of 4)*

TEST PIT EXCAVATION DETAILS AND SAMPLING SUMMARY - SUBAREAS N THROUGH S

Area I Investigation[1]

LTV Steel Company

Test Pit Designation[2]	Depth to Native/Refusal	Depth to Water[3]	Description Of Native Soil	Depth of Sample Collected	Analyses Performed	Comments
A1-TP-P21	5.5	5		0-5.5'	VOCs,SVOCs,8 Metals	None
A1-TP-P22	2.75		Silt with clay	0-2.75'	VOCs,SVOCs,8 Metals	None
A1-TP-P23	4		Silt with clay	0-4'	VOCs,SVOCs,8 Metals	None
A1-TP-P24	2.1		Clayey Silt	0-2.1'	VOCs,SVOCs,8 Metals	None
A1-TP-P25	4		Clayey Silt	0-4'	VOCs,SVOCs,8 Metals	None
A1-TP-P26	2		Clayey Silt	0-2'	VOCs,SVOCs,8 Metals	None
A1-TP-Q1	5	3.5	Silty Clay	0-5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q2	10	8.5	Refusal	0-10'	VOCs,SVOCs,8 Metals	None
A1-TP-Q3	7		Refusal	0-7'	VOCs,SVOCs,8 Metals	None
A1-TP-Q4	5	4	Silty Clay	0-5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q5	6	5	Refusal	0-5'	VOCs,SVOCs,8 Metals	Sheen on particles when wet,metallic
A1-TP-Q6	4		Clayey Silt	0-4'	VOCs,SVOCs,8 Metals	None
A1-TP-Q7	4.5		Clayey Silt	0-4.5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q8	6.5		Refusal	0-6.5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q9	11.5	10.5	Clayey Silt	0-11.5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q10	5		Refusal	0-5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q11	5		Refusal	0-5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q12	4.5	4.5	Clayey Silt	0-4.5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q13	8		Silt	0-7.8'	VOCs,SVOCs,8 Metals	
				7.8-8'	VOCs,SVOCs	At 8', PID=25 ppm, Petro Odor, Discrete sample
A1-TP-Q14	9	7	Silty Clay	0-9'	VOCs,SVOCs,8 Metals	None
A1-TP-Q15	9	8	Silty Clay	0-9'	VOCs,SVOCs,8 Metals	None
A1-TP-Q16	1		Refusal		No sample collected	
A1-TP-Q17	6		Refusal	0-6'	VOCs,SVOCs,8 Metals	None
A1-TP-Q18	17		Refusal	0-17'	VOCs,SVOCs,8 Metals	Test pit within basement, hit floor @17',significant brick
A1-TP-Q19	9	8	Silty Clay	0-9'	VOCs,SVOCs,8 Metals	None
A1-TP-Q20	10.5	10.5	Clayey Silt	0-10.5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q21	9.5	8.5	Silty Clay	0-9.5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q22	4.5		Refusal	0-4.5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q23	4		Refusal	0-4'	VOCs,SVOCs,8 Metals	None

Table 2-2 *(pg 4 of 4)*

TEST PIT EXCAVATION DETAILS AND SAMPLING SUMMARY - SUBAREAS N THROUGH S

Area I Investigation[1]

LTV Steel Company

Test Pit Designation[2]	Depth to Native/Refusal	Depth to Water[3]	Description Of Native Soil	Depth of Sample Collected	Analyses Performed	Comments
A1-TP-Q24	8.5	8.5	Silty Clay	0-8.5'	VOCs,SVOCs,8 Metals	None
A1-TP-Q25	6		Refusal	0-6'	VOCs,SVOCs,8 Metals	None
A1-TP-Q26	13.5	10.5	Silty Clay	0-13.5'	VOCs,SVOCs,8 Metals	Slight Creosote Odor
A1-TP-Q27	9	9	Silty Clay	0-9'	VOCs,SVOCs,8 Metals	Strong diesel odor at 8.5-9'
A1-TP-Q28	8	8	Silty Clay	0-8'	VOCs,SVOCs,8 Metals	Slight diesel odor at 7.5-8'
A1-TP-R1	3.5		Sandy Silt	0-3.5'	VOCs,SVOCs,8 Metals	None
A1-TP-R2	3.1		Silty Sand over Clayey Silt	0-3.1'	VOCs,SVOCs,8 Metals	None
A1-TP-R3	2.1		Silty Sand	0-2.1'	VOCs,SVOCs,8 Metals	None
A1-TP-R4	2.5		Silty Sand	0-2.5'	VOCs,SVOCs,8 Metals	None
A1-TP-R5	13	5.5	Sandy Silt	0-13'	VOCs,SVOCs,8 Metals	None
A1-TP-R6		5.5	Silt	0-native	VOCs,SVOCs,8 Metals	None
A1-TP-R7	5.75	6.1	Clayey Silt	0-5.75'	VOCs,SVOCs,8 Metals	None
A1-TP-R8	4		Sandy Silt	0-4'	VOCs,SVOCs,8 Metals	None
A1-TP-R9	11	6	Sandy Silt	0-11'	VOCs,SVOCs,8 Metals	None
A1-TP-S1	5		Silty Clay	0-5'	VOCs,SVOCs,8 Metals	None
A1-TP-S2	9	4.5	Silty Clay	0-9'	VOCs,SVOCs,8 Metals	None
A1-TP-S3	6.5	7.5	Clayey Silt	0-6.5'	VOCs,SVOCs,8 Metals	None
A1-TP-S4	6		Refusal	0-6'	VOCs,SVOCs,8 Metals	None
A1-TP-S5	7		Clayey Sandy Silt	0-7'	VOCs,SVOCs,8 Metals	None
A1-TP-S6	7	7	Clayey Silt	0-7'	VOCs,SVOCs,8 Metals	None
A1-TP-S7	7.5	7	Refusal	0-7.5'	VOCs,SVOCs,8 Metals	None
A1-TP-S8	4.5		Clayey Silt	0-4.5'	VOCs,SVOCs,8 Metals	None
A1-TP-S9	6.5		Clayey Silt	0-6.5'	VOCs,SVOCs,8 Metals	None
A1-TP-S10	2.5		Silty Clay	0-2.5'	VOCs,SVOCs,8 Metals	None

NOTES:

(1) Investigation performed in July & August 1999

(2) Test Pit Designation is labeled to indicate the Area of sample collection, i.e. Area I (A1), means of excavation, i.e.test pit (TP), and Subarea i.e. first sample in Subarea N (N1)

(3) Blank space indicates that there was no evidence of groundwater entering the excavation.

Table 2-3

TEST PIT EXCAVATION, SOIL BORING DETAILS AND SAMPLING SUMMARY - GAS HOLDER SUBAREA

Area II Investigation[1]

LTV Steel Company

Test Pit Designation[2]	Depth to Native/Refusal	Depth to Water[3]	Description Of Native Soil	Depth of Sample Collected	Analyses Performed	Comments
A2-TP-GH1	6.5	6.5	Silty Clay	0-6.5'	Composite Sample	On edge of Large gas holder
A2-TP-GH5	5.5		Refusal	0-5.5'	of GH1/4/5	Refusal on gas holder pad
A2-TP-GH4	6.5		Clayey Silt	0-5.5'	VOCs,SVOCs,8 Metals	On edge of Large gas holder
				5.5-6.5'	VOCs,SVOCs,8 Metals	Discrete sample from black layer 5.5-6.5'
A2-TP-GH2	6	6	Silty Clay	0-6'	Composite Sample of GH2/6	On edge of Large gas holder
A2-TP-GH6	4		Refusal	0-4'	VOCs,SVOCs,8 Metals	Refusal on Large gas holder pad
A2-TP-GH7	6	6		0-6'	Composite Sample	None
A2-TP-GH8	5		Silt	0-5'	of GH7/8/10	None
A2-TP-GH10	6.5		Peat over Silty Clay	0-6.5'	VOCs,SVOCs,8 Metals	None
A2-TP-GH9	5		Clayey Silt	0-5'	Composite Sample	None
A2-TP-GH11	4		Peat over Clayey Silt	0-4'	of GH9/11/12	None
A2-TP-GH12	6		Peat over Clayey Silt	0-6'	VOCs,SVOCs,8 Metals	None
A2-TP-GH13	5		Peat over Silty Clay		Composite Sample of GH13/14	Adjacent to Small gas holder
A2-TP-GH14	6		Peat over Silty Clay		VOCs,SVOCs,8 Metals	On edge of Small gas holder
A2-SB-GH1	7.2		Silty Clay to 13' (completion depth)		No sample collected	Roller Bit through gas holder pad, no impacted soil
A2-SB-GH2	6		Silty Clay to 12' (completion depth)		No sample collected	Roller Bit through gas holder pad, no impacted soil
A2-SB-GH3	8		Silty Clay to 10' (completion depth)	7-8'	VOCs,SVOCs	Adjacent to Small gas holder,sample of black layer
A2-SB-GH4	5		Silty Clay to 7' (completion depth)		No sample collected	Adjacent to Small gas holder
A2-SB-GH5	4.4		Clayey Silt to 8' (completion depth)		No sample collected	Adjacent to Small gas holder
A2-SB-GH6	5		Silty Clay to 7' (completion depth)		No sample collected	Roller bit through small gas holder pad, no impacted soil
A2-SB-GH7	1.5		Refusal		No sample collected	Refusal likely on Small gas holder
A2-SB-GH8	4		Silty Clay to 6' (completion depth)	3-4'	VOCs,SVOCs	Adjacent to Small gas holder,sample of black layer
A2-SB-GH9	4		Refusal		No sample collected	None

NOTES:

(1) Investigation performed in July & August 1999

(2) Test Pit Designation is labeled to indicate the Area of sample collection, i.e. Area II (A2), means of excavation, i.e.test pit (TP), and Subarea i.e. first sample in Subarea GH (GH1)

(3) Blank space indicates that there was no evidence of groundwater entering the excavation.

Table 2-4

TEST PIT EXCAVATION DETAILS AND SAMPLING SUMMARY - FORMER TANK LOCATIONS

Area I Investigation[1]

LTV Steel Company

Test Pit Designation[2]	Depth to Native/Refusal	Depth to Water[3]	Description Of Native Soil	Depth of Sample Collected	Analyses Performed	Comments
A1-TP-T1	5	5	Clayey Silt	5-5.5'	VOCs,SVOCs, 8 Metals	Sampled Slightly Impacted (by odor) material in a one sq. yd area from 5-5.5'
A1-TP-T2			Refusal		No sample collected.	Refusal at shallow depth.Unable to excavate in vicinity of the tank location.
						According to records, tank (if found) was supposed to be filled with sand.
A1-TP-T3	12		Silty Clay		No sample collected.	Diesel contamination above native, tank 8' diameter, filled w/water
A1-TP-T3a				2.5-5'	VOCs,SVOCs, 8 Metals	Diesel contamination from at least 2.5-5'
A1-TP-T3a				0-2.5'	VOCs,SVOCs, 8 Metals	Material above impacted soil.
A1-TP-T3b	9	8	Peat		No sample collected.	No evidence or odor of contamination. No sheen on water.
A1-TP-T3c	9.5	8.5	Peat, silt		No sample collected.	No evidence or odor of contamination. No sheen on water.
A1-TP-T3d	8.5	8	Peat, clayey silt		No sample collected.	No evidence or odor of contamination. No sheen on water.
A1-TP-T3e	5.5		Peat, silty clay		No sample collected.	No evidence or odor of contamination.
A1-TP-T4	12.5			0-12.5'	VOCs,SVOCs, 8 Metals	No evidence or odor of contamination.
A1-TP-T5a	11	11	Silty Clay		No sample collected.	Impacted from 10.5 to 11', PID=0 in native
A1-TP-D3	10				No sample collected.	V. strong gasoline odor to 14' at completion
A1-TP-D3a	9		SiSa over ClSi[4]		No sample collected.	V. strong gasoline odor to approx.16',fading below to bottom of test pit at 18.7'
A1-TP-T6	11.5		Clayey Silt	0-11.5'	VOCs,SVOCs, 8 Metals	No evidence or odor of contamination.
A1-TP-T7	9		Silt	0-9'	VOCs,SVOCs, 8 Metals	No evidence or odor of contamination.
A1-TP-T8	5.5	4.5	Clayey Silt	0-5.5'	VOCs,SVOCs, 8 Metals	No evidence or odor of contamination. No sheen on water.

NOTES:

(1) Investigation performed in July & August 1999

(2) Test Pit Designation is labeled to indicate the Area of sample collection, i.e. Area I (A1), means of excavation, i.e.test pit (TP), and Tank Number i.e. first test pit in Tank Location T3 (T3a)

(3) Blank space indicates that there was no evidence of groundwater entering the excavation.

(4) SiSa = silty sand, ClSi = Clayey Silt

Table 2-5

TEST PIT EXCAVATION DETAILS AND SAMPLING SUMMARY - MISCELLANEOUS LOCATIONS

Area I Investigation[1]

LTV Steel Company

Test Pit Designation[2]	Depth to Native/Refusal	Depth to Water[3]	Description Of Native Soil	Depth of Sample Collected	Analyses Performed	Comments
A1-TP-A1	10.8		Refusal			Very hard cemented slag from 7.5-10.8', thin film of #6 fuel oil on some slag chunks.
A1-TP-A3	10.6			10.5-10.6'	VOCs,SVOCs, 8 Metals	Impacted soil from 10.5-10.6', very thin layer in the slag.
A1-TP-A3a	Varies			0-11'	VOCs,SVOCs, 8 Metals	Native adjacent to outfall pipe approx. 17'(?), about 3' away from pipe-native at 10.9'.
A1-TP-A2a	11	11				Impact above native approx. 1 foot thick
A1-TP-A2b	7' & 8'		See Comments			Two foundations separated by wall. In found. Closest to wall, approx. 1" impacted mat'l
A1-TP-A	11		Sand & Silt			Very thin impact top native approx. 1/8" thick
A1-TP-B1	10.5		Silty Clay/Silt			Clean fill contact in excavation, South sidewall impacted 3" from 10.2-10.5'
A1-TP-B1a	9.5		Clayey Silt			No impact observed
A1-TP-B2	9.5		Silty Clay			Impacted Soil 9.2-9.5'
A1-TP-B2a	7		Silt w/clay			No impact observed
A1-TP-B2b	11		Clayey Silt			No impact observed
A1-TP-B2c	9.5		Refusal			Very small area of stained soil in one corner of test pit toward A1-SB-B1
A1-TP-C1	11.5		Sand & Silt			Impact in form of film on outside and in pores of slag from 11.2-11.5'
A1-TP-C1a	11					No impact observed
A1-TP-J2	8	8	Silty Clay			About 4" layer of oil-impacted soil/fill observed at 7.7-8'
A1-TP-J2a	7	7	Silty Clay			No impact observed
A1-TP-J2b	7.5	7.5	Silty Clay	0-6.5'	VOCs,SVOCs, 8 Metals	About 1' layer of oil-impacted soil/fill observed at 6.5-7.5'
A1-TP-J2c	5.5	5.5				About 1" layer of oil-impacted soil/fill observed at 5.4-5.5'
A1-TP-J2d	7	7	Silty Clay			No impact observed
A1-TP-J2e	8.5	5.5				No impact observed

NOTES:

(1) Investigation performed in July & August 1999

(2) Test Pit Designation is labeled to indicate the Area of sample collection, i.e. Area I (A1), means of excavation, i.e.test pit (TP), and Subarea i.e. first sample in Subarea A (A1)

(3) Blank space indicates that there was no evidence of groundwater entering the excavation.

Table 3-1a *(pg 1 of 2)*

SURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation[1]
LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level[2]	Sample Locations											
		A1-TP-N1	A1-TP-N2	A1-TP-N3	A1-TP-N4	A1-TP-N5	A1-TP-N6	A1-TP-N7	A1-TP-N8	A1-TP-N9	A1-TP-N10	A1-TP-N11	A1-TP-N12
Benzene		0.001 U	0.002	0.002	0.002	0.004	0.003	0.002	0.002	0.002	0.004	0.002	0.002
SEC-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.002	0.001 U
N-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl-tert-butylether		0.001 U	0.001 U	0.001 U	0.001 U	0.002	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
P-Isopropyltoluene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene		0.001 U	0.002	0.002	0.001 U	0.003	0.002	0.002	0.002	0.001	0.004	0.002	0.002
1,2,4-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
O-Xylene		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
M+P-Xylene		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total VOCs	10		0.004	0.004	0.002	0.011	0.007	0.005	0.004	0.003	0.008	0.006	0.004

Notes:
1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

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Table 3-1a *(pg 2 of 2)*

SURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level[2]	Sample Locations						
		A1-TP-N13	A1-TP-N15	A1-TP-N16	A1-TP-N17	A1-TP-N18	A1-TP-N19	A1-TP-N20
Benzene		0.003	0.007	0.005	0.004	0.003	0.001 U	0.003
SEC-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl-tert-butylether		0.002	0.002	0.003	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
P-Isopropyltoluene		0.001 U	0.001 U	0.001 U	0.003	0.001 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene		0.002	0.005	0.003	0.005	0.003	0.001 U	0.002
1,2,4-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
O-Xylene		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U
M+P-Xylene		0.002 U	0.002 U	0.002 U	0.002	0.002 U	0.002 U	0.002 U
Total VOCs	10	0.007	0.014	0.011	0.014	0.006		0.005

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

Table 3-1b *(pg 1 of 4)*

SURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations											
		A1-TP-N1	A1-TP-N2	A1-TP-N3	A1-TP-N4	A1-TP-N5	A1-TP-N6	A1-TP-N7	A1-TP-N8	A1-TP-N9	A1-TP-N10	A1-TP-N11	A1-TP-N12
Acenapthene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Acenaphthylene		0.36 U	0.34 U	0.35 U	0.35 U	0.35	0.35 U	0.96	0.35 U	0.75	0.34	2.4	0.7
Anthracene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.54	0.35 U	0.52	0.34 U	1.7 U	0.43
Benzo(a)anthracene		0.36 U	0.71	0.4	0.35 U	0.5	0.49	1.1	0.35 U	1.0	0.45	7.1	1.0
Benzo(a)pyrene		0.36 U	0.92	0.5	0.35 U	0.65	0.71	2.2	0.43	1.9	0.73	7.1	1.6
Benzo(b)fluoranthene		0.36 U	1	0.58	0.35 U	1.5	0.9	3.7	0.54	3.1	1.3	14	2.7
Benzo(g,h,i)perylene		0.36 U	0.4	0.35 U	0.35 U	0.34	0.35	1.3	0.5	1.0	0.45	2.3	0.68
Benzo(k)fluoranthene		0.37	0.93	0.69	0.41	1.0	0.74	2.6	0.62	1.8	1.0	10	2.2
Benzyl Alcohol		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Butyl Benzyl Phthalate		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Di-N-Butylphthalate		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Carbazole		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Indeno(1,2,3-cd)pyrene		0.36 U	0.45	0.35 U	0.35 U	0.42	0.38	1.5	0.43	1.2	0.49	3.0	0.8
4-Chloroaniline		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Bis(-2-Chloroethoxy)Methane		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Bis(-2-Chloroethyl)Ether		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
2-Chloronaphthalene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
2-Chlorophenol		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
2,2'-Oxybis(1-chloropropane)		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Chrysene		0.36 U	0.81	0.48	0.35 U	0.77	0.58	1.6	0.42	1.7	0.68	7.0	1.3
Dibenzo(a,h)anthracene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.62	0.35 U	0.54	0.34 U	1.7 U	0.36
Dibenzofuran		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
1,3-Dichlorobenzene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
1,2-Dichlorobenzene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
1,4-Dichlorobenzene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
3,3'-Dichlorobenzidine		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
2,4-Dichlorophenol		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
Diethylphthalate		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Dimethyl Phthalate		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
2,4-Dimethylphenol		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
2,4-Dinitrophenol		1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	6.8 U	1.4 U
2,4-Dinitrotoluene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
2,6-Dinitrotoluene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Bis(2-ethylhexyl)phthalate		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U

Table 3-1b (pg 2 of 4)

SURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations											
		A1-TP-N1	A1-TP-N2	A1-TP-N3	A1-TP-N4	A1-TP-N5	A1-TP-N6	A1-TP-N7	A1-TP-N8	A1-TP-N9	A1-TP-N10	A1-TP-N11	A1-TP-N12
Fluoranthene		0.36	1.5	0.87	0.47	0.98	0.9	1.5	0.59	1.8	0.69	11	1.8
Flourene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Hexachlorobenzene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Hexachlorobutadiene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Hexachlorocyclopentadiene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Hexachloroethane		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Isophorone		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
2-Methylnapthalene		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
4,6-Dinitro-2-methylphenol		1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	6.8 U	1.4 U
4-Chloro-3-methylphenol		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
2-Methylphenol		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
4-Methylphenol		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
Naphthalene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
2-Nitroanaline		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
3-Nitroanaline		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
4-Nitroanaline		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Nitrobenzene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
2-Nitrophenol		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
4-Nitrophenol		1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	6.8 U	1.4 U
N-Nitrosodimethylamine		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
N-Nitrosodiphenylamine		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Di-N-Octyl Phthalate		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Pentachlorophenol		1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	6.8 U	1.4 U
Phenanthrene		0.36 U	0.88	0.42	0.35 U	0.56	0.42	0.69	0.35 U	0.84	0.38	2.3	0.54
Phenol		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
4-Bromophenyl-phenylether		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
4-Chlorophenyl-phenylether		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
N-Nitroso-Di-N-Propylamine		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
Pyrene		0.36 U	1	0.58	0.35 U	0.75	0.67	1.3	0.48	1.5	0.66	13	1.8
1,2,4-Trichlorobenzene		0.36 U	0.34 U	0.35 U	0.35 U	0.34 U	0.35 U	0.34 U	0.35 U	0.35 U	0.34 U	1.7 U	0.36 U
2,4,6-Trichlorophenol		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
2,4,5-Trichlorophenol		0.74 U	0.70 U	0.71 U	0.72 U	0.70 U	0.71 U	0.70 U	0.71 U	0.70 U	0.70 U	3.5 U	0.72 U
Total SVOCs	500	0.7	8.6	4.5	0.9	7.8	6.1	19.6	4.0	17.7	7.2	79.2	15.9

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U = Indicates compound was analyzed for but not detected.

TurnKey Environmental Restoration, LLC

Table 3-1b *(pg 3 of 4)*

SURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations						
		A1-TP-N13	A1-TP-N15	A1-TP-N16	A1-TP-N17	A1-TP-N18	A1-TP-N19	A1-TP-N20
Acenapthene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Acenaphthylene		1.0	0.81	0.35 U	0.34 U	0.35 U	0.33 U	0.41
Anthracene		0.73	1.2	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Benzo(a)anthracene		2.4	1.6	0.41	0.38	0.35 U	0.33 U	0.89
Benzo(a)pyrene		2.9	2.5	0.74	0.52	0.39	0.33 U	1.2
Benzo(b)fluoranthene		4.3	3.8	0.89	0.73	0.5	0.33 U	1.6
Benzo(g,h,i)perylene		1.7	1.5	0.35 U	0.34 U	0.35 U	0.33 U	0.43
Benzo(k)fluoranthene		2.6	3.2	0.94	0.8	0.46	0.33 U	1.3
Benzyl Alcohol		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Butyl Benzyl Phthalate		1.1	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Di-N-Butylphthalate		0.38	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Carbazole		0.43	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Indeno(1,2,3-cd)pyrene		1.9	1.7	0.4	0.34 U	0.35 U	0.33 U	0.53
4-Chloroaniline		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Bis(-2-Chloroethoxy)Methane		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Bis(-2-Chloroethyl)Ether		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
2-Chloronaphthalene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
2-Chlorophenol		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
2,2'-Oxybis(1-chloropropane)		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Chrysene		3.1	2.3	0.56	0.47	0.35 U	0.33 U	1.0
Dibenzo(a,h)anthracene		0.76	0.73	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Dibenzofuran		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
1,3-Dichlorobenzene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
1,2-Dichlorobenzene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
1,4-Dichlorobenzene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
3,3'-Dichlorobenzidine		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
2,4-Dichlorophenol		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
Diethylphthalate		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Dimethyl Phthalate		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
2,4-Dimethylphenol		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
2,4-Dinitrophenol		1.3 U	2.7 U	1.4 U	1.3 U	1.4 U	1.3 U	1.3 U
2,4-Dinitrotoluene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
2,6-Dinitrotoluene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Bis(2-ethylhexyl)phthalate		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U

Table 5-10 *(pg 4 of 4)*

SURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations						
		A1-TP-N13	A1-TP-N15	A1-TP-N16	A1-TP-N17	A1-TP-N18	A1-TP-N19	A1-TP-N20
Fluoranthene		4.5	3.2	0.65	0.8	0.47	0.33 U	1.4
Flourene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Hexachlorobenzene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Hexachlorobutadiene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Hexachlorocyclopentadiene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Hexachloroethane		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Isophorone		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
2-Methylnapthalene		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
4,6-Dinitro-2-methylphenol		1.3 U	2.7 U	1.4 U	1.3 U	1.4 U	1.3 U	1.3 U
4-Chloro-3-methylphenol		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
2-Methylphenol		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
4-Methylphenol		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
Naphthalene		0.48	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
2-Nitroanaline		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
3-Nitroanaline		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
4-Nitroanaline		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Nitrobenzene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
2-Nitrophenol		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
4-Nitrophenol		1.3 U	2.7 U	1.4 U	1.3 U	1.4 U	1.3 U	1.3 U
N-Nitrosodimethylamine		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
N-Nitrosodiphenylamine		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Di-N-Octyl Phthalate		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Pentachlorophenol		1.3 U	2.7 U	1.4 U	1.3 U	1.4 U	1.3 U	1.3 U
Phenanthrene		1.6	1.3	0.36	0.35	0.35 U	0.33 U	0.61
Phenol		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
4-Bromophenyl-phenylether		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
4-Chlorophenyl-phenylether		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
N-Nitroso-Di-N-Propylamine		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
Pyrene		3.4	2.5	0.54	0.55	0.35 U	0.33 U	1.1
1,2,4-Trichlorobenzene		0.34 U	0.7 U	0.35 U	0.34 U	0.35 U	0.33 U	0.34 U
2,4,6-Trichlorophenol		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
2,4,5-Trichlorophenol		0.69 U	1.4 U	0.71 U	0.68 U	0.72 U	0.68 U	0.69 U
Total SVOCs	500	33.3	26.3	5.5	4.6	1.8		10.5

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

TurnKey Environmental Restoration, LLC

Table 3-1c *(pg 1 of 2)*

SURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N INORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels	Sample Locations											
		A1-TP-N1	A1-TP-N2	A1-TP-N3	A1-TP-N4	A1-TP-N5	A1-TP-N6	A1-TP-N7	A1-TP-N8	A1-TP-N9	A1-TP-N10	A1-TP-N11	A1-TP-N12
Arsenic	75	7.1	7.85	8.84	13.3	28.6	11.7	17	10.8	14.2	14.2	13.8	14.9
Barium	1000	134	159	186	324	92.4	130	101	110	74.5	129	98.1	99.4
Cadmium	15	2.57	4.69	4.37	2.8	2.22	5.14	0.873	1.98	0.844	0.521 U	0.522 U	5.56
Chromium	1000	727	709	764	578	224	635	113	456	107	199	77.3	7.23
Lead	1000	420	309	331	228	316	486	198	502	256	254	161	38.8
Mercury	10	0.524	0.106	0.117	0.082	0.313	0.165	0.216	0.072	0.248	0.137	0.809	0.217
Selenium	61	8.08	12	11.40	7.66	3.86	8.7	3.97	11.5	3.21	5.12	2.94	1.73
Silver	10	1.1 U	1.04 U	1.06 U	1.07 U	1.04 U	1.06 U	1.04 U	1.06 U	1.05 U	1.04 U	1.04 U	1.08 U

NOTES:
1. Investigation performed in July & August, 1999
2. U – Indicates compound was analyzed for but not detected.

TURNKEY ENVIRONMENTAL RESTORATION, LLC

Table 3-1c *(pg 2 of 2)*

SURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N INORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels	Sample Locations								
		A1-TP-N13	A1-TP-N15	A1-TP-N15 #1[3]	A1-TP-N15 #2[3]	A1-TP-N16	A1-TP-N17	A1-TP-N18	A1-TP-N19	A1-TP-N20
Arsenic	75	13.7	26.3			26	18.3	32.7	37.7	27.3
Barium	1000	137	164			109	70	131	79.5	58.1
Cadmium	15	0.787	3.84			0.531 U	0.93	1.04	1.46	0.989
Chromium	1000	454	157			75	207	133	183	50.9
Lead	1000	247	5640	354	580	105	228	452	326	111
Mercury	10	0.208	0.36			0.155	0.15	0.057	0.385	0.363
Selenium	61	6.06	1.12			3.57	2.86	3.99	3.49	2.61
Silver	10	1.04 U	1.05 U			1.06 U	1.02 U	1.07 U	1.01 U	1.03 U

NOTES:

1. Investigation performed in July & August, 1999
2. U=Indicates compound was analyzed for but not detected.
3. Analyzed two additional aliquots from the original sample jar. Labeled #1 and #2.
4. Shading indicates that the concentration exceeds the Site Specific Action Level.
5. Blank space indicates that the parameter was not analyzed.

0002-005
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Subarea N,surf

Table 3-1d *(pg 1 of 2)*

SURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N PCBs

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels[2]	Sample Locations											
		A1-TP-N1	A1-TP-N2	A1-TP-N3	A1-TP-N4	A1-TP-N5	A1-TP-N6	A1-TP-N7	A1-TP-N8	A1-TP-N9	A1-TP-N10	A1-TP-N11	A1-TP-N12
PCB 1016		0.44 U	0.42 U	0.43 U	0.43 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.43 U
PCB 1221		0.44 U	0.42 U	0.43 U	0.43 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.43 U
PCB 1232		0.44 U	0.42 U	0.43 U	0.43 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.43 U
PCB 1242		0.44 U	0.42 U	0.43 U	0.43 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.43 U
PCB 1248		0.44 U	0.42 U	0.43 U	0.43 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.43 U
PCB 1254		0.44 U	0.42 U	0.43 U	0.43 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.43 U
PCB 1260		0.44 U	0.42 U	0.43 U	0.43 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.43 U

NOTES:

1. Investigation performed in July & August, 1999
2. Blank Space indicates no proposed Site Specific Action Level
3. U = Indicates compound was analyzed for but not detected.

TurnKey Environmental Restoration, LLC

Table 3-1d *(pg 2 of 2)*

SURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N PCBs

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels[2]	Sample Locations						
		A1-TP-N13	A1-TP-N15	A1-TP-N16	A1-TP-N17	A1-TP-N18	A1-TP-N19	A1-TP-N20
PCB 1016		0.41 U	0.42 U	0.43 U	0.41 U	0.43 U	0.41 U	0.41 U
PCB 1221		0.41 U	0.42 U	0.43 U	0.41 U	0.43 U	0.41 U	0.41 U
PCB 1232		0.41 U	0.42 U	0.43 U	0.41 U	0.43 U	0.41 U	0.41 U
PCB 1242		0.41 U	0.42 U	0.43 U	0.41 U	0.43 U	0.41 U	0.41 U
PCB 1248		0.41 U	0.42 U	0.43 U	0.41 U	0.43 U	0.41 U	0.41 U
PCB 1254		0.41 U	0.42 U	0.43 U	0.41 U	0.43 U	0.41 U	0.41 U
PCB 1260		0.41 U	0.42 U	0.43 U	0.41 U	0.43 U	0.41 U	0.41 U

NOTES:

1. Investigation performed in July & August, 1999
2. Blank Space indicates no proposed Site Specific Action Level
3. U=Indicates compound was analyzed for but not detected.

TurnKey Environmental Restoration, LLC

Table 3-2a *(pg 1 of 2)*

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation(1)
LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level(2)	Sample Locations											
		A1-TP-N1	A1-TP-N2	A1-TP-N3	A1-TP-N4	A1-TP-N5	A1-TP-N6	A1-TP-N7	A1-TP-N8	A1-TP-N9	A1-TP-N10	A1-TP-N11	A1-TP-N12
Benzene		0.007	0.015	0.004	0.005	0.001 U	0.005	0.005	0.044	0.004	0.012	0.004	0.001 U
SEC-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl-tert-butylether		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene		0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U
Isopropylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
P-Isopropyltoluene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene		0.004	0.004	0.002	0.003	0.001 U	0.002	0.003	0.003	0.002	0.003	0.003	0.001 U
1,2,4-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
O-Xylene		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U
M+P-Xylene		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U
Total VOCs	10	0.013	0.019	0.006	0.008		0.007	0.010	0.047	0.006	0.015	0.008	

Notes:
1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

TurnKey Environmental Restoration, LLC

0002-005
8/16/99
Subarea '

Table 3-2a *(pg 2 of 2)*

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level[2]	Sample Locations								
		A1-TP-N13	A1-TP-N14	A1-TP-N14[4]	A1-TP-N15	A1-TP-N16	A1-TP-N17	A1-TP-N18	A1-TP-N19	A1-TP-N20
Benzene		0.004	15 U	15 U	0.004	0.007	0.001 U	0.005	0.001 U	0.007
SEC-Butylbenzene		0.001 U	15 U	15 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tert-Butylbenzene		0.002	15 U	15 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Butylbenzene		0.001 U	15 U	15 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl-tert-butylether		0.001 U	15 U	15 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene		0.001 U	15 U	15 U	0.001 U	0.001 U	0.001 U	0.003	0.001 U	0.001 U
Isopropylbenzene		0.001 U	15 U	15 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
P-Isopropyltoluene		0.001 U	15 U	15 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	15 U	15 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene		0.002	15 U	23	0.002	0.003	0.001 U	0.008	0.001 U	0.004
1,2,4-Trimethylbenzene		0.001 U	15 U	26	0.001 U	0.001 U	0.001 U	0.002	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.001 U	15 U	17	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U
O-Xylene		0.002 U	29 U	42	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U
M+P-Xylene		0.002 U	29 U	60	0.002 U	0.002 U	0.002 U	0.005	0.002 U	0.002 U
Total VOCs	10	0.008		168	0.006	0.010		0.024		0.011

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U = Indicates compound was analyzed for but not detected.
4. Sampled a second test pit to determine variability of material.
5. Shading indicates that concentration exceeds Site Specific Action Level.

TurnKey Environmental Restoration, LLC

Table 3-2b *(pg 1 of 4)*

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation(1)

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level(2)	Sample Locations											
		A1-TP-N1	A1-TP-N2	A1-TP-N3	A1-TP-N4	A1-TP-N5	A1-TP-N6	A1-TP-N7	A1-TP-N8	A1-TP-N9	A1-TP-N10	A1-TP-N11	A1-TP-N12
Acenapthene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Acenaphthylene		0.37 U	0.39 U	0.55	0.37 U	0.38 U	0.39 U	0.4 U	0.54	0.44	0.4 U	0.48	0.44 U
Anthracene		0.37 U	0.39 U	0.38	0.37 U	0.38 U	0.39 U	0.7	0.37 U	0.39	0.4 U	0.4 U	0.44 U
Benzo(a)anthracene		0.37 U	0.39 U	0.61	0.53	0.38 U	0.68	1.0	0.75	1.0	0.4 U	0.99	0.44 U
Benzo(a)pyrene		0.39	0.56	1.1	0.81	0.38 U	0.82	0.94	1.4	1.4	0.4 U	1.1	0.44 U
Benzo(b)fluoranthene		0.4	0.77	1.7	1.1	0.55	1	0.76	1.7	2.1	0.4 U	1.6	0.44 U
Benzo(g,h,i)perylene		0.37 U	0.39 U	0.58	0.38	0.38 U	0.39 U	0.4 U	1.0	0.67	0.4 U	0.44	0.44 U
Benzo(k)fluoranthene		0.55	0.64	1.1	0.82	0.53	1	0.96	1.5	1.5	0.4 U	1.7	0.44 U
Benzyl Alcohol		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Butyl Benzyl Phthalate		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Di-N-Butylphthalate		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Carbazole		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Indeno(1,2,3-cd)pyrene		0.37 U	0.39 U	0.68	0.41	0.38 U	0.42	0.4 U	0.97	0.79	0.4 U	0.53	0.44 U
4-Chloroaniline		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Bis(-2-Chloroethoxy)Methane		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Bis(-2-Chloroethyl)Ether		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
2-Chloronaphthalene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
2-Chlorophenol		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
2,2'-Oxybis(1-chloropropane)		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Chrysene		0.37 U	0.47	0.82	0.66	0.38 U	0.96	0.99	1.0	1.4	0.4 U	1.1	0.44 U
Dibenzo(a,h)anthracene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.43	0.38 U	0.4 U	0.4 U	0.44 U
Dibenzofuran		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
1,3-Dichlorobenzene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
1,2-Dichlorobenzene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
1,4-Dichlorobenzene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
3,3'-Dichlorobenzidine		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
2,4-Dichlorophenol		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
Diethylphthalate		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Dimethyl Phthalate		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
2,4-Dimethylphenol		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
2,4-Dinitrophenol		1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.5 U	1.6 U	1.5 U	1.5 U	1.6 U	1.6 U	1.7 U
2,4-Dinitrotoluene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
2,6-Dinitrotoluene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Bis(2-ethylhexyl)phthalate		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U

Table 3-2[illegible] *(pg 2 of 4)*

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations											
		A1-TP-N1	A1-TP-N2	A1-TP-N3	A1-TP-N4	A1-TP-N5	A1-TP-N6	A1-TP-N7	A1-TP-N8	A1-TP-N9	A1-TP-N10	A1-TP-N11	A1-TP-N12
Fluoranthene		0.6	0.64	0.9	1	0.55	1.4	2.8	1.4	1.7	0.4 U	2.2	0.44 U
Flourene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Hexachlorobenzene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Hexachlorobutadiene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Hexachlorocyclopentadiene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Hexachloroethane		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Isophorone		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
2-Methylnapthalene		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
4,6-Dinitro-2-methylphenol		1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.5 U	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
4-Chloro-3-methylphenol		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	1.6 U	1.5 U	1.5 U	1.6 U	1.6 U	1.7 U
2-Methylphenol		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
4-Methylphenol		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
Naphthalene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
2-Nitroanaline		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.97	0.44 U
3-Nitroanaline		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
4-Nitroanaline		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Nitrobenzene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
2-Nitrophenol		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
4-Nitrophenol		1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.5 U	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
N-Nitrosodimethylamine		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	1.6 U	1.5 U	1.5 U	1.6 U	1.6 U	1.7 U
N-Nitrosodiphenylamine		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Di-N-Octyl Phthalate		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Pentachlorophenol		1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.5 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Phenanthrene		0.37 U	0.39 U	0.55	0.49	0.39	1.2	1.6 U	1.5 U	1.5 U	1.6 U	1.6 U	1.7 U
Phenol		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	2.5	0.70	0.92	0.4 U	1.1	0.44 U
4-Bromophenyl-phenylether		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
4-Chlorophenyl-phenylether		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
N-Nitroso-Di-N-Propylamine		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
Pyrene		0.4	0.53	0.81	0.82	0.45	1.0	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
1,2,4-Trichlorobenzene		0.37 U	0.39 U	0.38 U	0.37 U	0.38 U	0.39 U	1.7	1.1	1.3	0.4 U	1.6	0.44 U
2,4,6-Trichlorophenol		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	0.4 U	0.37 U	0.38 U	0.4 U	0.4 U	0.44 U
2,4,5-Trichlorophenol		0.74 U	0.78 U	0.76 U	0.74 U	0.78 U	0.78 U	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
Total SVOCs	500	2.3	3.6	9.8	7.0	2.5	8.5	0.81 U	0.75 U	0.78 U	0.81 U	0.81 U	0.89 U
								12.8	12.5	13.6		13.8	

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

Table 5-20 (pg 3 of 4)

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations								
		A1-TP-N13	A1-TP-N14	A1-TP-N14[4]	A1-TP-N15	A1-TP-N16	A1-TP-N17	A1-TP-N18	A1-TP-N19	A1-TP-N20
Acenapthene		0.36 U	160	290	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Acenaphthylene		1.1	74	140	0.42	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Anthracene		0.73	150	300	0.58	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Benzo(a)anthracene		2.0	78	150	0.59	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Benzo(a)pyrene		2.6	61	110	0.83	0.41 U	0.36	0.43 U	0.4 U	0.38 U
Benzo(b)fluoranthene		3.7	51	120	1.2	0.41 U	0.48	0.43 U	0.4 U	0.44
Benzo(g,h,i)perylene		1.1	39 U	38 U	0.44	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Benzo(k)fluoranthene		2.7	65	130	1.0	0.41 U	0.41	0.43 U	0.4 U	0.38 U
Benzyl Alcohol		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Butyl Benzyl Phthalate		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Di-N-Butylphthalate		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Carbazole		0.36 U	46	100	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Indeno(1,2,3-cd)pyrene		1.3	39 U	38 U	0.51	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
4-Chloroaniline		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Bis(-2-Chloroethoxy)Methane		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Bis(-2-Chloroethyl)Ether		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
2-Chloronaphthalene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
2-Chlorophenol		0.73 U	78 U	78 U	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
2,2'-Oxybis(1-chloropropane)		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Chrysene		2.3	77	150	0.76	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Dibenzo(a,h)anthracene		0.59	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Dibenzofuran		0.36 U	130	230	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
1,3-Dichlorobenzene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
1,2-Dichlorobenzene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
1,4-Dichlorobenzene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
3,3'-Dichlorobenzidine		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
2,4-Dichlorophenol		0.73 U	78 U	78 U	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
Diethylphthalate		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Dimethyl Phthalate		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
2,4-Dimethylphenol		0.73 U	78 U	78 U	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
2,4-Dinitrophenol		1.4 U	150 U	150 U	1.4 U	1.6 U	1.4 U	1.7 U	1.6 U	1.5 U
2,4-Dinitrotoluene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
2,6-Dinitrotoluene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Bis(2-ethylhexyl)phthalate		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U

Table 3-2b *(pg 4 of 4)*

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations								
		A1-TP-N13	A1-TP-N14	A1-TP-N14[4]	A1-TP-N15	A1-TP-N16	A1-TP-N17	A1-TP-N18	A1-TP-N19	A1-TP-N20
Fluoranthene		3.4	330	500	1.3	0.41 U	0.67	0.43 U	0.4 U	0.41
Flourene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Hexachlorobenzene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Hexachlorobutadiene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Hexachlorocyclopentadiene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Hexachloroethane		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Isophorone		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
2-Methylnapthalene		0.73 U	180	290	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
4,6-Dinitro-2-methylphenol		1.4 U	150 U	150 U	1.4 U	1.6 U	1.4 U	1.7 U	1.6 U	1.5 U
4-Chloro-3-methylphenol		0.73 U	78 U	78 U	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
2-Methylphenol		0.73 U	78 U	78 U	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
4-Methylphenol		0.73 U	78 U	78 U	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
Naphthalene		0.91	870	1000	1.0	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
2-Nitroanaline		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
3-Nitroanaline		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
4-Nitroanaline		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Nitrobenzene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
2-Nitrophenol		0.73 U	78 U	78 U	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
4-Nitrophenol		1.4 U	150 U	150 U	1.4 U	1.6 U	1.4 U	1.7 U	1.6 U	1.5 U
N-Nitrosodimethylamine		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
N-Nitrosodiphenylamine		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Di-N-Octyl Phthalate		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Pentachlorophenol		1.4 U	150 U	150 U	1.4 U	1.6 U	1.4 U	1.7 U	1.6 U	1.5 U
Phenanthrene		1.3	360	580	1.2	0.41 U	0.38	0.43 U	0.4 U	0.38 U
Phenol		0.73 U	78 U	78 U	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
4-Bromophenyl-phenylether		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
4-Chlorophenyl-phenylether		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
N-Nitroso-Di-N-Propylamine		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
Pyrene		2.7	160	360	0.95	0.41 U	0.4	0.43 U	0.4 U	0.38 U
1,2,4-Trichlorobenzene		0.36 U	39 U	38 U	0.37 U	0.41 U	0.36 U	0.43 U	0.4 U	0.38 U
2,4,6-Trichlorophenol		0.73 U	78 U	78 U	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
2,4,5-Trichlorophenol		0.73 U	78 U	78 U	0.74 U	0.84 U	0.72 U	0.88 U	0.8 U	0.77 U
Total SVOCs	500	26.4	[redacted]	[redacted]	10.8		2.7			0.9

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U = Indicates compound was analyzed for [illegible] not detected.

TURNKEY ENVIRONMENTAL RESTORATION, LLC

0002-0' '16/99

Table 3-2c *(pg 1 of 2)*

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N INORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels	Sample Locations													
		A1-TP-N1	A1-TP-N2	A1-TP-N3	A1-TP-N4	A1-TP N4 #1[3]	A1-TP N4 #2[3]	A1-TP-N5	A1-TP-N6	A1-TP-N7	A1-TP-N8	A1-TP-N9	A1-TP-N10	A1-TP-N11	A1-TP-N12
Arsenic	75	16.3	9.93	65.8	26.9			50.6	13.9	14.8	11.5	19.3	27	13.5	31.2
Barium	1000	143	417	95.9	120			122	181	118	145	123	59.1	76.2	312
Cadmium	15	0.918	1.86	1.43	0.832			9.54	1.86	0.602 U	0.748	0.711	0.605 U	0.606 U	3.22
Chromium	1000	158	296	224	356			24.9	225	58.4	133	60.3	45	39.5	621
Lead	1000	309	197	205	1380	362	289	619	227	34.2	230	245	59.9	82.5	393
Mercury	10	0.167	0.151	0.129	0.253			0.084	0.093	0.06 U	0.096	0.203	0.061 U	0.137	0.067 U
Selenium	61	6.62	6.79	5.21	6.58			2.58	8.17	3.31	7.2	2.83	4.03	2.95	7.47
Silver	10	1.11 U	1.17 U	6.64	1.11 U			3.19	1.17 U	1.2 U	1.13 U	1.16 U	1.21 U	1.21 U	1.33 U

NOTES:
1. Investigation performed in July & August, 1999
2. U = Indicates compound was analyzed for but not detected.
3. Analyzed two additional aliquots from the original sample jar. Labeled #1 and #2.
4. Shading indicates that the concentration exceeds the Site Specific Action Level.
5. Blank space indicates that the parameter was not analyzed.

0002-005
9/13/99
Subarea N

Table 3-2c *(pg 2 of 2)*

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - Subarea N INORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels	Sample Locations								
		A1-TP-N13	A1-TP-N14	A1-TP-N14 [3]	A1-TP-N15	A1-TP-N16	A1-TP-N17	A1-TP-N18	A1-TP-N19	A1-TP-N20
Arsenic	75	27	13	25.9	19.5	19.2	35.6	29.4	21.5	24.1
Barium	1000	124	83	93.7	169	221	74.4	86.8	311	174
Cadmium	15	0.715	0.585 U	0.81	1.27	1.61	1.3	0.687	0.986	2.74
Chromium	1000	52.5	105	88.8	73.7	198	150	45.5	77.5	407
Lead	1000	130	67.1	106	409	397	310	54.4	66.5	656
Mercury	10	0.095	1.57	4.2	0.173	0.062 U	0.059	0.066 U	0.06 U	0.088
Selenium	61	3.58	2.82	2.93	5.10	5.3	2.9	3.66	5.7	5.32
Silver	10	1.08 U	1.17 U	1.16 U	1.11 U	1.25 U	1.08 U	1.31 U	1.2 U	1.15 U

NOTES:
1. Investigation performed in July & August, 1999
2. U – Indicates compound was analyzed for but not detected.
3. Sampled a second test pit to determine variability of material.

TURNKEY ENVIRONMENTAL RESTORATION, LLC

Table 3-3a

SOIL/FILL ANALYTICAL SUMMARY - Subarea O ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level[2]	Sample Locations												
		A1-TP-O1	A1-TP-O2	A1-TP-O3	A1-TP-O4	A1-TP-O6	A1-TP-O7	A1-TP-O8	A1-TP-O9	A1-TP-O10	A1-TP-O11	A1-TP-O12	A1-TP-O13	A1-TP-O14
Benzene		0.001 U	0.001 U	0.001 U	0.001 U	0.005	0.004	0.005	0.004	0.001 U	0.003	0.001 U	0.004	0.003
SEC-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl-tert-butylether		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
P-Isopropyltoluene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene		0.001 U	0.004 U	0.001	0.001	0.003	0.003	0.004	0.003	0.001 U	0.002	0.001 U	0.003	0.003
1,2,4-Trimethylbenzene		0.001 U	0.001	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
O-Xylene		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U
M+P-Xylene		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U
Total VOCs	10		0.001	0.001	0.002	0.008	0.008	0.011	0.009		0.005		0.007	0.006

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

0002-005
8/20/99
Subarea O

Table 3-3b *(pg 1 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea O ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations												
		A1-TP-O1	A1-TP-O2	A1-TP-O3	A1-TP-O4	A1-TP-O6	A1-TP-O7	A1-TP-O8	A1-TP-O9	A1-TP-O10	A1-TP-O11	A1-TP-O12	A1-TP-O13	A1-TP-O14
Acenapthene		1.8 U	3.8 U	1.4	7.3	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.3	0.81 U	2 U
Acenaphthylene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Anthracene		4.1	3.8 U	0.93	9	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2.5	2.4	0.81 U	2 U
Benzo(a)anthracene		7	3.8 U	1.1	9.8	3.4	1.9 U	1.9	2.4	3.9	6.1	4.7	1.5	3.1
Benzo(a)pyrene		7.2	3.8 U	1.2	9.3	3.8	1.9 U	2.3	3.7	4.6	6.7	5.7	1.7	3.3
Benzo(b)fluoranthene		7	3.8 U	1.4	11	4.5	1.9 U	2.4	3.8	4.9	6.9	6.6	2.0	3.9
Benzo(g,h,i)perylene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.8	0.81 U	2 U
Benzo(k)fluoranthene		6.9	3.8 U	1.1	7.5	3.2	1.9 U	2.6	3.4	4.2	6.7	5.1	2.1	3.4
Benzyl Alcohol		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Butyl Benzyl Phthalate		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Di-N-Butylphthalate		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Carbazole		1.8 U	3.8 U	0.77 U	5.2	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.1	0.81 U	2 U
Indeno(1,2,3-cd)pyrene		3	3.8 U	0.77 U	3.9	1.9 U	1.9 U	1.9 U	1.9 U	2.1	3.1	2.2	0.81 U	2 U
4-Chloroaniline		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Bis(-2-Chloroethoxy)Methane		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Bis(-2-Chloroethyl)Ether		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
2-Chloronaphthalene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
2-Chlorophenol		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
2,2'-Oxybis(1-chloropropane)		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Chrysene		7.0	3.8 U	1.3	10	3.7	1.9 U	2.1	3.4	4.0	6.6	5.2	1.7	3.1
Dibenzo(a,h)anthracene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.0	0.81 U	2 U
Dibenzofuran		1.8 U	3.8 U	0.84	6.1	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
1,3-Dichlorobenzene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
1,2-Dichlorobenzene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
1,4-Dichlorobenzene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
3,3'-Dichlorobenzidine		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
2,4-Dichlorophenol		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
Diethylphthalate		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Dimethyl Phthalate		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
2,4-Dimethylphenol		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
2,4-Dinitrophenol		7.2 U	15 U	3 U	7.6 U	7.5 U	7.6 U	7.3 U	7.7 U	7.6 U	7.7 U	3.3 U	3.2 U	7.7 U
2,4-Dinitrotoluene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
2,6-Dinitrotoluene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Bis(2-ethylhexyl)phthalate		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U

Table -.-b *(pg 2 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea O ORGANICS

Area I Additional Investigation[1]
LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations												
		A1-TP-O1	A1-TP-O2	A1-TP-O3	A1-TP-O4	A1-TP-O6	A1-TP-O7	A1-TP-O8	A1-TP-O9	A1-TP-O10	A1-TP-O11	A1-TP-O12	A1-TP-O13	A1-TP-O14
Fluoranthene		16	3.8 U	2.8	26	8	1.9 U	5	4	8.8	12	9.4	3.7	7.5
Flourene		1.8 U	3.8 U	1.1	9.3	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.3	0.81 U	2 U
Hexachlorobenzene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Hexachlorobutadiene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Hexachlorocyclopentadiene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Hexachloroethane		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Isophorone		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
2-Methylnapthalene		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
4,6-Dinitro-2-methylphenol		7.2 U	15 U	3 U	7.6 U	7.5 U	7.6 U	7.3 U	7.7 U	7.6 U	7.7 U	3.3 U	3.2 U	7.7 U
4-Chloro-3-methylphenol		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
2-Methylphenol		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
4-Methylphenol		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
Naphthalene		1.8 U	3.8 U	0.96	3.3	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
2-Nitroanaline		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
3-Nitroanaline		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
4-Nitroanaline		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Nitrobenzene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
2-Nitrophenol		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
4-Nitrophenol		7.2 U	15 U	3 U	7.6 U	7.5 U	7.6 U	7.3 U	7.7 U	7.6 U	7.7 U	3.3 U	3.2 U	7.7 U
N-Nitrosodimethylamine		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
N-Nitrosodiphenylamine		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Di-N-Octyl Phthalate		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Pentachlorophenol		7.2 U	15 U	3 U	7.6 U	7.5 U	7.6 U	7.3 U	7.7 U	7.6 U	7.7 U	3.3 U	3.2 U	7.7 U
Phenanthrene		11.0	3.8 U	3.2	28	4.9	1.9 U	2.8	1.9 U	5.5	6.3	6.5	2.6	3.4
Phenol		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
4-Bromophenyl-phenylether		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
4-Chlorophenyl-phenylether		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
N-Nitroso-Di-N-Propylamine		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
Pyrene		12	3.8 U	2.7	18	5.9	1.9 U	3.6	3.5	5.6	9.7	7.1	2.6	7.7
1,2,4-Trichlorobenzene		1.8 U	3.8 U	0.77 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	0.84 U	0.81 U	2 U
2,4,6-Trichlorophenol		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
2,4,5-Trichlorophenol		3.7 U	7.7 U	1.60 U	3.9 U	3.9 U	3.9 U	3.8 U	4.0 U	3.9 U	4 U	1.7 U	1.6 U	4 U
Total SVOCs	500	81.2		20.0	163.7	37.4		22.7	24.2	43.6	66.6	61.4	17.9	35.4

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U = Indicates compound was analyzed for but not detected.

Table 3-3c

SOIL/FILL ANALYTICAL SUMMARY - Subarea O ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site-Specific Action Levels	Sample Locations														
		A1-TP-O1	A1-TP-O2	A1-TP-O3	A1-TP-O4	A1-TP-O6	A1-TP-O7	A1-TP-O8	A1-TP-O9	A1-TP-O10	A1-TP-O10 #1[3]	A1-TP-O10 #2[3]	A1-TP-O11	A1-TP-O12	A1-TP-O13	A1-TP-O14
Arsenic	75	3.71	1.15 U	1.17 U	1.17 U	1.15 U	1.17 U	1.13 U	1.18 U	1.17 U			1.18 U	11.8	31	7.32
Barium	1000	163	72.9	183	174	131	192	151	139	211			131	173	132	135
Cadmium	15	0.76	0.743	0.72	0.922	0.903	0.875	2.56	1.95	2.73			2.66	2.82	0.917	1.08
Chromium	1000	101	584	248	615	610	474	685	675	1190	528	410	590	774	480	372
Lead	1000	176	865	124	365	292	191	475	637	405			409	499	191	157
Mercury	10	0.38	0.119	0.092	0.176	0.184	0.162	1.76	0.876	3.66			0.374	0.633	0.061 U	0.09
Selenium	61	5.2	15	8.71	18.4	17.7	10.5	11.3	12.6	20.8			14.2	9.38	10.2	5.55
Silver	10	1.11 U	1.15 U	1.17 U	1.17 U	1.15 U	1.17 U	1.13 U	1.18 U	1.17 U			1.18 U	1.27 U	1.22 U	1.19 U

NOTES:

1. Investigation performed in July & August, 1999
2. U = Indicates compound was analyzed for but not detected.
3. Analyzed two additional aliquots from the original sample jar. Labeled #1 and #2
4. Blank space indicates that parameter was not analyzed.
5. Shading indicates that the concentration exceeds the Site Specific Action Level.

Table 3-4a *(pg 1 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea P ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations												
		A1-TP-P1	A1-TP-P2	A1-TP-P2b Impacted Soil	A1-TP-P3	A1-TP-P4	A1-TP-P5	A1-TP-P6	A1-TP-P7	A1-TP-P8	A1-TP-P9	A1-TP-T5 (4)	A1-TP-P10	A1-TP-P11
Benzene		0.001 U	0.002 U	0.16 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
SEC-Butylbenzene		0.001 U	0.002	1.1	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.002 U	0.16 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
N-Butylbenzene		0.001 U	0.006	0.16 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
Methyl-tert-butylether		0.001 U	0.002 U	0.16 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
Ethylbenzene		0.001 U	0.002 U	0.16 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
Isopropylbenzene		0.001 U	0.002 U	0.18	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
P-Isopropyltoluene		0.001 U	0.003	0.16 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	0.002	1.9	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
Toluene		0.001 U	0.002 U	0.16	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
1,2,4-Trimethylbenzene		0.001 U	0.002	0.31 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.001 U	0.002 U	0.31 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U
O-Xylene		0.002 U	0.003 U	0.33	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U	0.003 U	0.002 U	0.004 U	0.002 U	0.002 U
M+P-Xylene		0.002 U	0.003 U	0.63 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U	0.003 U	0.002 U	0.004 U	0.002 U	0.002 U
Total VOCs	10		0.015	3.67										

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.
4. Discrete sample of Tan Sand-Chalky Material

Table 3-4a *(pg 2 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea P ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations														
		A1-TP-P12	A1-TP-P13	A1-TP-P14	A1-TP-P15	A1-TP-P16	A1-TP-P17	A1-TP-P18	A1-TP-P19	A1-TP-P20	A1-TP-P21	A1-TP-P22	A1-TP-P23	A1-TP-P24	A1-TP-P25	A1-TP-P26
Benzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
SEC-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl-tert-butylether		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
P-Isopropyltoluene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
O-Xylene		0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U	0.002 U
M+P-Xylene		0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U	0.002 U
Total VOCs	10															

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U–Indicates compound was analyzed for but not detected.

0002-005
8/12/99
Subarea

Table 3-4b *(pg 1 of 4)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea P ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations													
		A1-TP-P1	A1-TP-P2	A1-TP-P2[4]	A1-TP-P2b[5]	A1-TP-P3	A1-TP-P4	A1-TP-P5	A1-TP-P6	A1-TP-P7	A1-TP-P8	A1-TP-P9	A1-TP-T5[6]	A1-TP-P10	A1-TP-P11
Acenapthene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Acenaphthylene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Anthracene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Benzo(a)anthracene		0.37 U	0.49 U	0.66 U	2.1 U	4.0	0.46 U	1.6	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	9.2	0.4 U
Benzo(a)pyrene		0.37 U	0.49 U	0.66 U	2.1 U	5.0	0.57	1.8	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	5.5	0.4 U
Benzo(b)fluoranthene		0.37 U	0.49 U	0.66 U	2.1 U	8.8	0.95	3.4	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	5.6	0.4 U
Benzo(g,h,i)perylene		0.37 U	0.49 U	0.66 U	2.1 U	3.0	0.46 U	1.1	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Benzo(k)fluoranthene		0.37 U	0.49 U	0.66 U	2.1 U	4.3	0.66	1.8	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	6.4	0.4 U
Benzyl Alcohol		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Butyl Benzyl Phthalate		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Di-N-Butylphthalate		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Carbazole		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Indeno(1,2,3-cd)pyrene		0.37 U	0.49 U	0.66 U	2.1 U	3.2	0.46 U	1.2	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
4-Chloroaniline		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Bis(-2-Chloroethoxy)Methane		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Bis(-2-Chloroethyl)Ether		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
2-Chloronaphthalene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
2-Chlorophenol		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U
2,2'-Oxybis(1-chloropropane)		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Chrysene		0.37 U	0.49 U	0.66 U	2.1 U	5.1	0.67	2.3	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	6.9	0.4 U
Dibenzo(a,h)anthracene		0.37 U	0.49 U	0.66 U	2.1 U	2.0	0.46 U	0.57	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Dibenzofuran		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
1,3-Dichlorobenzene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
1,2-Dichlorobenzene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
1,4-Dichlorobenzene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
3,3'-Dichlorobenzidine		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
2,4-Dichlorophenol		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U
Diethylphthalate		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Dimethyl Phthalate		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
2,4-Dimethylphenol		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U
2,4-Dinitrophenol		1.5 U	1.9 U	2.6 U	8.2 U	1.6 U	1.8 U	1.5 U	1.9 U	1.6 U	1.7 U	1.5 U	2.5 U	15 U	1.6 U
2,4-Dinitrotoluene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
2,6-Dinitrotoluene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Bis(2-ethylhexyl)phthalate		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Fluoranthene		0.37 U	0.49 U	0.66 U	2.1 U	5.1	0.92	2.8	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	15	0.45
Flourene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Hexachlorobenzene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Hexachlorobutadiene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Hexachlorocyclopentadiene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Hexachloroethane		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Isophorone		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
2-Methylnapthalene		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U
2,6-Dinitro-2-methylphenol		1.5 U	1.9 U	2.6 U	8.2 U	1.6 U	1.8 U	1.5 U	1.9 U	1.6 U	1.7 U	1.5 U	2.5 U	15 U	1.6 U
4-Chloro-3-methylphenol		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U
2-Methylphenol		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U

Table 3-4b *(pg 2 of 4)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea P ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations												
		A1-TP-P1	A1-TP-P2	A1-TP-P2[4]	A1-TP-P2b[5]	A1-TP-P3	A1-TP-P4	A1-TP-P5	A1-TP-P6	A1-TP-P7	A1-TP-P8	A1-TP-P9	A1-TP-T5[6]	A1-TP-P10	A1-TP-P11
4-Methylphenol		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U
Naphthalene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
2-Nitroanaline		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
3-Nitroanaline		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
4-Nitroanaline		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Nitrobenzene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
2-Nitrophenol		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U
4-Nitrophenol		1.5 U	1.9 U	2.6 U	8.2 U	1.6 U	1.8 U	1.5 U	1.9 U	1.6 U	1.7 U	1.5 U	2.5 U	15 U	1.6 U
N-Nitrosodimethylamine		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
N-Nitrosodiphenylamine		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Di-N-Octyl Phthalate		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Pentachlorophenol		1.5 U	1.9 U	2.6 U	8.2 U	1.6 U	1.8 U	1.5 U	1.9 U	1.6 U	1.7 U	1.5 U	2.5 U	15 U	1.6 U
Phenanthrene		0.37 U	0.49 U	0.66 U	2.1 U	1.3	0.46 U	0.79	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Phenol		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U
4-Bromophenyl-phenylether		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
4-Chlorophenyl-phenylether		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
N-Nitroso-Di-N-Propylamine		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
Pyrene		0.37 U	0.49 U	0.66 U	2.1 U	3.4	0.52	1.6	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	15	0.42
1,2,4-Trichlorobenzene		0.37 U	0.49 U	0.66 U	2.1 U	0.4 U	0.46 U	0.38 U	0.48 U	0.42 U	0.43 U	0.39 U	0.62 U	3.8 U	0.4 U
2,4,6-Trichlorophenol		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U
2,4,5-Trichlorophenol		0.75 U	1.0 U	1.3 U	4.2 U	0.82 U	0.94 U	0.77 U	0.97 U	0.84 U	0.88 U	0.80 U	1.3 U	7.7 U	0.81 U
Total SVOCs	500					45.2	4.3	19.0						64	0.9

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U–Indicates compound was analyzed for but not detected.
4. Discrete sample of cemented blue slag.
5. Sample of impacted soil in A1-TP-P2
6. Discrete sample of Tan Sand-Chalky Material

TurnKey Environmental Restoration, LLC

Table 3-4b *(pg 3 of 4)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea P ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations														
		A1-TP-P12	A1-TP-P13	A1-TP-P14	A1-TP-P15	A1-TP-P16	A1-TP-P17	A1-TP-P18	A1-TP-P19	A1-TP-P20	A1-TP-P21	A1-TP-P22	A1-TP-P23	A1-TP-P24	A1-TP-P25	A1-TP-P26
Acenapthene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Acenaphthylene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Anthracene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Benzo(a)anthracene		0.38 U	0.38 U	0.37 U	0.83	0.37 U	0.37 U	0.37 U	1.6	0.37 U	2.5	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Benzo(a)pyrene		0.38 U	0.38 U	0.37 U	0.69	0.37 U	0.37 U	0.37 U	1.6	0.37 U	1.4	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Benzo(b)fluoranthene		0.48	0.38 U	0.37 U	0.92	0.37 U	0.49	0.37 U	2.2	0.37 U	3.2	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Benzo(g,h,i)perylene		0.38 U	0.38 U	0.37 U	0.62	0.37 U	0.37 U	0.37 U	1.2	0.37 U	1.5	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Benzo(k)fluoranthene		0.39	0.38 U	0.37 U	0.81	0.37 U	0.41	0.37 U	2.0	0.37 U	3.0	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Benzyl Alcohol		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Butyl Benzyl Phthalate		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Di-N-Butylphthalate		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Carbazole		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Indeno(1,2,3-cd)pyrene		0.38 U	0.38 U	0.37 U	0.55	0.37 U	0.37 U	0.37 U	1.2	0.37 U	1.5	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
4-Chloroaniline		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Bis(-2-Chloroethoxy)Methane		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Bis(-2-Chloroethyl)Ether		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
2-Chloronaphthalene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
2-Chlorophenol		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U
2,2'-Oxybis(1-chloropropane)		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Chrysene		0.42	0.38 U	0.37 U	0.94	0.37 U	0.4	0.37 U	2.1	0.37 U	3.4	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Dibenzo(a,h)anthracene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.52	0.37 U	0.85	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Dibenzofuran		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
1,3-Dichlorobenzene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
1,2-Dichlorobenzene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
1,4-Dichlorobenzene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
3,3'-Dichlorobenzidine		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
2,4-Dichlorophenol		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U
Diethylphthalate		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Dimethyl Phthalate		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
2,4-Dimethylphenol		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U
2,4-Dinitrophenol		1.5 U	1.5 U	1.5 U	1.6 U	1.5 U	1.5 U	1.4 U	1.7 U	1.4 U	1.5 U	1.9 U	1.4 U	1.4 U	1.5 U	1.4 U
2,4-Dinitrotoluene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
2,6-Dinitrotoluene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Bis(2-ethylhexyl)phthalate		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	1.3	0.37 U	0.35 U
Fluoranthene		0.38 U	0.38 U	0.37 U	1.1	0.37 U	0.61	0.37 U	2.2	0.37 U	2.2	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Flourene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Hexachlorobenzene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Hexachlorobutadiene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Hexachlorocyclopentadiene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Hexachloroethane		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Isophorone		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
2-Methylnapthalene		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U
4,6-Dinitro-2-methylphenol		1.5 U	1.5 U	1.5 U	1.6 U	1.5 U	1.5 U	1.4 U	1.7 U	1.4 U	1.5 U	1.9 U	1.4 U	1.4 U	1.5 U	1.4 U
4-Chloro-3-methylphenol		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U
2-Methylphenol		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U

Table 3-4b *(pg 4 of 4)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea P ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations														
		A1-TP-P12	A1-TP-P13	A1-TP-P14	A1-TP-P15	A1-TP-P16	A1-TP-P17	A1-TP-P18	A1-TP-P19	A1-TP-P20	A1-TP-P21	A1-TP-P22	A1-TP-P23	A1-TP-P24	A1-TP-P25	A1-TP-P26
4-Methylphenol		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U
Naphthalene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
2-Nitroanaline		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
3-Nitroanaline		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
4-Nitroanaline		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Nitrobenzene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
2-Nitrophenol		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U
4-Nitrophenol		1.5 U	1.5 U	1.5 U	1.6 U	1.5 U	1.5 U	1.4 U	1.7 U	1.4 U	1.5 U	1.9 U	1.4 U	1.4 U	1.5 U	1.4 U
N-Nitrosodimethylamine		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
N-Nitrosodiphenylamine		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Di-N-Octyl Phthalate		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Pentachlorophenol		1.5 U	1.5 U	1.5 U	1.6 U	1.5 U	1.5 U	1.4 U	1.7 U	1.4 U	1.5 U	1.9 U	1.4 U	1.4 U	1.5 U	1.4 U
Phenanthrene		0.38 U	0.38 U	0.37 U	0.46	0.37 U	0.53	0.37 U	0.81	0.37 U	0.44	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Phenol		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U
4-Bromophenyl-phenylether		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
4-Chlorophenyl-phenylether		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
N-Nitroso-Di-N-Propylamine		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
Pyrene		0.38 U	0.38 U	0.37 U	0.83	0.37 U	1.0	0.37 U	1.6	0.37 U	1.7	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
1,2,4-Trichlorobenzene		0.38 U	0.38 U	0.37 U	0.41 U	0.37 U	0.37 U	0.37 U	0.43 U	0.37 U	0.39 U	0.48 U	0.37 U	0.35 U	0.37 U	0.35 U
2,4,6-Trichlorophenol		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U
2,4,5-Trichlorophenol		0.78 U	0.78 U	0.75 U	0.83 U	0.75 U	0.76 U	0.74 U	0.88 U	0.74 U	0.79 U	0.97 U	0.75 U	0.72 U	0.76 U	0.71 U
Total SVOCs	500	1.3			7.8		3.4		17.0		21.7			1.3		

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U = Indicates compound was analyzed for but not detected.

Table 3-4c *(pg 1 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea P INORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels	Sample Locations												
		A1-TP-P1	A1-TP-P2	A1-TP-P2b[3]	A1-TP-P3	A1-TP-P4	A1-TP-P5	A1-TP-P6	A1-TP-P7	A1-TP-P8	A1-TP-P9	A1-TP-T5[4]	A1-TP-P10	A1-TP-P11
Arsenic	75	4.02	1.49 U	3.66	12.6	5.67	4.54	4.38	9.96	5.9	6.17	1.89 U	12	7.1
Barium	1000	328	466	55	102	306	141	331	126	154	174	191	330	168
Cadmium	15	0.562 U	0.744 U	0.628 U	0.61 U	0.698 U	0.578 U	0.727 U	0.631 U	0.659 U	0.595 U	0.943 U	1.06	0.641
Chromium	1000	7.08	35.1	6.06	12.6	13.8	21.6	14.2	6.57	7.02	8.68	2.25	31.8	48
Lead	1000	29.6	14.6	9.26	119	60.3	45.7	10.3	202	78.3	29.6	9.43 U	145	80.6
Mercury	10	0.071	0.074 U	0.063 U	0.061 U	0.102	0.065	0.209	0.149	0.066 U	0.060 U	0.094 U	0.117	0.069
Selenium	61	1.09	2.93	1.1	1.0	2.28	2.18	2.7	1.64	2.46	1.44	1.77	2.93	1.99
Silver	10	1.12 U	1.49 U	1.26 U	1.22 U	1.4 U	1.16 U	1.45 U	1.26 U	1.32 U	1.19 U	1.89 U	1.14 U	1.2 U

NOTES:

1. Investigation performed in July & August, 1999
2. U=Indicates compound was analyzed for but not detected.
3. Discrete sample from impacted soil in A1-TP-P2
4. Discrete sample from Tan Sand-Chalky Material in A1-TP-T5

TurnKey Environmental Restoration, LLC

Table 3-4c *(pg 2 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea P INORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels	Sample Locations														
		A1-TP-P12	A1-TP-P13	A1-TP-P14	A1-TP-P15	A1-TP-P16	A1-TP-P17	A1-TP-P18	A1-TP-P19	A1-TP-P20	A1-TP-P21	A1-TP-P22	A1-TP-P23	A1-TP-P24	A1-TP-P25	A1-TP-P26
Arsenic	75	5.44	7.15	4.38	9.33	1.43	2.36	6.53	4.5	1.57	5.47	3.19	3.22	3.52	1.26	3.01
Barium	1000	59.8	107	94.6	195	79	511	63.5	112	31	23	68.8	76.2	46.2	21.9	35.9
Cadmium	15	0.581 U	0.683	0.558 U	1.91	0.565	1.01	0.554 U	0.654 U	0.554 U	0.592 U	0.725 U	0.557 U	0.839	0.568 U	0.548
Chromium	1000	38	390	77.2	232	40.3	406	7.49	48.1	194	7.23	200	278	43.1	10.1	14
Lead	1000	50.9	74.1	64.4	208	35.5	122	26.9	25.5	57	21.3	41.7	45.7	73.8	10.1	39
Mercury	10	0.058 U	0.135	0.056 U	0.163	0.056 U	0.057 U	0.055 U	0.065 U	0.055 U	0.059 U	0.073 U	0.059	0.054 U	0.057 U	0.053 U
Selenium	61	1.44	4.55	2.1	5.76	1.88	7.38	1.59	2.2	3.68	0.592 U	1.36	3.1	1.21	0.568 U	0.53 U
Silver	10	1.16 U	1.16 U	1.12 U	1.23 U	1.12 U	1.13 U	1.11 U	1.31 U	1.11 U	1.18 U	1.45 U	1.11 U	1.07 U	1.14 U	1.06 U

NOTES:
1. Investigation performed in July & August, 1999
2. U=Indicates compound was analyzed for but not detected.

TURNKEY ENVIRONMENTAL RESTORATION, LLC

0002-005
8/12/99
Subarea

Table 3-5a *(pg 1 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea Q ORGANICS

Area I Additional Investigation(1)

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level(2)	Sample Locations													
		A1-TP-Q1	A1-TP-Q2	A1-TP-Q3	A1-TP-Q4	A1-TP-Q5	A1-TP-Q6	A1-TP-Q7	A1-TP-Q8	A1-TP-Q9	A1-TP-Q10	A1-TP-Q11	A1-TP-Q12	A1-TP-Q13	A1-TP-Q13b(4)
Benzene		0.002 U	0.001 U	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
SEC-Butylbenzene		0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
Tert-Butylbenzene		0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
N-Butylbenzene		0.01	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.003	0.002 U
Methyl-tert-butylether		0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
Ethylbenzene		0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
Isopropylbenzene		0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
P-Isopropyltoluene		0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
N-Propylbenzene		0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
Toluene		0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
1,2,4-Trimethylbenzene		0.011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
1,3,5-Trimethylbenzene		0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U
O-Xylene		0.003 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U	0.003 U	0.003 U	0.002 U	0.002 U	0.003 U	0.003 U	0.003 U
M+P-Xylene		0.003 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U	0.002 U	0.003 U	0.003 U	0.002 U	0.002 U	0.003 U	0.003 U	0.003 U
Total VOCs	10	0.037		0.002										0.003	

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

0002-005
8/12/99
Subarea Q

Table 3-5a *(pg 2 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea Q ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level[2]	Sample Locations													
		A1-TP-Q14	A1-TP-Q15	A1-TP-Q17	A1-TP-Q18	A1-TP-Q19	A1-TP-Q20	A1-TP-Q21	A1-TP-Q22	A1-TP-Q23	A1-TP-Q24	A1-TP-Q25	A1-TP-Q26	A1-TP-Q27	A1-TP-Q28
Benzene		0.001 U	0.001 U	0.001 U	0.001 U	0.008	0.001 U	0.003	0.001 U	0.003	0.007	0.004	0.006	0.004	0.008
SEC-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.003	0.12
Tert-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.003 U
N-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.003	0.001 U	0.001 U	0.001 U	0.001 U	0.002	0.001 U	0.001 U	0.008	0.32
Methyl-tert-butylether		0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.003 U
Ethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.003 U
Isopropylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004
P-Isopropyltoluene		0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.003 U
N-Propylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.017	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.056
Toluene		0.001 U	0.001 U	0.001 U	0.001 U	0.008	0.001 U	0.001	0.001 U	0.002	0.003	0.002	0.002	0.002	0.006
1,2,4-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.002	0.001 U	0.001 U	0.004	0.17
1,3,5-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.003 U
O-Xylene		0.003 U	0.003 U	0.002 U	0.002 U	0.005 U	0.003 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.008
M+P-Xylene		0.003 U	0.003 U	0.002 U	0.002 U	0.005	0.003 U	0.002 U	0.002 U	0.002 U	0.003	0.002 U	0.003 U	0.002 U	0.006 U
Total VOCs	10					0.049		0.004		0.005	0.019	0.006	0.008	0.021	0.692

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

Table 3-5b *(pg 1 of 4)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea Q ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations												
		A1-TP-Q1	A1-TP-Q2	A1-TP-Q3	A1-TP-Q4	A1-TP-Q5	A1-TP-Q6	A1-TP-Q7	A1-TP-Q8	A1-TP-Q9	A1-TP-Q10	A1-TP-Q11	A1-TP-Q12	A1-TP-Q13
Acenapthene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Acenaphthylene		0.56 U	0.37 U	0.39 U	0.51	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Anthracene		0.56 U	0.37 U	0.39 U	1.2	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Benzo(a)anthracene		0.56 U	0.37 U	0.39 U	2.5	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Benzo(a)pyrene		0.56 U	0.37 U	0.39 U	2.4	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Benzo(b)fluoranthene		0.56 U	0.37 U	0.39 U	2.7	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Benzo(g,h,i)perylene		0.56 U	0.37 U	0.39 U	0.94	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Benzo(k)fluoranthene		0.56 U	0.37 U	0.39 U	2.7	0.4	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Benzyl Alcohol		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Butyl Benzyl Phthalate		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Di-N-Butylphthalate		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Carbazole		0.56 U	0.37 U	0.39 U	0.66	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Indeno(1,2,3-cd)pyrene		0.56 U	0.37 U	0.39 U	1.2	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
4-Chloroaniline		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Bis(-2-Chloroethoxy)Methane		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Bis(-2-Chloroethyl)Ether		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
2-Chloronaphthalene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
2-Chlorophenol		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
2,2'-Oxybis(1-chloropropane)		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Chrysene		0.56 U	0.37 U	0.39 U	2.5	0.46	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Dibenzo(a,h)anthracene		0.56 U	0.37 U	0.39 U	0.56	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Dibenzofuran		0.56 U	0.37 U	0.39 U	0.61	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
1,3-Dichlorobenzene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
1,2-Dichlorobenzene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
1,4-Dichlorobenzene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
3,3'-Dichlorobenzidine		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
2,4-Dichlorophenol		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
Diethylphthalate		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Dimethyl Phthalate		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
2,4-Dimethylphenol		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
2,4-Dinitrophenol		2.2 U	1.5 U	1.5 U	1.6 U	1.4 U	1.6 U	1.5 U	1.7 U	1.7 U	1.5 U	1.6 U	1.7 U	1.7 U
2,4-Dinitrotoluene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
2,6-Dinitrotoluene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Bis(2-ethylhexyl)phthalate		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U

Table 3-5b *(pg 2 of 4)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea Q ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations												
		A1-TP-Q1	A1-TP-Q2	A1-TP-Q3	A1-TP-Q4	A1-TP-Q5	A1-TP-Q6	A1-TP-Q7	A1-TP-Q8	A1-TP-Q9	A1-TP-Q10	A1-TP-Q11	A1-TP-Q12	A1-TP-Q13
Fluoranthene		0.81	0.37 U	0.46	6.0	0.89	0.4 U	0.39	0.43 U	0.8	0.39 U	0.4 U	0.44 U	0.47
Flourene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Hexachlorobenzene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Hexachlorobutadiene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Hexachlorocyclopentadiene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Hexachloroethane		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Isophorone		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
2-Methylnapthalene		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
4,6-Dinitro-2-methylphenol		2.2 U	1.5 U	1.5 U	1.6 U	1.4 U	1.6 U	1.5 U	1.7 U	1.7 U	1.5 U	1.6 U	1.7 U	1.7 U
4-Chloro-3-methylphenol		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
2-Methylphenol		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
4-Methylphenol		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
Naphthalene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
2-Nitroanaline		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
3-Nitroanaline		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
4-Nitroanaline		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Nitrobenzene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
2-Nitrophenol		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
4-Nitrophenol		2.2 U	1.5 U	1.5 U	1.6 U	1.4 U	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
N-Nitrosodimethylamine		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	1.6 U	1.5 U	1.7 U	1.7 U	1.5 U	1.6 U	1.7 U	1.7 U
N-Nitrosodiphenylamine		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Di-N-Octyl Phthalate		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Pentachlorophenol		2.2 U	1.5 U	1.5 U	1.6 U	1.4 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Phenanthrene		0.78	0.37 U	0.39 U	5.7	0.96	1.6 U	1.5 U	1.7 U	1.7 U	1.5 U	1.6 U	1.7 U	1.7 U
Phenol		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.4 U	0.38 U	0.43 U	0.49	0.38 U	0.4 U	0.44 U	0.44 U
4-Bromophenyl-phenylether		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
4-Chlorophenyl-phenylether		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
N-Nitroso-Di-N-Propylamine		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
Pyrene		0.59	0.37 U	0.39 U	3.5	0.9	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
1,2,4-Trichlorobenzene		0.56 U	0.37 U	0.39 U	0.41 U	0.37 U	0.4 U	0.38 U	0.43 U	0.47	0.38 U	0.4 U	0.44 U	0.44 U
2,4,6-Trichlorophenol		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.4 U	0.38 U	0.43 U	0.42 U	0.38 U	0.4 U	0.44 U	0.44 U
2,4,5-Trichlorophenol		1.10 U	0.75 U	0.78 U	0.83 U	0.75 U	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
Total SVOCs	500	2.2		0.5	33.7	3.6	0.81 U	0.78 U	0.87 U	0.86 U	0.77 U	0.81 U	0.89 U	0.90 U
								0.4		1.8				0.5

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U – Indicates compound was analyzed for but not detected.

Table [illegible]D (pg 3 of 4)

SOIL/FILL ANALYTICAL SUMMARY - Subarea Q ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations													
		A1-TP-Q14	A1-TP-Q15	A1-TP-Q17	A1-TP-Q18	A1-TP-Q19	A1-TP-Q20	A1-TP-Q21	A1-TP-Q22	A1-TP-Q23	A1-TP-Q24	A1-TP-Q25	A1-TP-Q26	A1-TP-Q27	A1-TP-Q28
Acenapthene		0.43 U	0.41 U	0.38 U	0.38 U	2.2	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4
Acenaphthylene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.98	0.36 U	0.4 U
Anthracene		0.43 U	0.41 U	0.38 U	0.38 U	0.54	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	1.3	0.4	0.44
Benzo(a)anthracene		0.43 U	0.66	0.65	1.3	0.66	0.41	0.8	0.95	0.74	1.2	1.0	3.9	0.92	0.99
Benzo(a)pyrene		0.43 U	0.78	0.97	2.2	0.59	0.8	0.76	1.6	0.71	0.87	0.91	3.1	0.75	0.85
Benzo(b)fluoranthene		0.43 U	0.75	1.2	2.2	0.69	0.99	0.92	1.7	0.97	1.1	1.2	3.1	0.87	0.88
Benzo(g,h,i)perylene		0.43 U	0.42	0.5	1.0	0.38 U	0.41 U	0.48	0.68	0.5	0.59	0.64	1.1	0.42	0.44
Benzo(k)fluoranthene		0.43 U	0.81	1.2	2.1	0.58	0.93	0.67	1.7	0.73	1.1	0.95	3.5	0.76	0.83
Benzyl Alcohol		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Butyl Benzyl Phthalate		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Di-N-Butylphthalate		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Carbazole		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Indeno(1,2,3-cd)pyrene		0.43 U	0.43	0.57	1.1	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.5	0.36 U	0.4 U
4-Chloroaniline		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.42	0.49	0.75	0.52	0.59	0.64	1.3	0.45	0.48
Bis(-2-Chloroethoxy)Methane		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Bis(-2-Chloroethyl)Ether		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
2-Chloronaphthalene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
2-Chlorophenol		0.87 U	0.83 U	0.77 U	0.78 U	0.77 U	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	0.82 U
2,2'-Oxybis(1-chloropropane)		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Chrysene		0.43 U	0.72	0.85	1.6	0.65	0.58	0.78	1.2	0.76	1.1	0.98	3.2	0.8	0.85
Dibenzo(a,h)anthracene		0.43 U	0.41 U	0.38 U	0.52	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.52	0.36 U	0.4 U
Dibenzofuran		0.43 U	0.41 U	0.38 U	0.38 U	1.1	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
1,3-Dichlorobenzene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
1,2-Dichlorobenzene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
1,4-Dichlorobenzene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
3,3'-Dichlorobenzidine		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
2,4-Dichlorophenol		0.87 U	0.83 U	0.77 U	0.78 U	0.77 U	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	0.82 U
Diethylphthalate		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Dimethyl Phthalate		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
2,4-Dimethylphenol		0.87 U	0.83 U	0.77 U	0.78 U	0.77 U	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	0.82 U
2,4-Dinitrophenol		1.7 U	1.6 U	1.5 U	1.5 U	1.5 U	1.6 U	1.6 U	1.4 U	1.5 U	1.6 U	1.5 U	1.7 U	1.4 U	1.6 U
2,4-Dinitrotoluene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
2,6-Dinitrotoluene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Bis(2-ethylhexyl)phthalate		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U

Table 3-5b *(pg 4 of 4)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea Q ORGANICS

Area I Additional Investigation[1]
LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations													
		A1-TP-Q14	A1-TP-Q15	A1-TP-Q17	A1-TP-Q18	A1-TP-Q19	A1-TP-Q20	A1-TP-Q21	A1-TP-Q22	A1-TP-Q23	A1-TP-Q24	A1-TP-Q25	A1-TP-Q26	A1-TP-Q27	A1-TP-Q28
Fluoranthene		0.43 U	1.5	1.2	1.9	1.6	0.6	1.0	1.7	0.94	2.1	1.2	6.3	1.8	1.5
Flourene		0.43 U	0.41 U	0.38 U	0.38 U	1.4	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.64	0.36 U	0.72
Hexachlorobenzene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Hexachlorobutadiene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Hexachlorocyclopentadiene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Hexachloroethane		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Isophorone		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
2-Methylnaphthalene		0.87 U	0.83 U	0.77 U	0.78 U	1.4	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	1.7
4,6-Dinitro-2-methylphenol		1.7 U	1.6 U	1.5 U	1.5 U	1.5 U	1.6 U	1.6 U	1.4 U	1.5 U	1.6 U	1.5 U	1.7 U	1.4 U	1.6 U
4-Chloro-3-methylphenol		0.87 U	0.83 U	0.77 U	0.78 U	0.77 U	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	0.82 U
2-Methylphenol		0.87 U	0.83 U	0.77 U	0.78 U	0.77 U	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	0.82 U
4-Methylphenol		0.87 U	0.83 U	0.77 U	0.78 U	0.77 U	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	0.82 U
Naphthalene		0.43 U	0.41 U	0.38 U	0.38 U	2.3	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.42	0.4 U
2-Nitroanaline		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
3-Nitroanaline		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
4-Nitroanaline		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Nitrobenzene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
2-Nitrophenol		0.87 U	0.83 U	0.77 U	0.78 U	0.77 U	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	0.82 U
4-Nitrophenol		1.7 U	1.6 U	1.5 U	1.5 U	1.5 U	1.6 U	1.6 U	1.4 U	1.5 U	1.6 U	1.5 U	1.7 U	1.4 U	1.6 U
N-Nitrosodimethylamine		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
N-Nitrosodiphenylamine		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Di-N-Octyl Phthalate		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Pentachlorophenol		1.7 U	1.6 U	1.5 U	1.5 U	1.5 U	1.6 U	1.6 U	1.4 U	1.5 U	1.6 U	1.5 U	1.7 U	1.4 U	1.6 U
Phenanthrene		0.43 U	1.2	0.69	0.61	3.0	0.41 U	0.75	0.72	0.59	1.3	0.68	4.4	1.30	1.9
Phenol		0.87 U	0.83 U	0.77 U	0.78 U	0.77 U	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	0.82 U
4-Bromophenyl-phenylether		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
4-Chlorophenyl-phenylether		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
N-Nitroso-Di-N-Propylamine		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
Pyrene		0.43 U	0.96	0.9	1.5	1.3	0.46	0.86	1.1	0.93	2.4	1.0	6.3	1.1	1.2
1,2,4-Trichlorobenzene		0.43 U	0.41 U	0.38 U	0.38 U	0.38 U	0.41 U	0.4 U	0.37 U	0.38 U	0.4 U	0.39 U	0.43 U	0.36 U	0.4 U
2,4,6-Trichlorophenol		0.87 U	0.83 U	0.77 U	0.78 U	0.77 U	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	0.82 U
2,4,5-Trichlorophenol		0.87 U	0.83 U	0.77 U	0.78 U	0.77 U	0.83 U	0.82 U	0.75 U	0.78 U	0.82 U	0.78 U	0.86 U	0.74 U	0.82 U
Total SVOCs	500		8.2	8.7	16.0	18.0	5.2	7.5	12.1	7.4	12.4	9.2	40.1	10.0	13.2

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U = Indicates compound was analyzed for but not detected.

Table 3-5c *(pg 1 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea Q INORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site-Specific Action Levels	Sample Locations																
		A1-TP-Q1	A1-TP-Q2	A1-TP Q2 #1[3]	A1-TP Q2 #2[3]	A1-TP-Q3	A1-TP-Q4	A1-TP-Q5	A1-TP Q5 #1[3]	A1-TP Q5 #2[3]	A1-TP-Q6	A1-TP-Q7	A1-TP-Q8	A1-TP-Q9	A1-TP-Q10	A1-TP-Q11	A1-TP-Q12	A1-TP-Q13
Arsenic	75	16.3	7.28			7.15	20.7	1.11 U			2.39	9.29	10.7	14.6	5.7	1.43	8.87	26
Barium	1000	156	162			128	177	110			174	144	299	93.5	174	128	79.7	105
Cadmium	15	0.845 U	0.56 U			0.585 U	3.82	1.15			0.601 U	0.579 U	3.81	0.642 U	0.624	0.602 U	0.665 U	0.67 U
Chromium	1000	72.5	1050	2050	1050	382	706	1280	1970	1820	14.7	20.3	58.2	185	227	85.9	23.1	249
Lead	1000	186	219			124	258	234			30	98.6	657	90	67.7	21.8	53.2	74.4
Mercury	10	0.126	0.056 U			0.133	0.135	0.056 U			0.06 U	0.058 U	0.29	0.075	0.057 U	0.06 U	0.11	0.067 U
Selenium	61	3.01	13.1			6.39	11.4	17.5			2.46	1.71	2.95	4.47	8.79	3.88	1.88	1.94
Silver	10	1.69 U	1.12 U			1.17 U	1.24 U	1.11 U			1.2 U	1.16 U	1.31 U	1.28 U	1.14 U	1.2 U	1.33 U	1.34 U

NOTES:
1. Investigation performed in July & August, 1999
2. U=Indicates compound was analyzed for but not detected.
3. Analyzed two additional aliquots from the original sample jar. Labeled #1 and #2.
4. Shading indicates that the concentration exceeds the Site Specific Action Level.
5. Blank space indicates that the parameter was not analyzed.

TurnKey Environmental Restoration, LLC

Table 3-5c *(pg 2 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea Q INORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site-Specific Action Levels	Sample Locations																			
		A1-TP-Q14	A1-TP Q14 #1[3]	A1-TP Q14 #2[3]	A1-TP-Q15	A1-TP-Q17	A1-TP-Q18	A1-TP Q18 #1[3]	A1-TP Q18 #2[3]	A1-TP-Q19	A1-TP Q19 #1[3]	A1-TP Q19 #2[3]	A1-TP-Q20	A1-TP-Q21	A1-TP-Q22	A1-TP-Q23	A1-TP-Q24	A1-TP-Q25	A1-TP-Q26	A1-TP-Q27	A1-TP-Q28
Arsenic	75	317	413	399	15.2	25.6	60.8			33.6			36.5	13.2	22.9	21	3.86	14.8	11.6	14.1	10.3
Barium	1000	138			191	191	140			95			76.5	129	227	183	105	118	177	169	123
Cadmium	15	0.653 U			0.783	1.1	2.16			3.06			0.617 U	5.12	1.69	1.54	0.991	0.854	1.21	0.549 U	1.47
Chromium	1000	13.6			14.7	147	225			331			24.6	127	288	183	118	162	109	60.2	76.9
Lead	1000	44.5			70.3	164	4070	5770	3620	2700	2390	2940	53.1	157	194	218	197	372	277	205	192
Mercury	10	0.164			0.062 U	0.163	0.533			0.171			0.123	0.08	0.238	0.151	0.135	0.059 U	0.494	0.211	0.267
Selenium	61	3.76			4.12	5.94	2.26			6.65			2.02	6.66	7.83	6.4	6.27	6.59	4.77	3.93	4.82
Silver	10	1.31 U			1.24 U	1.15 U	1.17 U			1.14 U			1.23 U	1.22 U	1.11 U	1.16 U	1.22 U	1.17 U	1.29 U	1.1 U	1.22 U

NOTES:
1. Investigation performed in July & August, 1999
2. U – Indicates compound was analyzed for but not detected.
3. Analyzed two additional aliquots from the original sample jar. Labeled #1 and #2.
4. Shading indicates that the concentration exceeds the Site Specific Action Level.
5. Blank space indicates that the parameter was not analyzed.

TurnKey Environmental Restoration, LLC

Table 3-6a

SOIL/FILL ANALYTICAL SUMMARY - Subarea R ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level[2]	Sample Locations								
		A1-TP-R1	A1-TP-R2	A1-TP-R3	A1-TP-R4	A1-TP-R5	A1-TP-R6	A1-TP-R7	A1-TP-R8	A1-TP-R9
Benzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
SEC-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Butylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl-tert-butylether		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
P-Isopropyltoluene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
O-Xylene		0.002 U	0.003 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U
M+P-Xylene		0.002 U	0.003 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U
Total VOCs	10									

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

Table 3-6b *(pg 1 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea R ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations								
		A1-TP-R1	A1-TP-R2	A1-TP-R3	A1-TP-R4	A1-TP-R5	A1-TP-R6	A1-TP-R7	A1-TP-R8	A1-TP-R9
Acenapthene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Acenaphthylene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Anthracene		0.78 U	0.44	0.4 U	0.39 U	0.38 U	0.54	0.38 U	0.4 U	0.84 U
Benzo(a)anthracene		6.0	1.4	0.97	1.2	0.38 U	0.85	1.1	1.2	2.6
Benzo(a)pyrene		4.8	1.0	0.85	0.98	0.38 U	0.94	1.1	1.0	1.9
Benzo(b)fluoranthene		4.0	0.94	0.90	1.0	0.38 U	0.94	1.3	1.0	1.7
Benzo(g,h,i)perylene		2.0	0.46	0.52	0.51	0.38 U	0.46 U	0.52	0.51	0.84
Benzo(k)fluoranthene		4.1	0.99	0.86	0.93	0.38 U	1.0	1.1	1.1	1.8
Benzyl Alcohol		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Butyl Benzyl Phthalate		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Di-N-Butylphthalate		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Carbazole		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Indeno(1,2,3-cd)pyrene		2.0	0.46	0.51	0.5	0.38 U	0.49	0.53	0.54	0.88
4-Chloroaniline		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Bis(-2-Chloroethoxy)Methane		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Bis(-2-Chloroethyl)Ether		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
2-Chloronaphthalene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
2-Chlorophenol		1.6 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.77 U	0.82 U	1.70 U
2,2'-Oxybis(1-chloropropane)		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Chrysene		4.6	1.2	0.97	1.1	0.38 U	0.97	1.1	1.1	2.2
Dibenzo(a,h)anthracene		0.87	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Dibenzofuran		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
1,3-Dichlorobenzene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
1,2-Dichlorobenzene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
1,4-Dichlorobenzene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
3,3'-Dichlorobenzidine		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
2,4-Dichlorophenol		1.6 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.77 U	0.82 U	1.70 U
Diethylphthalate		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Dimethyl Phthalate		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
2,4-Dimethylphenol		1.6 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.77 U	0.82 U	1.70 U
2,4-Dinitrophenol		3.1 U	1.7 U	1.6 U	1.5 U	1.5 U	1.8 U	1.5 U	1.6 U	3.3 U
2,4-Dinitrotoluene		2.1	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
2,6-Dinitrotoluene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Bis(2-ethylhexyl)phthalate		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U

Table . (pg 2 of 2)

SOIL/FILL ANALYTICAL SUMMARY - Subarea R ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations								
		A1-TP-R1	A1-TP-R2	A1-TP-R3	A1-TP-R4	A1-TP-R5	A1-TP-R6	A1-TP-R7	A1-TP-R8	A1-TP-R9
Fluoranthene		6.7	2.4	1.5	1.7	0.38 U	2.1	1.5	1.7	4.5
Flourene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Hexachlorobenzene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Hexachlorobutadiene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Hexachlorocyclopentadiene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Hexachloroethane		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Isophorone		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
2-Methylnapthalene		0.78 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.77 U	0.82 U	1.70 U
4,6-Dinitro-2-methylphenol		3.1 U	1.7 U	1.6 U	1.5 U	1.5 U	1.8 U	1.5 U	1.6 U	3.3 U
4-Chloro-3-methylphenol		1.6 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.77 U	0.82 U	1.70 U
2-Methylphenol		1.6 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.77 U	0.82 U	1.70 U
4-Methylphenol		1.6 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.77 U	0.82 U	1.70 U
Naphthalene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
2-Nitroanaline		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
3-Nitroanaline		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
4-Nitroanaline		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Nitrobenzene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
2-Nitrophenol		1.6 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.38 U	0.4 U	0.84 U
4-Nitrophenol		3.1 U	1.7 U	1.6 U	1.5 U	1.5 U	1.8 U	0.77 U	0.82 U	1.70 U
N-Nitrosodimethylamine		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	1.5 U	1.6 U	3.3 U
N-Nitrosodiphenylamine		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Di-N-Octyl Phthalate		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Pentachlorophenol		3.1 U	1.7 U	1.6 U	1.5 U	1.5 U	1.8 U	0.38 U	0.4 U	0.84 U
Phenanthrene		1.5	1.9	0.71	1.2	0.38 U	1.7	1.5 U	1.6 U	3.3 U
Phenol		1.6 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.68	1.0	3.1
4-Bromophenyl-phenylether		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.77 U	0.82 U	1.70 U
4-Chlorophenyl-phenylether		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
N-Nitroso-Di-N-Propylamine		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	0.38 U	0.4 U	0.84 U
Pyrene		7.9	2.2	1.2	1.7	0.38 U	1.7	0.38 U	0.4 U	0.84 U
1,2,4-Trichlorobenzene		0.78 U	0.42 U	0.4 U	0.39 U	0.38 U	0.46 U	1.5	1.6	3.6
2,4,6-Trichlorophenol		1.6 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.38 U	0.4 U	0.84 U
2,4,5-Trichlorophenol		1.6 U	0.86 U	0.82 U	0.80 U	0.76 U	0.93 U	0.77 U	0.82 U	1.70 U
								0.77 U	0.82 U	1.70 U
Total SVOCs	**500**	46.6	13.4	9.0	10.8		11.2	10.4	10.8	23.1

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U = Indicates compound was analyzed for but not detected.

TurnKey Environmental Restoration, LLC

0002-005, 8/11/99

Table 3-6c

SOIL/FILL ANALYTICAL SUMMARY - Subarea R ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site-Specific Action Levels	Sample Locations								
		A1-TP-R1	A1-TP-R2	A1-TP-R3	A1-TP-R4	A1-TP-R5	A1-TP-R6	A1-TP-R7	A1-TP-R8	A1-TP-R9
Arsenic	75	10.4	12.1	12	18.4	3.98	15.1	14.3	16.7	14.8
Barium	1000	235	301	173	181	59.1	182	181	185	138
Cadmium	15	1.27	0.879	1.28	1.28	0.568 U	3.72	2.49	3.27	1.51
Chromium	1000	68.6	79.4	22.5	58.1	23.8	34.3	373	95.7	25.1
Lead	1000	205	599	180	221	30.5	238	416	392	184
Mercury	10	0.059 U	1.15	0.061 U	0.141	0.057 U	0.21	0.23	0.711	0.288
Selenium	61	3.27	2.95	2.32	2.63	1.07	1.53	7.49	2.78	2.12
Silver	10	1.18 U	1.28 U	1.22 U	1.19 U	1.14 U	1.39 U	1.15 U	1.23 U	1.28 U

NOTES:
1. Investigation performed in July & August, 1999
2. U – Indicates compound was analyzed for but not detected.

TurnKey Environmental Restoration, LLC

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Subarea

Table 3-7a

SOIL/FILL ANALYTICAL SUMMARY - Subarea S ORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level[2]	Sample Locations									
		A1-TP-S1	A1-TP-S2	A1-TP-S3	A1-TP-S4	A1-TP-S5	A1-TP-S6	A1-TP-S7	A1-TP-S8	A1-TP-S9	A1-TP-S10
Benzene		0.001 U	0.001 U	0.14 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
SEC-Butylbenzene		0.001 U	0.001 U	0.14 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.001 U	0.14 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Butylbenzene		0.001 U	0.001 U	0.18	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl-tert-butylether		0.001 U	0.001 U	0.14 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene		0.001 U	0.001 U	0.14 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropylbenzene		0.001 U	0.001 U	0.14 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
P-Isopropyltoluene		0.001 U	0.001 U	0.14 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	0.001 U	0.14 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene		0.001 U	0.001 U	0.33	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trimethylbenzene		0.001 U	0.001 U	0.34	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.001 U	0.001 U	0.14 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
O-Xylene		0.002 U	0.002 U	0.28 U	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U
M+P-Xylene		0.002 U	0.002 U	0.41	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total VOCs	10			1.3							

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

0002-005
8/11/99
Subarea S

Table 3-7b *(pg 1 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Subarea S ORGANICS

Area I Additional Investigation[1]
LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations									
		A1-TP-S1	A1-TP-S2	A1-TP-S3	A1-TP-S4	A1-TP-S5	A1-TP-S6	A1-TP-S7	A1-TP-S8	A1-TP-S9	A1-TP-S10
Acenapthene		1.9 U	0.4 U	13	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Acenaphthylene		1.9 U	0.4 U	3.8 U	1.1	0.4 U	1.9 U	0.42	0.4 U	0.39 U	0.39 U
Anthracene		3.6	0.4 U	28	0.78 U	0.63	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Benzo(a)anthracene		3.6	0.4 U	18	1.4	1.1	3.6	0.69	0.44	0.65	0.39 U
Benzo(a)pyrene		3.6	0.4 U	18	3.2	1.3	4.4	1.4	0.58	0.8	0.39 U
Benzo(b)fluoranthene		3.6	0.4 U	18	3.8	1.6	4.1	1.7	0.74	1.0	0.39 U
Benzo(g,h,i)perylene		2.0	0.4 U	9.7	1.7	1.3	1.9 U	0.96	0.44	0.44	0.39 U
Benzo(k)fluoranthene		4.0	0.4 U	17	2.8	1.2	5.1	1.6	0.56	0.94	0.39 U
Benzyl Alcohol		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Butyl Benzyl Phthalate		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	7.6	0.4 U	0.4 U	0.39 U	0.39 U
Di-N-Butylphthalate		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Carbazole		2.0	0.4 U	16	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Indeno(1,2,3-cd)pyrene		2.2	0.4 U	11	1.8	1.3	2.1	0.93	0.44	0.47	0.39 U
4-Chloroaniline		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Bis(-2-Chloroethoxy)Methane		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Bis(-2-Chloroethyl)Ether		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
2-Chloronaphthalene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
2-Chlorophenol		3.9 U	0.81 U	7.6 U	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
2,2'-Oxybis(1-chloropropane)		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Chrysene		3.6	0.4 U	17	1.8	1.3	3.7	0.97	0.57	0.79	0.39 U
Dibenzo(a,h)anthracene		1.9 U	0.4 U	5.3	0.83	0.56	1.9 U	0.41	0.4 U	0.39 U	0.39 U
Dibenzofuran		1.9 U	0.4 U	17	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
1,3-Dichlorobenzene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
1,2-Dichlorobenzene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
1,4-Dichlorobenzene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
3,3'-Dichlorobenzidine		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
2,4-Dichlorophenol		3.9 U	0.81 U	7.6 U	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
Diethylphthalate		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Dimethyl Phthalate		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
2,4-Dimethylphenol		3.9 U	0.81 U	7.6 U	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
2,4-Dinitrophenol		7.6 U	1.6 U	15 U	3.1 U	1.6 U	7.5 U	1.6 U	1.6 U	1.5 U	1.5 U
2,4-Dinitrotoluene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
2,6-Dinitrotoluene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Bis(2-ethylhexyl)phthalate		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U

Table , (pg 2 of 2)

SOIL/FILL ANALYTICAL SUMMARY - Subarea S ORGANICS

Area I Additional Investigation(1)

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level(2)	Sample Locations									
		A1-TP-S1	A1-TP-S2	A1-TP-S3	A1-TP-S4	A1-TP-S5	A1-TP-S6	A1-TP-S7	A1-TP-S8	A1-TP-S9	A1-TP-S10
Fluoranthene		13	0.4 U	51	1.7	2.8	8.4	1.1	0.8	1.4	0.49
Flourene		2.5	0.4 U	27	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Hexachlorobenzene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Hexachlorobutadiene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Hexachlorocyclopentadiene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Hexachloroethane		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Isophorone		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
2-Methylnapthalene		3.9 U	0.81 U	14	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
4,6-Dinitro-2-methylphenol		7.6 U	1.6 U	15 U	3.1 U	1.6 U	7.5 U	1.6 U	1.6 U	1.5 U	1.5 U
4-Chloro-3-methylphenol		3.9 U	0.81 U	7.6 U	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
2-Methylphenol		3.9 U	0.81 U	7.6 U	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
4-Methylphenol		3.9 U	0.81 U	7.6 U	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
Naphthalene		3.5	0.4 U	34	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
2-Nitroanaline		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
3-Nitroanaline		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
4-Nitroanaline		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Nitrobenzene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
2-Nitrophenol		3.9 U	0.81 U	7.6 U	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
4-Nitrophenol		7.6 U	1.6 U	15 U	3.1 U	1.6 U	7.5 U	1.6 U	1.6 U	1.5 U	1.5 U
N-Nitrosodimethylamine		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
N-Nitrosodiphenylamine		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Di-N-Octyl Phthalate		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Pentachlorophenol		7.6 U	1.6 U	15 U	3.1 U	1.6 U	7.5 U	1.6 U	1.6 U	1.5 U	1.5 U
Phenanthrene		12	0.4 U	58	0.78 U	2.2	1.9 U	0.4 U	0.44	0.73	0.39 U
Phenol		3.9 U	0.81 U	7.6 U	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
4-Bromophenyl-phenylether		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
4-Chlorophenyl-phenylether		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
N-Nitroso-Di-N-Propylamine		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
Pyrene		5.8	0.4 U	25	1.4	2.0	5.3	0.79	0.6	0.97	0.97 U
1,2,4-Trichlorobenzene		1.9 U	0.4 U	3.8 U	0.78 U	0.4 U	1.9 U	0.4 U	0.4 U	0.39 U	0.39 U
2,4,6-Trichlorophenol		3.9 U	0.81 U	7.6 U	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
2,4,5-Trichlorophenol		3.9 U	0.81 U	7.6 U	1.60 U	0.8 U	3.9 U	0.8 U	0.81 U	0.79 U	0.79 U
Total SVOCs	500	65.0		397.0	21.5	17.3	44.3	11.0	5.6	8.2	0.5

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U = Indicates compound was analyzed for but not detected.

TurnKey Environmental Restoration, LLC

Table 3-7c

SOIL/FILL ANALYTICAL SUMMARY - Subarea S INORGANICS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels	Sample Locations											
		A1-TP-S1	A1-TP-S2	A1-TP-S3	A1-TP-S4	A1-TP-S5	A1-TP-S6	A1-TP-S7	A1-TP-S8	A1-TP-S9	A1-TP-S9 #1[3]	A1-TP-S9 #2[3]	A1-TP-S10
Arsenic	75	15.5	8.43	7.9	22.3	16.8	9.52	15.7	19	17.7			15
Barium	1000	200	68.4	267	104	112	305	722	154	178			200
Cadmium	15	0.809	0.602 U	1.73	1.97	1.39	1.23	1.41	0.875	4.0			0.689
Chromium	1000	164	130	318	313	326	169	122	120	87.1			59.7
Lead	1000	93.3	7.73	139	245	441	336	171	135	863			745
Mercury	10	0.098	0.060 U	0.082	0.129	0.158	0.058 U	0.123	0.072	[illegible]	15.4	[illegible]	0.0803
Selenium	61	4.61	6.0	6.28	4.83	5.47	2.6	3.11	6.91	2.72			1.74
Silver	10	1.18 U	1.2 U	1.14 U	1.18 U	1.2 U	1.15 U	1.2 U	1.22 U	1.18 U			1.17 U

NOTES:

1. Investigation performed in July & August, 1999
2. U = Indicates compound was analyzed for but not detected.
3. Analyzed two additional aliquots from the original sample jar. Labeled #1 and #2.
4. Shading indicates that the concentration exceeds the Site Specific Action Level.
5. Blank space indicates that the parameter was not analyzed.

TURNKEY ENVIRONMENTAL RESTORATION, LLC

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Subare:

Table 3-8a

SOIL/FILL ANALYTICAL SUMMARY - Gas Holder Subarea ORGANICS

Area II Additional Investigation(1)

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level(3)	Sample Locations													
		A2-TP-GH1 (1)	A2-TP-GH2 (1)	A2-TP-GH4 (1)	A2-TP-GH5 (1)	A2-TP-GH6 (1)	A2-TP-GH7 (1)	A2-TP-GH8 (1)	A2-TP-GH9 (1)	A2-TP-GH10 (1)	A2-TP-GH11 (1)	A2-TP-GH12 (1)	A2-SB-GH3 (2)	A2-SB-GH8 (2)	A2-TP-GH13/14 (1)
Benzene		0.013	0.11	0.019	0.023	0.006	0.017	0.008	0.001 U	0.002	0.001 U	0.007	0.17 U	0.002	0.001 U
SEC-Butylbenzene		0.001 U	0.002	0.001 U	0.003	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.17 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.001	0.001 U	0.008	0.001 U	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.17 U	0.001 U	0.001 U
N-Butylbenzene		0.003	0.002	0.011	0.004	0.001	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.17 U	0.001 U	0.001 U
Methyl-tert-butylether		0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.17 U	0.001 U	0.001 U
Ethylbenzene		0.011	0.004	0.001 U	0.005	0.002	0.001 U	0.003	0.001 U	0.001 U	0.001 U	0.002	0.17 U	0.001 U	0.001 U
Isopropylbenzene		0.001 U	0.001 U	0.009	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.17 U	0.001 U	0.001 U
P-Isopropyltoluene		0.001 U	0.001 U	0.052	0.002 U	0.003	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.17 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	0.001 U	0.001 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.17 U	0.001 U	0.001 U
Toluene		0.01	0.01	0.004	0.006	0.001	0.003	0.015	0.001 U	0.002	0.001 U	0.008	0.17 U	0.002	0.001 U
1,2,4-Trimethylbenzene		0.01	0.004	0.015	0.008	0.002	0.001 U	0.004	0.001 U	0.001 U	0.001 U	0.002	0.24	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.009	0.005	0.001 U	0.005	0.002	0.001 U	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.17 U	0.001 U	0.001 U
O-Xylene		0.006	0.005	0.003	0.005 U	0.002 U	0.003 U	0.005	0.002 U	0.002 U	0.002 U	0.004	0.33 U	0.002 U	0.002 U
M+P-Xylene		0.01	0.009	0.003 U	0.007	0.002 U	0.003 U	0.012	0.002 U	0.002 U	0.002 U	0.005	0.33 U	0.002 U	0.002 U
Total VOCs	10	0.072	0.152	0.113	0.069	0.017	0.022	0.050		0.004		0.028	0.240	0.004	

Notes:

1. Investigation performed in July & August, 1999
2. Additional soil borings performed in September, 1999
3. Blank space indicates no Site-Specific Action Level proposed for that parameter.
4. U=Indicates compound was analyzed for but not detected.

TurnKey Environmental Restoration, LLC

Table 3-8b *(pg 1 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - Gas Holder Subarea ORGANICS

Area II Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations							
		A2-TP-GH1/4/5	A2-TP-GH4	A2-TP-GH2/6	A2-TP-GH7/8/10	A2-TP-GH9/11/12	A2-SB-GH3	A2-SB-GH8	A2-TP-GH13/14
Acenapthene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Acenaphthylene		0.37 U	0.5	1.9 U	0.76 U	0.75 U	4.4 U	0.74	0.39 U
Anthracene		0.37 U	0.91	1.9 U	0.76 U	1.6	4.4 U	0.39 U	0.39 U
Benzo(a)anthracene		0.47	2.3	2.0	1.3	2.4	5.1	0.85	0.56
Benzo(a)pyrene		0.62	2.7	2.7	1.6	2.3	5.4	1.0	0.69
Benzo(b)fluoranthene		0.78	3.0	2.8	2.2	2.8	4.8	1.1	0.74
Benzo(g,h,i)perylene		0.38	0.98	1.9 U	0.76 U	0.75 U	4.4 U	0.49	0.39 U
Benzo(k)fluoranthene		0.58	2.8	2.4	1.6	2.5	5.1	1.0	0.92
Benzyl Alcohol		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Butyl Benzyl Phthalate		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Di-N-Butylphthalate		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Carbazole		0.37 U	0.44	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Indeno(1,2,3-cd)pyrene		0.37	1.1	1.9 U	0.79	0.76	4.4 U	0.51	0.39 U
4-Chloroaniline		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Bis(-2-Chloroethoxy)Methane		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Bis(-2-Chloroethyl)Ether		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
2-Chloronaphthalene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
2-Chlorophenol		0.75 U	0.86 U	3.8 U	1.50 U	1.50 U	9.0 U	0.79 U	0.80 U
2,2'-Oxybis(1-chloropropane)		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Chrysene		0.63	2.4	2.5	1.5	2.4	5.1	0.87	0.63
Dibenzo(a,h)anthracene		0.37 U	0.44	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Dibenzofuran		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
1,3-Dichlorobenzene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
1,2-Dichlorobenzene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
1,4-Dichlorobenzene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
3,3'-Dichlorobenzidine		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
2,4-Dichlorophenol		0.75 U	0.86 U	3.8 U	1.50 U	1.50 U	9.0 U	0.79 U	0.80 U
Diethylphthalate		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Dimethyl Phthalate		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
2,4-Dimethylphenol		0.75 U	0.86 U	3.8 U	1.50 U	1.50 U	9.0 U	0.79 U	0.80 U
2,4-Dinitrophenol		1.5 U	1.7 U	7.4 U	3.0 U	2.9 U	17 U	1.5 U	1.5 U
2,4-Dinitrotoluene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
2,6-Dinitrotoluene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Bis(2-ethylhexyl)phthalate		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.61	0.39 U

Table 3-0D (pg 2 of 2)

SOIL/FILL ANALYTICAL SUMMARY - Gas Holder Subarea ORGANICS

Area II Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Sample Locations							
		A2-TP-GH1/4/5	A2-TP-GH4	A2-TP-GH2/6	A2-TP-GH7/8/10	A2-TP-GH9/11/12	A2-SB-GH3	A2-SB-GH8	A2-TP-GH13/14
Fluoranthene		1.2	4.6	5.4	3.0	5.9	12	1.4	1.2
Flourene		0.37 U	0.43	1.9 U	0.76 U	0.78	10	0.85	0.39 U
Hexachlorobenzene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Hexachlorobutadiene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Hexachlorocyclopentadiene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Hexachloroethane		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Isophorone		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
2-Methylnapthalene		0.75 U	0.86 U	3.8 U	1.5 U	1.5 U	9.0 U	0.79 U	0.80 U
4,6-Dinitro-2-methylphenol		1.5 U	1.7 U	7.4 U	3.0 U	2.9 U	17 U	1.5 U	1.5 U
4-Chloro-3-methylphenol		0.75 U	0.86 U	3.8 U	1.5 U	1.5 U	9.0 U	0.79 U	0.80 U
2-Methylphenol		0.75 U	0.86 U	3.8 U	1.5 U	1.5 U	9.0 U	0.79 U	0.80 U
4-Methylphenol		0.75 U	0.86 U	3.8 U	1.5 U	1.5 U	9.0 U	0.79 U	0.80 U
Naphthalene		0.88	0.75	1.9 U	0.76 U	0.75 U	19	2.0	0.39 U
2-Nitroanaline		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
3-Nitroanaline		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
4-Nitroanaline		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Nitrobenzene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
2-Nitrophenol		0.75 U	0.86 U	3.8 U	1.5 U	1.5 U	9.0 U	0.79 U	0.80 U
4-Nitrophenol		1.5 U	1.7 U	7.4 U	3.0 U	2.9 U	17 U	1.5 U	1.5 U
N-Nitrosodimethylamine		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
N-Nitrosodiphenylamine		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Di-N-Octyl Phthalate		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Pentachlorophenol		1.5 U	1.7 U	7.4 U	3.0 U	2.9 U	17 U	1.5 U	1.5 U
Phenanthrene		0.91	3.4	3.4	1.8	5.50	7.8	1.1	0.75
Phenol		0.75 U	0.86 U	3.8 U	1.5 U	1.50 U	9.0 U	0.79 U	0.80 U
4-Bromophenyl-phenylether		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
4-Chlorophenyl-phenylether		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
N-Nitroso-Di-N-Propylamine		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
Pyrene		1.0	5.4	4.2	2.4	4.1	8.0	1.1	0.8
1,2,4-Trichlorobenzene		0.37 U	0.43 U	1.9 U	0.76 U	0.75 U	4.4 U	0.39 U	0.39 U
2,4,6-Trichlorophenol		0.75 U	0.86 U	3.8 U	1.5 U	1.50 U	9.0 U	0.79 U	0.80 U
2,4,5-Trichlorophenol		0.75 U	0.86 U	3.8 U	1.5 U	1.50 U	9.0 U	0.79 U	0.80 U
Total SVOCs	500	7.8	32.2	25.4	16.2	31.0	82.3	13.6	6.3

NOTES:

1. Investigation performed in July & August, 1999. Soil Borings performed in Sept.1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.

Table 3-8c

SOIL/FILL ANALYTICAL SUMMARY - Gas Holder Subarea INORGANICS

Area II Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels	Sample Locations							
		A2-TP-GH1/4/5	A2-TP-GH4	A2-TP-GH4 #1[3]	A2-TP-GH4 #2[3]	A2-TP-GH2/6	A2-TP-GH7/8/10	A2-TP-GH9/11/12	A2-TP-GH13/14
Arsenic	75	6.0	41.6			18.3	11.5	10.6	2.78
Barium	1000	112	170			220	127	167	54.3
Cadmium	15	2.63	5.23			2.52	1.36	1.23	0.595 U
Chromium	1000	292	96.8			367	61.1	181	29.3
Lead	1000	267	1010	448	563	548	350	354	163
Mercury	10	0.272	0.656			0.261	1.11	0.381	0.344
Selenium	61	6.1	2.9			6.62	2.82	3.38	1.19 U
Silver	10	1.12 U	1.29 U			1.13 U	1.15 U	1.13 U	1.19 U

NOTES:

1. Investigation performed in July & August, 1999
2. U = Indicates compound was analyzed for but not detected.
3. Analyzed two additional aliquots from the original sample jar. Labeled #1 and #2
4. Blank space indicates that parameter was not analyzed.

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Table 3-9a

SOIL/FILL ANALYTICAL SUMMARY - ORGANICS - FORMER TANK LOCATIONS

Area I Additional Investigation[1]

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site Specific Action Level[2]	Former Tank Locations						
		A1-TP-T1	A1-TP-T3a	A1-TP-T3a	A1-TP-T4	A1-TP-T6	A1-TP-T7	A1-TP-T8
Benzene		0.001 U	0.66	0.003	0.001 U	0.001 U	0.001 U	0.001 U
SEC-Butylbenzene		0.001 U	4.2	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.64 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Butylbenzene		0.009	24	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl-tert-butylether		0.001 U	0.64 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene		0.001 U	4.6	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropylbenzene		0.001 U	1.3	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
P-Isoproyltoluene		0.001 U	0.64 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
N-Propylbenzene		0.002	9.6	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene		0.001 U	0.64 U	0.003	0.001 U	0.001 U	0.001 U	0.001 U
1,2,4-Trimethylbenzene		0.002	8.2	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.002	4.9	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
O-Xylene		0.002 U	1.3 U	0.002 U	0.003 U	0.003 U	0.003 U	0.002 U
M+P-Xylene		0.002 U	1.4	0.002 U	0.003 U	0.003 U	0.003 U	0.002 U
Total VOCs	10	0.015	[illegible]	0.006				

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U = Indicates compound was analyzed for but not detected.

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Table 3-9b *(pg 1 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - ORGANICS - FORMER TANK LOCATIONS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Former Tank Locations						
		A1-TP-T1	A1-TP-T3a	A1-TP-T3a	A1-TP-T4	A1-TP-T6	A1-TP-T7	A1-TP-T8
Acenapthene		0.4 U	14	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Acenaphthylene		0.4 U	8.4 U	0.83	0.46 U	0.43 U	0.41 U	0.38 U
Anthracene		0.4 U	8.4 U	1.1	0.46 U	0.43 U	0.41 U	0.38 U
Benzo(a)anthracene		0.4 U	8.4 U	2	0.46	0.43 U	0.41 U	0.42
Benzo(a)pyrene		0.4 U	8.4 U	2.5	0.46 U	0.43 U	0.41 U	0.49
Benzo(b)fluoranthene		0.4 U	8.4 U	2.6	0.54	0.43 U	0.41 U	0.51
Benzo(g,h,i)perylene		0.4 U	8.4 U	1.3	0.46 U	0.43 U	0.41 U	0.38 U
Benzo(k)fluoranthene		0.4 U	8.4 U	2.8	0.46 U	0.43 U	0.41 U	0.53
Benzyl Alcohol		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Butyl Benzyl Phthalate		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Di-N-Butylphthalate		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Carbazole		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Indeno(1,2,3-cd)pyrene		0.4 U	8.4 U	1.4	0.46 U	0.43 U	0.41 U	0.38 U
4-Chloroaniline		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Bis(-2-Chloroethoxy)Methane		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Bis(-2-Chloroethyl)Ether		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
2-Chloronaphthalene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
2-Chlorophenol		0.81 U	17 U	1.5 U	0.92 U	0.88 U	0.83 U	0.78 U
2,2'-Oxybis(1-chloropropane)		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Chrysene		0.4 U	8.4 U	2.2	0.52	0.43 U	0.41 U	0.46
Dibenzo(a,h)anthracene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Dibenzofuran		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
1,3-Dichlorobenzene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
1,2-Dichlorobenzene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
1,4-Dichlorobenzene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
3,3'-Dichlorobenzidine		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
2,4-Dichlorophenol		0.81 U	17 U	1.5 U	0.92 U	0.88 U	0.83 U	0.78 U
Diethylphthalate		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Dimethyl Phthalate		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
2,4-Dimethylphenol		0.81 U	17 U	1.5 U	0.92 U	0.88 U	0.83 U	0.78 U
2,4-Dinitrophenol		1.6 U	33 U	2.8 U	1.8 U	1.7 U	1.6 U	1.5 U
2,4-Dinitrotoluene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
2,6-Dinitrotoluene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Bis(2-ethylhexyl)phthalate		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U

Table . . o (pg 2 of 2)

SOIL/FILL ANALYTICAL SUMMARY - ORGANICS - FORMER TANK LOCATIONS

Area I Additional Investigation(1)

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level(2)	Former Tank Locations						
		A1-TP-T1	A1-TP-T3a	A1-TP-T3a	A1-TP-T4	A1-TP-T6	A1-TP-T7	A1-TP-T8
Fluoranthene		0.4 U	8.4 U	5	0.88	0.43 U	0.41 U	0.9
Flourene		0.4 U	22	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Hexachlorobenzene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Hexachlorobutadiene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Hexachlorocyclopentadiene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Hexachloroethane		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Isophorone		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
2-Methylnapthalene		0.81 U	34	1.5 U	0.94	0.88 U	0.83 U	0.78 U
4,6-Dinitro-2-methylphenol		1.6 U	33 U	2.8 U	1.8 U	1.7 U	1.6 U	1.5 U
4-Chloro-3-methylphenol		0.81 U	17 U	1.5 U	0.92 U	0.88 U	0.83 U	0.78 U
2-Methylphenol		0.81 U	17 U	1.5 U	0.92 U	0.88 U	0.83 U	0.78 U
4-Methylphenol		0.81 U	17 U	1.5 U	0.92 U	0.88 U	0.83 U	0.78 U
Naphthalene		0.4 U	8.4 U	0.72 U	0.63	0.43 U	0.41 U	0.38 U
2-Nitroanaline		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
3-Nitroanaline		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
4-Nitroanaline		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Nitrobenzene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
2-Nitrophenol		0.81 U	17 U	1.5 U	0.92 U	0.88 U	0.83 U	0.78 U
4-Nitrophenol		1.6 U	33 U	2.8 U	1.8 U	1.7 U	1.6 U	1.5 U
N-Nitrosodimethylamine		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
N-Nitrosodiphenylamine		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Di-N-Octyl Phthalate		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Pentachlorophenol		1.6 U	33 U	2.8 U	1.8 U	1.7 U	1.6 U	1.5 U
Phenanthrene		0.4 U	19	1.7	1	0.43 U	0.41 U	0.52
Phenol		0.81 U	17 U	1.5 U	0.92 U	0.88 U	0.83 U	0.78 U
4-Bromophenyl-phenylether		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
4-Chlorophenyl-phenylether		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
N-Nitroso-Di-N-Propylamine		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
Pyrene		0.4 U	8.4 U	3	0.62	0.43 U	0.41 U	0.65
1,2,4-Trichlorobenzene		0.4 U	8.4 U	0.72 U	0.46 U	0.43 U	0.41 U	0.38 U
2,4,6-Trichlorophenol		0.81 U	17 U	1.5 U	0.92 U	0.88 U	0.83 U	0.78 U
2,4,5-Trichlorophenol		0.81 U	17 U	1.5 U	0.92 U	0.88 U	0.83 U	0.78 U
Total SVOCs	500		89.0	26.43	5.6			4.5

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U = Indicates compound was analyzed for but not detected.

Table 3-9c

SOIL/FILL ANALYTICAL SUMMARY - INORGANICS - FORMER TANK LOCATIONS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels	Former Tank Locations						
		A1-TP-T1	A1-TP-T3a	A1-TP-T3a	A1-TP-T4	A1-TP-T6	A1-TP-T7	A1-TP-T8
Arsenic	75	1.2 U	13.2	10.8	9.66	15.3	5.2	7.26
Barium	1000	35.6	107	133	114	209	144	277
Cadmium	15	0.601 U	0.639 U	1.83	0.69 U	0.658 U	0.62 U	0.58 U
Chromium	1000	8.97	105	270	11.1	91.1	13.2	10.4
Lead	1000	18.1	190	477	37.2	60.4	32.8	109
Mercury	10	0.06 U	0.07	0.476	0.069 U	0.066 U	0.062 U	0.205
Selenium	61	1.25	5.42	7.87	5.57	3.28	4.65	4.98
Silver	10	1.2 U	1.28 U	1.09 U	1.38 U	1.32 U	1.24 U	1.16 U

NOTES:

1. Investigation performed in July & August, 1999
2. U = Indicates compound was analyzed for but not detected.

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Table 3-10a

SOIL/FILL ANALYTICAL SUMMARY - ORGANICS - MISCELLANEOUS TEST LOCATIONS

Area I Additional Investigation[1]

LTV Steel Company

Volatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Description of Material Tested and Sample Locations		
		Above Impacted Layer A1-TP-J2b	Impacted Soil A1-TP-A3	Soil Above Impacted Soil A1-TP-A3a
Benzene		0.004	0.001 U	0.001 U
SEC-Butylbenzene		0.001 U	0.001 U	0.001 U
Tert-Butylbenzene		0.001 U	0.028	0.001 U
N-Butylbenzene		0.001 U	0.099	0.001 U
Methyl-tert-butylether		0.001 U	0.001 U	0.001 U
Ethylbenzene		0.001 U	0.017	0.001 U
Isopropylbenzene		0.001 U	0.008	0.001 U
P-Isoproyltoluene		0.001 U	0.001 U	0.001 U
N-Propylbenzene		0.001 U	0.039	0.001 U
Toluene		0.003	0.001 U	0.001 U
1,2,4-Trimethylbenzene		0.001 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene		0.001 U	0.025	0.001 U
O-Xylene		0.002 U	0.003 U	0.003 U
M+P-Xylene		0.002 U	0.003 U	0.003 U
Total VOCs	10	0.007	0.216	

Notes:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level proposed for that parameter.
3. U=Indicates compound was analyzed for but not detected.
4. Not Analyzed-indicated parameters were not analyzed during this investigation.

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0002-005
8/20/99
Misc. samples

Table 3-10b *(pg 1 of 2)*

SOIL/FILL ANALYTICAL SUMMARY - ORGANICS - MISCELLANEOUS TEST LOCATIONS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Description of Material Tested and Sample Locations		
		Above Impacted Layer A1-TP-J2b	Impacted Soil A1-TP-A3	Soil Above Impacted Soil A1-TP-A3a
Acenapthene		0.36 U	4.4 U	0.82 U
Acenaphthylene		0.6	4.4 U	0.82 U
Anthracene		0.39	4.4 U	0.82 U
Benzo(a)anthracene		1.1	4.4 U	0.82 U
Benzo(a)pyrene		1.4	4.4 U	0.82 U
Benzo(b)fluoranthene		1.8	4.4 U	0.82 U
Benzo(g,h,i)perylene		0.92	4.4 U	0.82 U
Benzo(k)fluoranthene		1.4	4.4 U	0.82 U
Benzyl Alcohol		0.36 U	4.4 U	0.82 U
Butyl Benzyl Phthalate		0.36 U	4.4 U	0.82 U
Di-N-Butylphthalate		0.36 U	4.4 U	0.82 U
Carbazole		0.36 U	4.4 U	0.82 U
Indeno(1,2,3-cd)pyrene		0.9	4.4 U	0.82 U
4-Chloroaniline		0.36 U	4.4 U	0.82 U
Bis(-2-Chloroethoxy)Methane		0.36 U	4.4 U	0.82 U
Bis(-2-Chloroethyl)Ether		0.36 U	4.4 U	0.82 U
2-Chloronaphthalene		0.36 U	4.4 U	0.82 U
2-Chlorophenol		0.73 U	8.9 U	1.7 U
2,2'-Oxybis(1-chloropropane)		0.36 U	4.4 U	0.82 U
Chrysene		1.2	4.4 U	0.82 U
Dibenzo(a,h)anthracene		0.37	4.4 U	0.82 U
Dibenzofuran		0.36 U	4.4 U	0.82 U
1,3-Dichlorobenzene		0.36 U	4.4 U	0.82 U
1,2-Dichlorobenzene		0.36 U	4.4 U	0.82 U
1,4-Dichlorobenzene		0.36 U	4.4 U	0.82 U
3,3'-Dichlorobenzidine		0.36 U	4.4 U	0.82 U
2,4-Dichlorophenol		0.73 U	8.9 U	1.7 U
Diethylphthalate		0.36 U	4.4 U	0.82 U
Dimethyl Phthalate		0.36 U	4.4 U	0.82 U
2,4-Dimethylphenol		0.73 U	8.9 U	1.7 U
2,4-Dinitrophenol		1.4 U	17 U	3.2 U
2,4-Dinitrotoluene		0.36 U	4.4 U	0.82 U
2,6-Dinitrotoluene		0.36 U	4.4 U	0.82 U
Bis(2-ethylhexyl)phthalate		0.36 U	4.4 U	0.82 U

Table :) (pg 2 of 2)

SOIL/FILL ANALYTICAL SUMMARY - ORGANICS - MISCELLANEOUS TEST LOCATIONS

Area I Additional Investigation[1]

LTV Steel Company

Semivolatile Organic Compounds (mg/kg)	Proposed Site-Specific Action Level[2]	Description of Material Tested and Sample Locations		
		Above Impacted Layer A1-TP-J2b	Impacted Soil A1-TP-A3	Soil Above Impacted Soil A1-TP-A3a
Fluoranthene		2.1	4.4 U	0.82 U
Flourene		0.36 U	4.4 U	0.82 U
Hexachlorobenzene		0.36 U	4.4 U	0.82 U
Hexachlorobutadiene		0.36 U	4.4 U	0.82 U
Hexachlorocyclopentadiene		0.36 U	4.4 U	0.82 U
Hexachloroethane		0.36 U	4.4 U	0.82 U
Isophorone		0.36 U	4.4 U	0.82 U
2-Methylnapthalene		0.36 U	4.4 U	0.82 U
4,6-Dinitro-2-methylphenol		0.73 U	8.9 U	1.7 U
4-Chloro-3-methylphenol		1.4 U	17 U	3.2 U
2-Methylphenol		0.73 U	8.9 U	1.7 U
4-Methylphenol		0.73 U	8.9 U	1.7 U
Naphthalene		0.73 U	8.9 U	1.7 U
2-Nitroanaline		0.36 U	4.4 U	0.82 U
3-Nitroanaline		0.36 U	4.4 U	0.82 U
4-Nitroanaline		0.36 U	4.4 U	0.82 U
Nitrobenzene		0.36 U	4.4 U	0.82 U
2-Nitrophenol		0.36 U	4.4 U	0.82 U
4-Nitrophenol		0.73 U	8.9 U	1.7 U
N-Nitrosodimethylamine		1.4 U	17 U	3.2 U
N-Nitrosodiphenylamine		0.36 U	4.4 U	0.82 U
Di-N-Octyl Phthalate		0.36 U	4.4 U	0.82 U
Pentachlorophenol		0.36 U	4.4 U	0.82 U
Phenanthrene		1.4 U	17 U	3.2 U
Phenol		1.1	4.4 U	0.82 U
4-Bromophenyl-phenylether		0.73 U	8.9 U	1.7 U
4-Chlorophenyl-phenylether		0.36 U	4.4 U	0.82 U
N-Nitroso-Di-N-Propylamine		0.36 U	4.4 U	0.82 U
Pyrene		0.36 U	4.4 U	0.82 U
1,2,4-Trichlorobenzene		1.8	4.4 U	0.82 U
2,4,6-Trichlorophenol		0.36 U	4.4 U	0.82 U
2,4,5-Trichlorophenol		0.73 U	8.9 U	1.7 U
		0.73 U	8.9 U	1.7 U
Total SVOCs	500	15.1		

NOTES:

1. Investigation performed in July & August, 1999
2. Blank space indicates no Site-Specific Action Level for that parameter.
3. U = Indicates compound was analyzed for but not detected.
4. Shading indicates that concentrations are above Site Specific Action Level.

Table 3-10c

SOIL/FILL ANALYTICAL SUMMARY

INORGANICS-MISCELLANEOUS TEST LOCATIONS

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Levels	Sample Locations		
		Above Impacted Layer A1-TP-J2b	Impacted Soil A1-TP-A3	Above Impacted Layer A1-TP-A3a
Arsenic	75	16.9	8.92	3.05
Barium	1000	81.6	198	180
Cadmium	15	0.548 U	0.666 U	0.624 U
Chromium	1000	205	39.7	150
Lead	1000	241	63.5	103
Mercury	10	0.52	0.091	0.078
Selenium	61	4.51	7.38	7.53
Silver	10	1.1 U	1.33 U	1.25 U

NOTES:
1. Investigation performed in July & August, 1999
2. U=Indicates compound was analyzed for but not detected.

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Appendix A

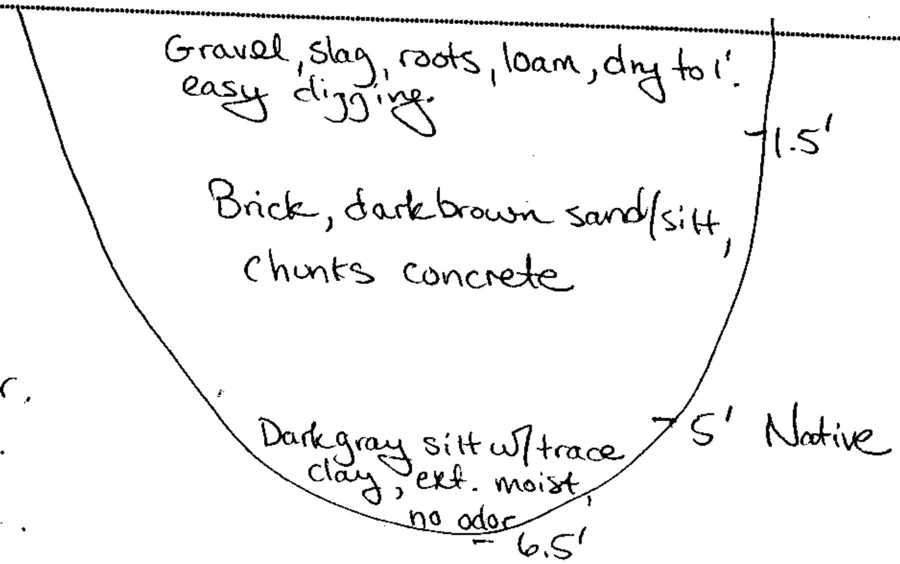
Test Pit Logs- Subareas N through S

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N1	**Project:**	Area I Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



No Water.
PID=0.
Pict 2.

not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

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FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N2	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JMA/PJD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

Gravel, silt loam, slag, brick, concrete chunks, dry

1'

Dark brown gravel & cinder-like sand w/ silt, over 3" of angular poorly graded gravel

2'

Dark brown gravel & cinder-like sand with silt.

3.5'

Silt/Sand, dark brown w/ pumous-like slag w/ sulphur odor

5.5'

Dark gray silt w/ trace clay, ect. moist

6.5'

No Water.
PID=0.
Pict 4,5

not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

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FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N3	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JMM/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

Silt loam, mixed w/ cinder-like sand, gravel, slag, brick, concrete, wood chunk @ 4', more slag at bottom.

No Water.
PID=0.
Pict 3.

Dark gray silt w/ trace clay, ~~ext~~. moist

4.3' Native

not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

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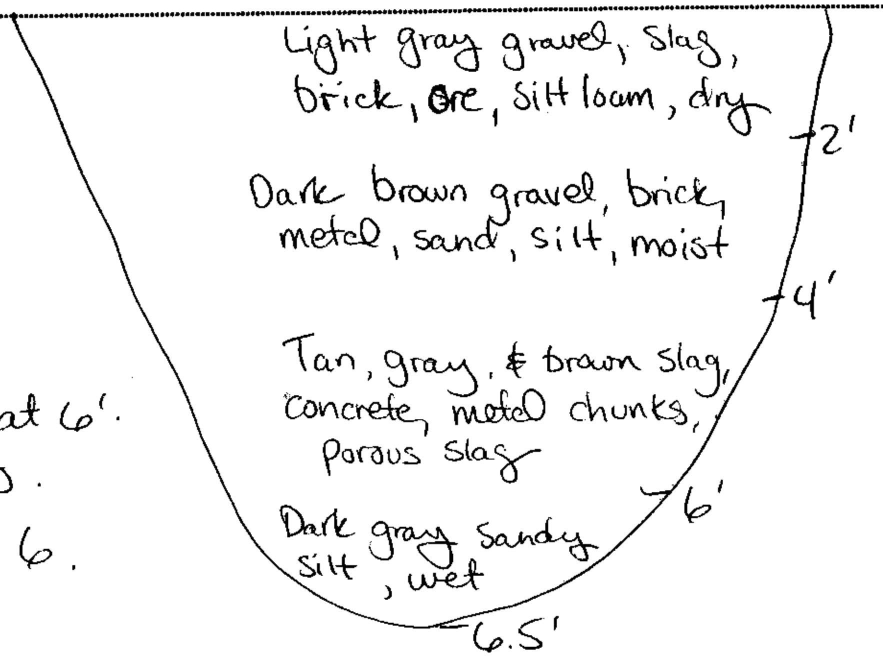
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N4	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/28/99	Logged By:	JMM/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Water at 6'.
PID=0.
Pict 6.

not to scale

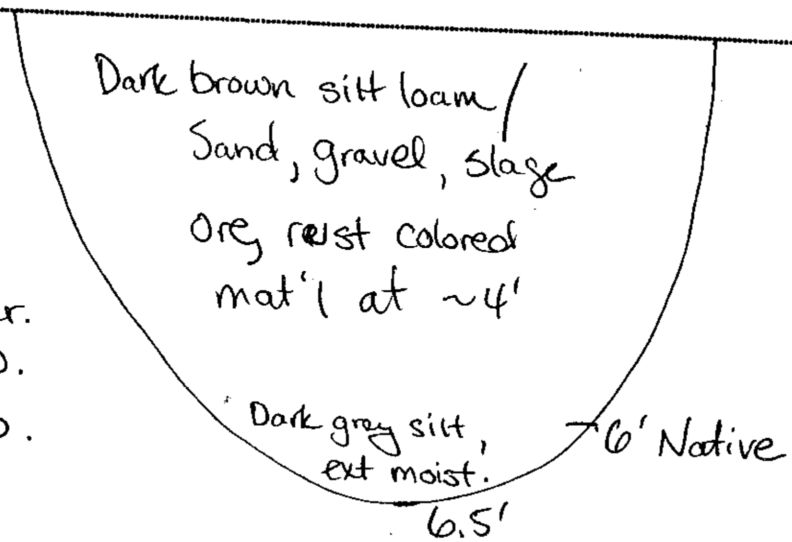
Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N5	**Project:**	Area I Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JMM / ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



No Water.
PID=0.
Pict 8.

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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FIELD TEST PIT LOG

Test Pit No.: A1-TP-N6	**Project:** Area 1 Invest.
Location:	**Project No:** 0002-005
Date: 7/28/99	**Logged By:** JMA / RUD
Excavation Method: Liebherr 932	

Test Pit Profile

grade

Silt loam, roots, Slag, brick, dry

2'

Dark brown Slag, cinder-like sand, gravel, relatively hard

2.5'

4-layers of dark brown tan, red, brown sandy material

3.5'

Slag, concrete, brick, metal

Water entering @ 6'. V. Slowly.

PID=0.

PICT 7.

Dark Gray Silt w/ trace clay ~~ext~~ moist

6' Native

6.5'

not to scale

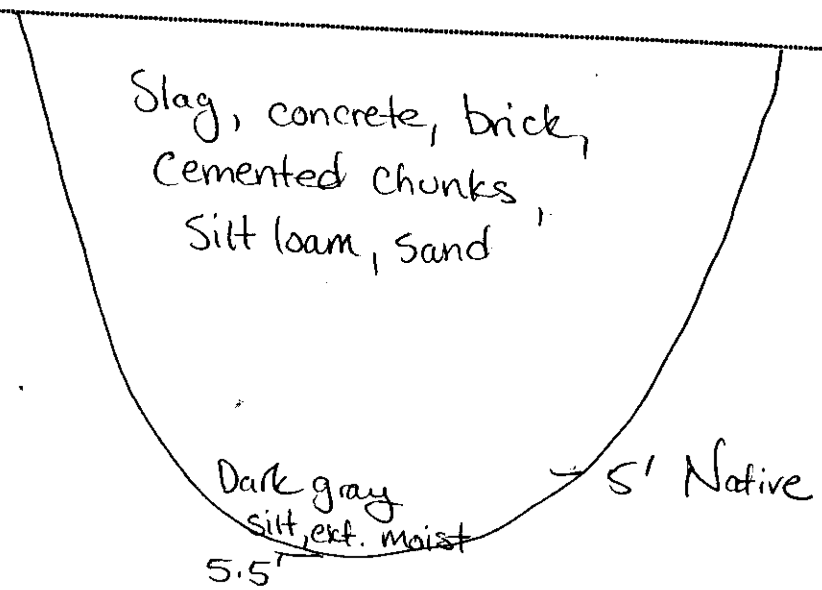
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N7	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JWA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



No Water.
PID=0
PICT 9.

not to scale

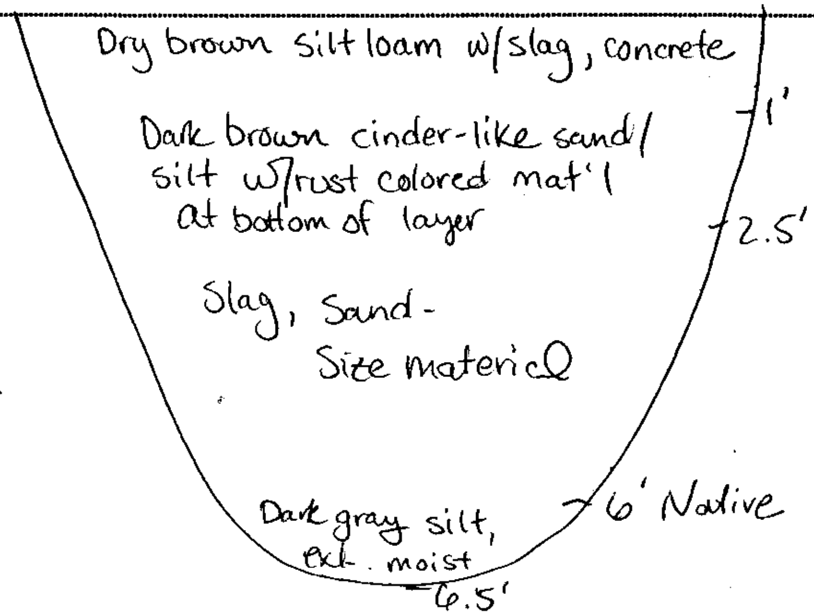
Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N8	**Project:**	Area I Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JWM / PLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



No Water.
PID=0
Pict 10.

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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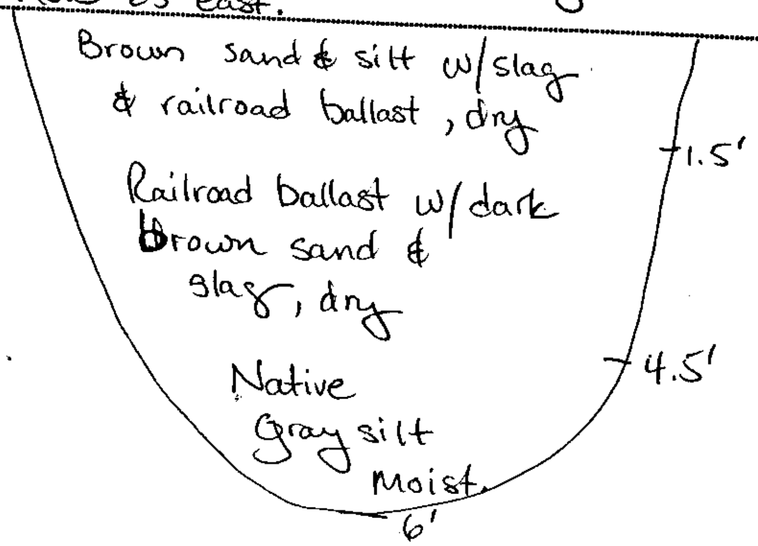
FIELD TEST PIT LOG

Test Pit No.: AI-TP-N9
Location:
Date: 7/28/99
Excavation Method: Liebherr 932

Project: Areal Invest.
Project No: 0002-005
Logged By: RLD | GMA
PHW at site.

Test Pit Profile
grade

Refusal at original stake 3.5' bg.
Move 25' East.



PICT 11.

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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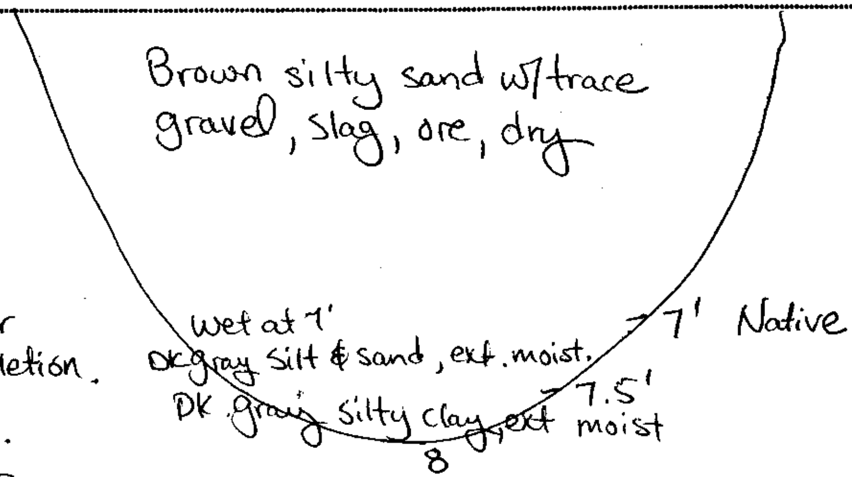
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N10	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



No Water at completion.

PID=0.

Pict 12.

not to scale

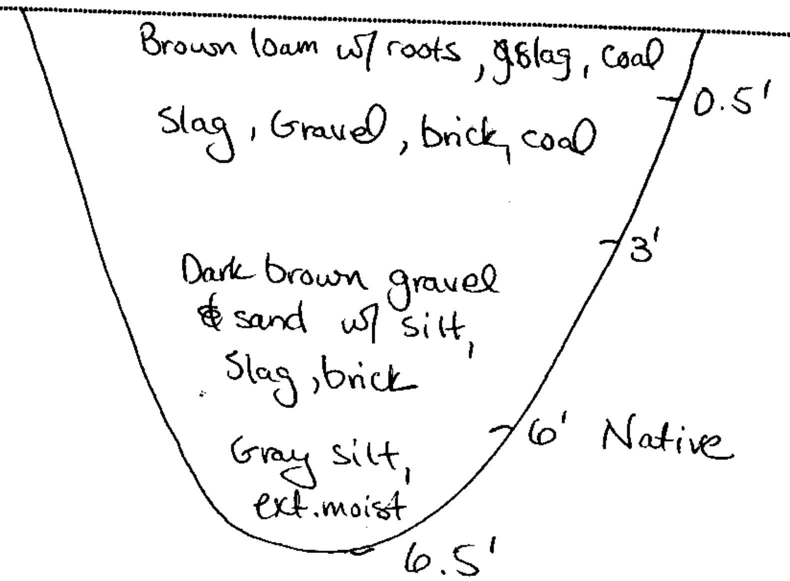
Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N11	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/28/99	Logged By:	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



No Water.
PIC 13.
PID=0.

not to scale

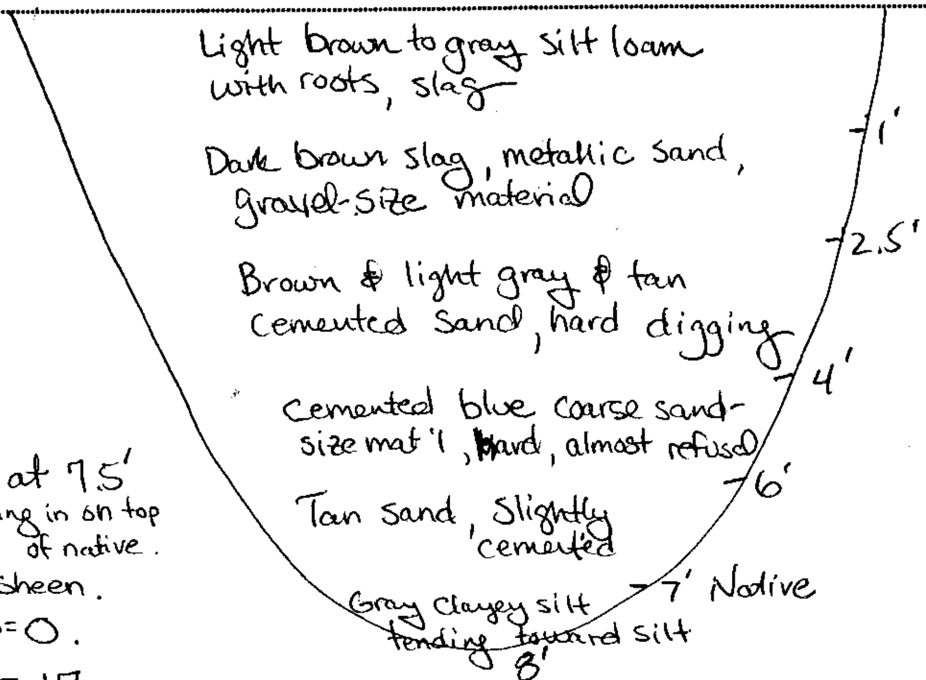
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N12	**Project:**	Areal Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JMP / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Water at 7.5' coming in on top of native.

No sheen.

PID=0.

Pict 17.

not to scale

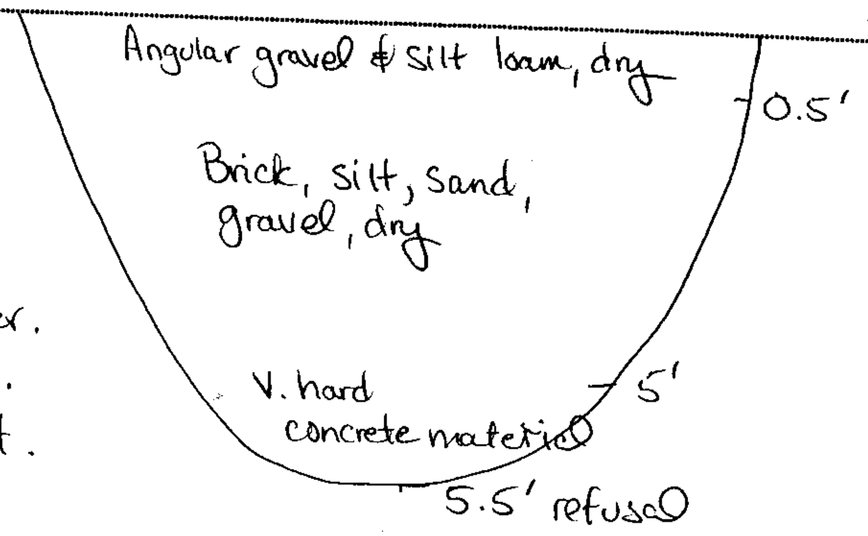
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-N13	**Project:** Area I West.
Location:	**Project No:** 0002-005
Date: 7/28/99	**Logged By:** DMA / RCD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



No Water.
PID=0.
Pict 14.

not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

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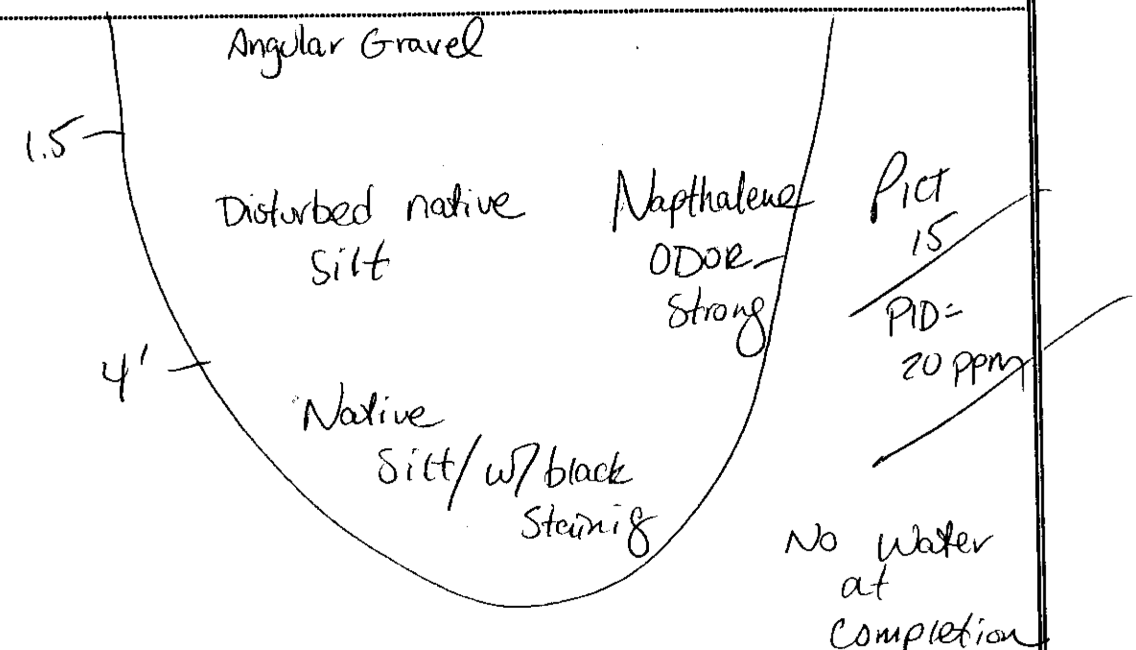
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N14	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	TMD/ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

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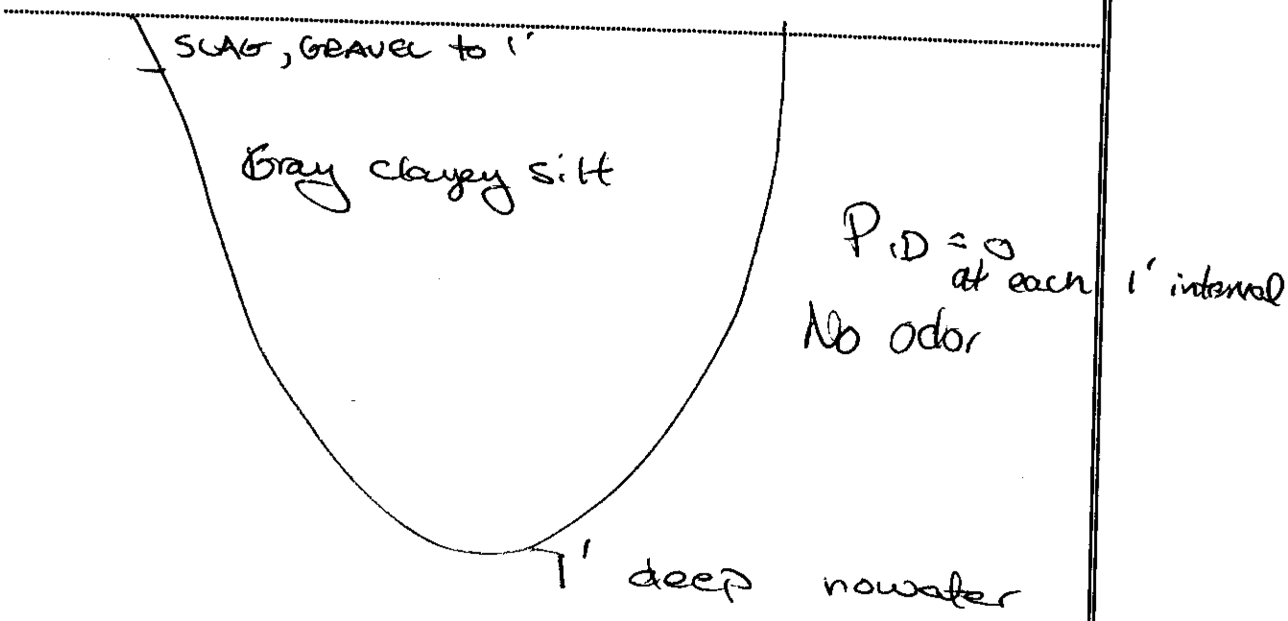
FIELD TEST PIT LOG

Test Pit No.: AI-TP-N14a	Project: Area Invest.
Location: ~45' E of N14	Project No: 0002-005
Date: 7/29/99	Logged By: JMM
Excavation Method: Liebherr 932	

Test Pit Profile

Testpit to north ~ 25' away (refusal)

grade



not to scale

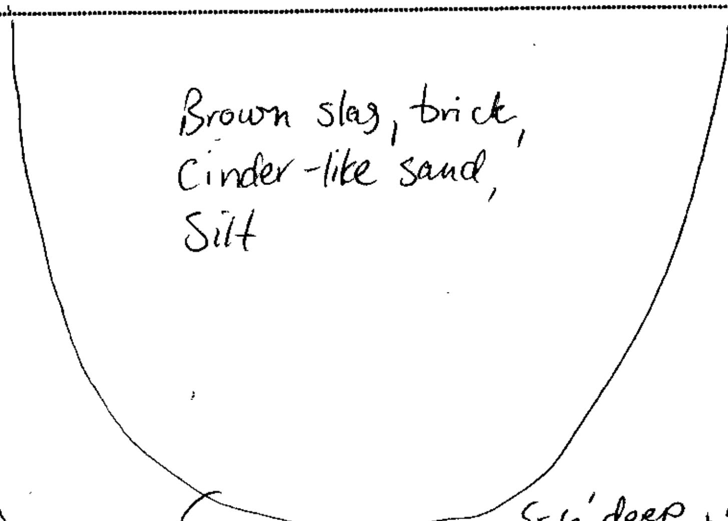
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
AI-TP-N14B			
	140' W of N14		
	Clean brown fill to 9' bg. Water at 8'		
	No odor, no sheen, PID = 0		
	Just SE of N13 ~25'		

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N14a	**Project:**	Area 1 Invest.
Location:	Just North of A1-TP-N14 ~ 20'	**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JMD/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Brown slag, brick, cinder-like sand, silt

No Water at completion

5-6' deep, refused

Refused at very hard concrete mat'l

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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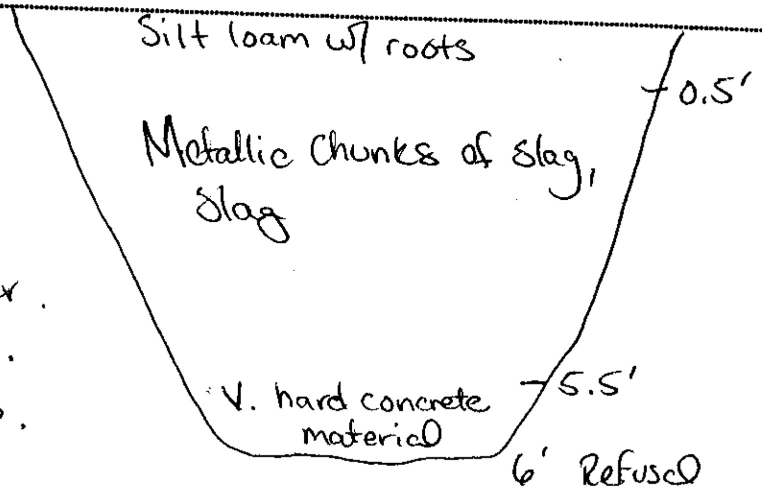
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N15	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JMA/RSD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



No Water.
PID=0.
PICT 16.

not to scale

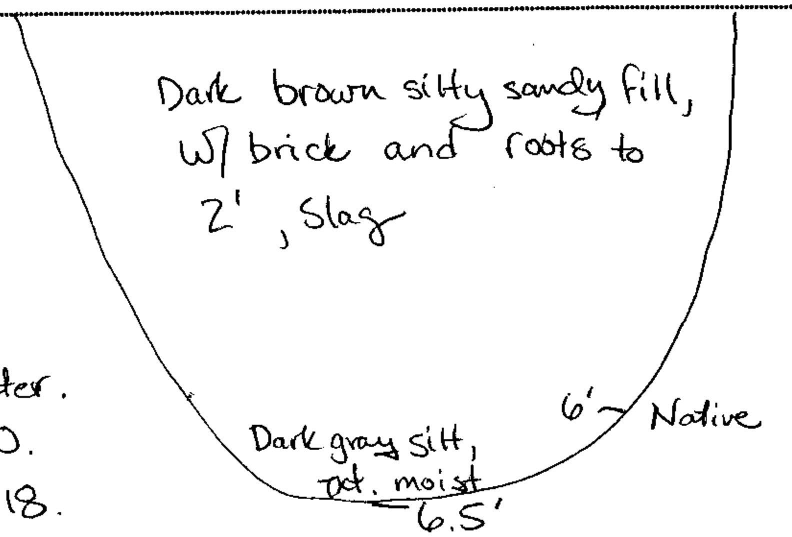
Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-N16	**Project:** Area 1 Invest.
Location:	**Project No:** 0002-005
Date: 7/28/99	**Logged By:** [illegible] /RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



No Water.
PID=0.
PICT 18.

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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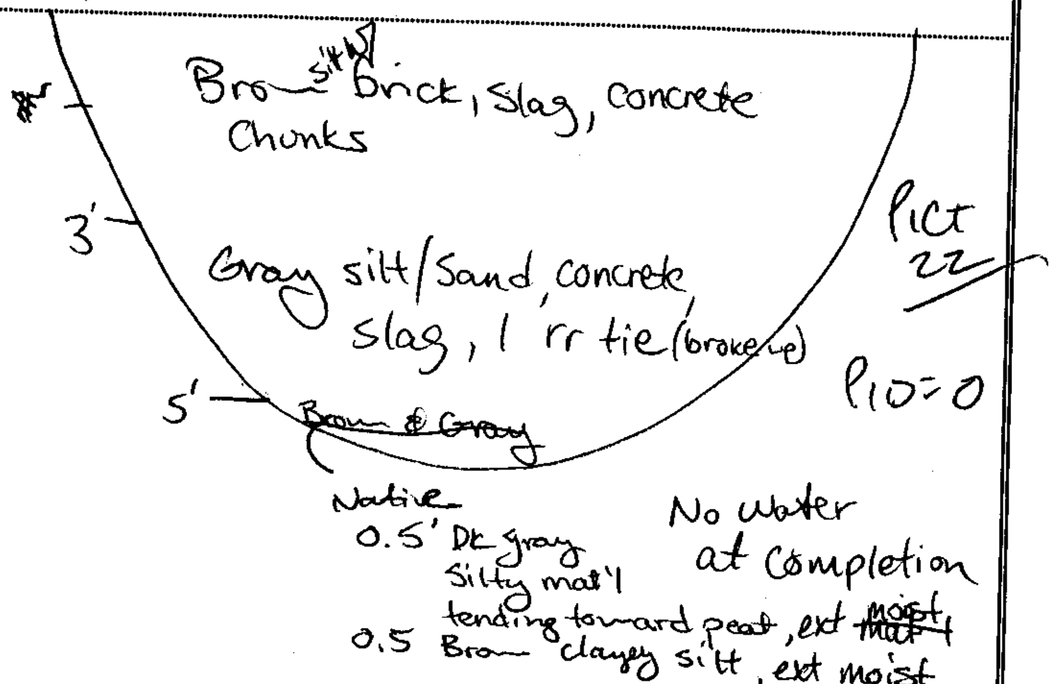
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N17	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/29/99	Logged By:	JMA/ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

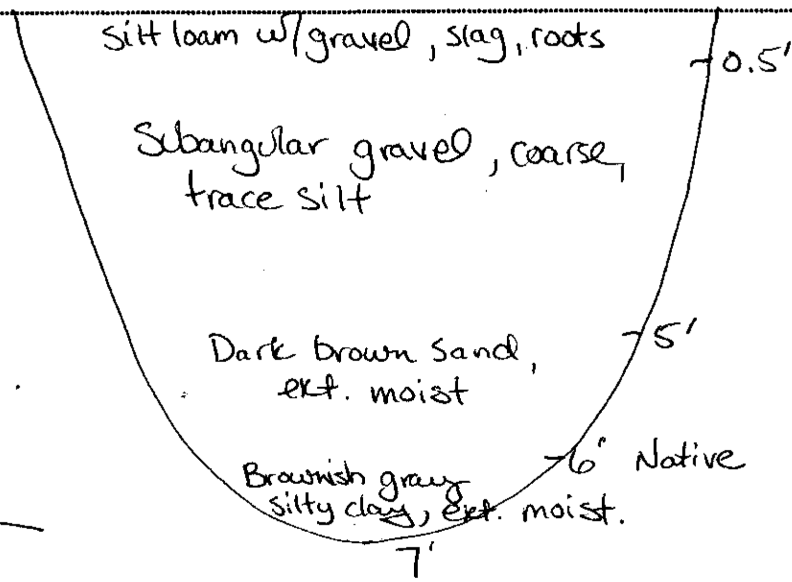
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N18	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



No Water.
PID=0
PIG 19

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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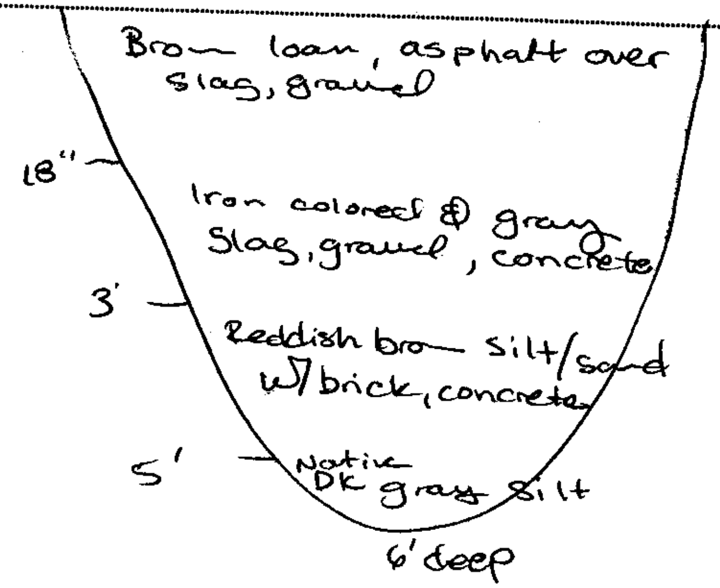
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-N19	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/29/99	**Logged By:**	JMA / RD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



PID=0

PID 23'

No water at completion

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

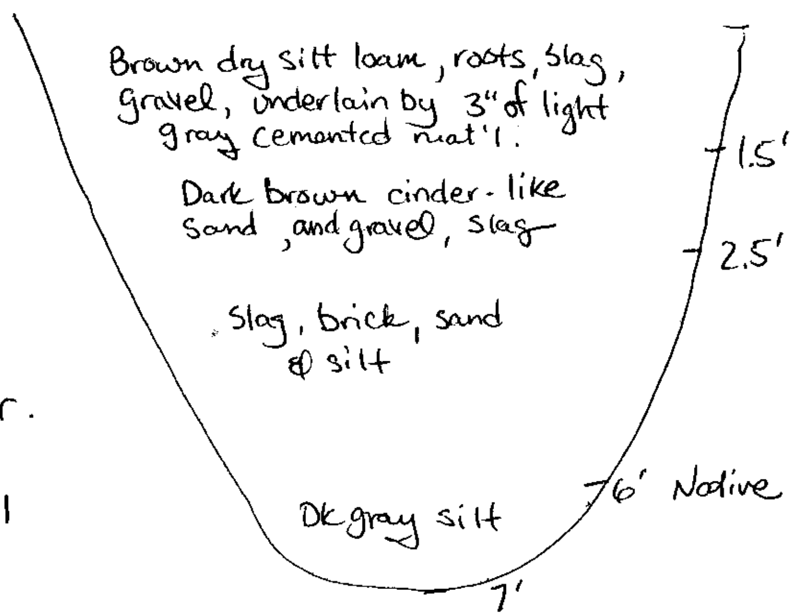
FIELD TEST PIT LOG

Test Pit No.:	AI-TP-N20	**Project:**	Area I Invest.
Location:		**Project No:**	0002-005
Date:	7/28/99	**Logged By:**	TMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile Refusal 3' bg in 2 locations closest to River. Very hard.

grade Refusal at location 20' away on RR bed.

At 4th location



No Water.
PID=0
PICT 21

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

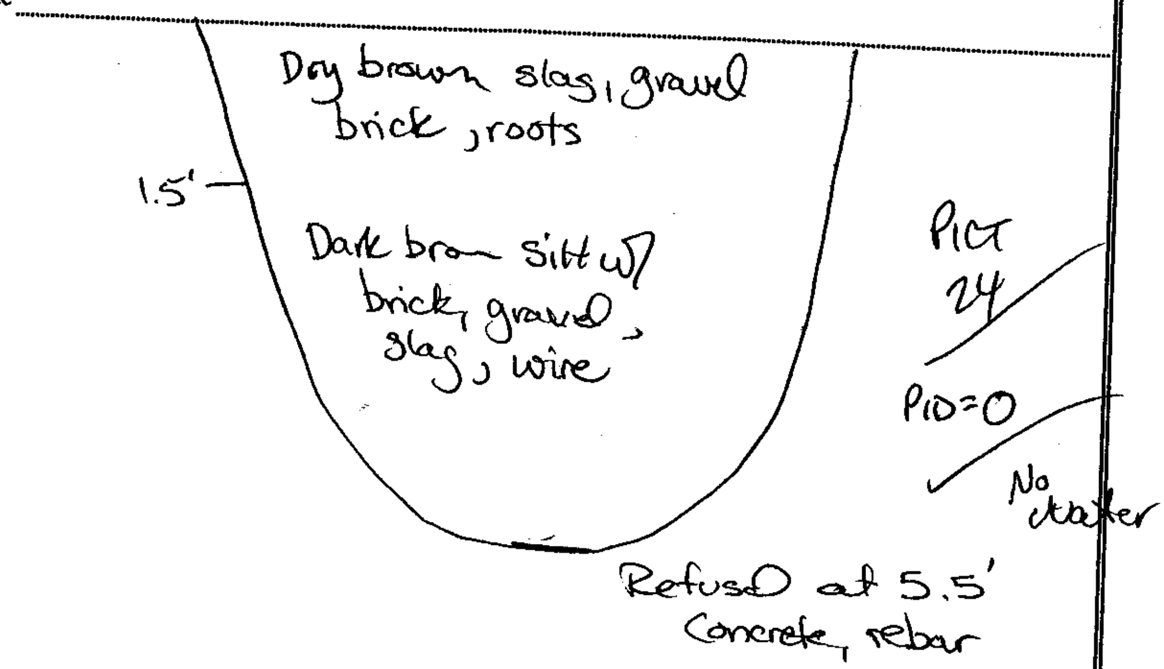
TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

Test Pit No.:	Al-TP-01	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	8/2/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

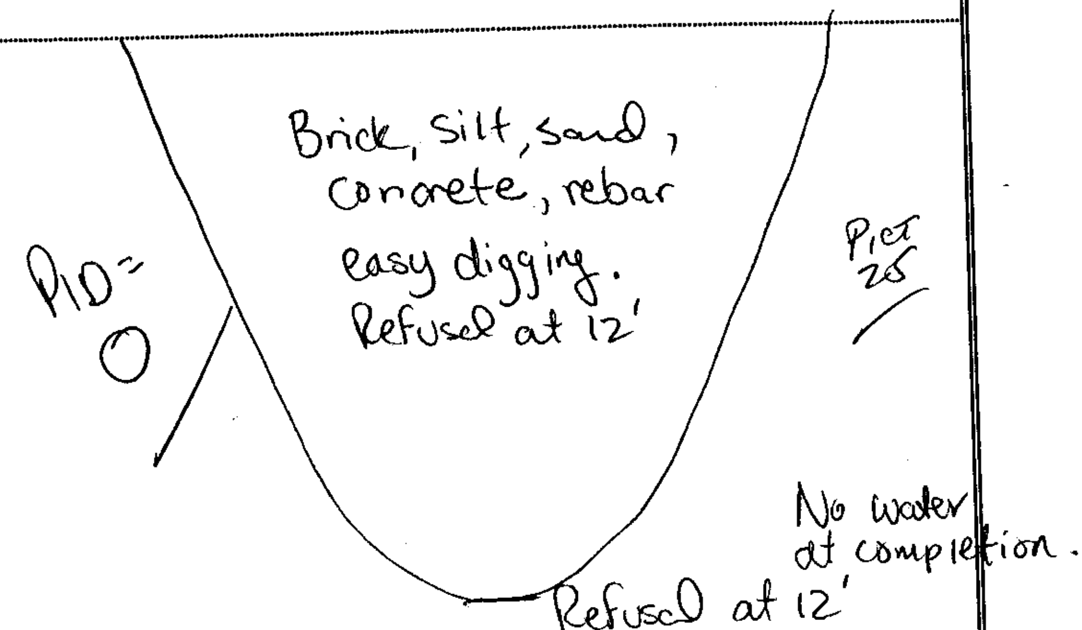
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: AI-TP-02	Project: Area I Invest.
Location:	Project No: 2002-005
Date: 8/2/99	Logged By: JMA/RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

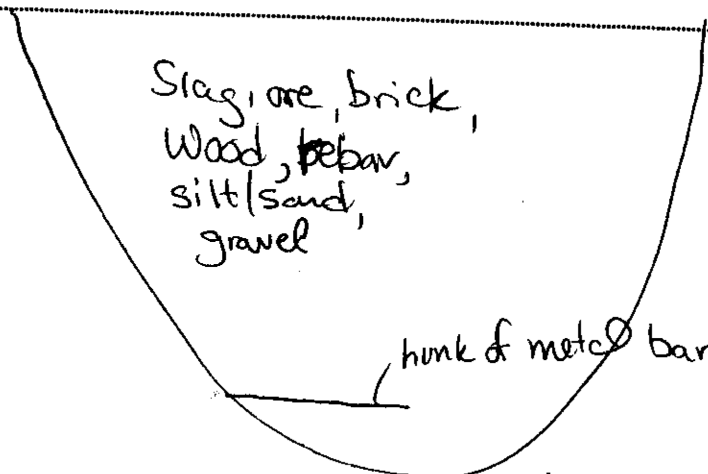
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-03	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	8/2/99	Logged By:	JMA/RJD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



PICT 23

PID=0.9

5.5' refusal, concrete, rebar

No water at completion

not to scale

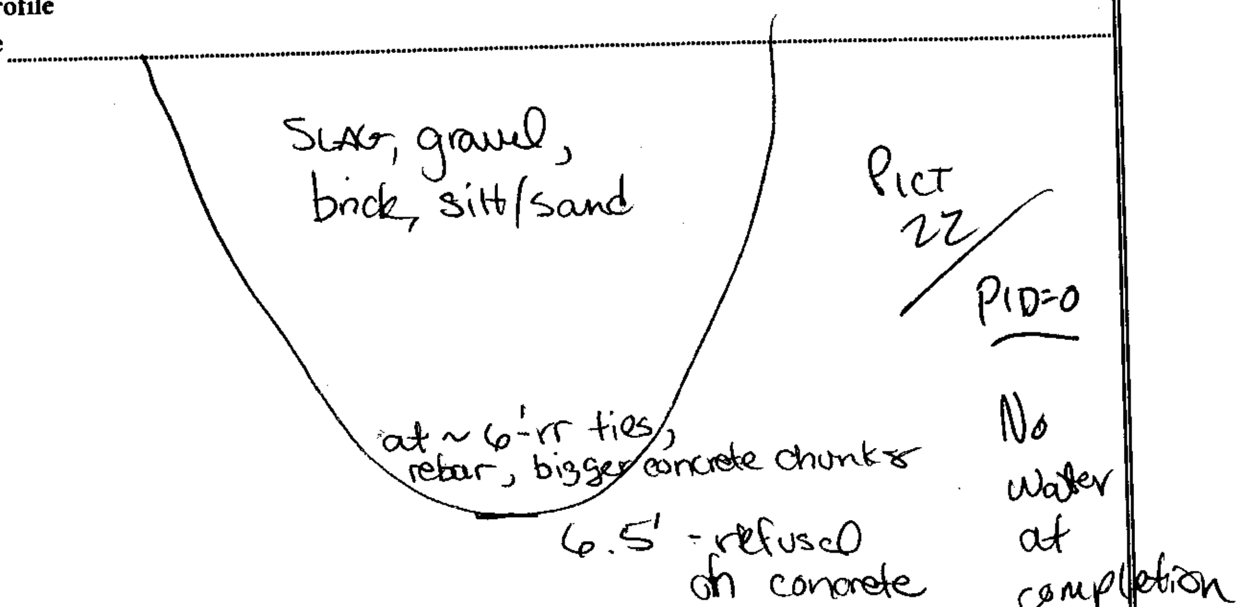
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Ø4	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	8/2/99	Logged By:	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

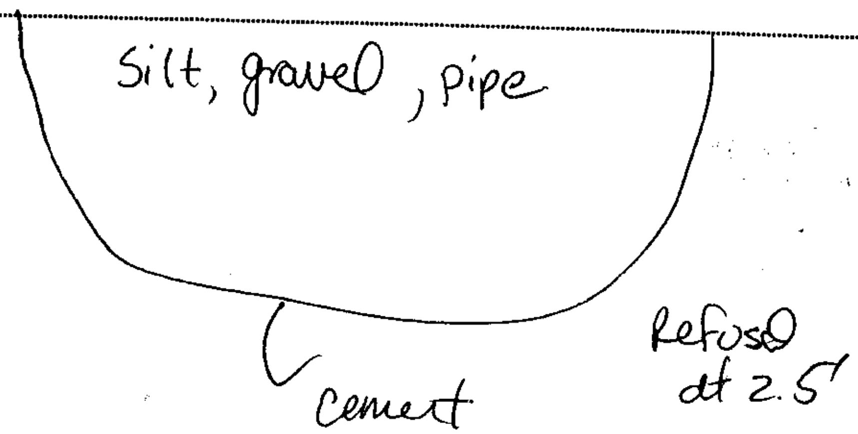
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Ø5	Project:	Area 1 Invest
Location:		Project No:	0002-005
Date:	7/30/99	Logged By:	JMM/BLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

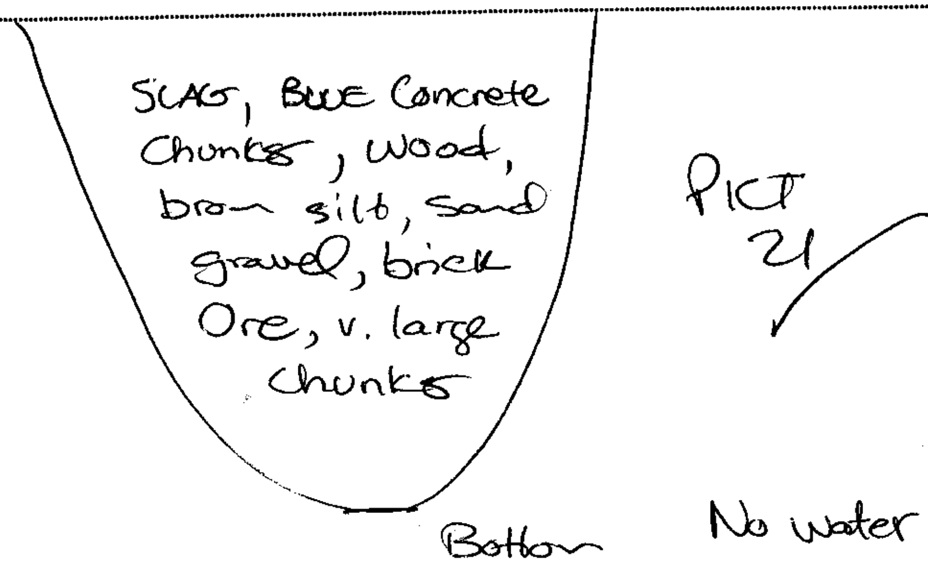
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-06	Project:	Area I Invest.
Location:		Project No:	0002-005
Date:	7/30/99	Logged By:	SMA / LLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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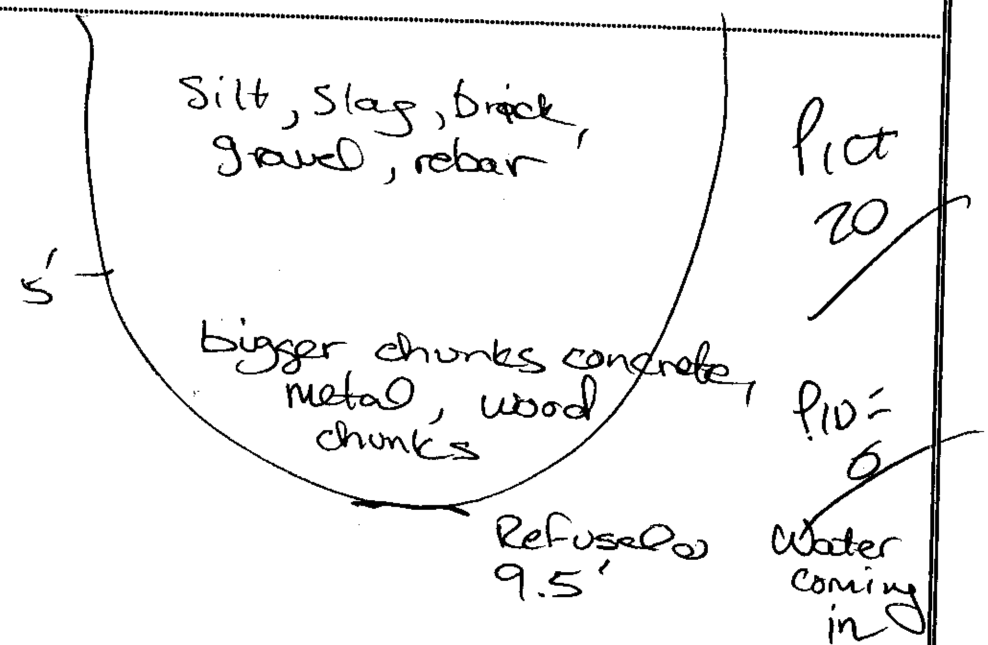
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-07	**Project:**	Area 1 Invest
Location:		**Project No:**	0002-005
Date:	7/30/99	**Logged By:**	JMA / RLP
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

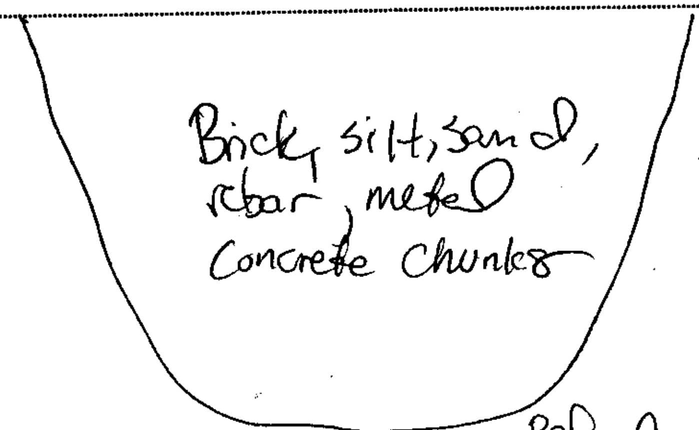
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1 - TP - Ø8	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/30/99	**Logged By:**	BMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Pict
19

PID
0

Refusal at 5.5'
White cement
Mat'l

No water at completion

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

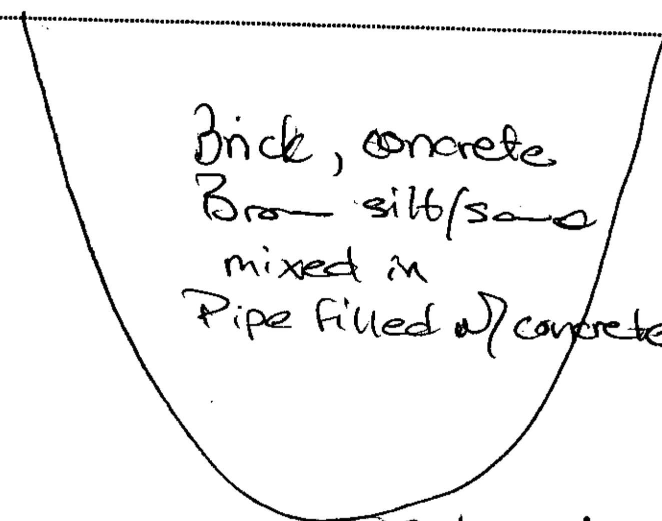
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-09	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/30/99	Logged By:	Jun/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Brick, concrete
Brown silt/sand
mixed in
Pipe filled w/ concrete

Pict/13

No Water

Bottom at 8.5
Refusal, concrete floor?

not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

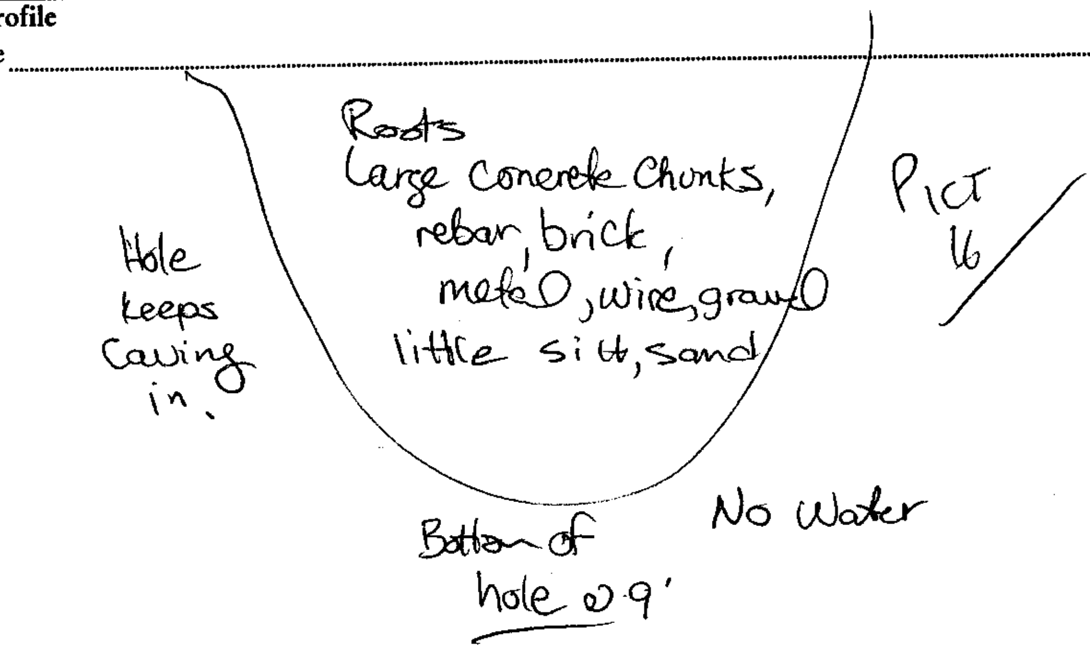
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1 - TP - Ø10	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/30/99	Logged By:	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

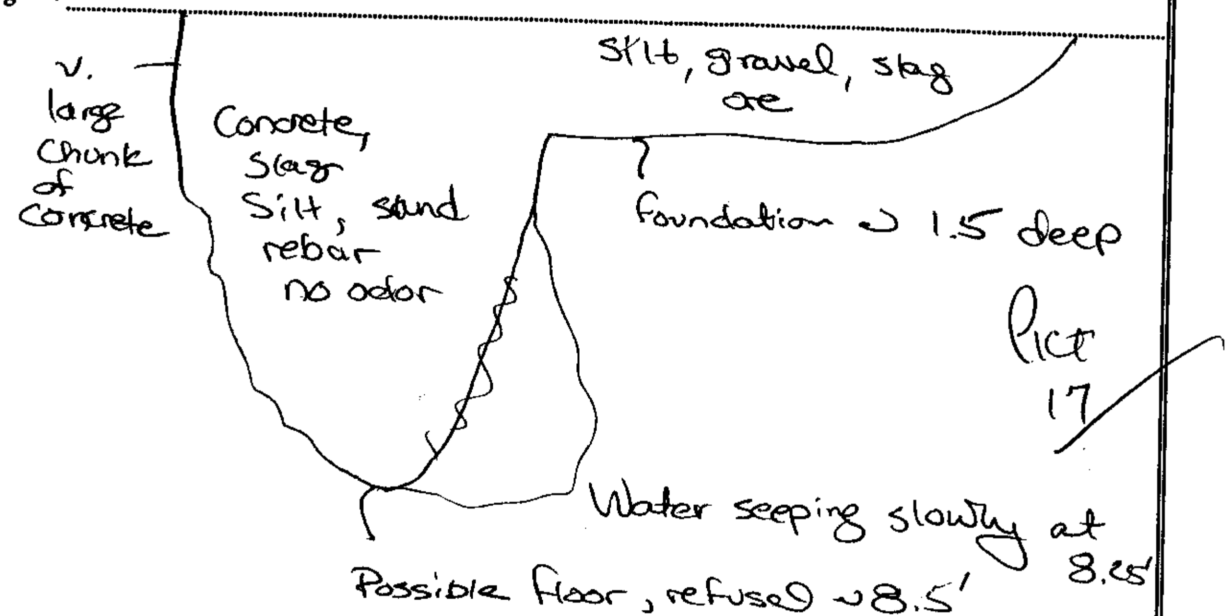
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: Al-TP-Ø11	**Project:** Area I Invest.
Location:	**Project No:** 0002-005
Date: 7/30/99	**Logged By:** JMA/RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

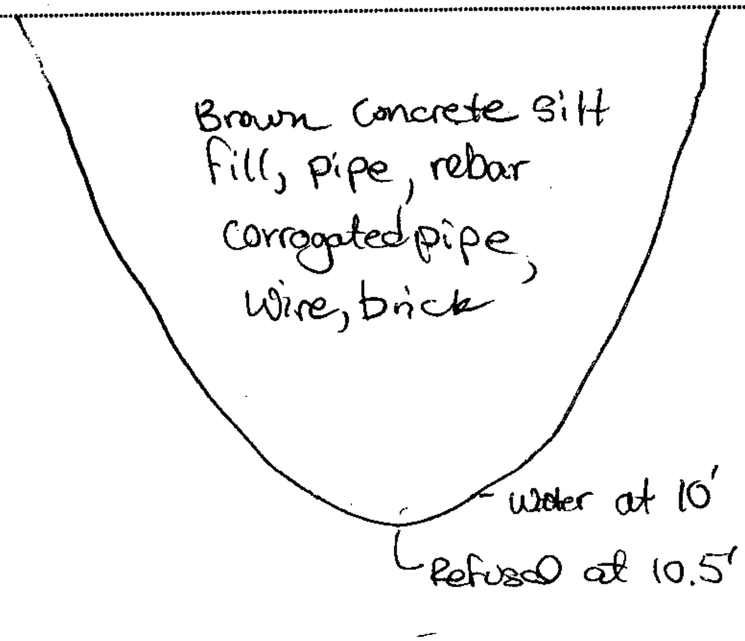
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: Al-TP-Ø12	Project: Area I Invest.
Location:	Project No: 0002-005
Date: 7/30/99	Logged By: JMA / PWD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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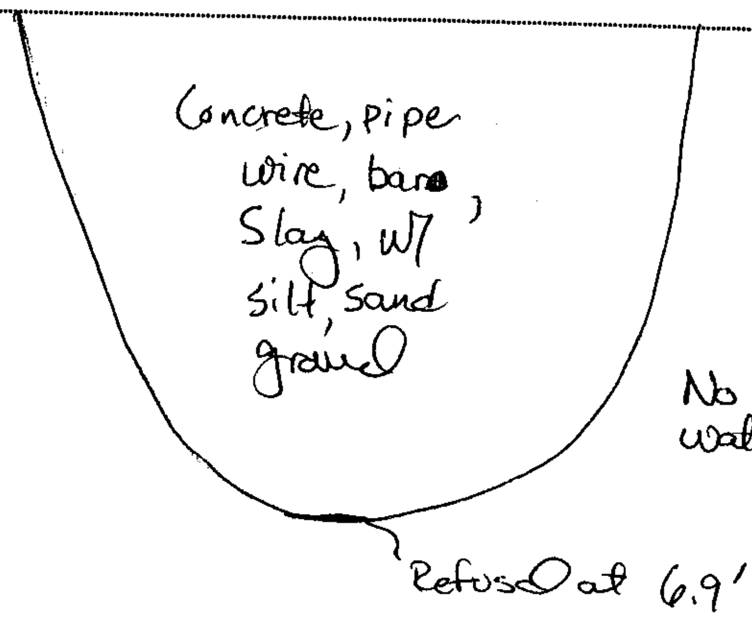
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-013	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/30/99	**Logged By:**	JMO/ECD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



No water.

Liver at 10.0' BGS

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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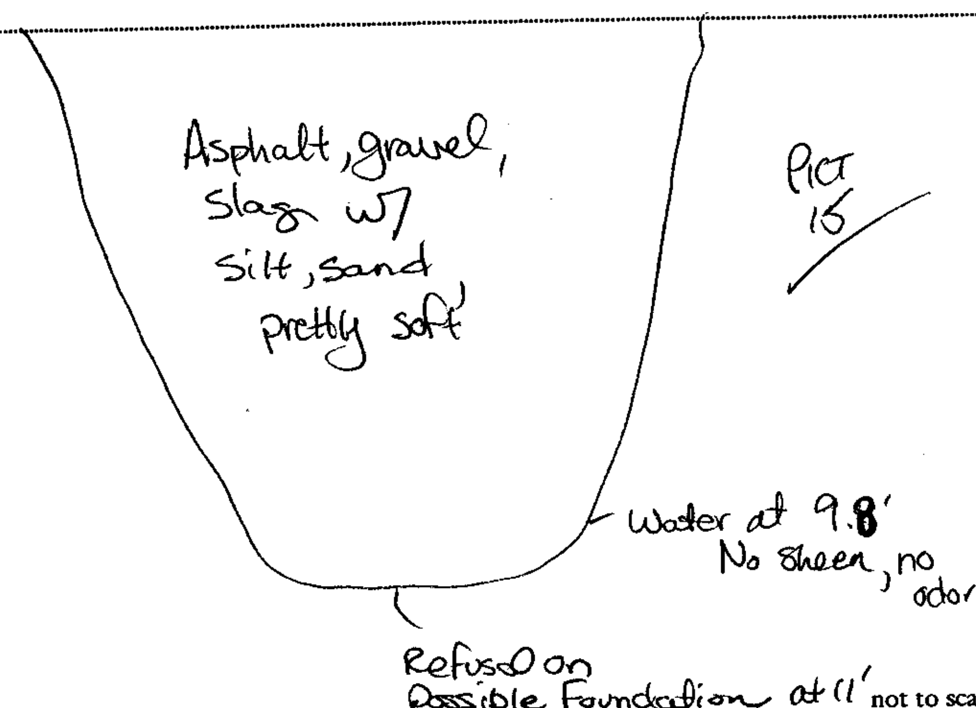
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Ø14	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/30/99	Logged By:	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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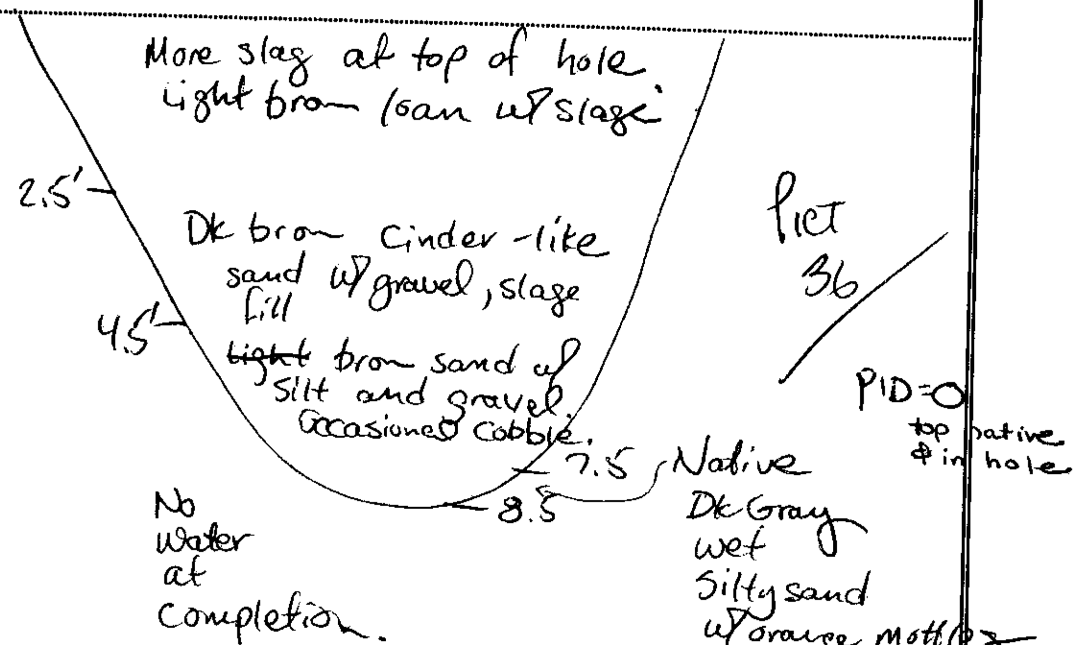
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P1	Project:	Area 1 Invest.
Location:		Project No:	0007-005
Date:	9/19/99	Logged By:	SNA/BLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

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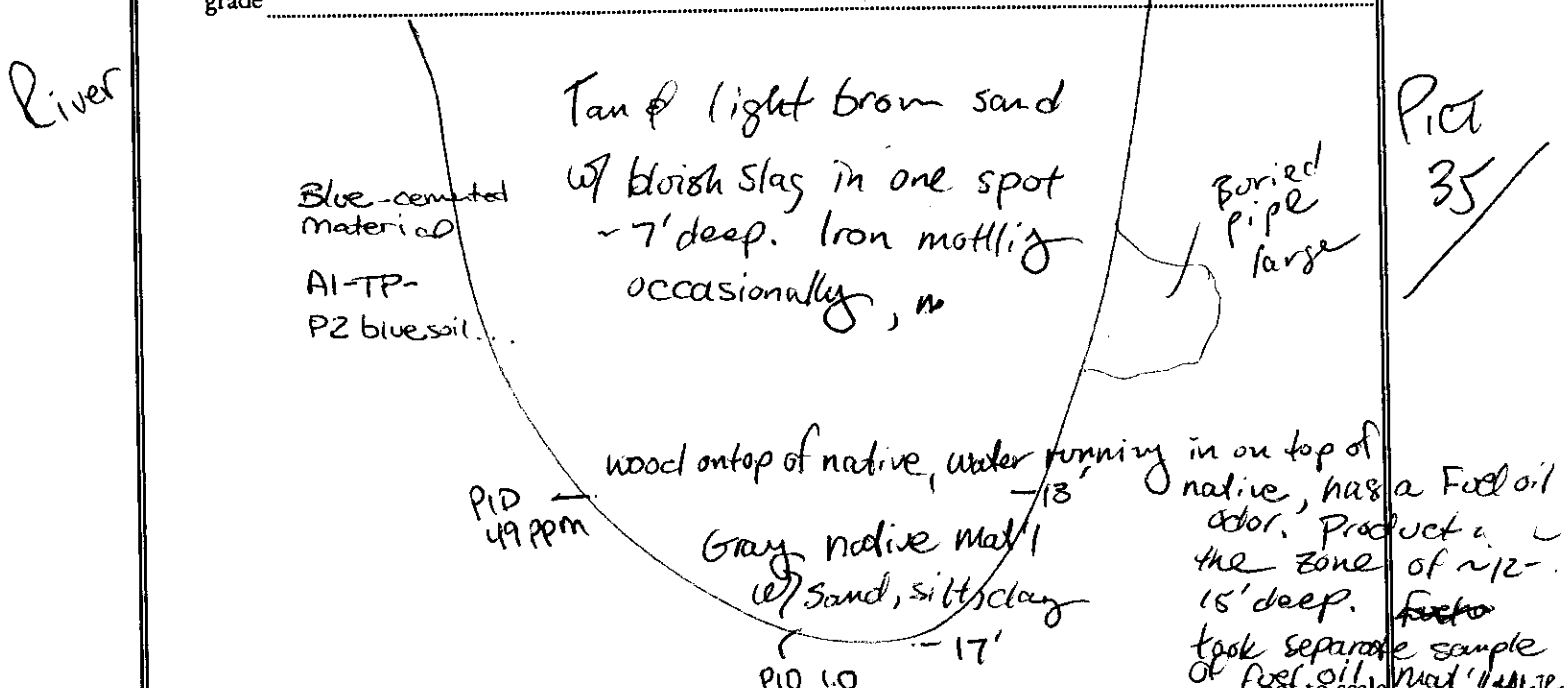
FIELD TEST PIT LOG

Test Pit No.:	AI-TP-P2	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/19/99	**Logged By:**	JMA / ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
AI-TP-P2a	This test pit was extended to the South	on the other side of	
	the buried pit. Excavated 11.5' deep to native, (Native at 10.5' Bro- iron-colored		
	mottles) silt/clayey silt. No odor or black mat'l evident.		
	Large pipe may have been placed into native-excavated hole. Run out		
	of blue-cemented mat'l away from pipe.		
AI-TP-P2b	TP to the West. TP 11' deep. Native at 10' bg. V. little		
	Cemented blue. Native bro- w/ iron-colored mottles.		
	No Water		

TP to the S. West. only dug 3' and out of product.
Discussed w/ G. Sutton. Appear to be out of oily mat'l.
Fill in hole. leave stained mat'l on surface.

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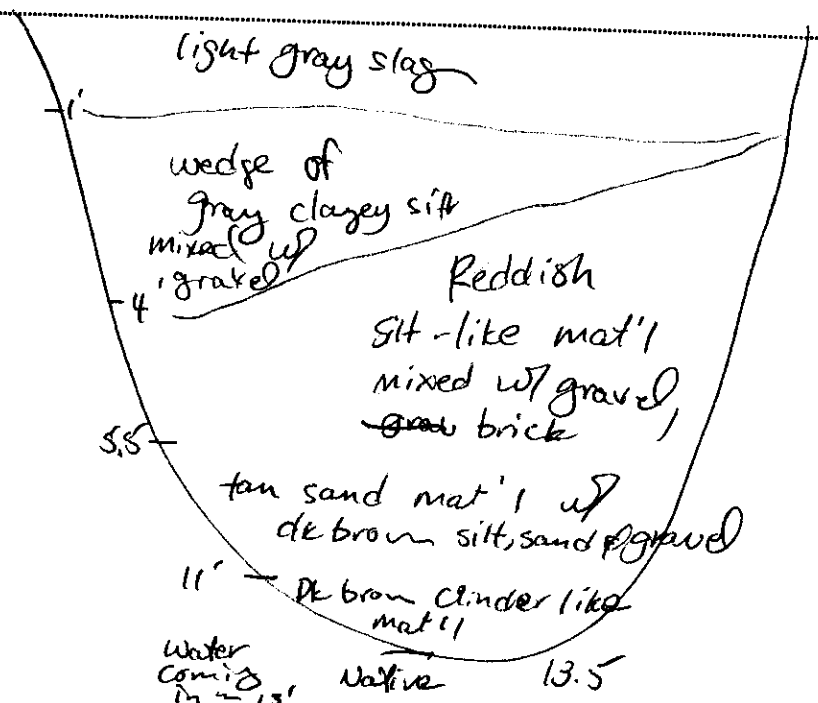
FIELD TEST PIT LOG

Test Pit No.: A1-TP-P3	Project: Area 1 Invest.
Location:	Project No: 0002-005
Date: 7/19/99	Logged By: TMA/ECD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



Pict 34

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-04	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/19/99	Logged By:	JMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

SLAG & CLAY, roots, dry

1'

Reddish brown Silty Clay mixed w/little slag gravel, wood

3.5'

Dk brown - olive brown sand and gravel, trace silt

4.5'

Tan sand w/iron colored mottles, bluish slag in 1 corner of hole

7'

Dk Brown - black cinder-like sand rusty mat'l baked in w/bottom 1' of this layer, slg, gravel

Native — Dk brown wet layer top of native

Water seeping in cut ~13'

13'

13.5'

Dk Gray Clayey silt, ext moist - wet.

PICT 33

not to scale

Depth bgs	Soil Description	Samples– Depth	Comments include Water entering pit w/depth

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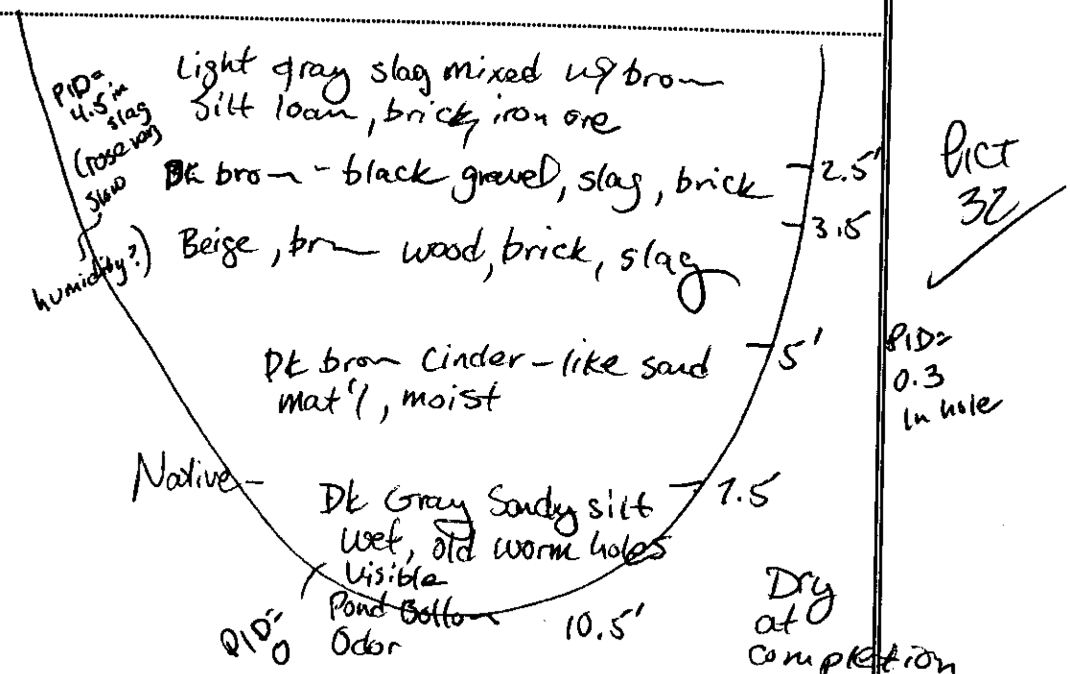
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P5	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/19/99	Logged By:	DMA/ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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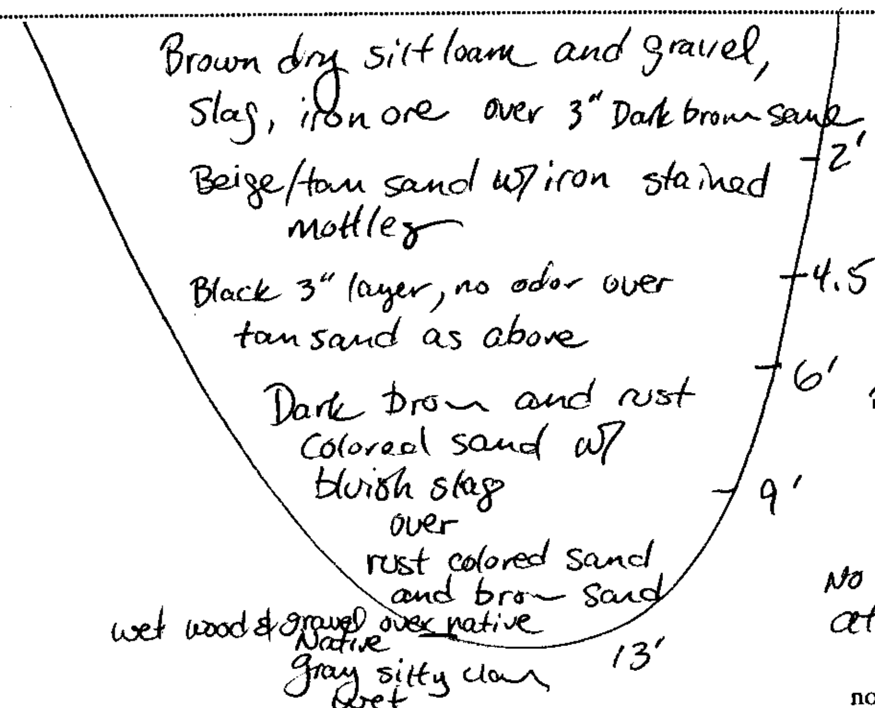
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P6	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/19/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Pict 31

PID: 0.5 of soilpile

No water at completion

not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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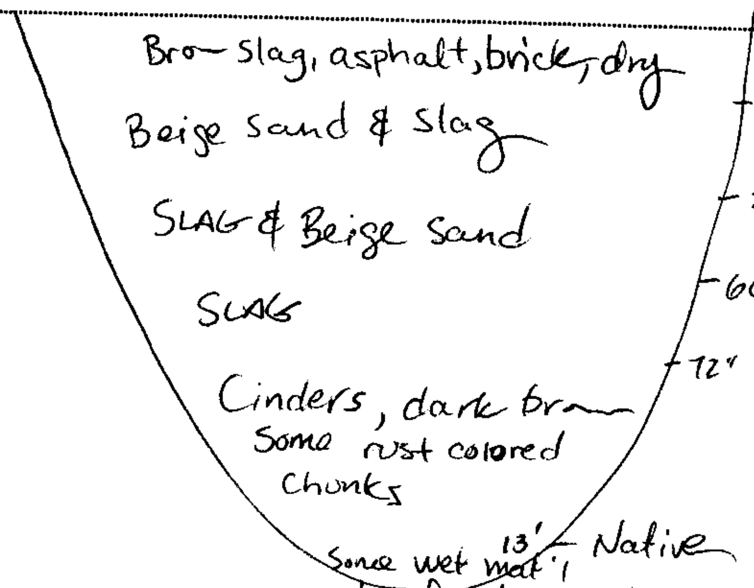
FIELD TEST PIT LOG

Test Pit No.:	AI-TP-P7	**Project:**	Area I Invest.
Location:		**Project No:**	00027-003
Date:	7/19/99	**Logged By:**	JMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Pict 30

PID=0

No water at completion

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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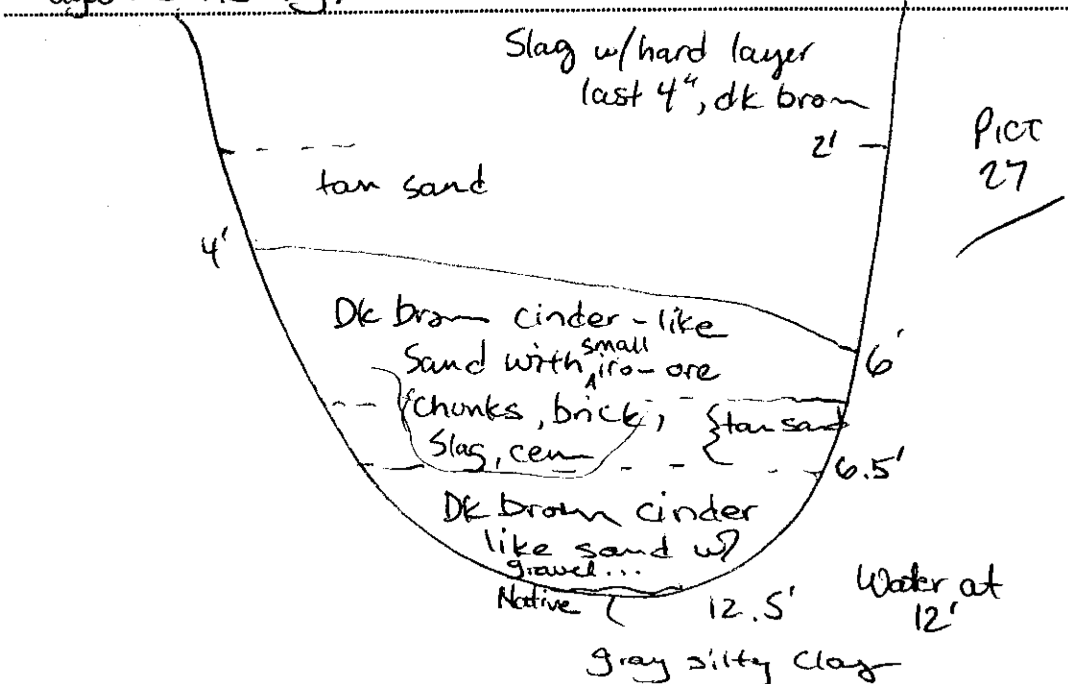
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P8	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-003
Date:	7/19/99	**Logged By:**	JWD / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile Refused at original location. Moved 15' to West. Refused

grade again @ 1.5' bg.



not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

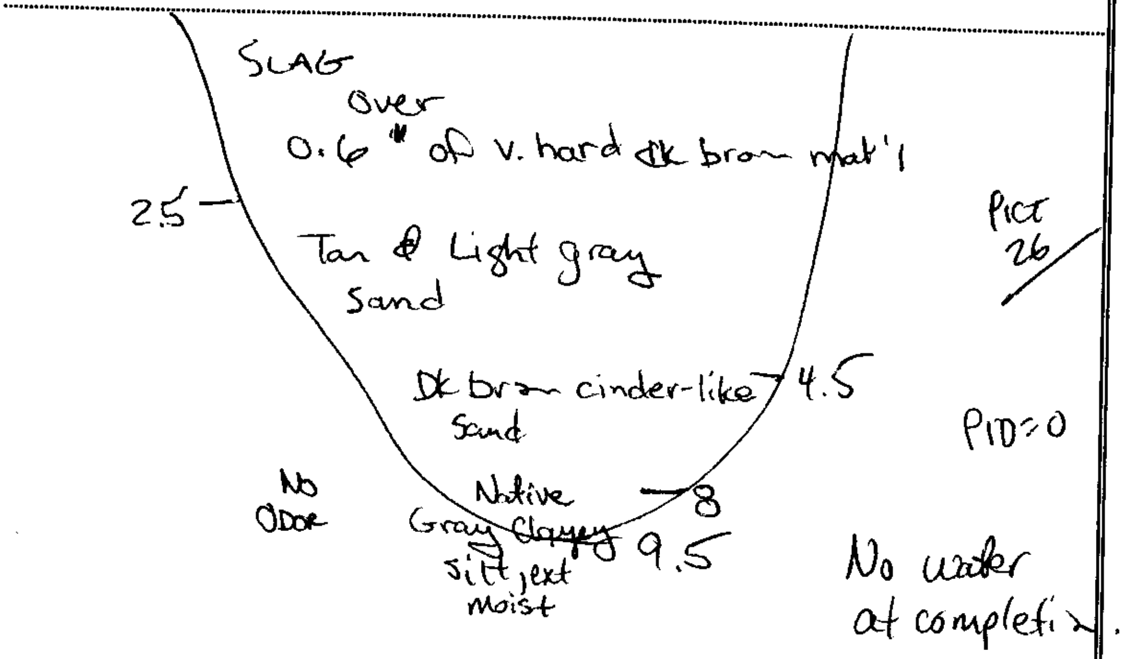
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P9	**Project:**	Area 1 Investigation
Location:		**Project No:**	0002-005
Date:	7/16/99	**Logged By:**	JMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

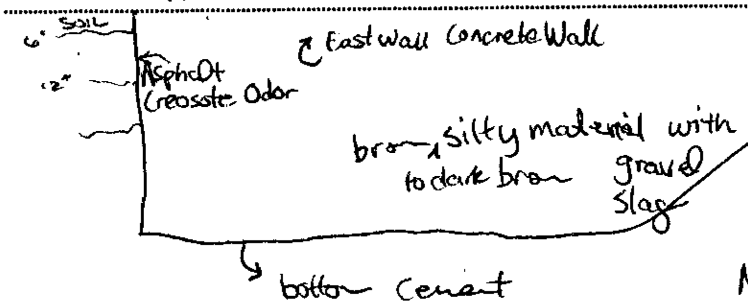
FIELD TEST PIT LOG

Test Pit No.:	AI-TP-P10	**Project:**	Area I Investigation
Location:		**Project No:**	0002-005
Date:	7/16/99	**Logged By:**	JMM/RCD
Excavation Method:	Liebherr 932		

Test Pit Profile

Refusal at original location @ ~1' below grade
Moved ~20'. ~~PA State~~ Refusal to the E toward T-5. Try to the West. Moved 25' to W.

grade



Pict 25

No Water

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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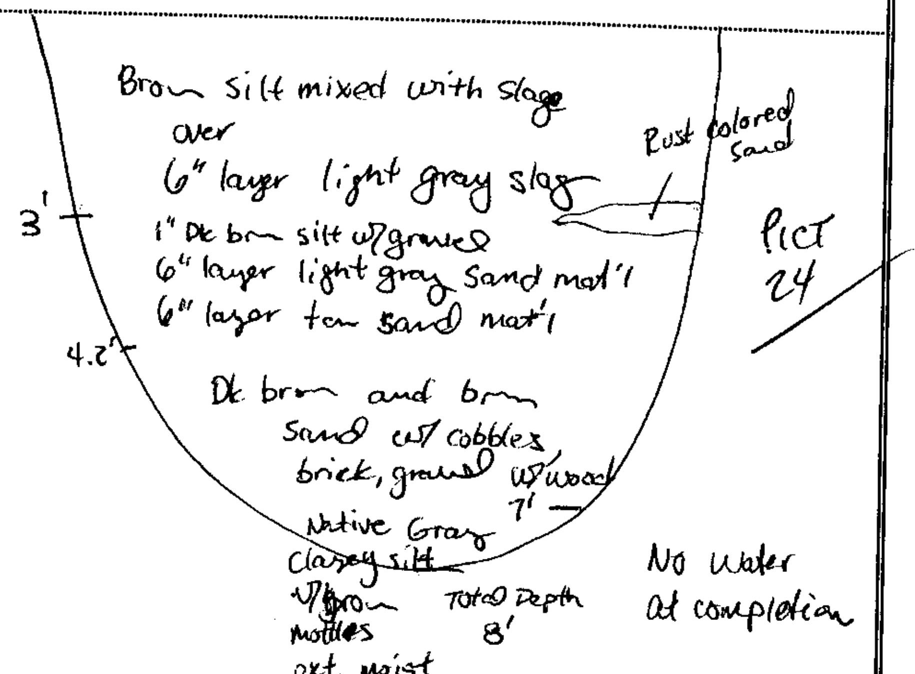
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P11	Project:	Area I Invest.
Location:		Project No:	0002-005
Date:	7/16/99	Logged By:	JMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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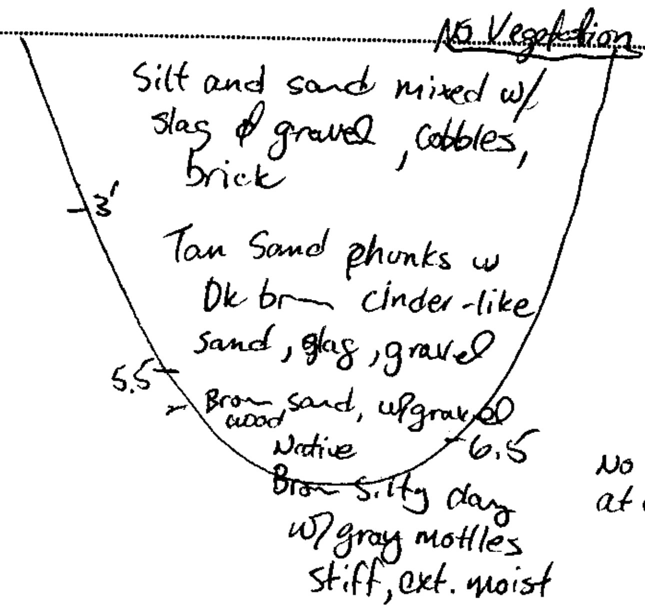
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P12	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/16/99	Logged By:	SMD/ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



PID=0

Pict 23

No water at completion

not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

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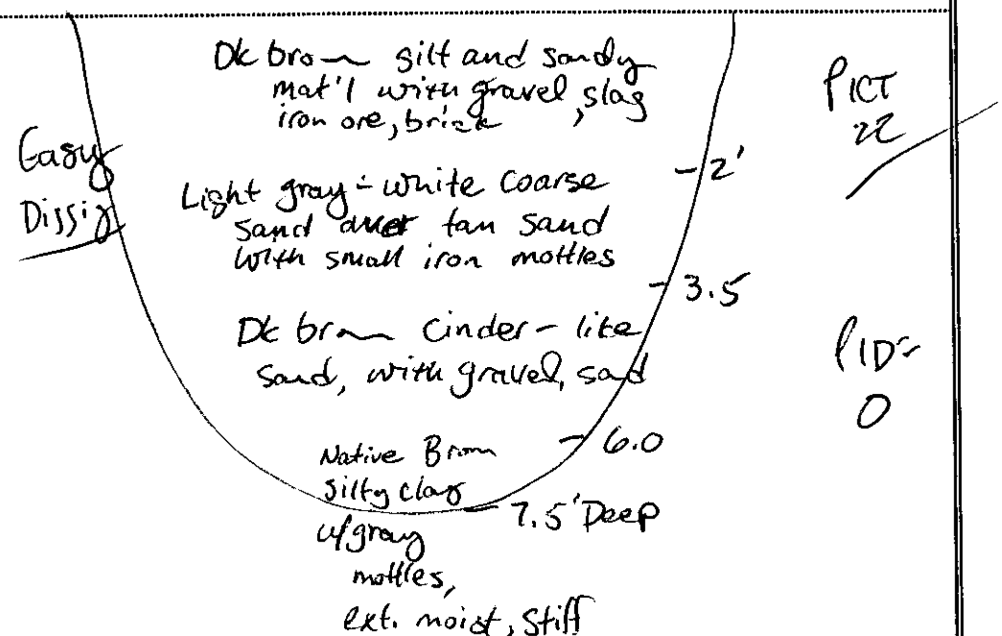
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P13	**Project:**	Area I Investigation
Location:		**Project No:**	0002-005
Date:	7/16/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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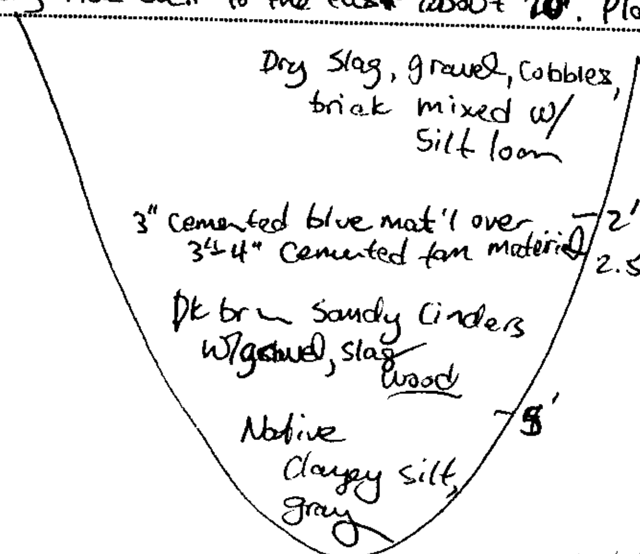
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P14	Project:	Area 1 Investigation
Location:		Project No:	0002-005
Date:	7/16/99	Logged By:	JMM/ECD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

Refusal at original hole at ~1.5' below grade
Swung hoe over to the east about 10'. Place stake into new hole



pict 21

PID=1.0

6.5' Deep

NO Water at Completion

not to scale

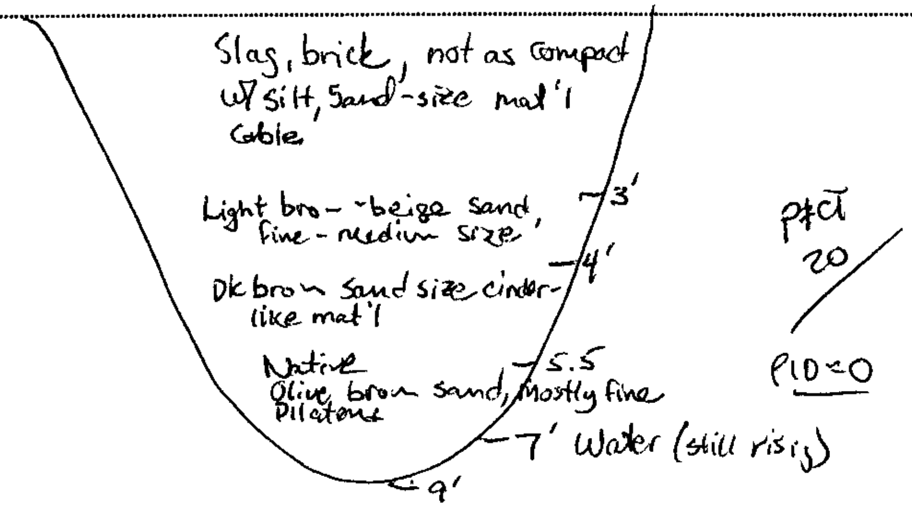
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-P15	**Project:** Area 1 Investigation
Location:	**Project No:** 0002-005
Date: 7/16/99	**Logged By:** GWD/RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

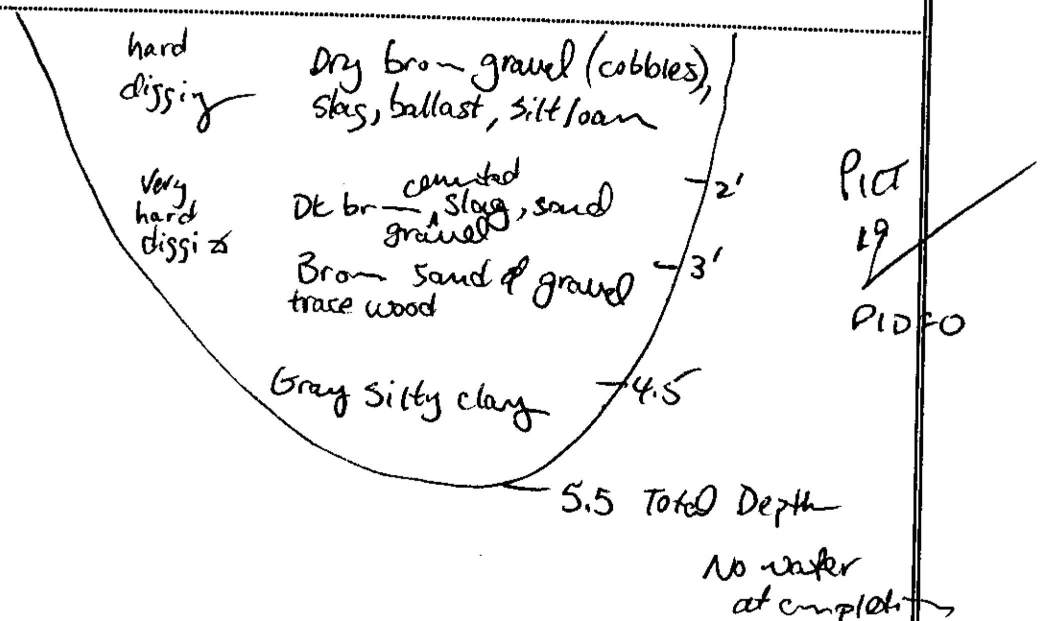
Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	AI-TP-P16	Project:	Area I Invest.
Location:		Project No:	0002-005
Date:	7/16/99	Logged By:	SMO/RCD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

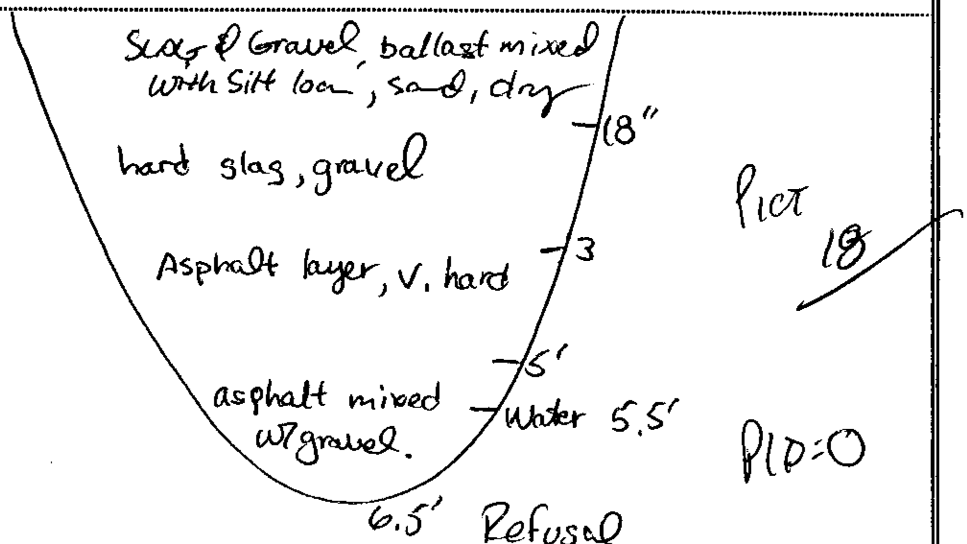
Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-P17	**Project:** Area 1 Invest
Location:	**Project No:** 0002-005
Date: 7/16/99	**Logged By:** DMO/RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

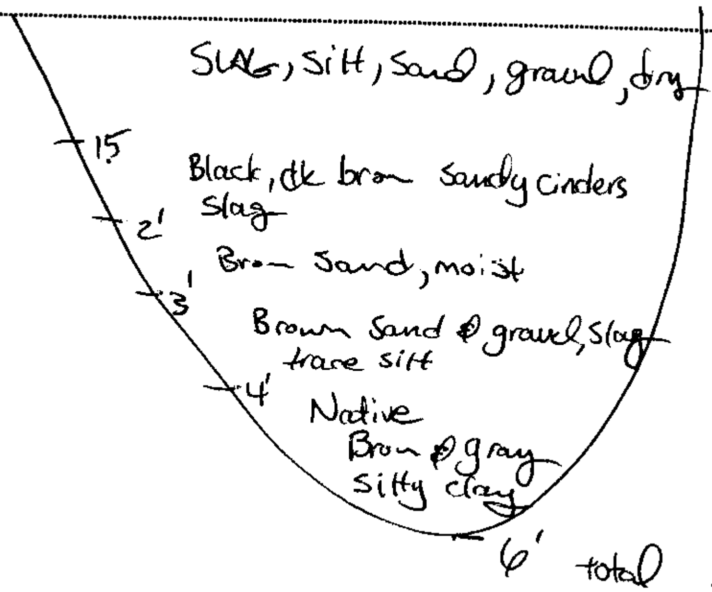
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP#18	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/16/99	**Logged By:**	JMM / ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



PICT 17

PID=0

No water at completion

not to scale

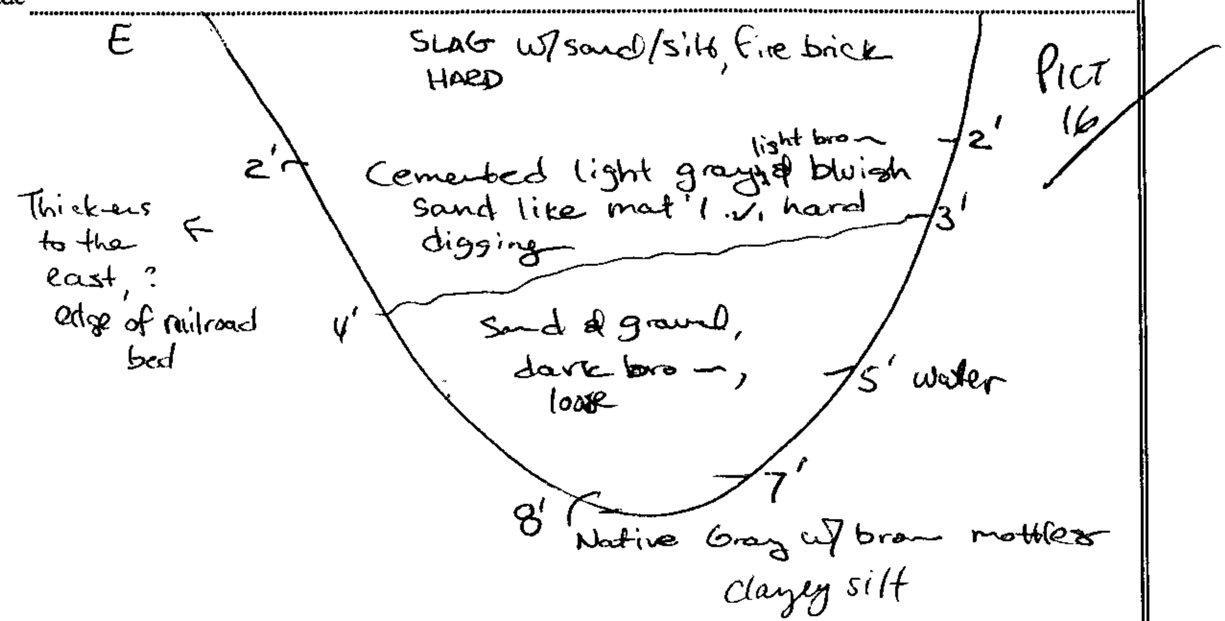
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A-TP-Ø19	**Project:** Area 1 Invest.
Location:	**Project No:** 0002-005
Date: 7/16/99	**Logged By:** JMA/ELD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

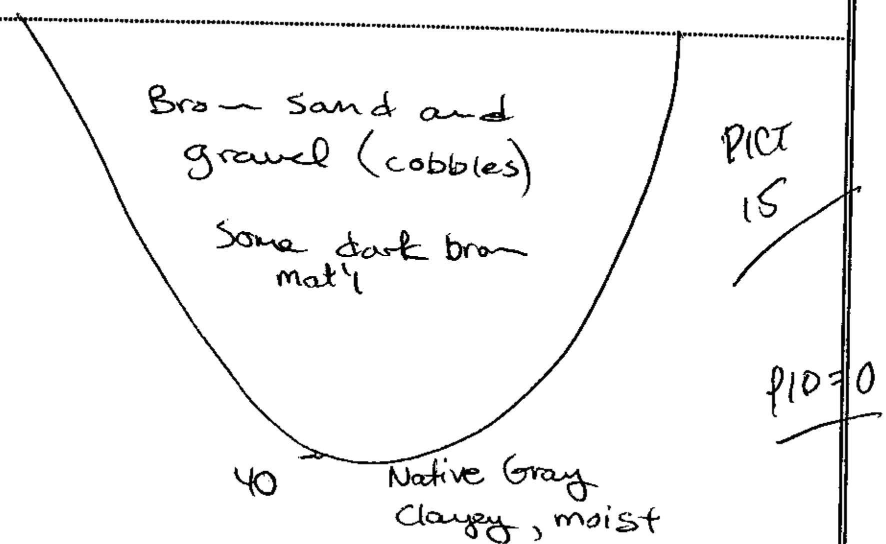
FIELD TEST PIT LOG

TurnKey Environmental Restoration, LLC — Benchmark Environmental Engineering & Science, PLLC

Test Pit No.: A1-TP-P20	**Project:** Area 1 Invest.
Location:	**Project No:** 0002-005
Date: 7/15/99	**Logged By:** JMD/ELD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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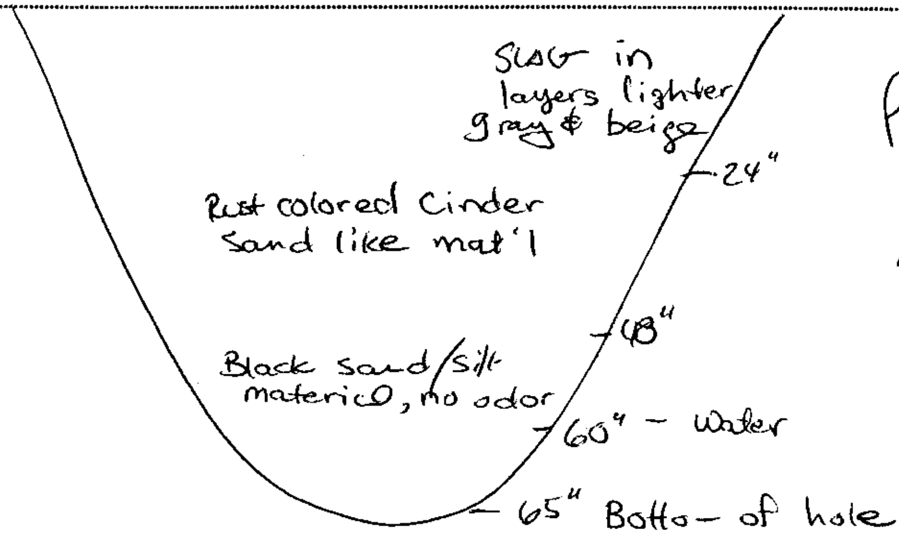
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P21	**Project:**	Area 1 Invest.
Location:		**Project No:**	
Date:	7/15/99	**Logged By:**	
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Pict 14

PID=0

not to scale

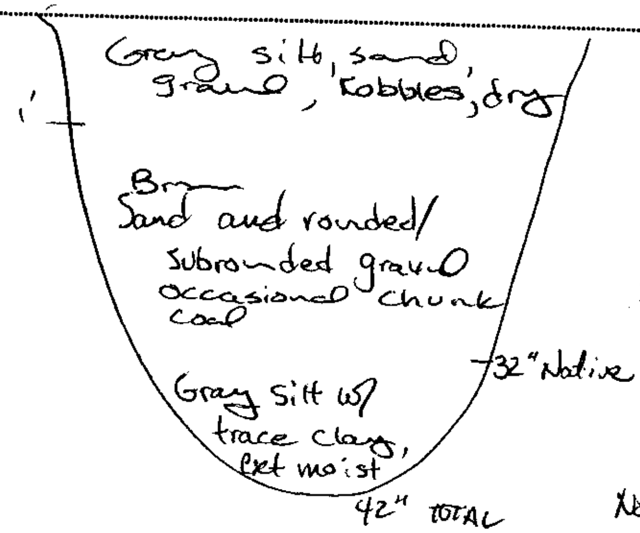
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	Al-TP-P22	**Project:**	Area I Invest.
Location:		**Project No:**	0002-003
Date:	7/15/99	**Logged By:**	JWD/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Pict 13

PID=0

No water at completion

not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

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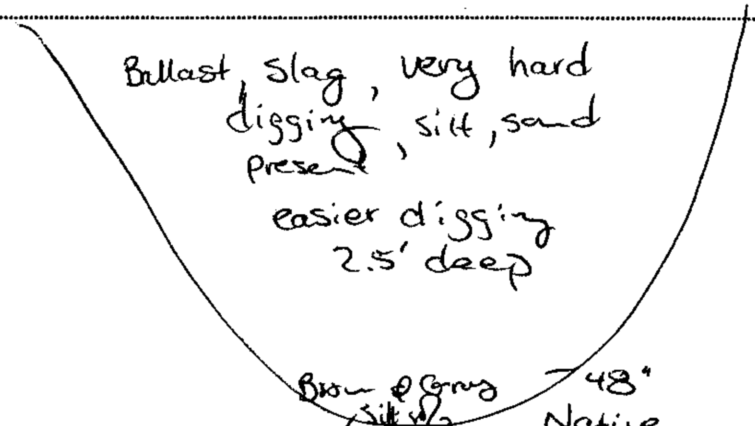
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P23	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-003
Date:	7/15/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile refusal at original hole, swung hole to the west, about 15'

grade



PICT 12

PID=0

not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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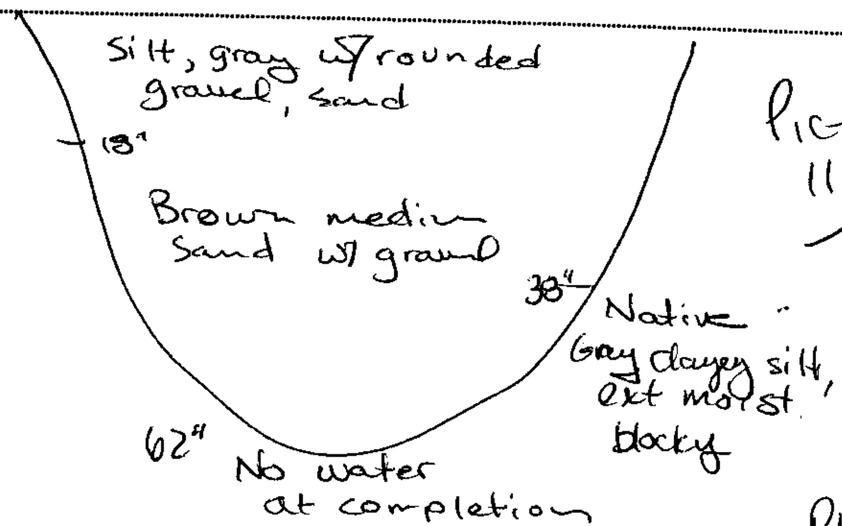
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-P24	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/15/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Pict 11

PID=0

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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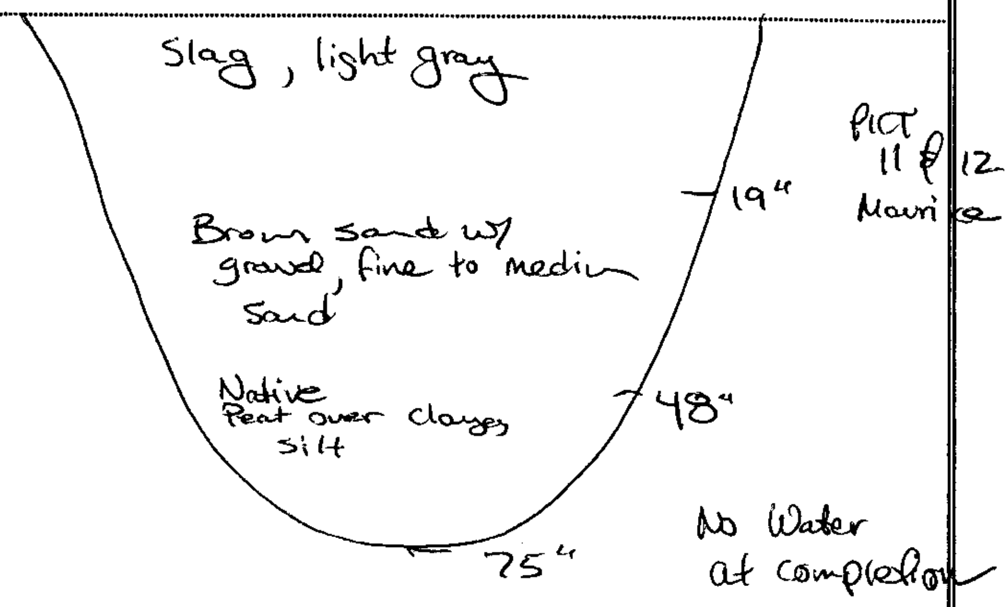
FIELD TEST PIT LOG

Test Pit No.:	AI-TP-P25	**Project:**	Area I Invest
Location:		**Project No:**	0002-005
Date:	7/15/99	**Logged By:**	JMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

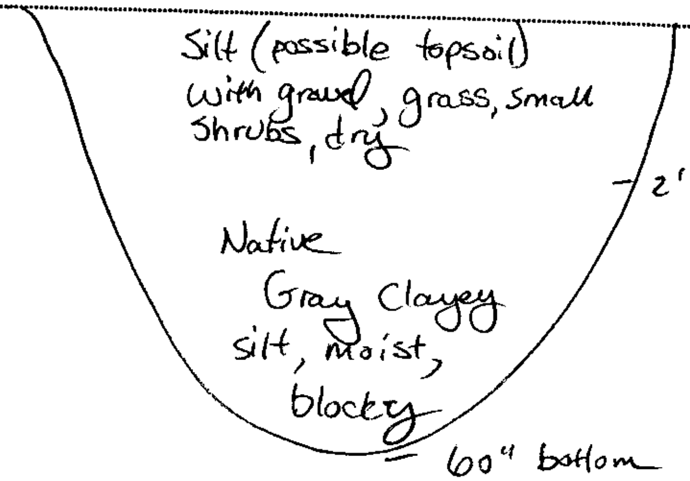
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-P26	Project: Area 1 Inv.
Location: Rail Road Sub	Project No: 0002-005
Date: 7/15/99	Logged By: JNA/RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



PICT 10

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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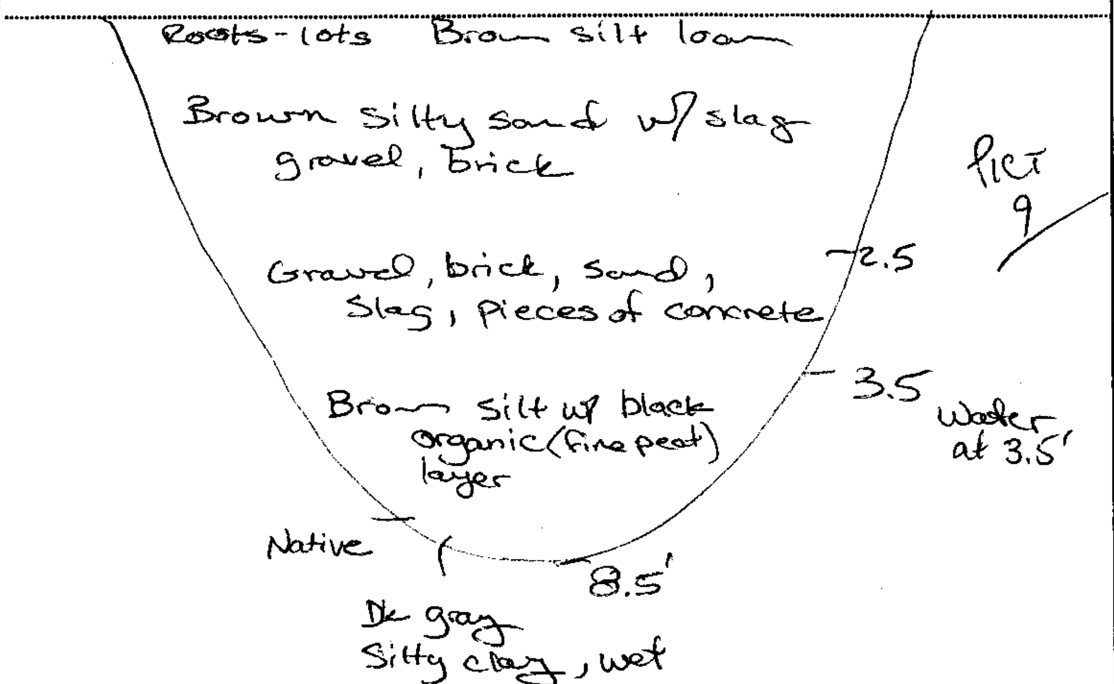
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q1	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/22/99	Logged By:	[illegible]/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile Little wet area phragmites

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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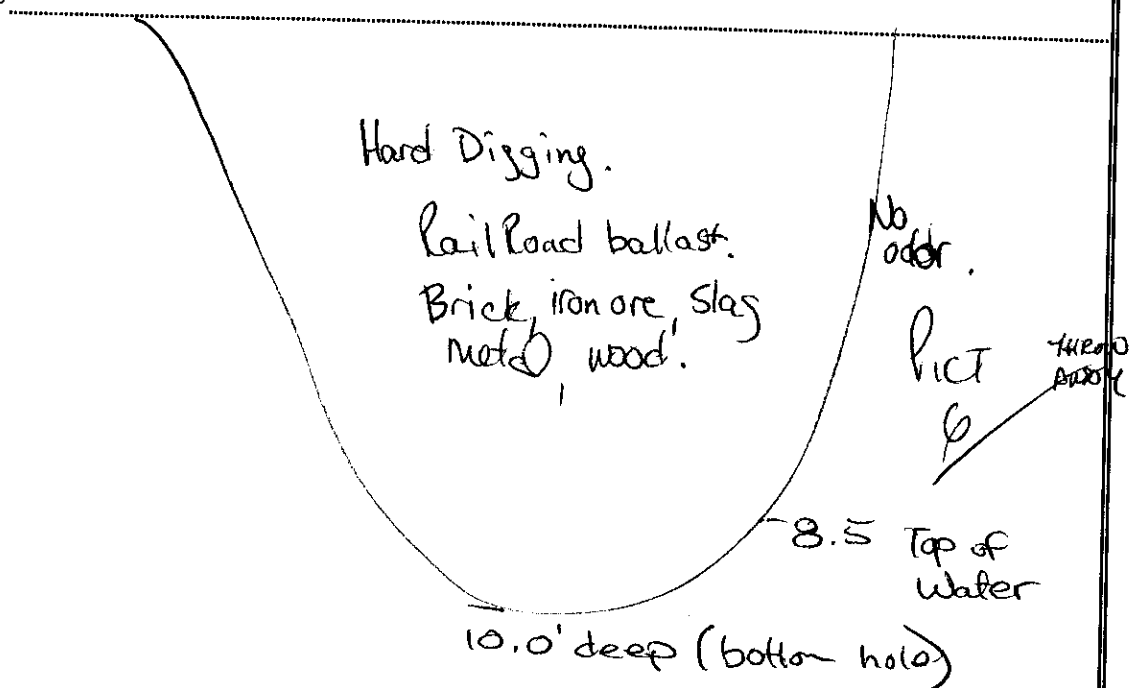
FIELD TEST PIT LOG

Test Pit No.: A1-TP-Q2	**Project:** Area 1 Invest.
Location:	**Project No:** 0002-005
Date: 7/22/99	**Logged By:** JMM/RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

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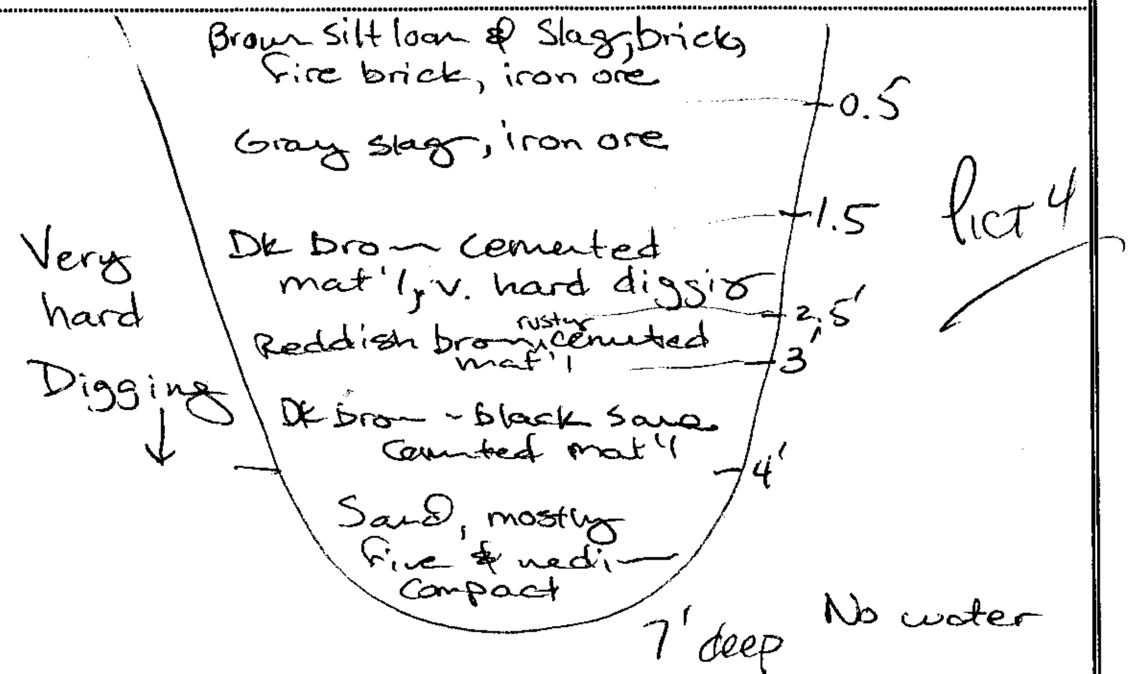
FIELD TEST PIT LOG

Test Pit No.:	Al-TP-Q3	**Project:**	Area I Invest.
Location:		**Project No:**	0002-006
Date:	7/22/99	**Logged By:**	JWP/ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



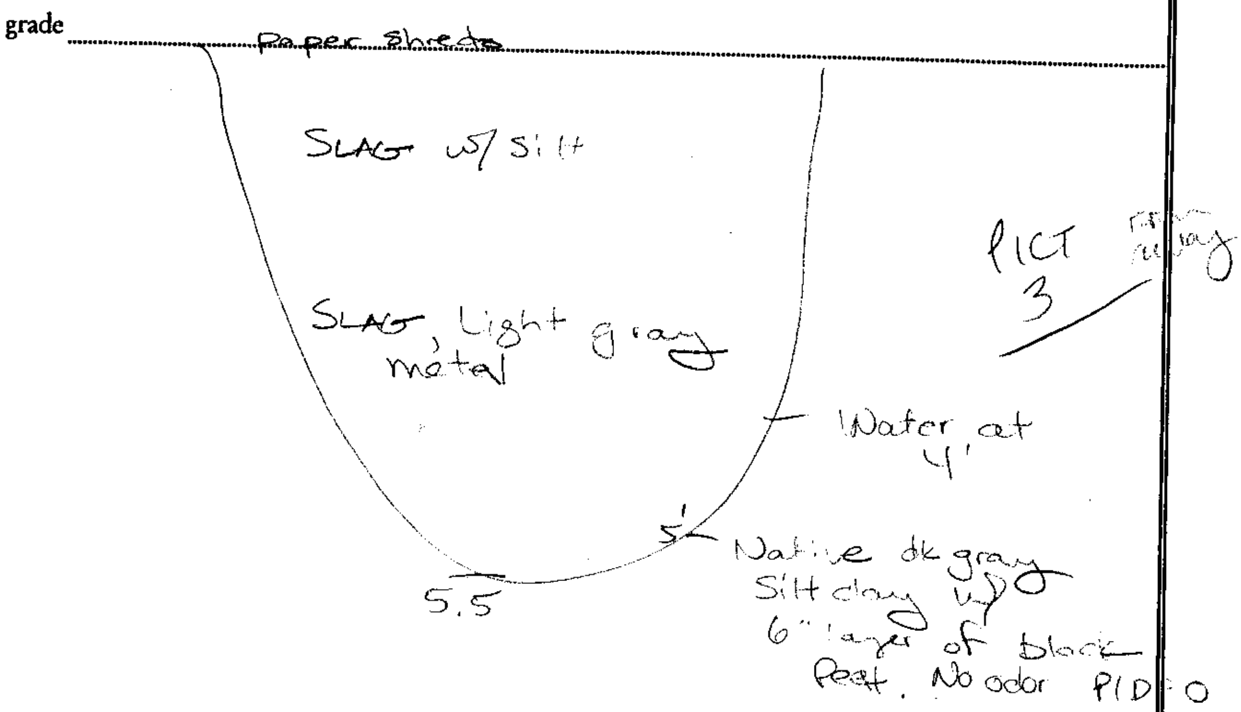
not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-Q4	**Project:** Area 1 Invest.
Location:	**Project No:** 0002-005
Date: 7/22/99	**Logged By:** JWA/RLD
Excavation Method: Liebherr 932	

Test Pit Profile



not to scale

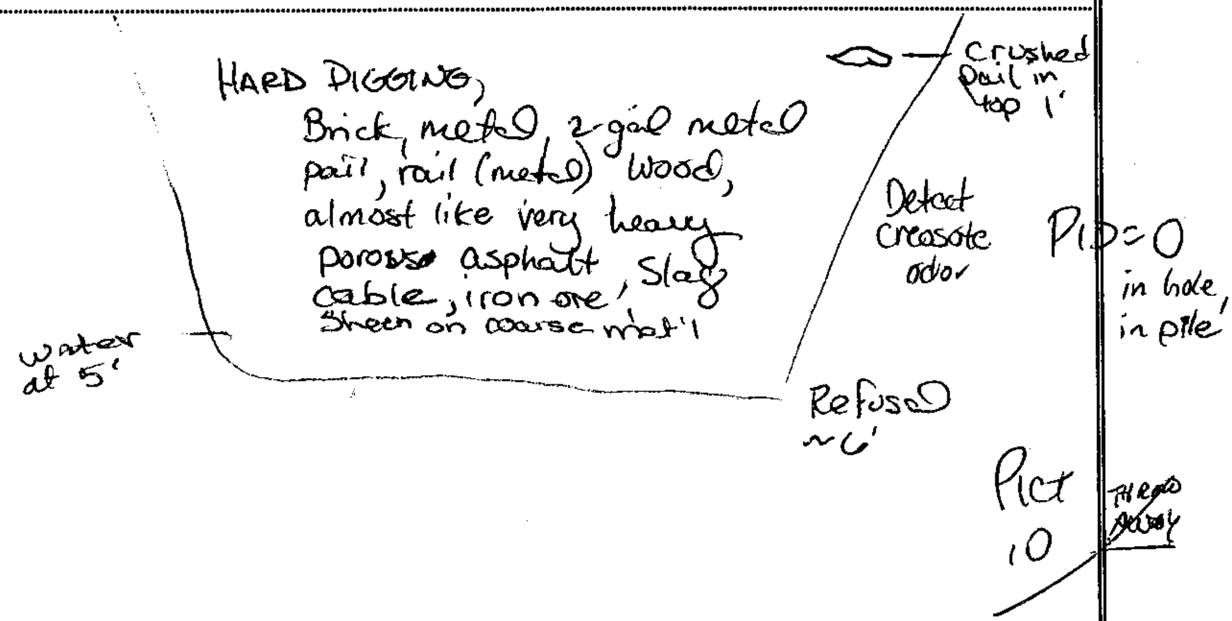
Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q5	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/22/99	Logged By:	JMA / RLD
Excavation Method:	Liebherr 937		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

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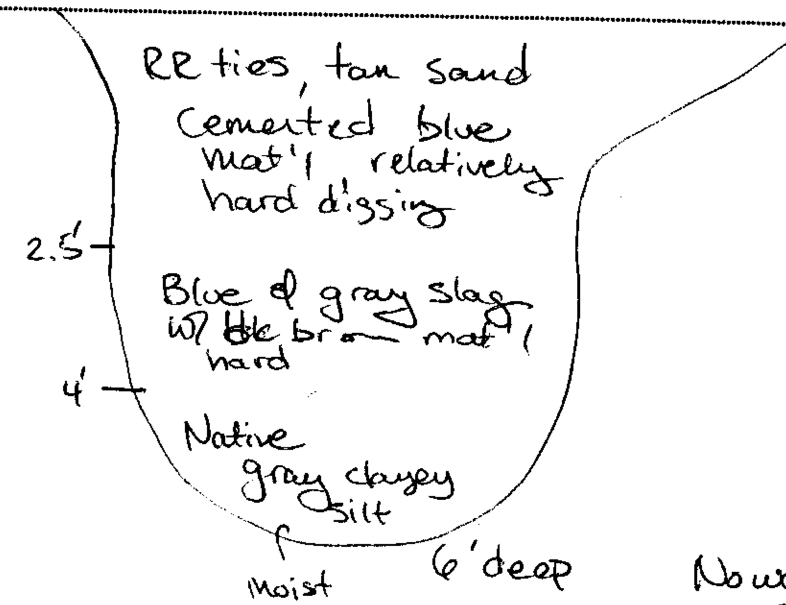
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q6	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	9/22/99	Logged By:	SMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



PICT 11

PID = 0

No water at completion

not to scale

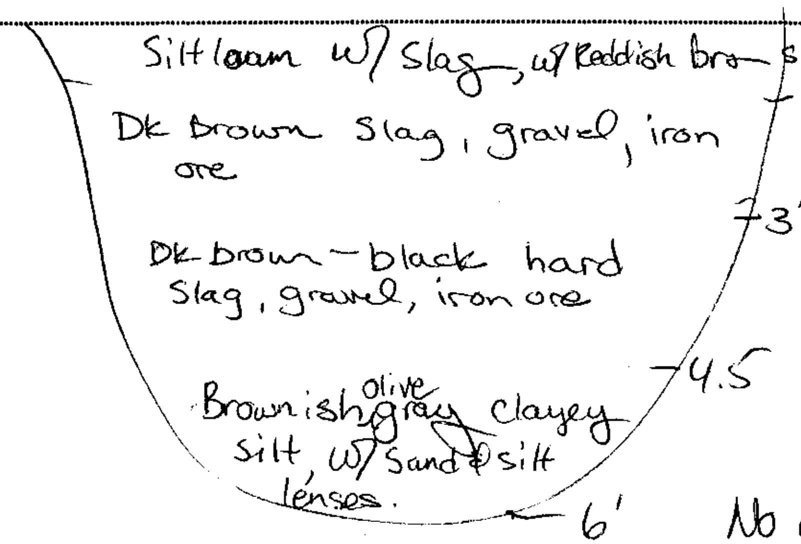
Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q7	**Project:**	Area I Invest.
Location:		**Project No:**	0002-005
Date:	7/22/99	**Logged By:**	JMD/RWD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Pict 2 thrown away

No water at completion.

not to scale

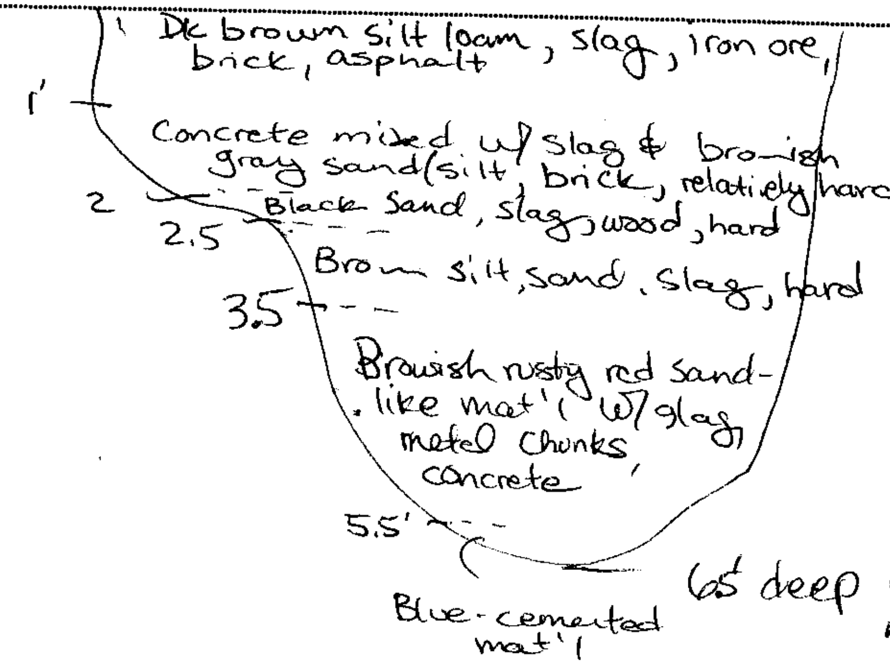
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	AL TP-08	Project:	Area I Invest.
Location:		Project No:	0002-005
Date:	7/23/99	Logged By:	TMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Pict 4

PID=0

6.5' deep refusal
No water at completion.

not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

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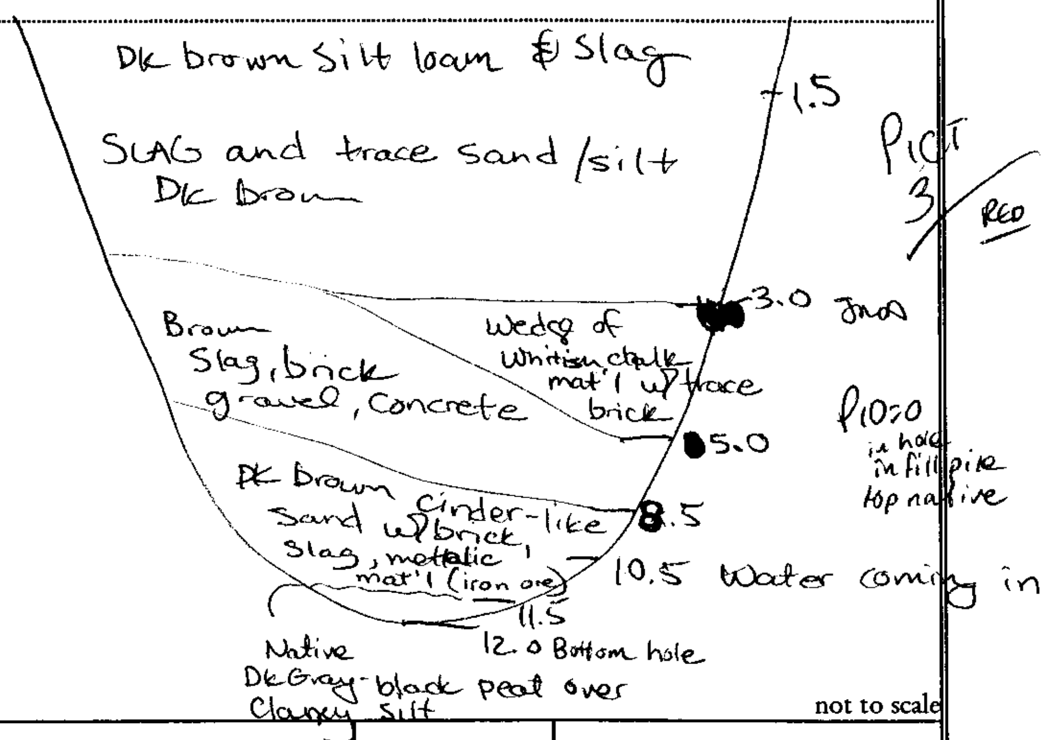
FIELD TEST PIT LOG

Test Pit No.:	A1- TP-Q9	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/23/99	**Logged By:**	JMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

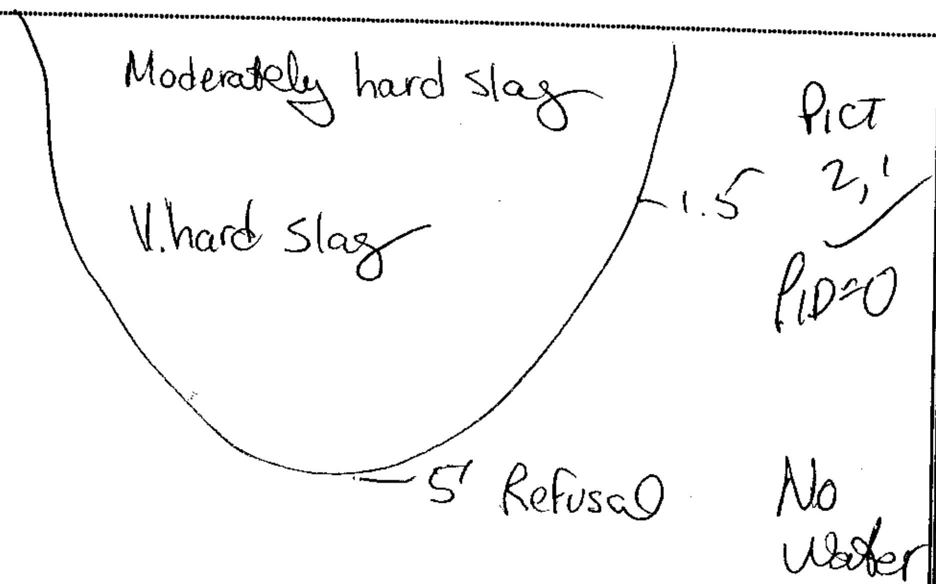
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q10	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/22/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q-11	Project:	AREA-1 Inv
Location:		Project No:	0002-005
Date:	7/20/99	Logged By:	RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

Refusal @ 5.5' slag from 0-5.5' grey w/ brn sand.

moved 20' south ~~of~~ of A1TPQ11 - Refusal at 3' - slag cobbles material

moved 15-20' N of A1TP-Q11 - Refusal @ 4.5' - slag material

Pic #15

not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

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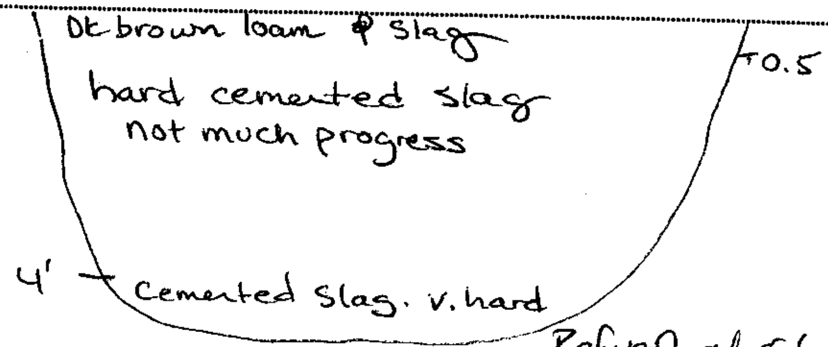
FIELD TEST PIT LOG

Test Pit No.:	Al-TP-Q11 (new)	**Project:**	Area 1 Add'l Invest.
Location:		**Project No:**	0002-005
Date:	7/22/99	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile 5th attempt.

grade



Refused at 5'

Pict 14 (Throw away)

No water

not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

3842

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FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q12	**Project:**	AREA 1 INV
Location:		**Project No:**	0002-005
Date:	7/20/99	**Logged By:**	RLP
Excavation Method:	LIEBHERR 932		

Test Pit Profile

grade

0-6" TOPSOIL w/ SLAG & SAND material - rootlets

6"-4.5' BRN cindery material w/ SAND - moist
native entering @ 4.5'

4.5'-8' DARK grey ~~sandy~~ clayey silt - NATIVE
moist

PIC # 16

not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

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FIELD TEST PIT LOG

Test Pit No.:	A1-TP-13	Project:	AREA-1 Inv
Location:		Project No:	0002-005
Date:	7/20/99	Logged By:	RCD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

0-2' BRN TOPSOIL & SAND LAYER

2-5' BRN SAND LAYER

5-8' SLAG LAYER LT GREY-COBBLES

8' DRK HUMUS LAYER w/ WOODY MATERIAL — *ADDITIONAL SAMPLE COLLECTED FOR SVOA, VOA A1-TPS-13B 25 PPM - PID Reading

8'-9' GREY SILT w/ RUST COLORED MOTTLING

PETROLEUM TYPE ODOR

PID 25 PPM

PIC #17

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

Q11
~95'
S

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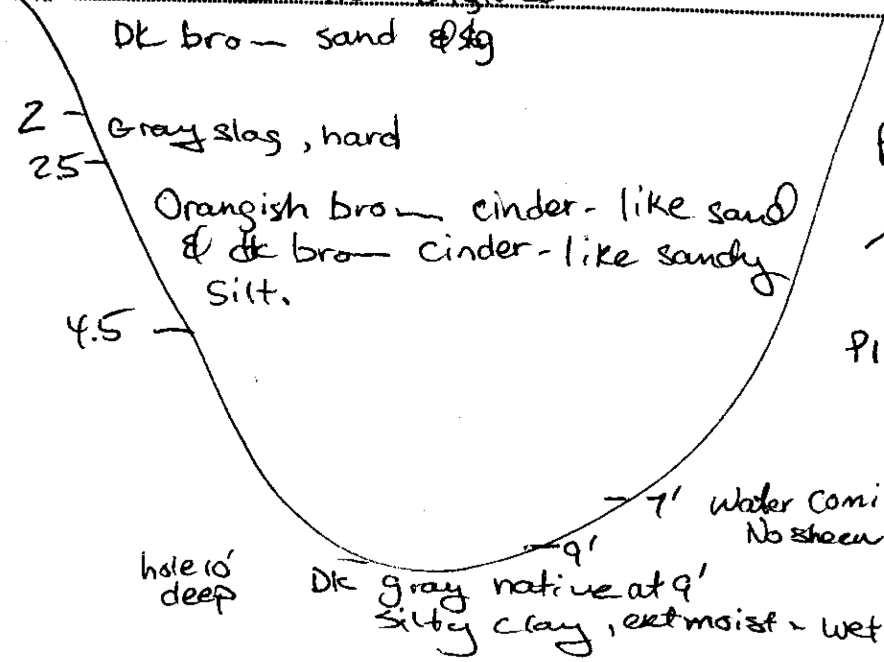
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q14	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/22/99	Logged By:	[illegible]/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile Refusal ~6.5' to 7' at original location. Water at 6.5'. Soil fill to ~3-4' before got hard.
grade Rotated backhoe 90° to the west. Put stake in new location. Hole ~20' to west from original



PICT 13 / Throw away

PID = 0

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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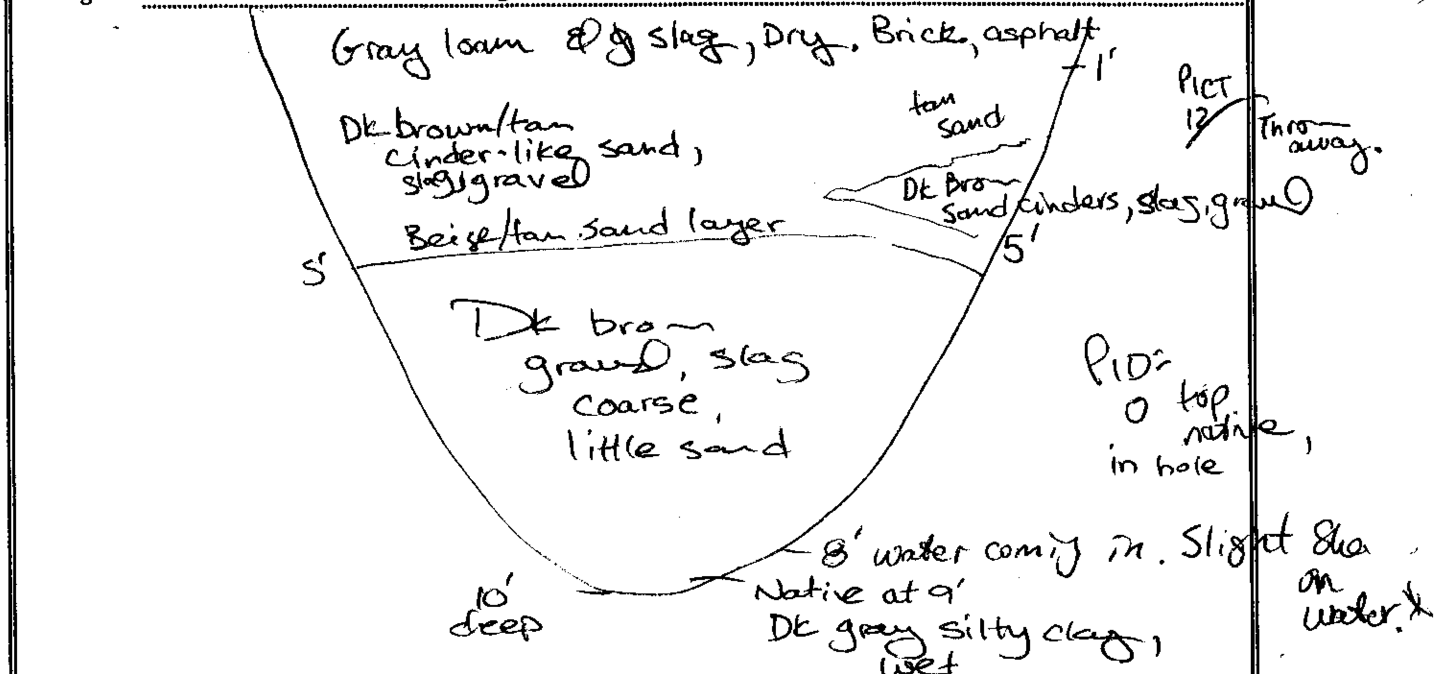
FIELD TEST PIT LOG

Test Pit No.:	AI-TP-Q15	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/22/99	**Logged By:**	SMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile Refused at original Q15 location. Moved about 20' to the North West. Likely foundation ~1' bg. Put stake in new hole (stake broke)

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
			* Pulled 1 extra scoop and did not detect any odors/PID hits. Discuss w/ Maurice Moore (DEC), possibly bucket grease.

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FIELD TEST PIT LOG

Test Pit No.:	Al-TP-Q16	**Project:**	Area I Invest.
Location:		**Project No:**	0002-005
Date:	7/23/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

Refusal in two places @ 1' bg.

On top, gravel - yellow well sorted

No sample.

not to scale

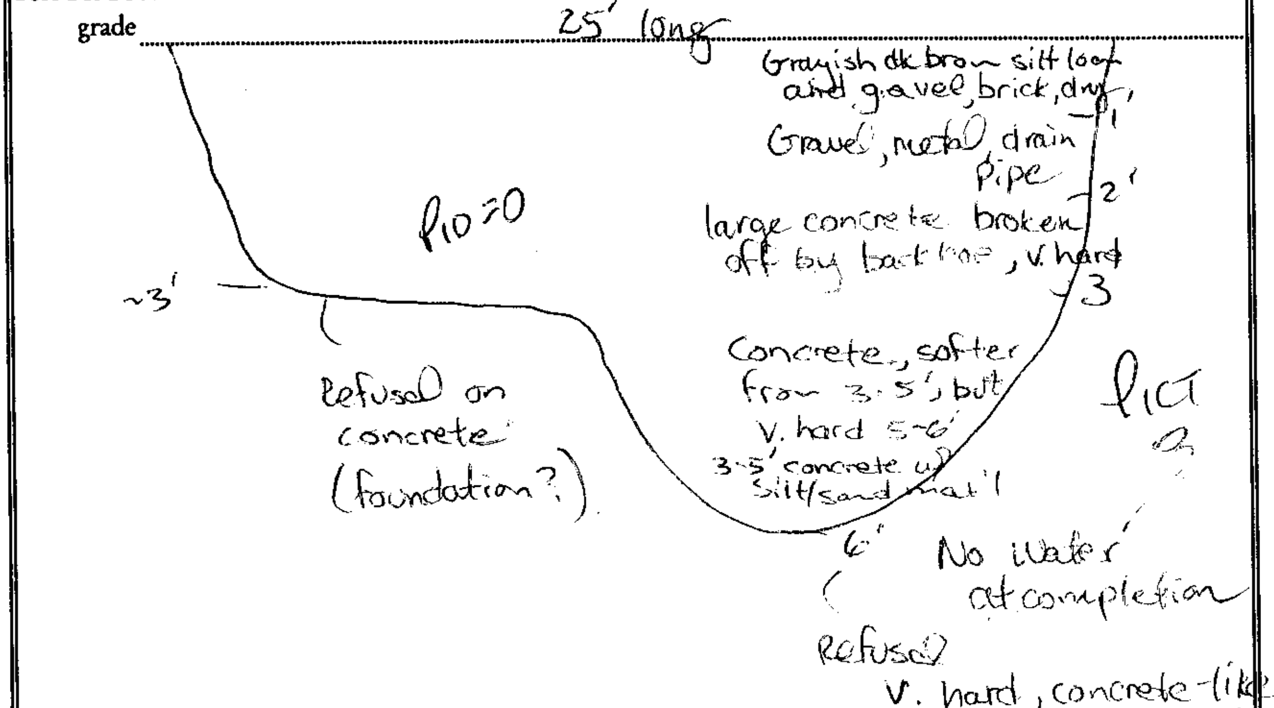
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q17	Project:	Area 1 Invest
Location:		Project No:	0002-005
Date:	7/23/99	Logged By:	JNH / KHD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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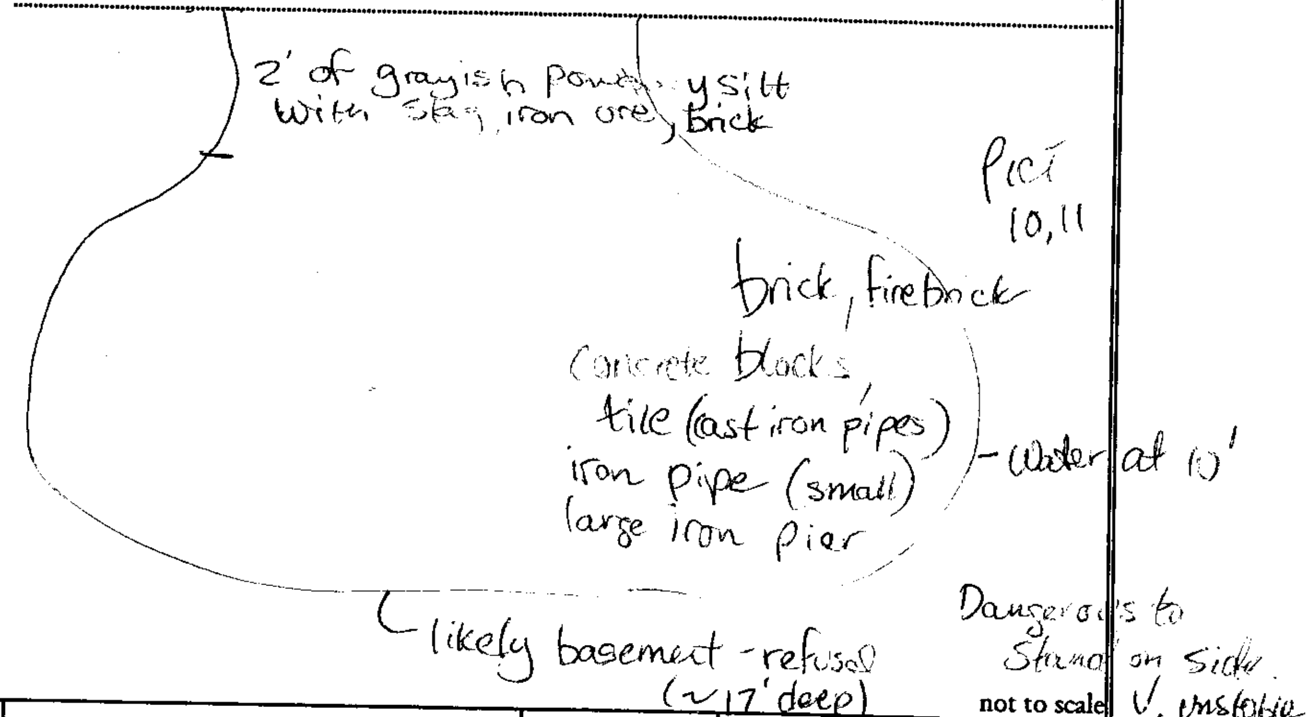
FIELD TEST PIT LOG

Test Pit No.:	A1 - TP - Q18	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002 - 005
Date:	7/23/99	**Logged By:**	JWM / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

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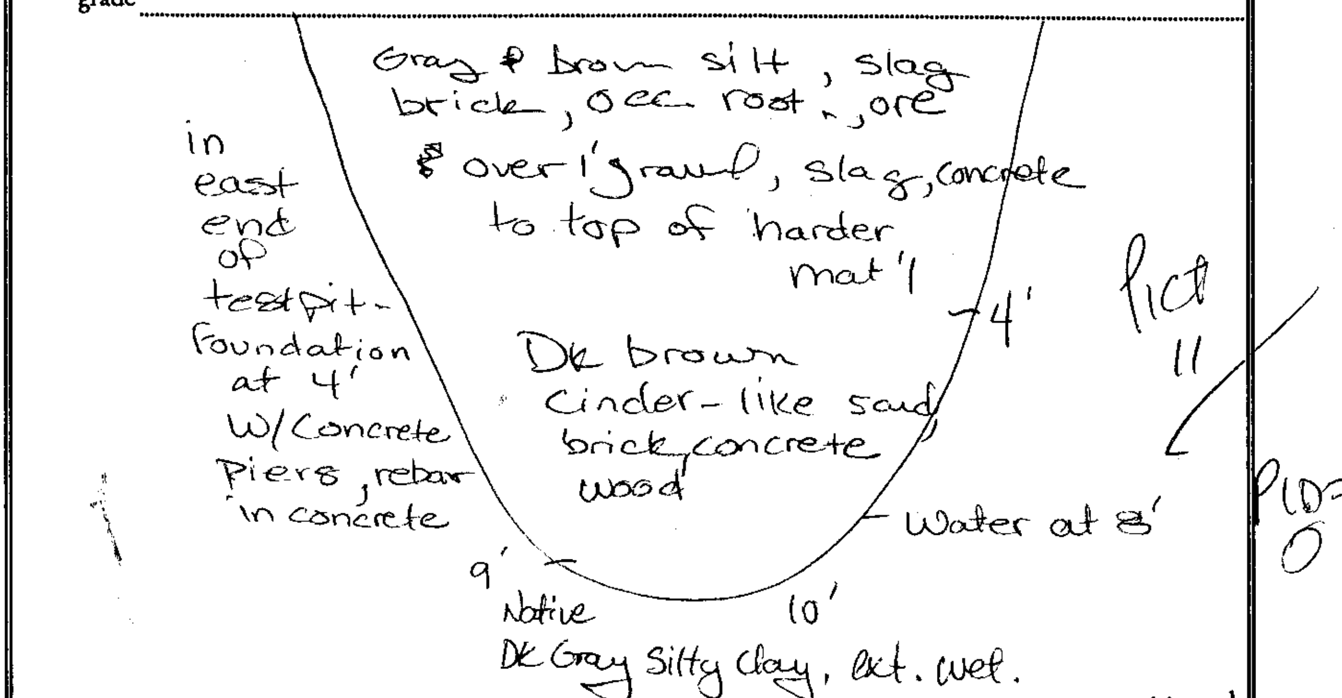
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q19	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/23/99	**Logged By:**	JMM/PLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

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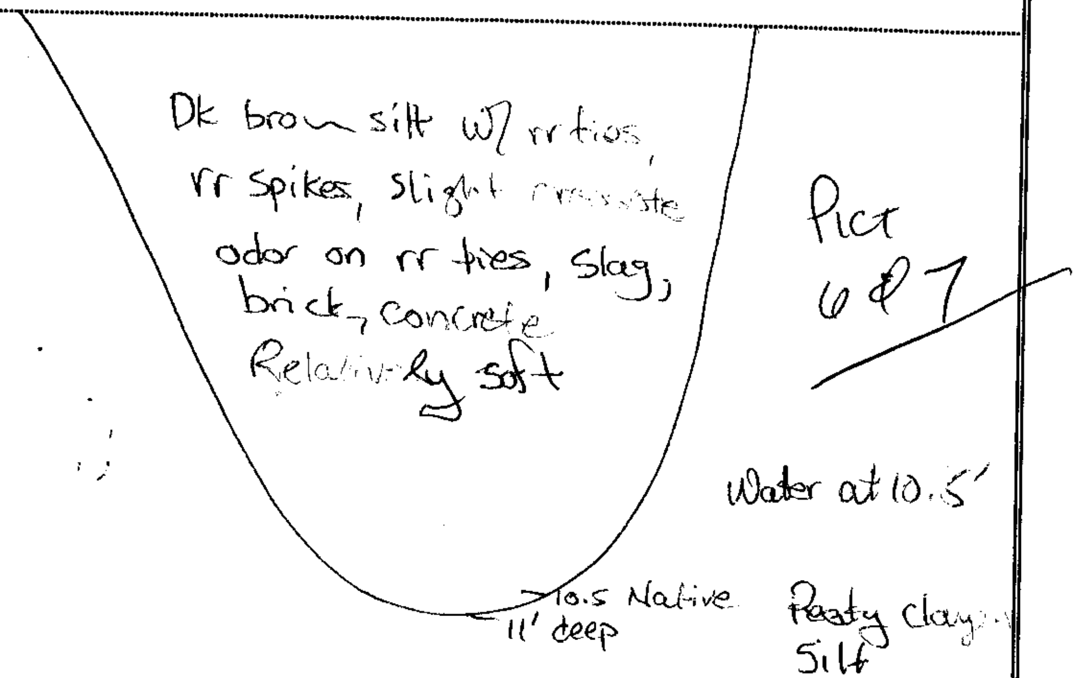
Test Pit No.:	AI-TP-Q20	**Project:**	Area I Invest.
Location:		**Project No:**	0002-005
Date:	7/23/9[illegible]	**Logged By:**	JNA / ECD
Excavation Method:	Liebherr [illegible]2		

Test Pit Profile

grade



not to scale

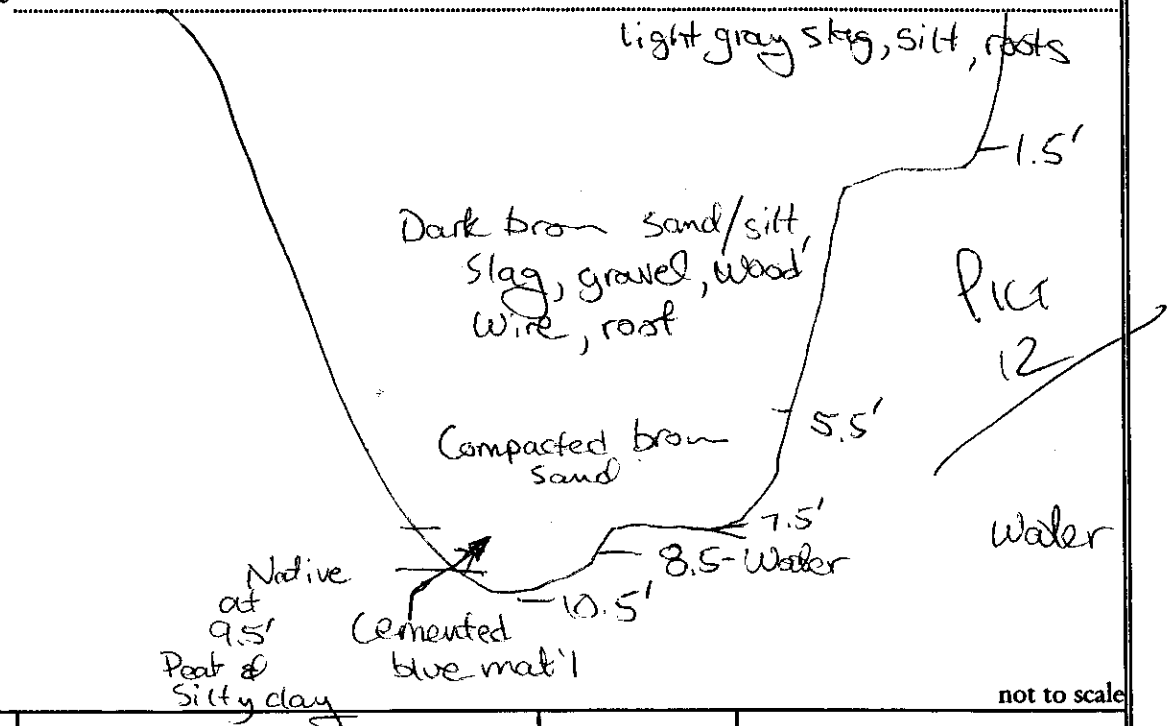
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q21	**Project:**	Area I Invest.
Location:		**Project No:**	0002-005
Date:	7/23/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

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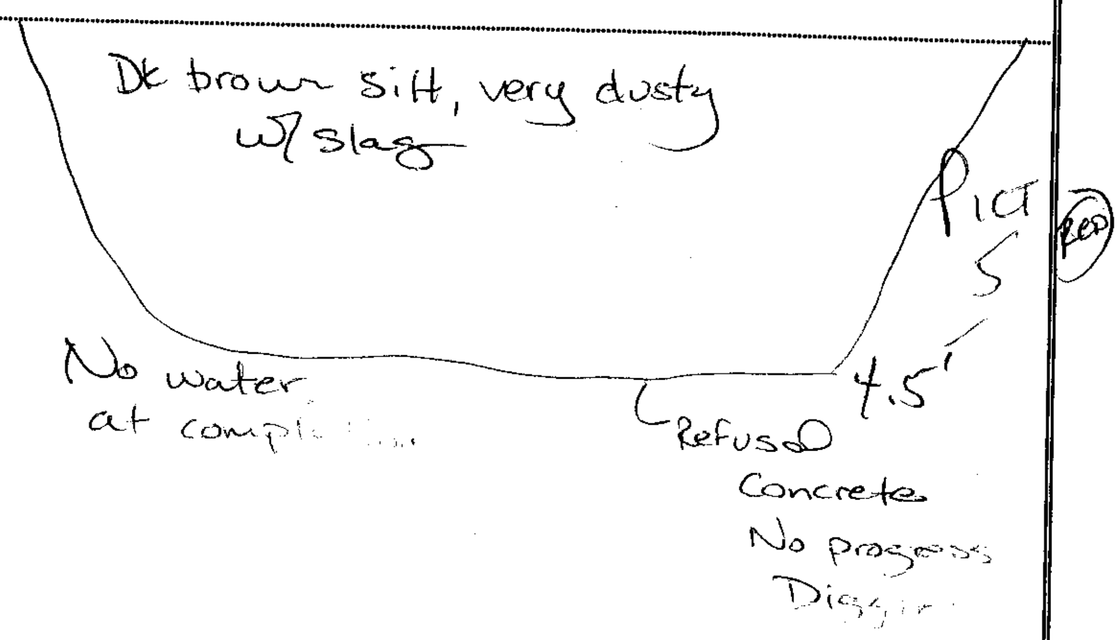
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q22	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/23/99	**Logged By:**	DWA / RJD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples– Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q23	**Project:**	Area 1 Invest.
Location:		**Project No:**	0202-005
Date:	7/23/99	**Logged By:**	JMA / CWD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

Dk brown silt loam/slag gravel

1'

Poorly graded gravel, slag, angular

2.5'

Dk brown - black gravel, slag

3.5

Refusal on bluish-cement mat'l. V. hard.

PICT 13

No water at completion

not to scale

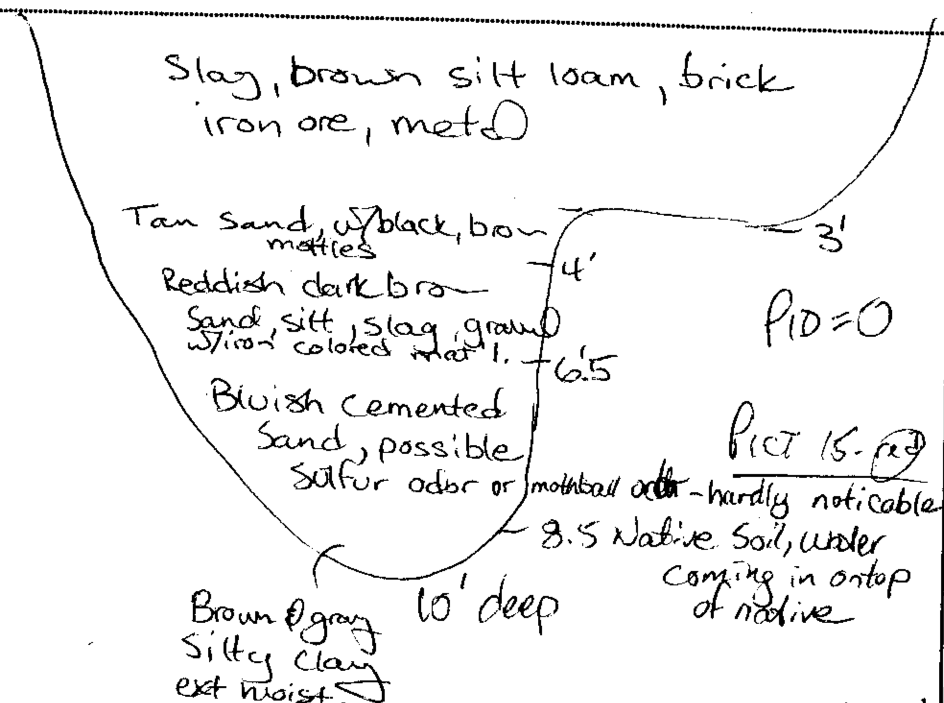
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q24	**Project:**	Area 1 Invest
Location:		**Project No:**	0002-005
Date:	7/23/99	**Logged By:**	JMA / RWD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

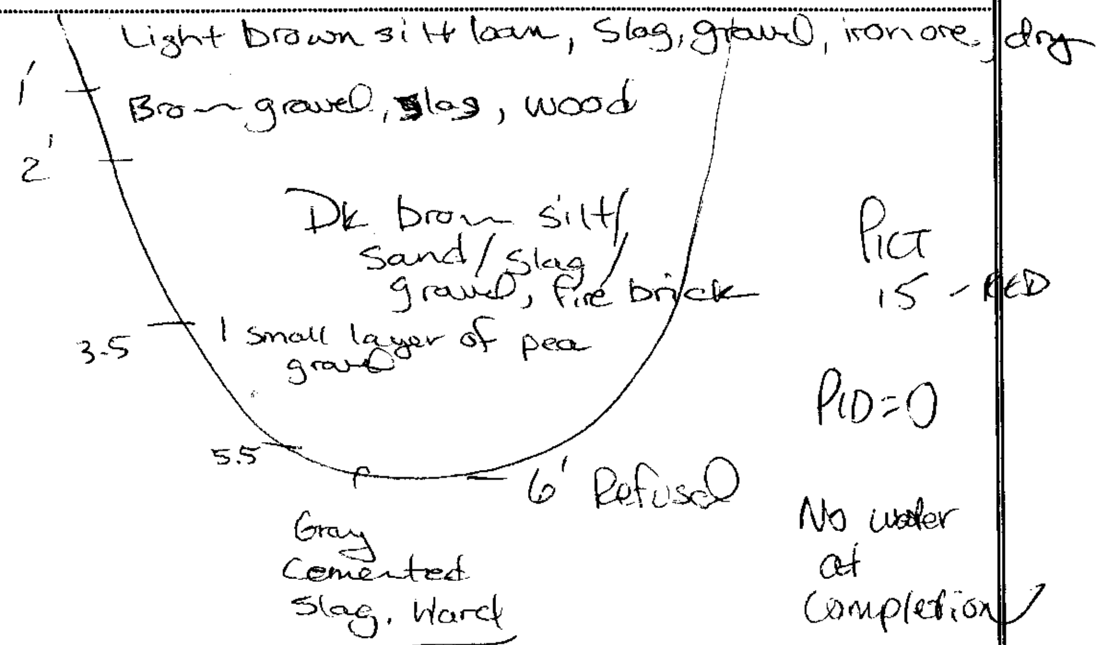
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q25	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/23/99	**Logged By:**	TMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

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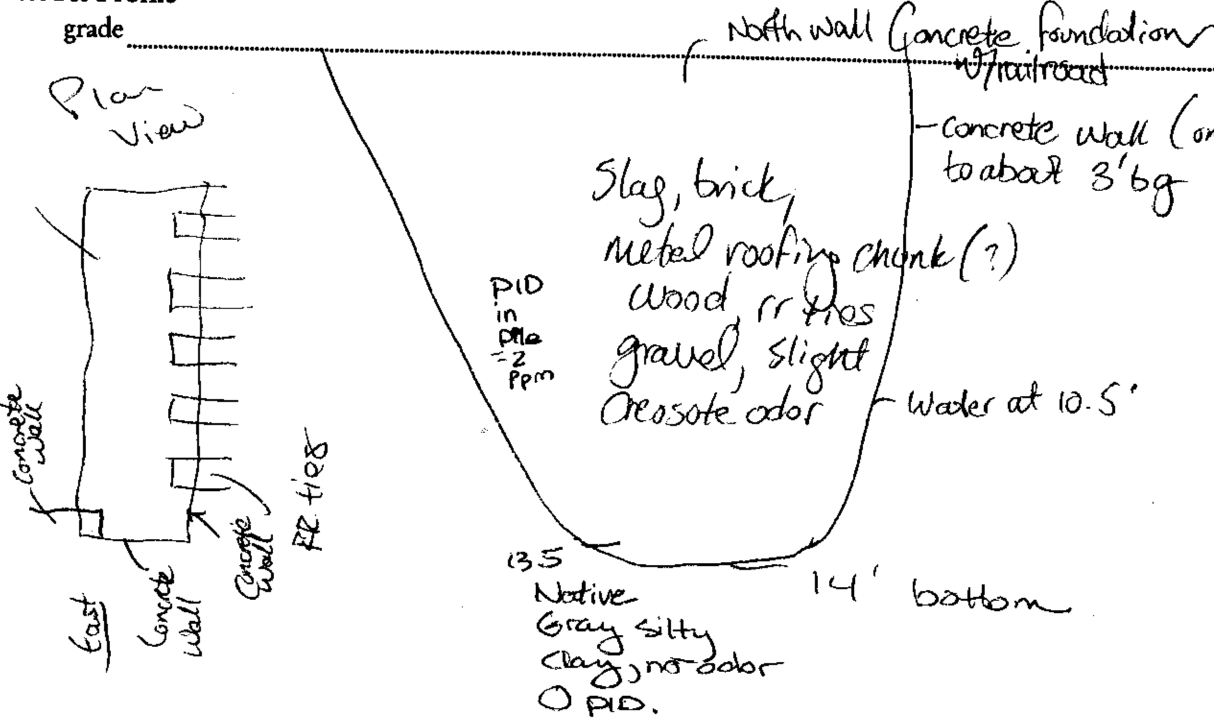
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-026	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/23/99	**Logged By:**	BMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile



PICT 16,17,18

Suggest that may be heated switch.

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

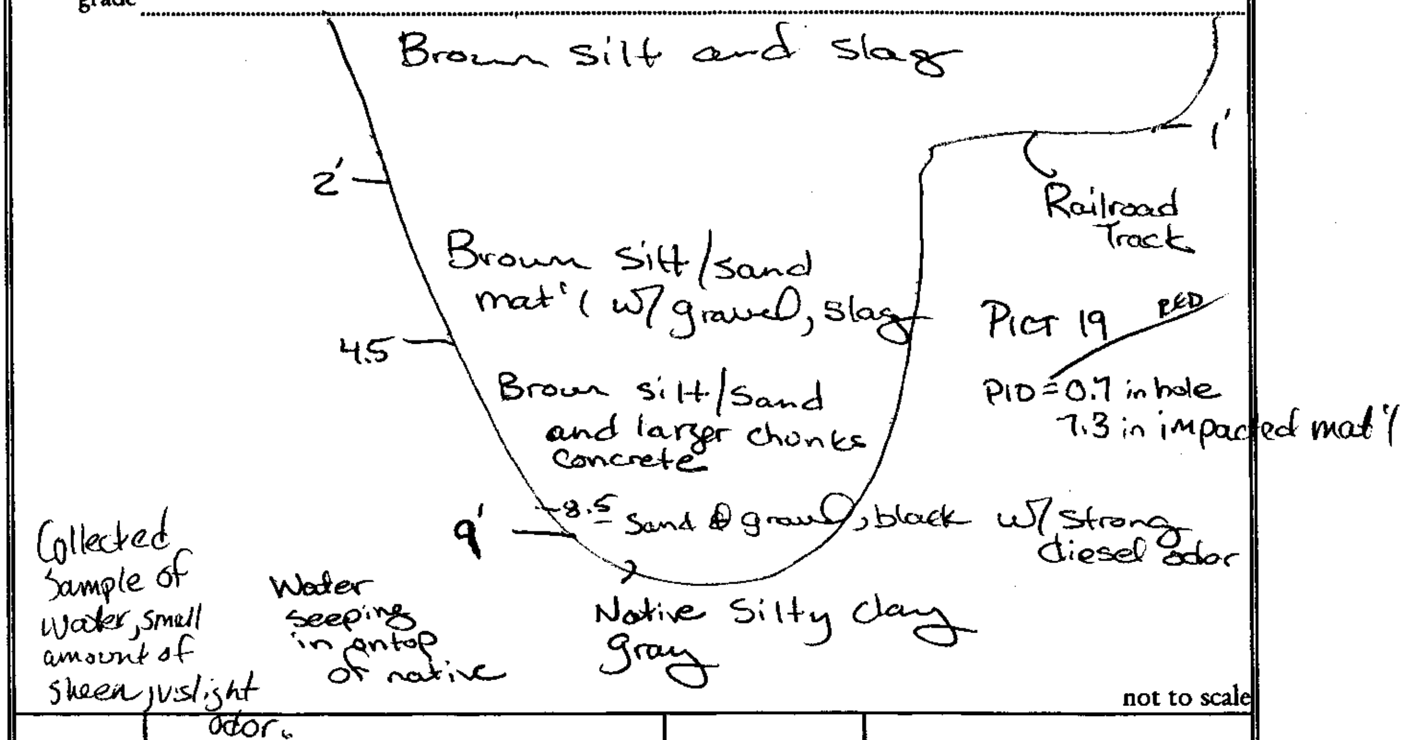
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	Al-TP-Q27	**Project:**	Area I Invest.
Location:		**Project No:**	0002-005
Date:	7/26/99	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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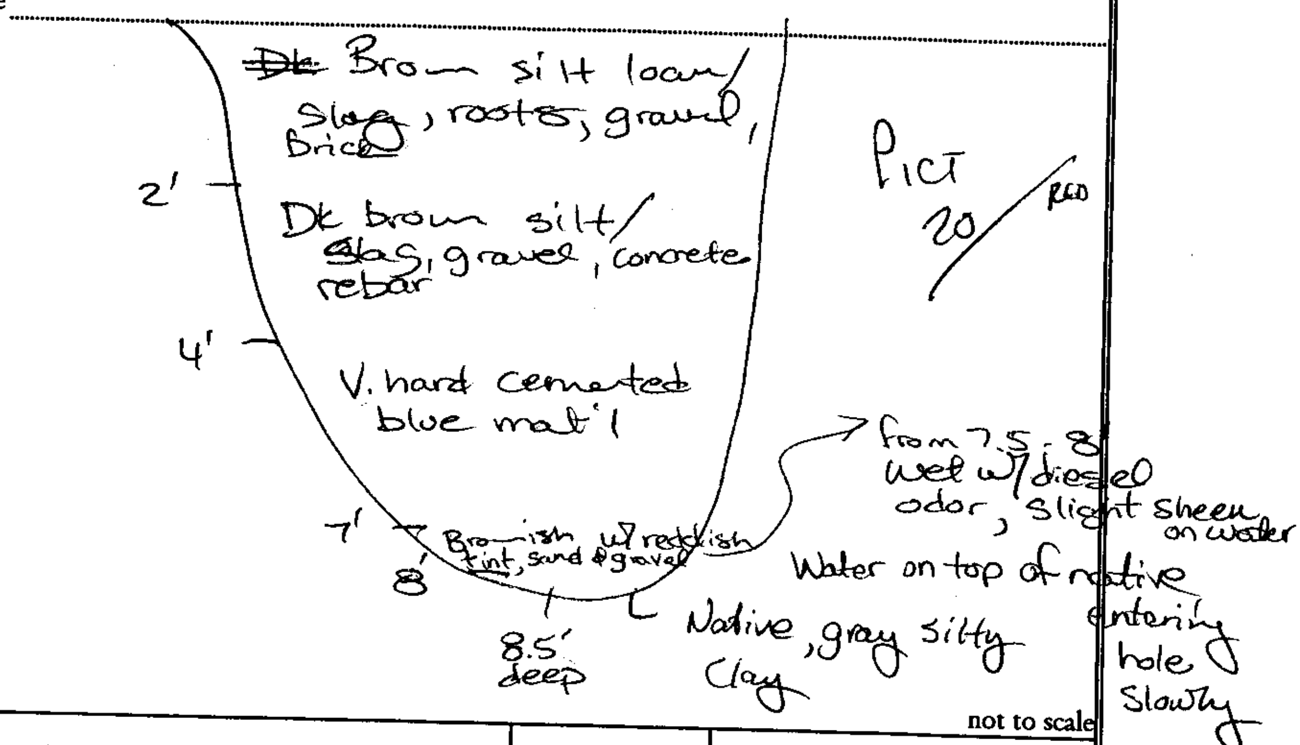
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-Q28	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-065
Date:	7/26/99	**Logged By:**	[illegible]/RCD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

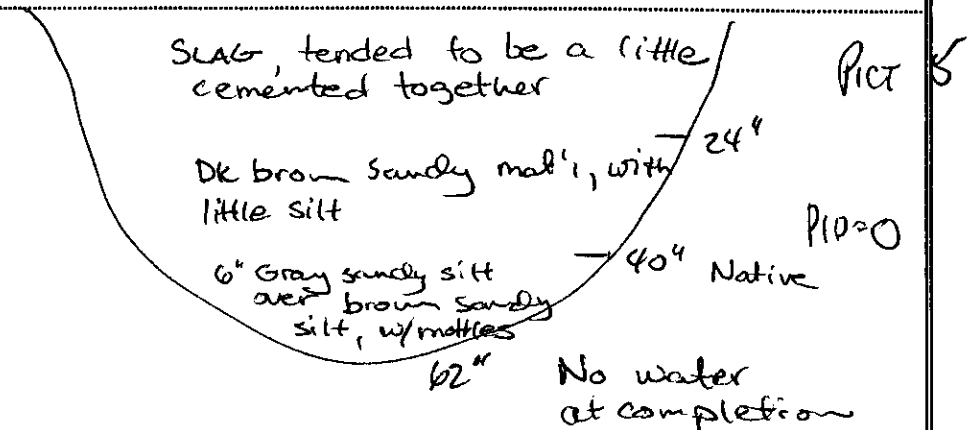
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-R1	**Project:**	Area I Invest.
Location:	as shown	**Project No:**	0602-005
Date:	7/15/99	**Logged By:**	TMA/ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

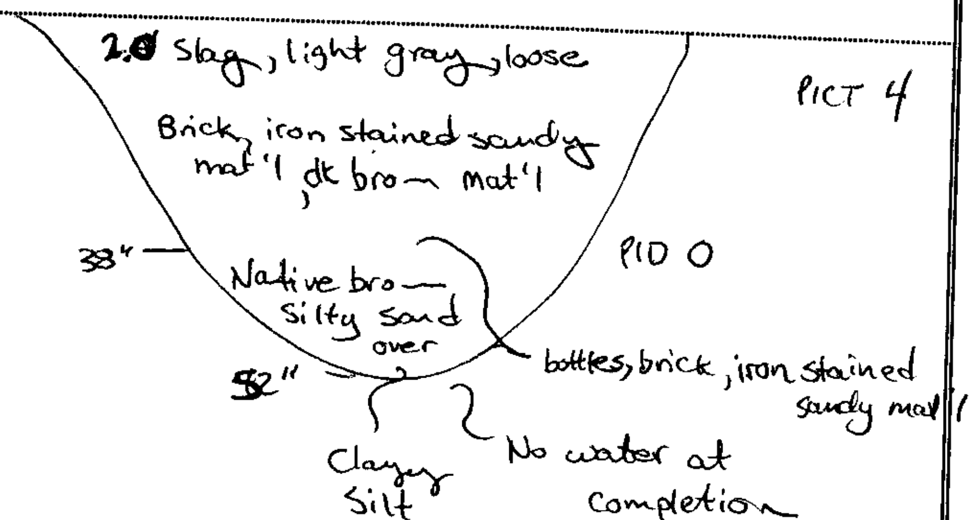
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	AI-TP-RZ	**Project:**	Area 1 Invest.
Location:	As shown	**Project No:**	0002-003
Date:	7/15/99	**Logged By:**	JMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

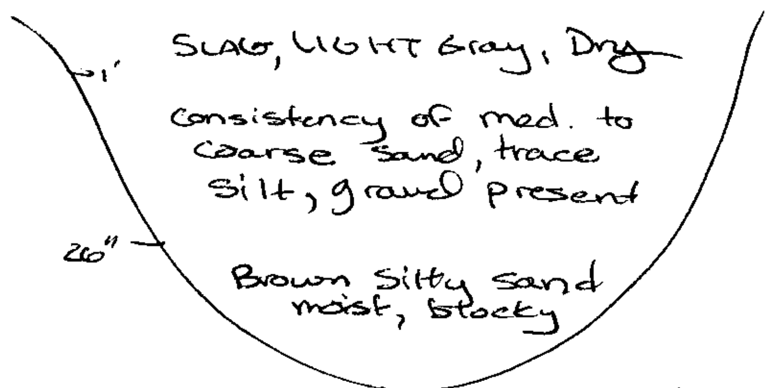
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-R3	Project:	Area I Invest.
Location:	as shown	Project No:	0002-005
Date:	7/15/99	Logged By:	JWD/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Pict. 3

59" TOTAL DEPTH

No water at Completion

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

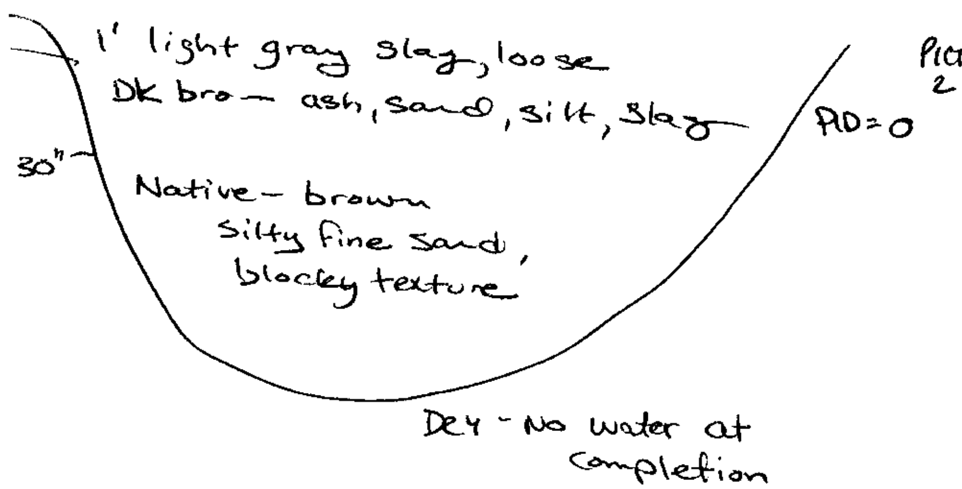
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.: A1-TP-R4	**Project:** Area 1 Invest.
Location: as shown	**Project No:** 0002-005
Date: 7/13/99	**Logged By:** JWA/RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

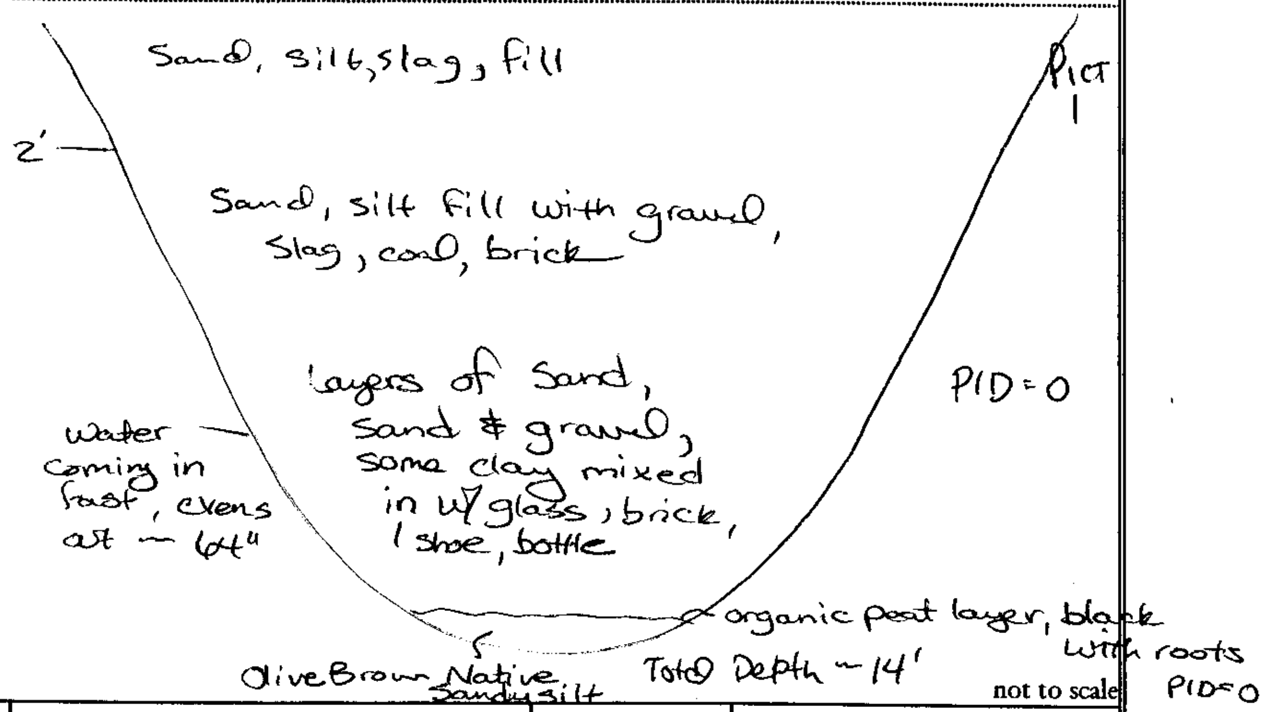
Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-R5	**Project:**	Area I Invest.
Location:	A1-TP-R5	**Project No:**	0002-005
Date:	7/15/99	**Logged By:**	JMA/RLD
Excavation Method:	Backhoe, Liebherr 932		

Test Pit Profile

grade



not to scale

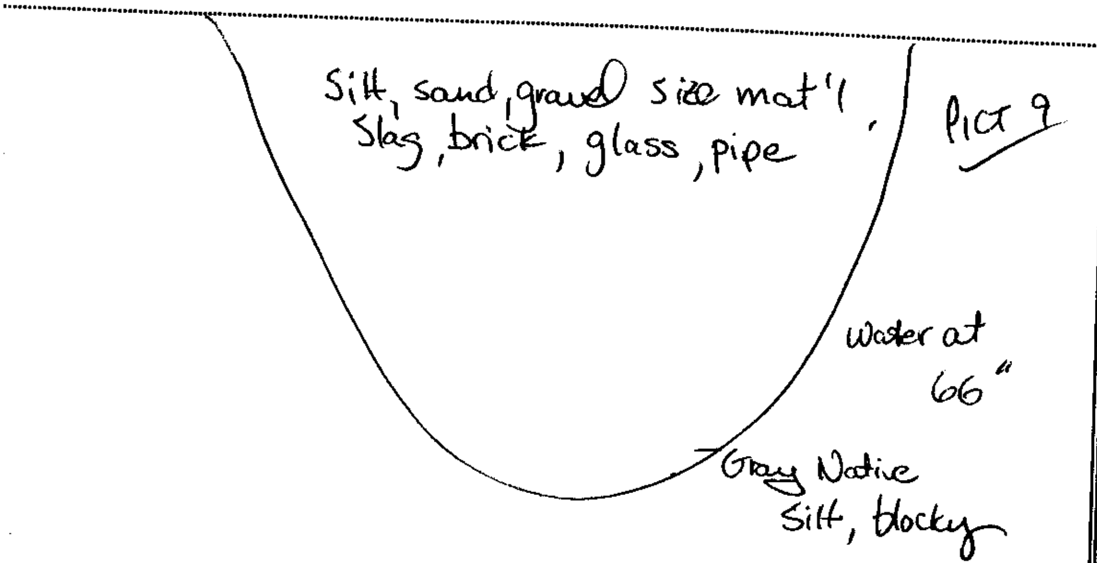
Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-R6	**Project:** Area 1 Invest.
Location:	**Project No:** 0002-005
Date: 7/15/99	**Logged By:** JMM/RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

Lab p. 1-up

TurnKey Environmental Restoration, LLC

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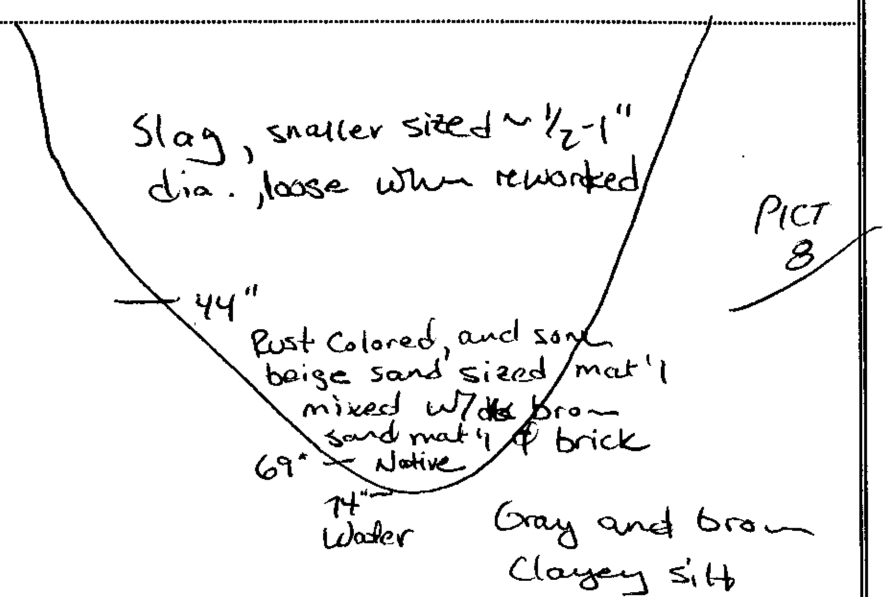
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-R7	Project:	AREA 1 Invest.
Location:		Project No:	0002-005
Date:	7/15/99	Logged By:	JWA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

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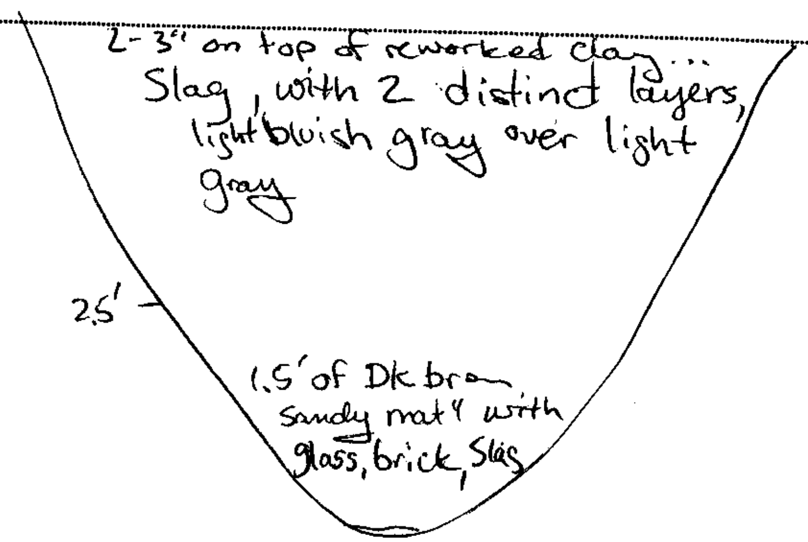
FIELD TEST PIT LOG

Test Pit No.:	Al- TP-R8	Project:	Area 1 Invest.
Location:		Project No:	0002-005
Date:	7/15/99	Logged By:	JMA/RLD
Excavation Method:	Liebharr 932		

Test Pit Profile

grade



Pict 7

PID=0

48" Native
No water at completion.

Brown Sandy Silt, Moist, blocky

not ~~to~~ scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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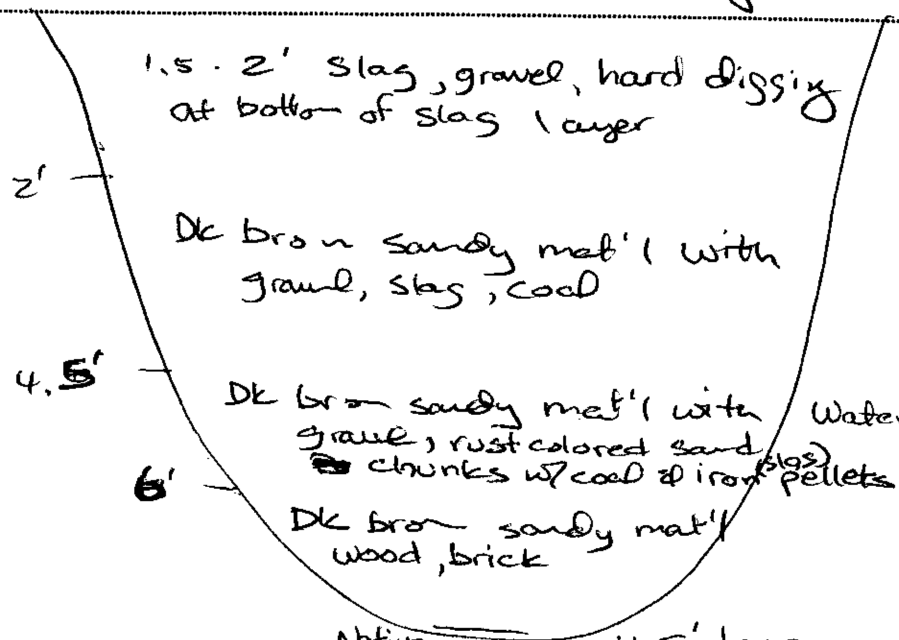
FIELD TEST PIT LOG

Test Pit No.:	AI-TP-R9	**Project:**	Area I Invest.
Location:	as shown	**Project No:**	0002-003
Date:	7/15/99	**Logged By:**	JMA / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

refusal at original location, move east ~15', refusal again at ~1.5' below on molten cemented slag

grade



Separate archive sample of rust-orange mat'l

not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-S-1	**Project:** AREA-1 Invest
Location:	**Project No:** 0002-003
Date: 7/20/99	**Logged By:** RCD
Excavation Method: Liebherr 932	

Test Pit Profile

grade N S

0-12" Bituminous ~~Top~~soil & SLAG mixed

12"-2' Asphalt & SLAG LAYER - HARD

2-8' BRN SAND mixed w/ cinders/GRAVEL
BRICK material

Native at 5' LT BRN silty CLAY - moist.

Pic #27
PID - 0ppm

not to scale

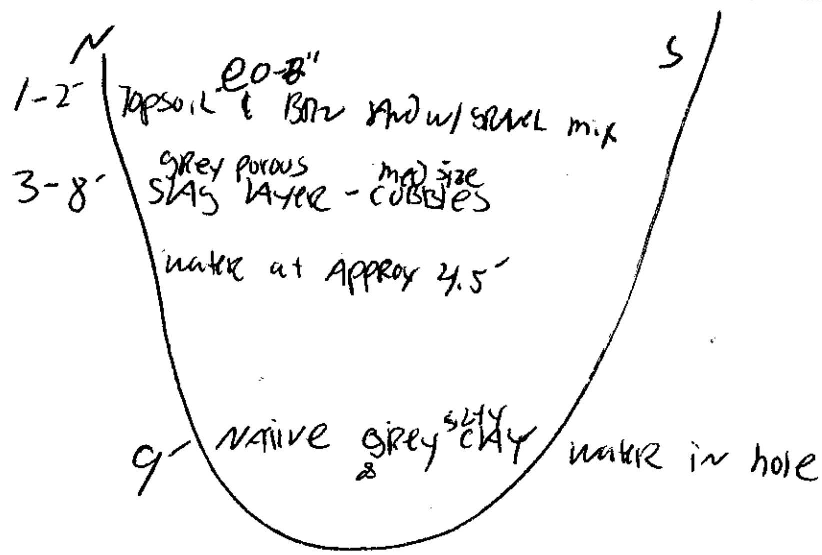
Depth bgs	Soil Description	Samples– Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1 TP S-2	**Project:**	AREA 1 ZVV
Location:		**Project No:**	0002-005
Date:	7/20/99	**Logged By:**	RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



pic #26

PID - 0ppm

not to scale

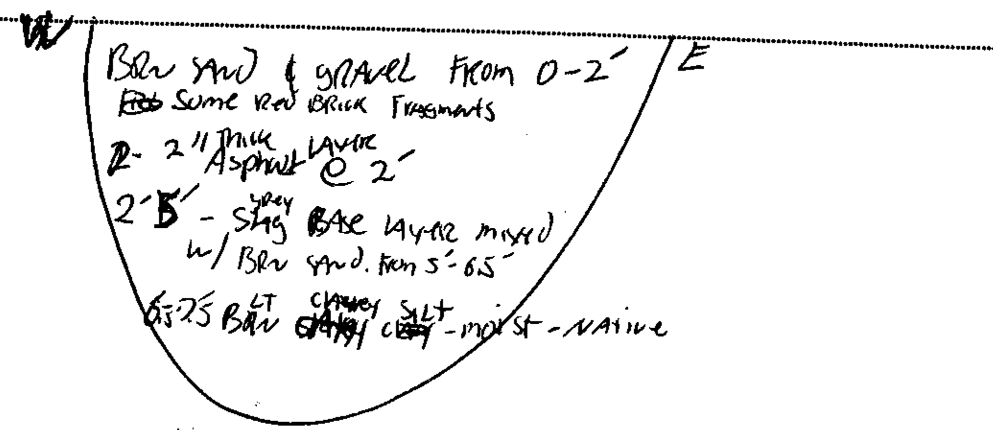
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1 TP S3	**Project:**	AREA 7 Inv
Location:		**Project No:**	0002-005
Date:	7/20/99	**Logged By:**	R4D
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



~~7.5'~~ water entering @ 7.5' Bottom of Hole

PIC #24

PID - 0ppm

TAR ODOR FROM ASPHALT LAYER DETECTED

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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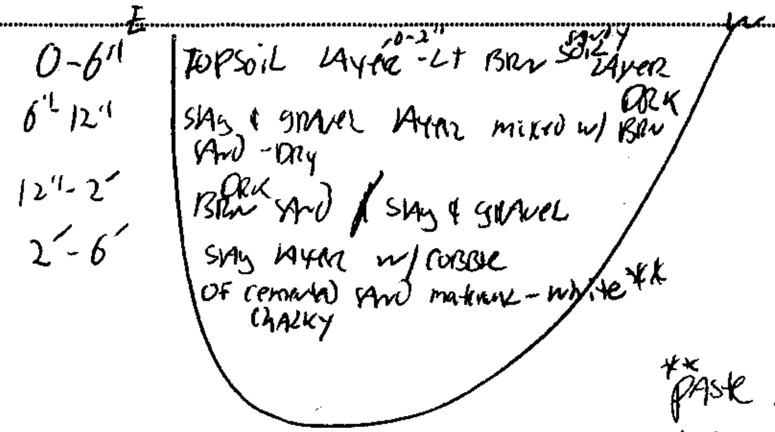
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-S4	**Project:**	AREA 1 Invest
Location:		**Project No:**	0002-005
Date:	7/20/99	**Logged By:**	RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



** PASTE LIKE MATERIAL WHEN WET

REFUSAL @ 6'
NO WATER
PID - 0PPM

PIC #25

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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FIELD TEST PIT LOG

Test Pit No.:	A1 TP-5-5	Project:	AREA-1 Inv
Location:		Project No:	0002-005
Date:	7/20/99	Logged By:	RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

6" - BRN SAND & GRAVEL / ROOTLETS

1-2' GREY SLAG LAYER - W/ POWDER GREY SAND FILL

2'-7' FILL - BRN SAND & SLAG W/ BRICK AND FOUNDRY - REBAR / BUILDING BRICK

7-8' NATIVE LT BRN CLAYEY SANDY SILT W/ RUST MOTTLING

PIC #23

PID - 0 ppm

not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

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FIELD TEST PIT LOG

Test Pit No.:	A1-TP 56	Project:	AREA-1 INV
Location:		Project No:	0002-005
Date:	7/20/99	Logged By:	RCD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

0-3' BRICK LT BRN SAND, Building Debris

3-5' Grey colored Slag layer

5-6.5' DRK BRN SAND w/Red BRICK

@ 7' Rust colored Slag layer

7-9' CLAY-native grey gumbo layer at 7' -water in Hole

Pic #22

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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FIELD TEST PIT LOG

Test Pit No.:	A1- ~~[illegible]~~ TP S-7	Project:	AREA-1 Inv
Location:		Project No:	0002-005
Date:	7/20/99	Logged By:	RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

0-6" - grey cobble slag layer

6"-12" - Drk Brn sand layer w/ small gravel & slag

1'-7.5' - slag layer cobbley - water in hole.

Refusal @ 7.5'

Pic #21

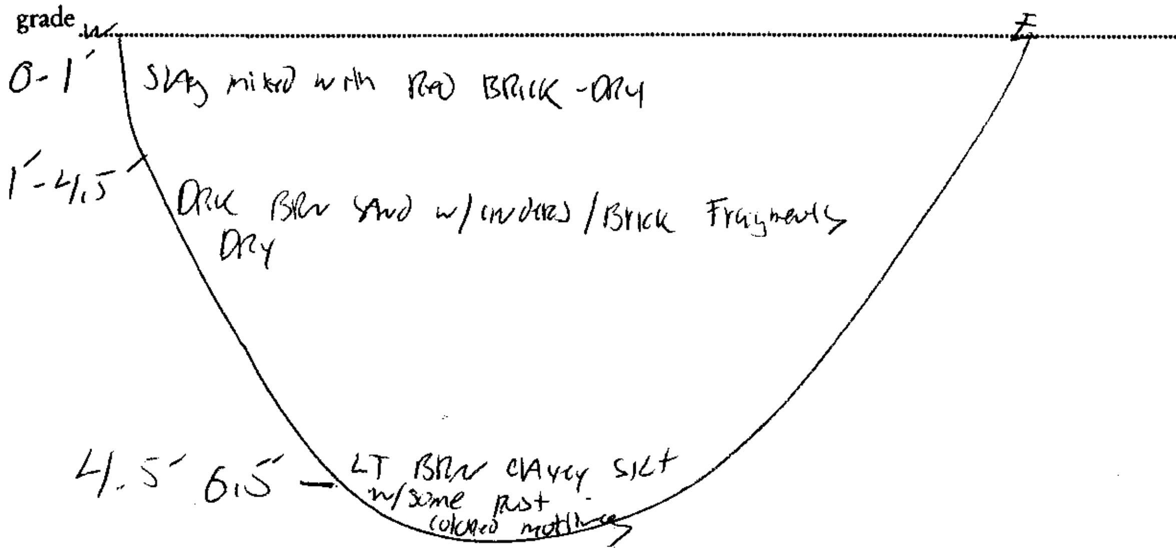
not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-58	**Project:**	AREA 1 - Inv
Location:		**Project No:**	0002-005
Date:	7/20/99	**Logged By:**	RLD
Excavation Method:	Liebherr 932		

Test Pit Profile



pic #20

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1 TP-59
Location:
Date: 7/20/99
Excavation Method: Liebherr 932

Project: AREA 1 INV
Project No: 0002-005
Logged By: [illegible]

Test Pit Profile

grade

N

0-2.5' LT RED-BROWN SAND & RED WHITE BRICK METAL BUILDING DEBRIS/ROOTLETS

2.5-6.5' DRK BRN SAND -FILL w/ GRAVEL & BRICK FRAGMENTS

6.5-7.5' DRK GREY ~~CLAY~~ CLAYEY SILT ~~CLAY~~ LAYER - NATIVE

7.5-8' LT-BRN CLAYEY SILT w/ SOME MOTTLING

PIC #19

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-S-10	**Project:** AREA 1 IW
Location:	**Project No:** 0002-005
Date: 7/20/99	**Logged By:** RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade

0-2.5' FILL material - BRICK w/ BRN SAND & GRAVEL MIX / ROOTLETS

2.5-8' BT BRN / GREY SILTY CLAY SMALL lense OF DRK GREY SILT @ 3.5' NATIVE
BLK HUMUS peat material

PIC #18

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

Appendix B

Test Pit Logs/Soil Borings from Gas Holder Subarea

TurnKey Environmental Restoration, LLC

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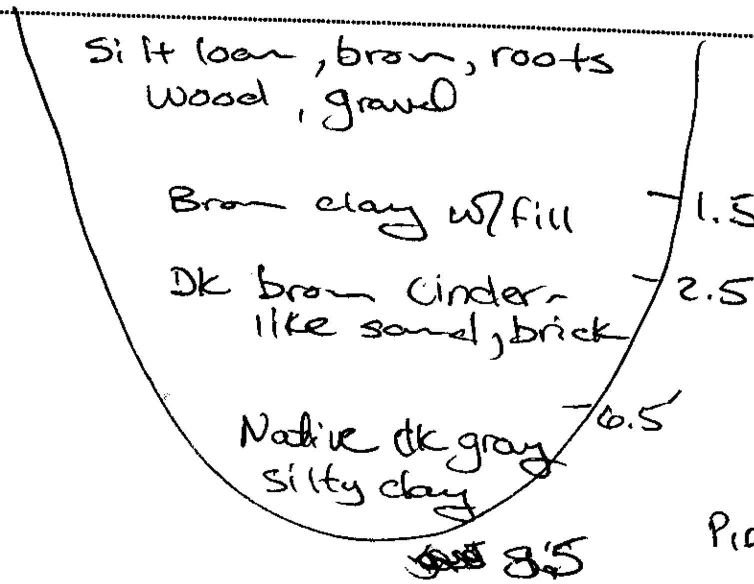
FIELD TEST PIT LOG

Test Pit No.:	AZ - TP - GH 1	**Project:**	Area 2 Invest.
Location:		**Project No:**	0002 - 003
Date:	7/29/99	**Logged By:**	SMM/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



continued TP on to the south see notes below

Pict 11

PID=0

No water

not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth
	edge holder 23' from GH 1 stake (to the south)		
		6'	- Holder Foundation
			Native
			Brown silty clay, water coming in on top of native below holder foundation
		10' deep	

Pict 12

No odor, no impacted soil

TurnKey Environmental Restoration, LLC

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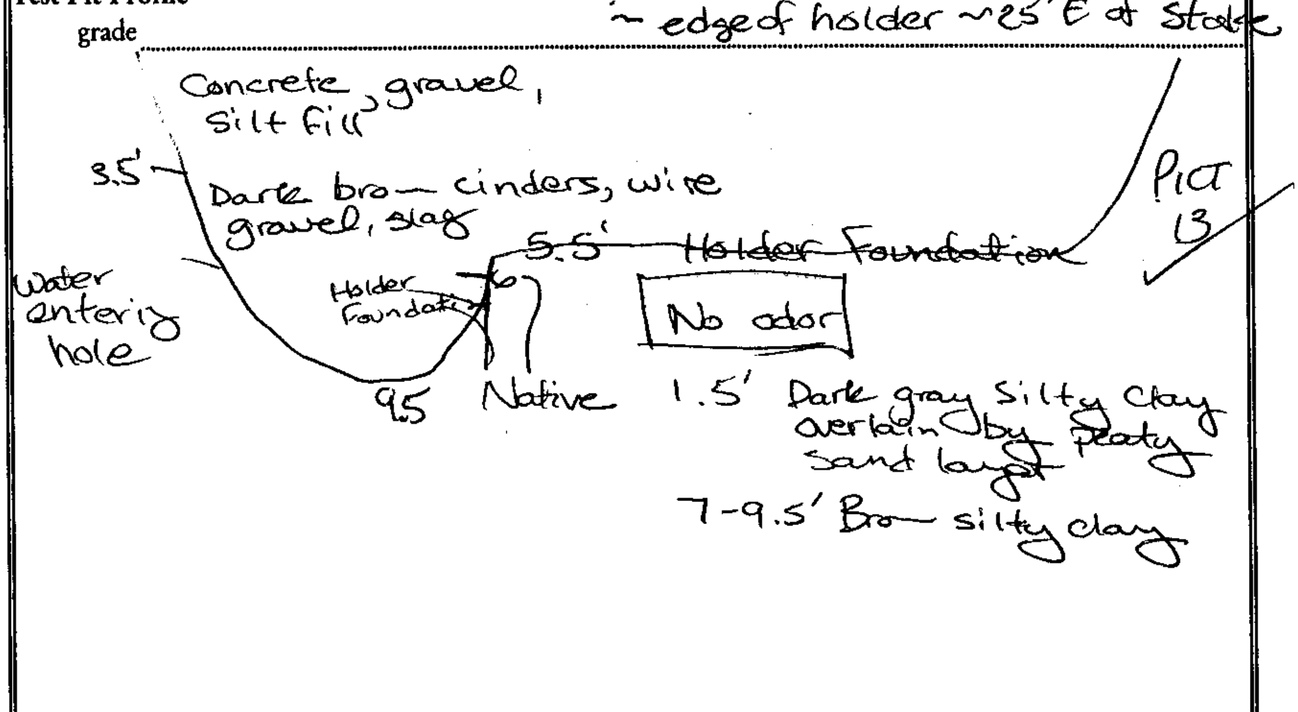
FIELD TEST PIT LOG

Test Pit No.:	A2 - TP - GH2	Project:	Area I Invest.
Location:		Project No:	0002.008
Date:	7/29/99	Logged By:	TMA/RLD
Excavation Method:	Liebherr 932		Composite 296

Test Pit Profile



not to scale

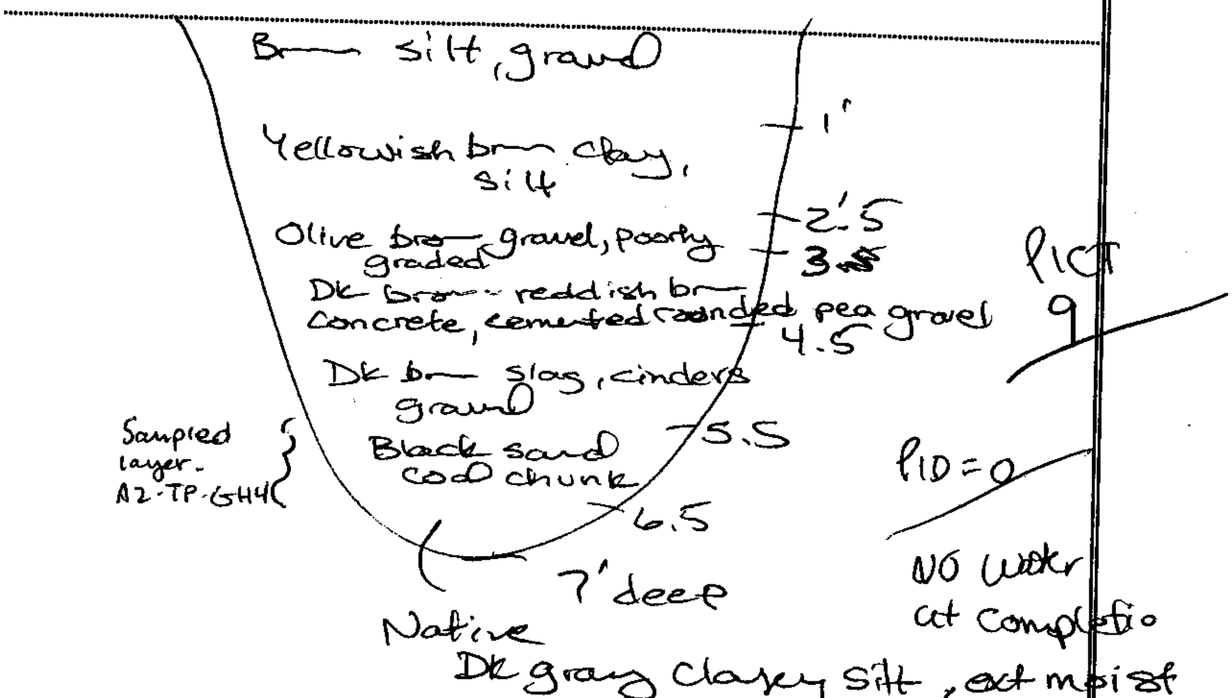
Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A2-TP-GH4	**Project:**	Area 2 (Gas Holder Invest)
Location:		**Project No:**	0002-003
Date:	7/29/99	**Logged By:**	JMA / ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



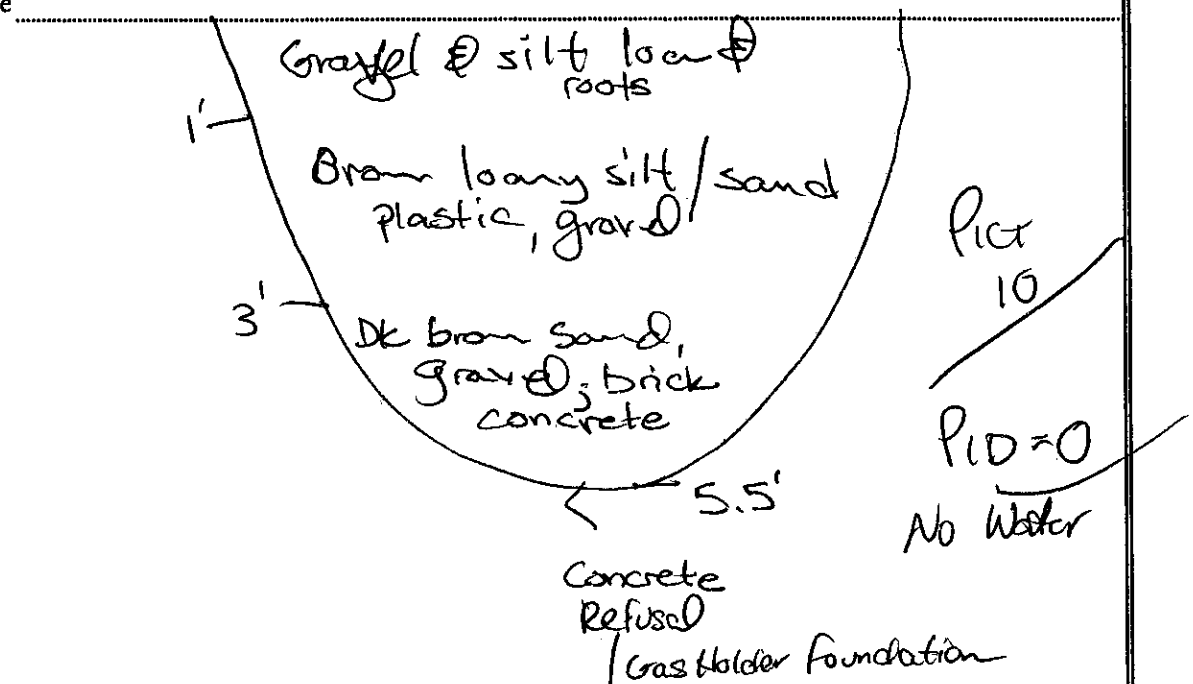
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A2-TP-GH5	**Project:** Gas Holder Invest.
Location:	**Project No:** 0002-005
Date: 7/29/99	**Logged By:** JMA/RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

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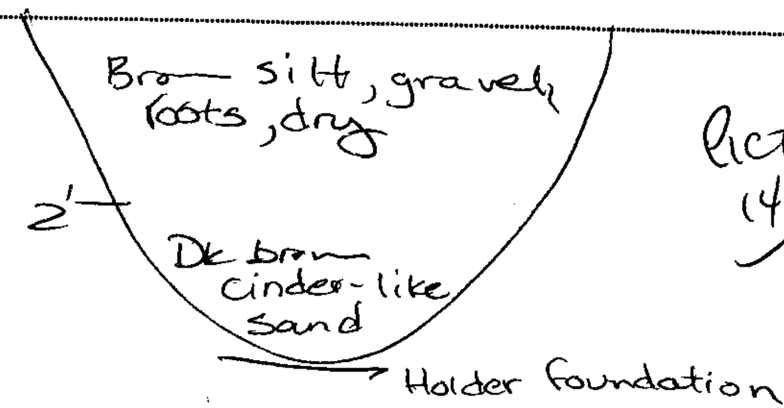
FIELD TEST PIT LOG

Test Pit No.:	A2-TP-GH6	**Project:**	Area 2/Gas Holder Invest)
Location:		**Project No:**	0002-003
Date:	7/29/99	**Logged By:**	JMA/RHD
Excavation Method:	Liebherr 932		
		Composite 2 & 6	

Test Pit Profile

grade



Pict 14

No Water

not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth
	A2-TP-GH3 not performed because		
	location is too close to Barge.		
	NYSDEC satisfied with edge		
	investigation.		

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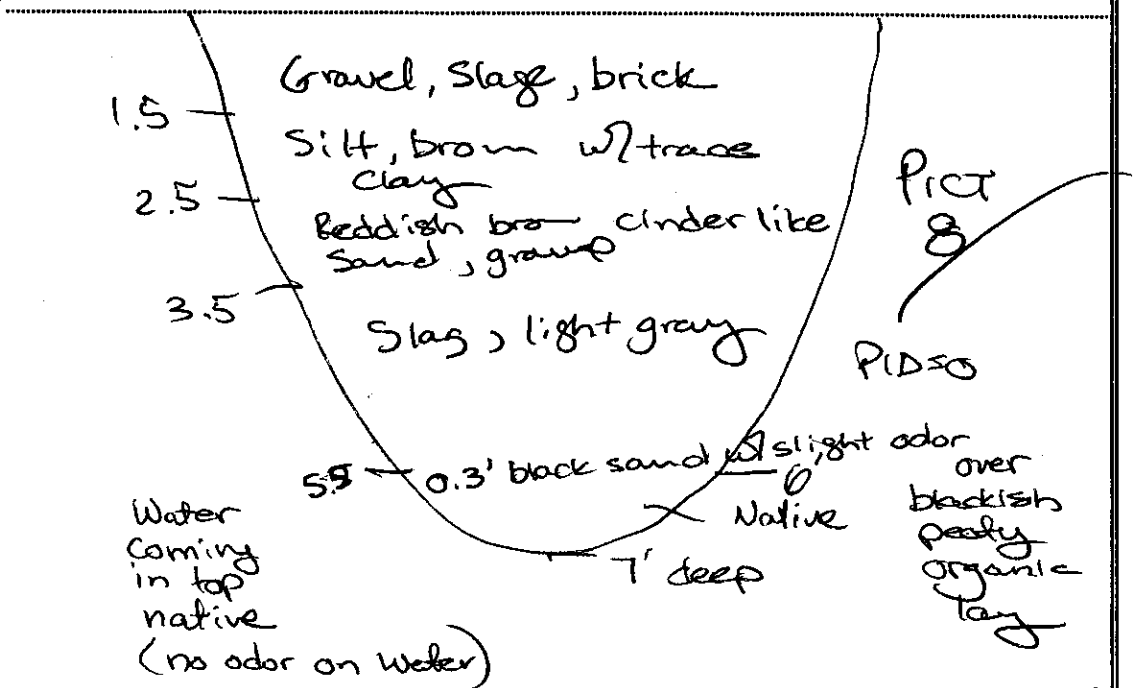
FIELD TEST PIT LOG

Test Pit No.:	AR - TP - GHT	**Project:**	Area 2 Invest.
Location:		**Project No:**	0002-003
Date:	7/29/99	**Logged By:**	DMA / RLD
Excavation Method:	Liebherr 932		Sample, composite 7,10,8

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

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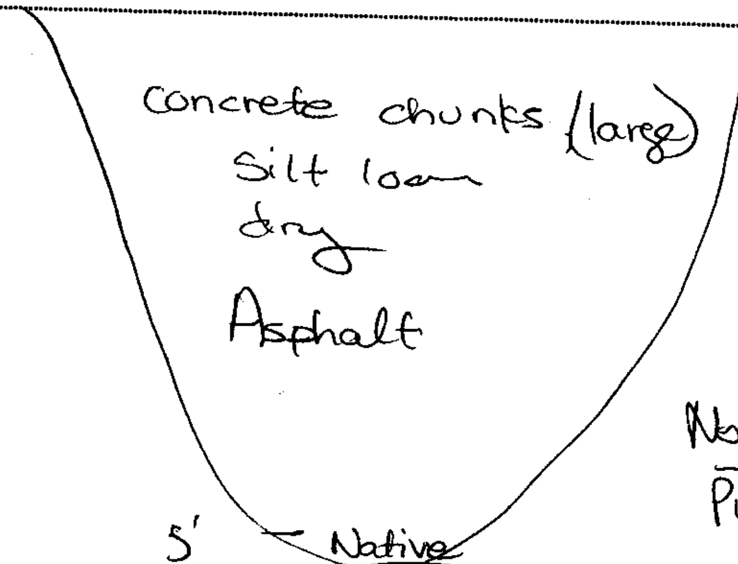
FIELD TEST PIT LOG

Test Pit No.:	A2-TP-GH8	**Project:**	Area 2 Invest.
Location:		**Project No:**	0002-003
Date:	7/29/99	**Logged By:**	JMP/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



PID=0

No Water

PICT 6

Dk Gray
Silt, ext moist

Hole 5.5' deep

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A2-TP-049	**Project:**	Area 2 Invest.
Location:		**Project No:**	0002-003
Date:	7/29/99	**Logged By:**	DMD/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile composite 9, 11, 12 Test Pits

grade

~~Dk~~ Brown dry loam w/ roots over brick, concrete, rebar easy digging, Pipe, blocks, wood, gravel

PID=0

PICT 6

5'

No water at completion.

Native

6' deep

Gray clayey silt, ext moist

not to scale

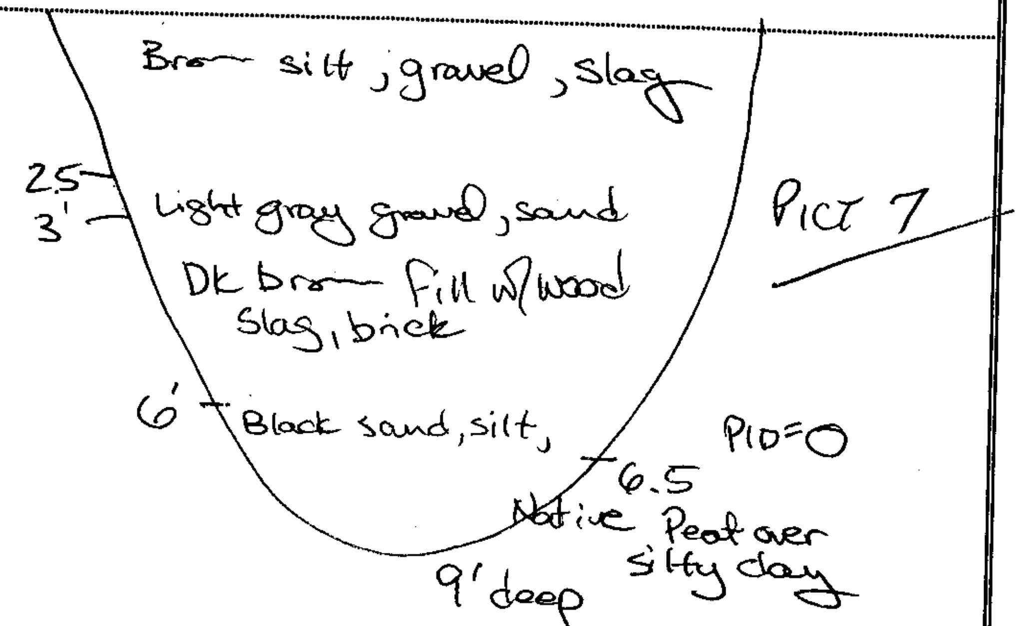
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A2-TP-GZ#10	**Project:**	Area 2 Invest.
Location:		**Project No:**	0002-003
Date:	7/29/99	**Logged By:**	JMN/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

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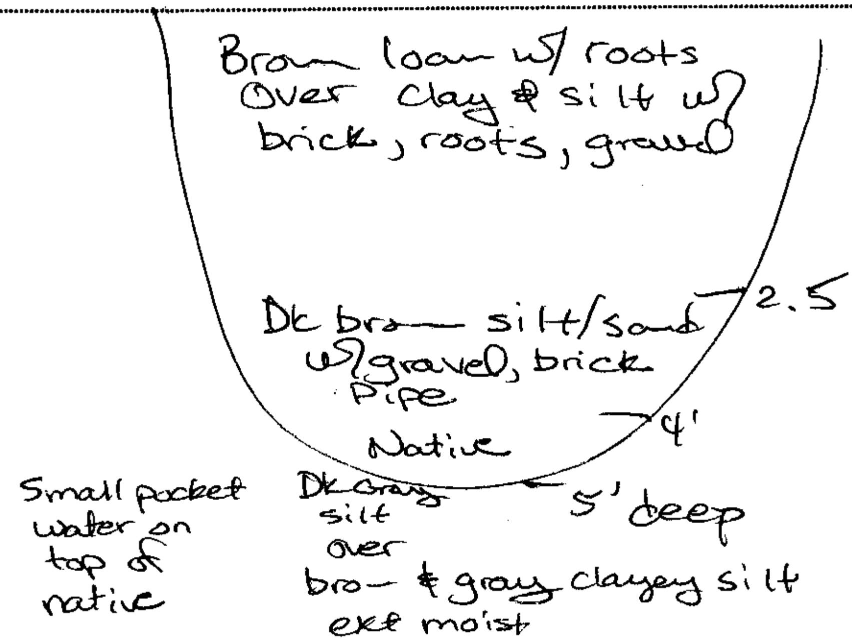
FIELD TEST PIT LOG

Test Pit No.:	A2 - TP - GH 11	**Project:**	Area 2 Invest.
Location:		**Project No:**	0302-003
Date:	7/29/99	**Logged By:**	TWM / RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



PID=0

Pict
4

No water
at completion

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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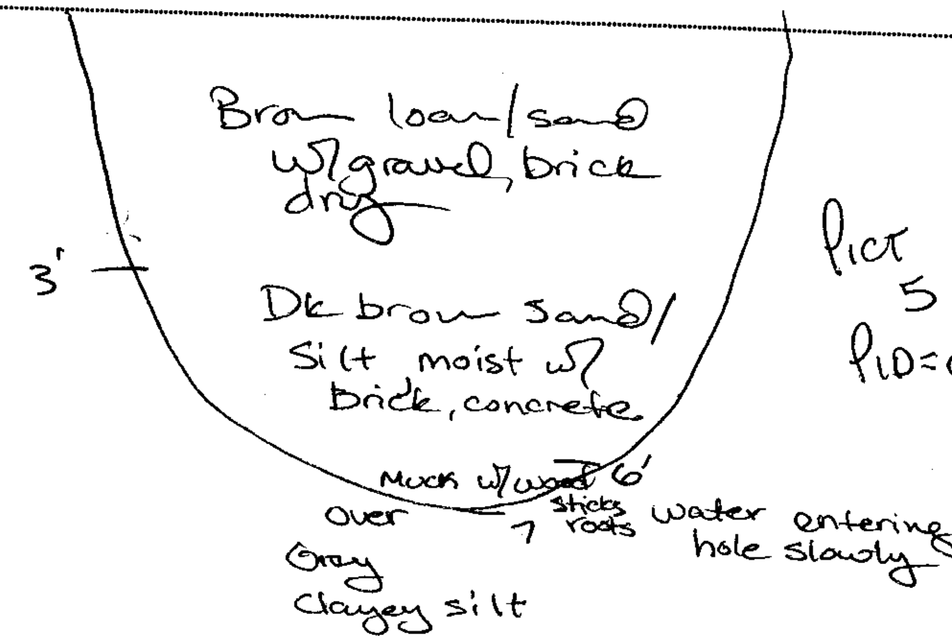
FIELD TEST PIT LOG

Test Pit No.:	A2-TP-GH12	**Project:**	Area 2 Invest.
Location:		**Project No:**	0002-003
Date:	7/29/99	**Logged By:**	DMD/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Pict
5
PID=0

not to scale

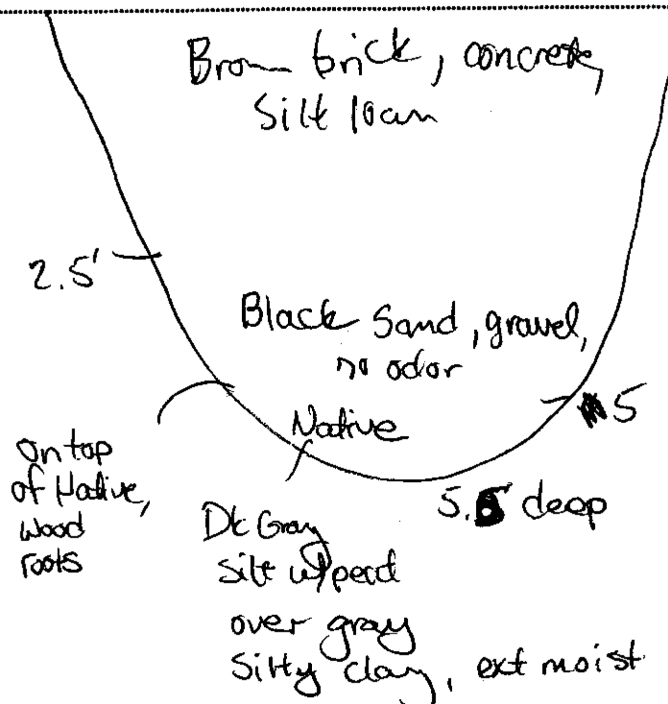
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A2-TP-GH13	**Project:** Area 2 Invest.
Location:	**Project No:** 0002-003
Date: 7/29/99	**Logged By:** MMD/RLD
Excavation Method: Liebherr 932	

Test Pit Profile

grade



PID=0

PICT 24

No water at completion.

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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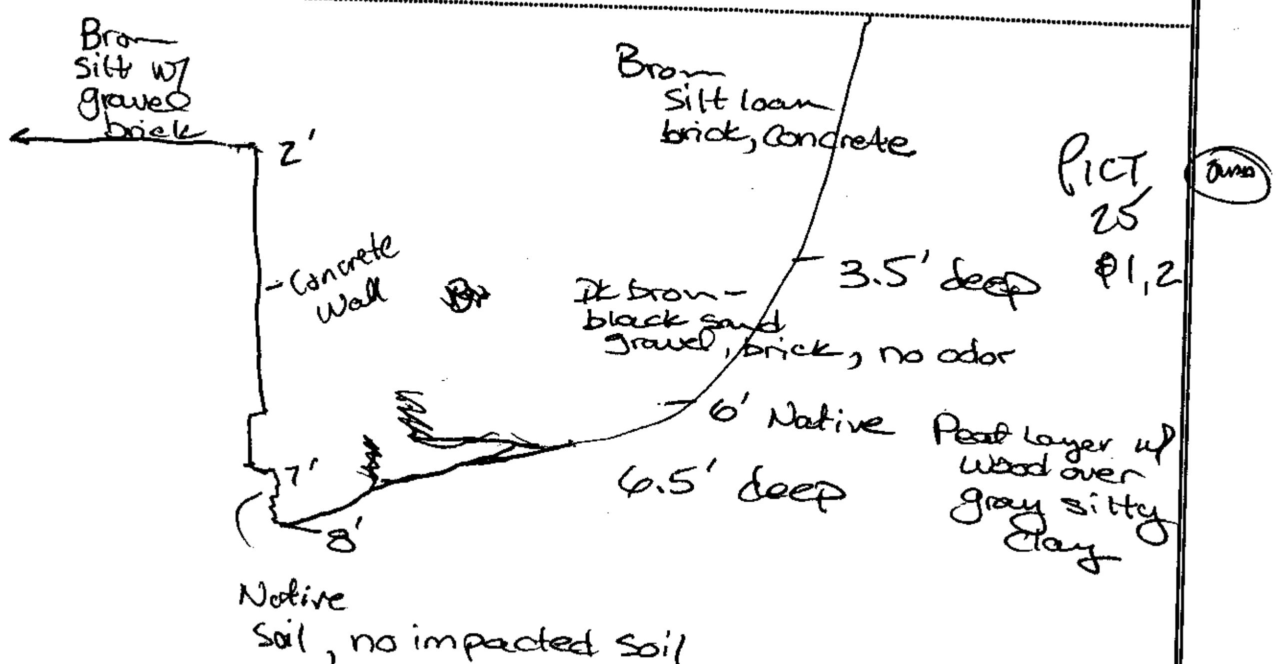
FIELD TEST PIT LOG

Test Pit No.:	AR-TP-GH14	Project:	Area 2 Invest.
Location:		Project No:	0002-003
Date:	7/29/99	Logged By:	JMD/RCD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD BOREHOLE LOG

Borehole No.:	A2-SB-GH1	Project:	Area 2-Gas Holder Inv.	Surface Elev.:	
Location:	North ~15' from GH6	Project No:	0002-003	Ref. Elev.	
Date(s):	9/1/99	Logged By:	JMA		
Drilling Method:	CME	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0					Advance 4¼" HSA to 5.5' below grade at refusal.			
2								
4								
					Use roller bitt from 5.5 to 6.2', able to lower roller			
6					bit assembly & rod to 7.2'. Clay on bottom of roller bit			
					assembly, no odor or evidence of contamination.			
7		1	1.4'		0.2 Gray silty clay, ext. moist, no odor on top of			
		2			native.			
		2			1.2' Gray w/ orange mottles, ext. moist, silty clay, no odor			
		3			or evidence of contamination			
9		2	0.5		0.5 As Above			
		3						
		2						
		3						
11		3	0.5		0.5 Brown silty clay, moist, stiff, no odor or			
		2			evidence of contamination.			
		1						
		1						
					Boring complete at 13' below grade.			

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FIELD BOREHOLE LOG

Borehole No.: AZ-SB-GHZ
Location: South 20' of GHS
Date(s): 9/1/99
Drilling Method: CME
Project:
Project No:
Logged By:
Drilling Co.:
Surface Elev.:
Ref. Elev.:

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0								
2								
4								
					Roller bit from 5-6'. Driller reports about 0.3' Void under foundation			
6		1	1.0'		Gray silty clay, ext moist no odor or evidence of contamination			
		1						
		1						
		1						
8		2	1.3'	0	A/A becoming mottled w/ orange at ~9' ext moist to moist, Silty clay			
		2						
		3						
		3						
10		4	0.2'	0	A/A			
		3						
		4						
		4						
					Boring complete at 12' below grade.			

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FIELD BOREHOLE LOG

Page ____ of ____

Borehole No.:	AZ-SB-G43	Project:	
Location:	~20'E of northern TP by little ladder	Project No:	
Date(s):	9/1/99	Logged By:	
Drilling Method:	CME 4 1/4" Augers	Drilling Co.:	

Surface Elev.:

Ref. Elev.

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0								
				0	Black soil came up in augers at ~7.5'			
8			1.6	0	Brown & gray moist silty clay			
				0				

Sample AZ-SB-G43 did not have property of tar - did not smear spatula, creosote odor

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FIELD BOREHOLE LOG

Borehole No.:	AZ-SB-GH4	Project:	Gas Holder Invest.	Surface Elev.:	
Location:	10' S of TP GH13	Project No:	0002-003	Ref. Elev.	
Date(s):	9/1/99	Logged By:	JMA		
Drilling Method:	CME	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
					Advanced 4¼" HSA to 5' below grade.			
5		3	1.3	0	Gray mottled brown silty Clay, ~~wet~~ moist.			
		3			No odor or evidence of contam.			
		4						
		4						
					Boring complete at 7' below grade.			

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FIELD BOREHOLE LOG

Borehole No.:	A2-SB-GH5	Project:	Area 2 - Gas Holder Inv.
Location:	2' from east end of TP-GH14	Project No:	0002-003
Date(s):	9/1/99	Logged By:	JWS
Drilling Method:	CME	Drilling Co.:	SJB

Surface Elev.:
Ref. Elev.:

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
					Advance HSA to 4' bg. Auger through very hard layer from ~3-4'. Seems like slag			
4		3	1.6	0	1.2 Gray & Brown fill w/ gravel, slag, silt			
		2		0	0.2 Black sandy mat'l & brick, v. slight odor			
		2		0	0.2 Dk gray clayey silt, moist			
		2						
6		2	1.2	0	1.2 Gray w/ orange mottles silty clay, no odor, moist, wet top native			
		2						
		3						
		3						
					Boring complete at 8' below grade.			

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FIELD BOREHOLE LOG

Borehole No.:	A2-SB-GH6	Project:	Gas Holder Invest	Surface Elev.:	
Location:	at TP-14	Project No:	0002-003	Ref. Elev.	
Date(s):	9/1/99	Logged By:	JWA		
Drilling Method:	CME	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
					Advanced 4 1/4" HSA to 2.2'. Roller bit to 3.2'.			
3			1.2	0	0.2 Silt & clay, gray, disturbed			
					1.0 Dk gray silt, sand, wood, no odor or evidence of contam.			
5			0.9	0	0.9 Gray w/ orange mottles, moist silty clay, no odor or evidence of contamination			
					Boring complete at 7' below grade.			

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FIELD BOREHOLE LOG

Borehole No.:	A2-SB-GH7	Project:	Area 2-Gasholder
Location:	15' East from A3-SB-GH6	Project No:	0002-003 Invest
Date(s):	9/1/99	Logged By:	JMA
Drilling Method:	CME	Drilling Co.:	SJB

Surface Elev.:
Ref. Elev.:

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
					Auger to 1.5'. Concrete at 1.5'. Refusal			

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FIELD BOREHOLE LOG

Borehole No.:	A2-SB-GH8	Project:	Area 2- Gas Holder Inv.	Surface Elev.:	
Location:	15' E of A2-SB-GH3	Project No:	0002-003	Ref. Elev.	
Date(s):	9/1/99	Logged By:	JMA		
Drilling Method:	CME	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
					Advance 4¼" HSA to 4'			
					Black mat'l came up auger flights ~3-4' - Sample A2-SB-GH8		✓	
4		3	10	0	Gray silty clay w/ trace orange mottling, moist			
		4						
		3						
		3						
					Boring complete at 6'			

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FIELD BOREHOLE LOG

Borehole No.:	A2-SB-GH9	Project:	Area 2-Gas Holder Invest.	Surface Elev.:	
Location:	on little berm by road edge of road, east of A2-GH8	Project No:	0002-003	Ref. Elev.	
Date(s):	9/1/99	Logged By:	JMA		
Drilling Method:	CME	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0					Advance 4¼" HSA to 3.5'			
2								
3.5		10	0.3	0	0.3 Dk brown to black sand, cinder-like mat'l w/molten porous quality, lightweight, refusal on slab(?)			
					Boring complete at 4'			

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Appendix C
Test Pit Logs – Former Tank Locations

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FIELD TEST PIT LOG

Test Pit No.:	A1-TP-T1	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/22/99	**Logged By:**	JMD/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
	Excavated to 5.5-6' bg	Water at	5.
	Mat'l w/odor at ~5'.	Lifted	odiferous
	mat'l out. Placed on	top. Only	a small amount.
	Trench 50' long. Mostly	brown	sand over
	Gray sand over gray	clayey	silt. About
	3' of brown sand.	No tank.	Very slight
	odor. PID=0, PICT 8		

TurnKey Environmental Restoration, LLC

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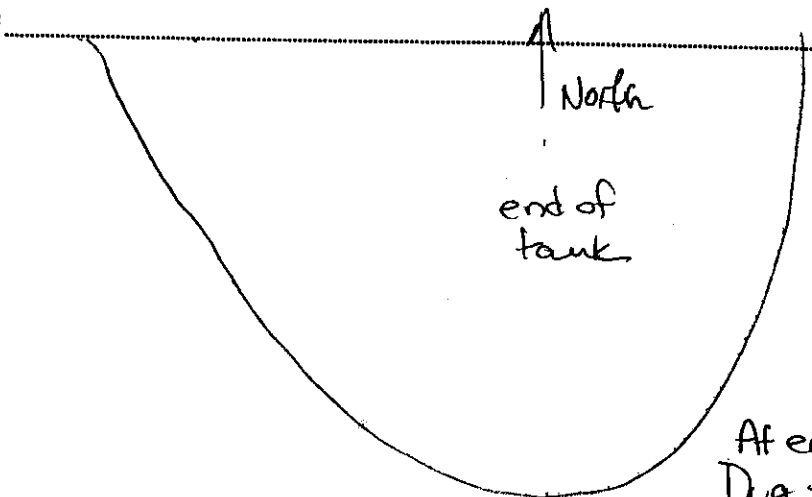
FIELD TEST PIT LOG

Test Pit No.:	T-3 AI-TP-T3	**Project:**	Area I Invest.
Location:		**Project No:**	0002-005
Date:	7/26/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebber 932		

Test Pit Profile

grade



Pict 21
RLD

At end of tank
Dug to bottom of
tank sitting on
top of native, native
Silty Clay, brown mottled,
no odor in native

not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth
	At original tank location, where stake was located		
	excavated 4' below grade. Found edge of tank.		
	Dug ~20' away to the south. Found a fill port.		
	Open to the inside, filled w/ liquid. Checked w/ rod.		
	Tank 8' deep and filled with water. No sheen		
	on rod. Found end of tank. Fill from ~6' to native (~12')		
	had a ~~fuel oil~~ JMA diesel odor.		

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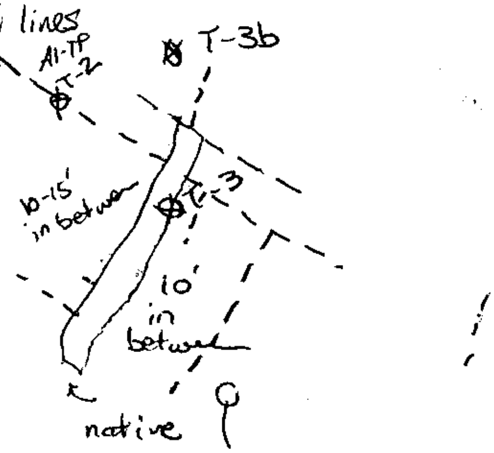
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-T3a / A1-TP-T2	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	7/27/99	**Logged By:**	JMM
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

Excavated at all dashed lines to attempt to find tank locations.



Stake is at T-3 location.

Only one tank found at location T-3. Very hard, refused at T-2 location.

50' from T-3 Called TP-T3a

not to scale

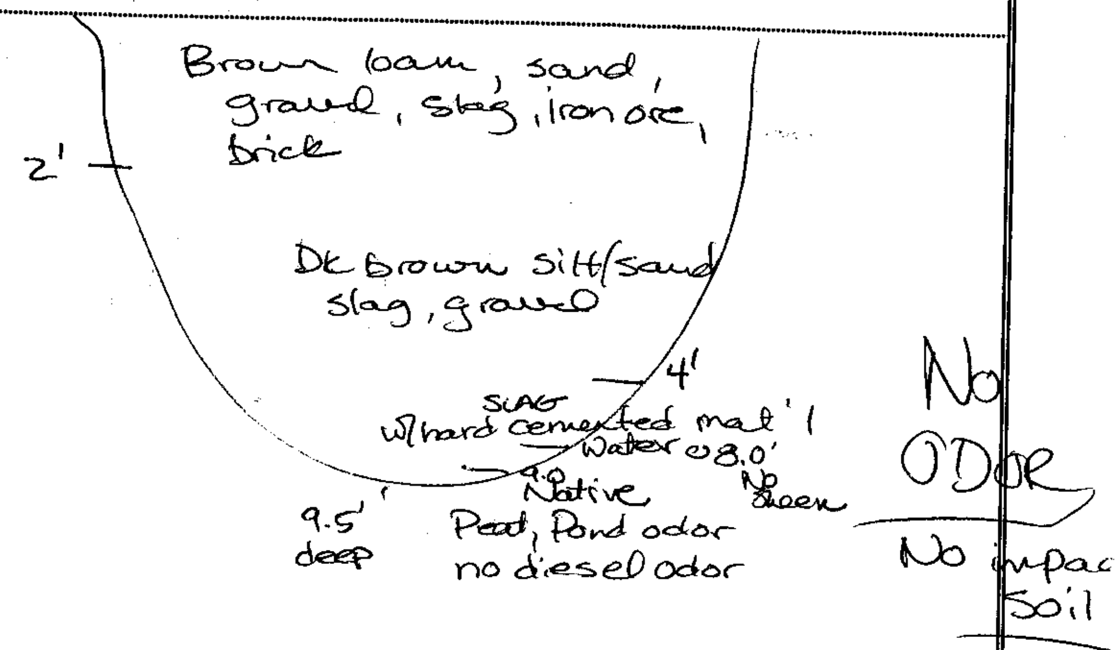
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
0-2.5	Brown silt loam w/roots, dry to 2', w/gravel, slag		None
2.5-5'	Dk brown-black sand-like mat'l, strong diesel odor, moist	2.5-5'	None

FIELD TEST PIT LOG

Test Pit No.: AI-TP-T36	Project: Area I Invest.
Location: 75' N of T-3	Project No: 0002-005
Date: 7/27/99	Logged By: JNA
Excavation Method: Liebherr 932	

Test Pit Profile

grade



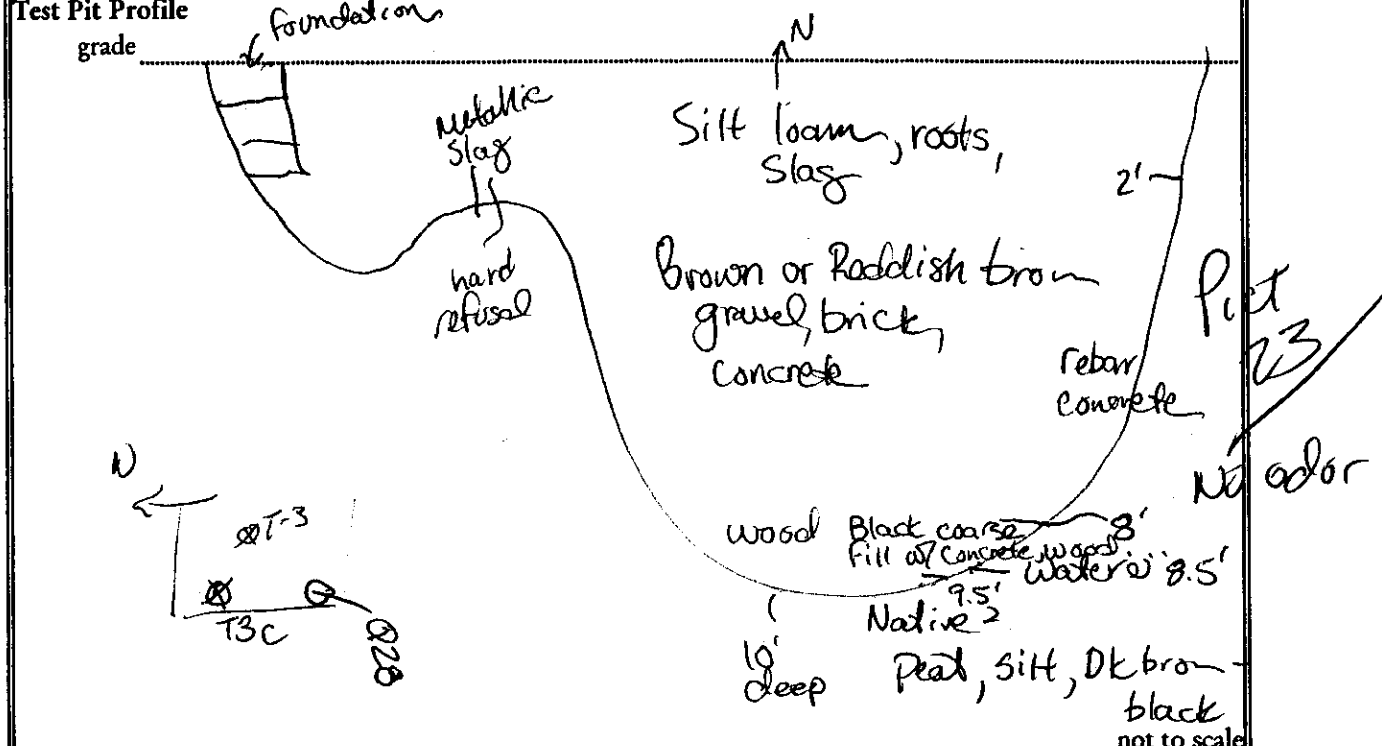
not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	AI-TP-T3c	**Project:**	Area I Invest.
Location:	35' W of stake T-3	**Project No:**	0002-005
Date:	7/27/99	**Logged By:**	JMA/RLD
Excavation Method:	Liebherr 932		

Test Pit Profile



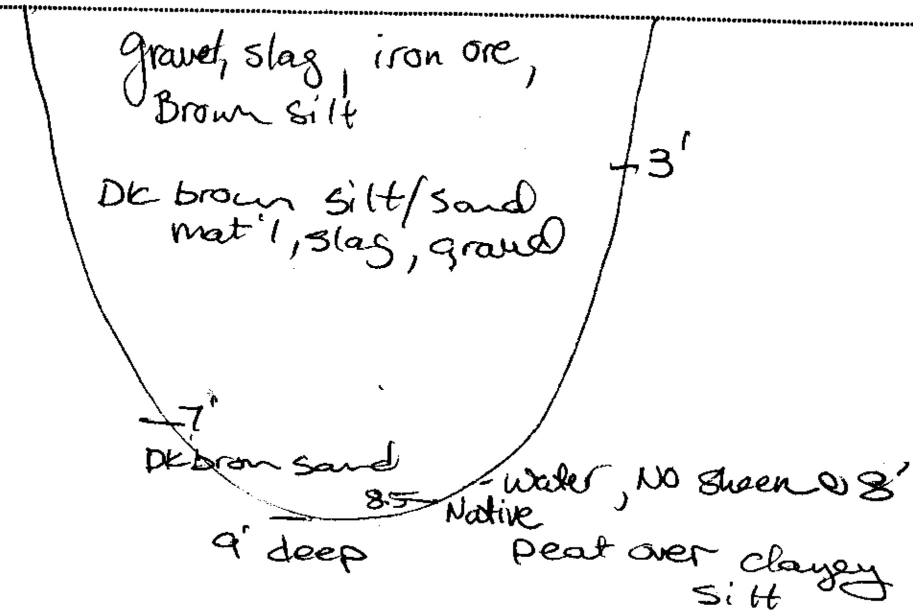
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	Al-TP-T3d	**Project:**	Area I Invest.
Location:	East of T3	**Project No:**	0002-005
Date:	7/27/99	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

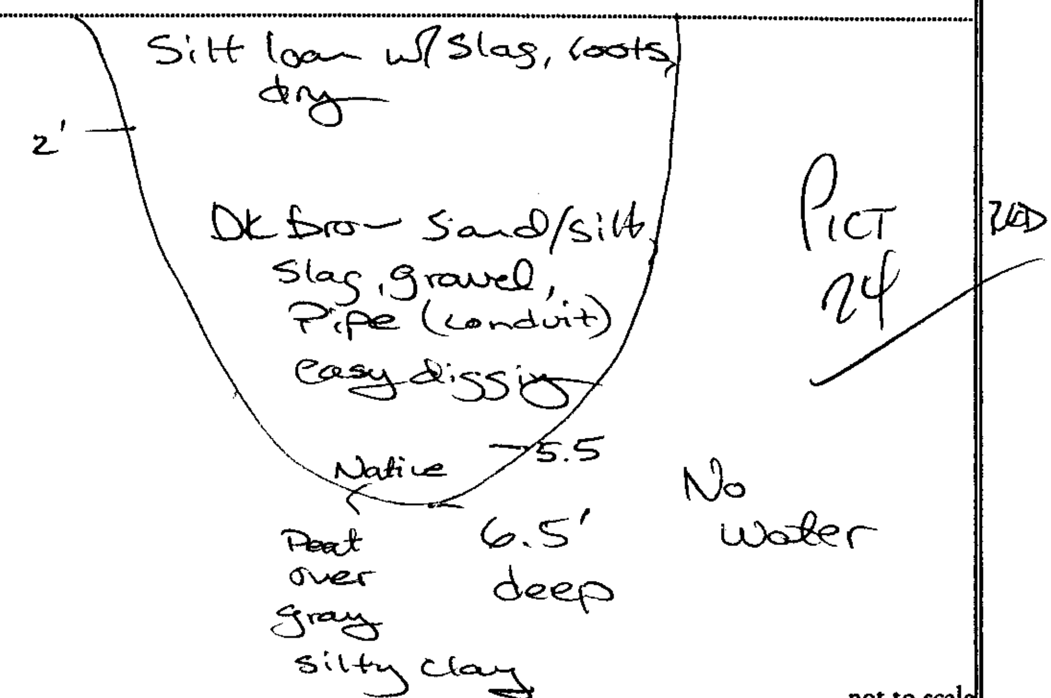
Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.: A1-TP-T3e	**Project:** Area I Invest.
Location: ~65' W [illegible] ~15' N of Road	**Project No:** 0002-005
Date: 7/27/99	**Logged By:** JMA
Excavation Method: Liebherr 932	

Test Pit Profile

grade



not to scale

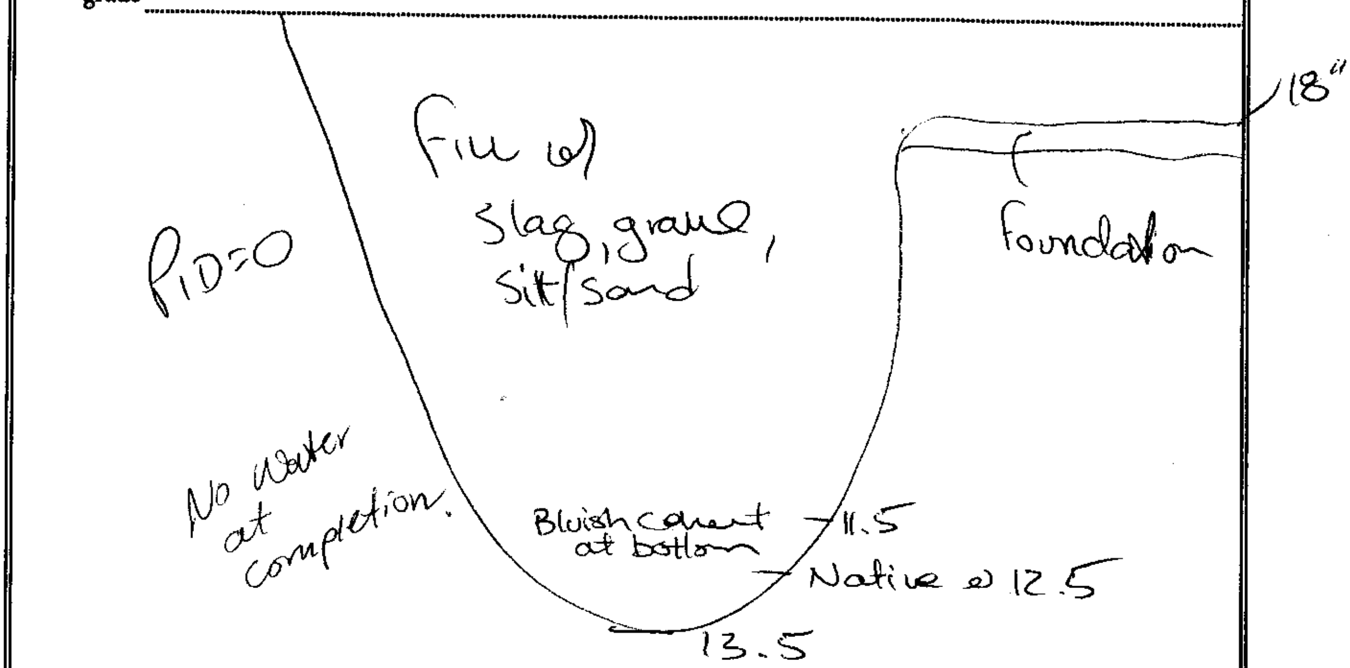
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-T-4	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-005
Date:	8/3/99	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

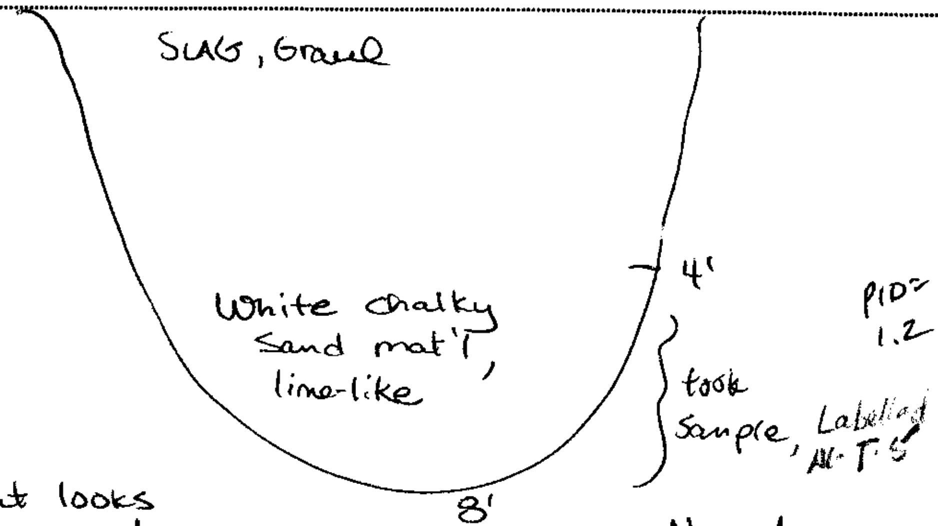
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
	Continued test pit toward the River approx.		
	10' to attempt to encounter tank location.		
	Still no evidence of contamination.		

FIELD TEST PIT LOG

Test Pit No.: T-5	Project: Area I Invest.
Location: Subarea D	Project No: 0022-005
Date: 7/16/99	Logged By: SMA
Excavation Method: Liebherr 932	

Test Pit Profile

grade



Found what looks like a fill port in test pit. Fill port filled with cement.

not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

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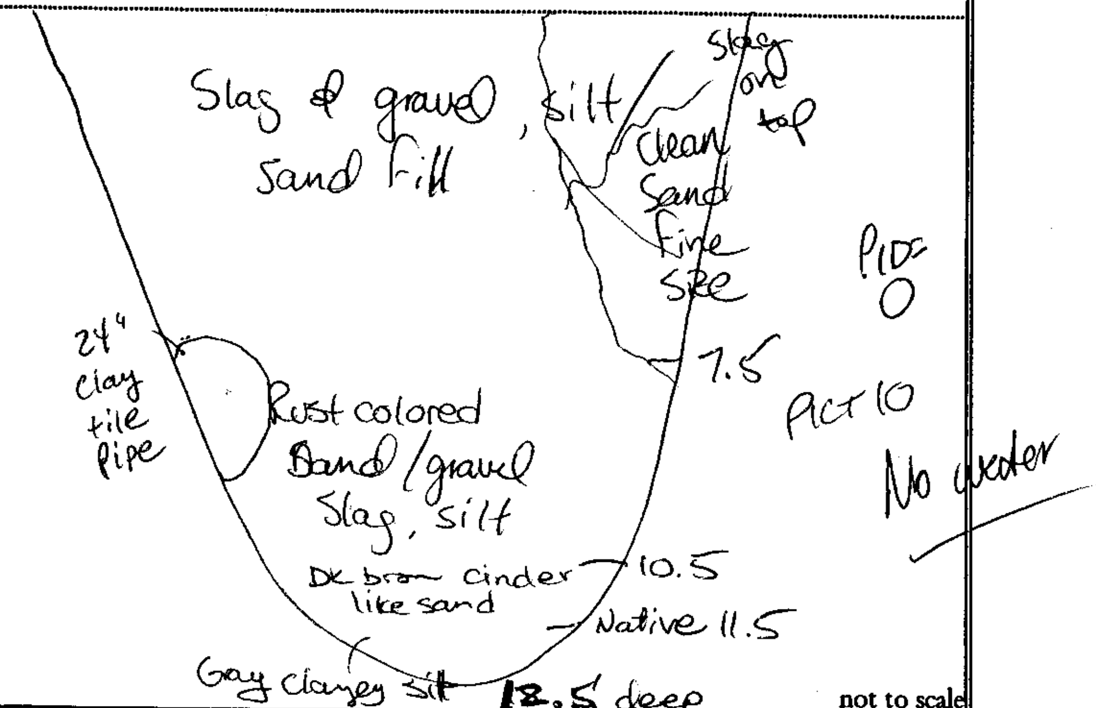
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-T-6	**Project:**	Area 1 Invest.
Location:		**Project No:**	0002-003
Date:	8/3/99	**Logged By:**	GMM
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

wet. moist

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-T-7	**Project:**	Area 1 Invest.
Location:	AREA - 1	**Project No:**	0002 -005
Date:	8/4/99	**Logged By:**	RLD
Excavation Method:	BACKHOE / Liebherr 932		

Test Pit Profile

grade

0-9' SLAG LAYERS with BRN SAND FROM SURFACE to native material

very hard digging
NO ODOR/PRODUCT OBSERVED.
NO water in Hole

Native- 9' LT BRN/RUST colored SILT-moist NO ODOR

* Thin organic peat LAYER ABOVE native SILT

TOTAL DEPTH 12'

SAMPLES collected FOR ANALYSIS

Pic #11

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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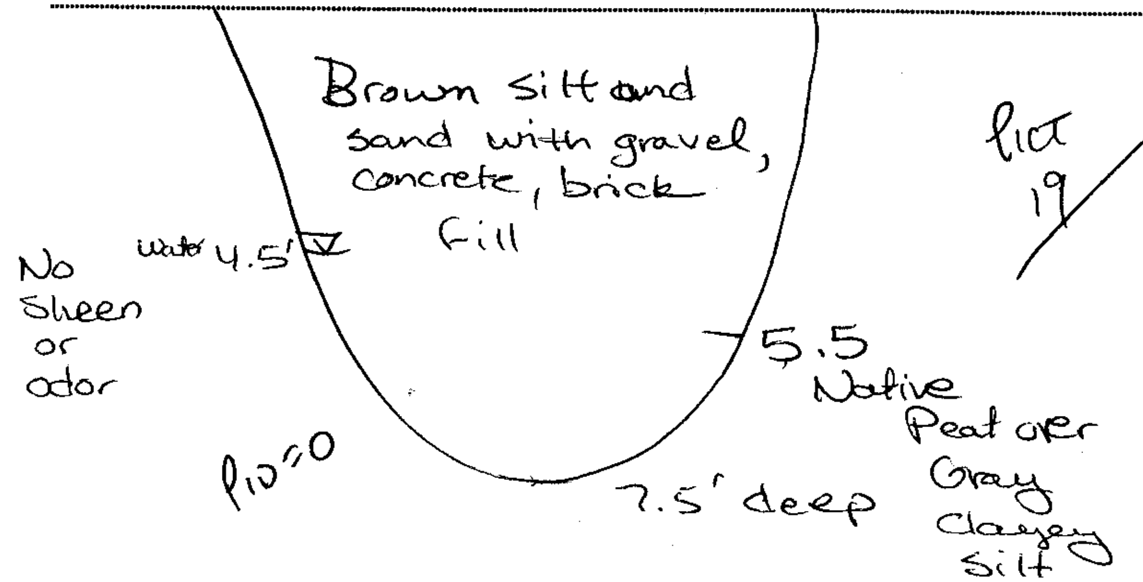
FIELD TEST PIT LOG

Test Pit No.:	Al - TP - T-8	**Project:**	Area I Invest.
Location:		**Project No:**	0002 - 005
Date:	8/5/99	**Logged By:**	SMA
Excavation Method:	Liebherr 932		Third hole dug. No evidence of tank leakage

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

Appendix D

Test Pit Logs – Phase I/II Boring Locations

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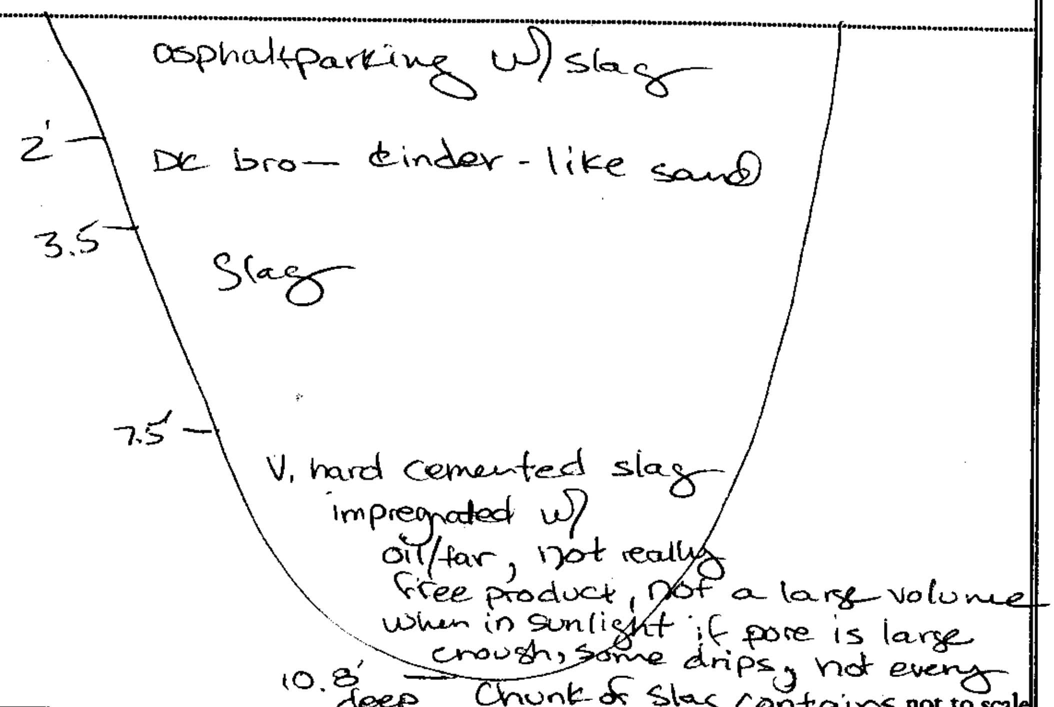
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-A1 (at boring)	**Project:**	Area 1 Invest.
Location:	Subarea A	**Project No:**	0002-005
Date:	8/3/99	**Logged By:**	BMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Chunks of Slag range from 1" to 4" (approx) in diameter

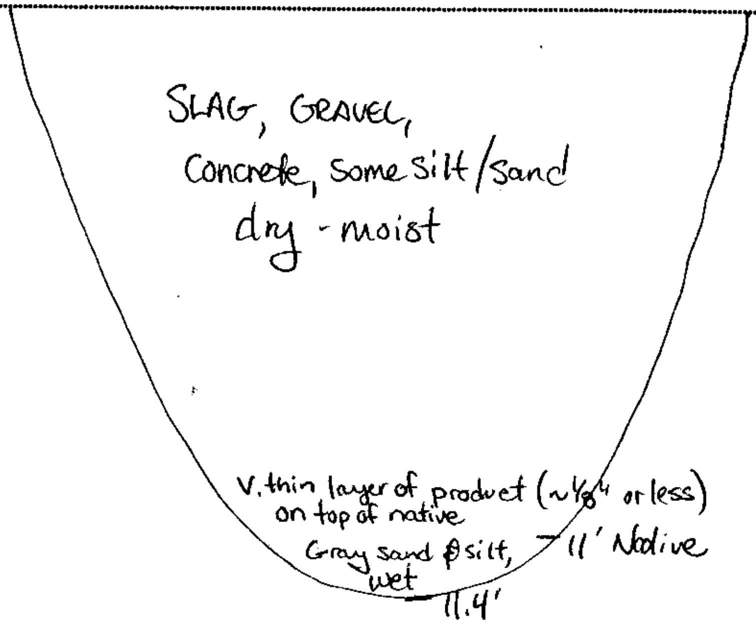
Depth bgs	Soil Description	Samples–Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-A	**Project:**	Area 1 Invest.
Location:	110' W (almost Midpoint of wall) from end of wall	**Project No:**	0002-005
Date:	8/3/99	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



No Water.

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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FIELD TEST PIT LOG

Test Pit No.:	A1-TP-A2a & A1-TP-A2b	**Project:**	Area 1 Invest.
Location:	Subarea A	**Project No:**	0002-006
Date:	8/3/99	**Logged By:**	JMM
Excavation Method:	Liebherr 932		

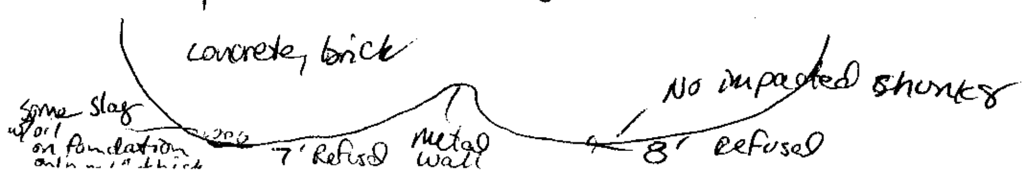
Test Pit Profile

grade

Pic 4,5,6

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
A1-TP-A2a ①	Dug trench, continued from 8/2/99 trench. ~25' S of A1-SB-A2, Hole 13' deep, Native @ 11' Hard cemented slag to ~2', ~3' of brick & soil, Cinders & prous slag to native, ~1' of impacted soil (slag) above native, water entering hole		
A1-TP-A2b ②	Dug trench ~25' W of last hole & making line of TP's parallel to wall trench ~20' long running perpen to well		



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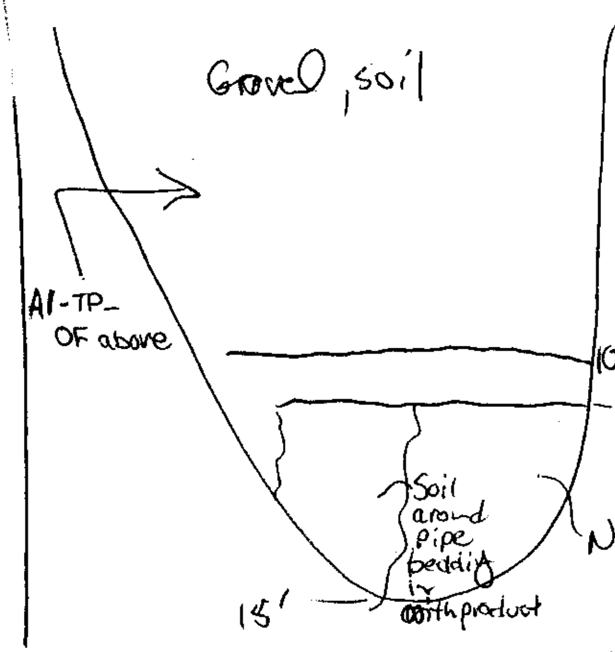
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-A3a A1-STP-A3	**Project:**	Area 1 Invest.
Location:	Subarea A	**Project No:**	0002-005
Date:	8/2/99	**Logged By:**	[illegible]
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

8/3/99 A1-TP-A3a 21' W of E edge of wal



Native Brownish gray Silt & Sand some odor little pods where product lays, not as impacted very minimal

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
	A1-SB-A3 ~13' deep		
	impacted soil ~10.5		
	Native @ 10.6'		
10'	off wall to 12'		
	native @ 11'		

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FIELD TEST PIT LOG

Test Pit No.:	A1-~~SB~~ TP-B-1	**Project:**	Area 1 Invest.
Location:		**Project No:**	0602-005
Date:	8/6/99	**Logged By:**	RLO
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

0-1' Gravel & LT Brn Sand & Slag

1'-10.5' Various slag layers grey/dark brn
no odors ~~observed~~ or staining observed

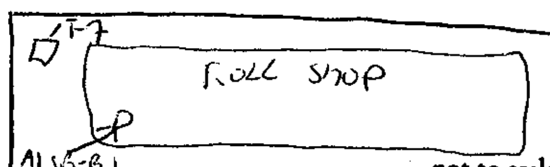
10.5' - 3" thick product layer (#6 oil) sitting on top of native material*

native @ 10.5'

Product observed along south side of test pit, - ~~most~~ ~~this~~ could be limits of product within the area

*Native varys from north side to south side of test pit, - LT Brn/rust colored silt on north side, Grey silty clay along south side

10.5' to native



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

*# Test pit moved approx 11-12' west due to refusal @ 4'.

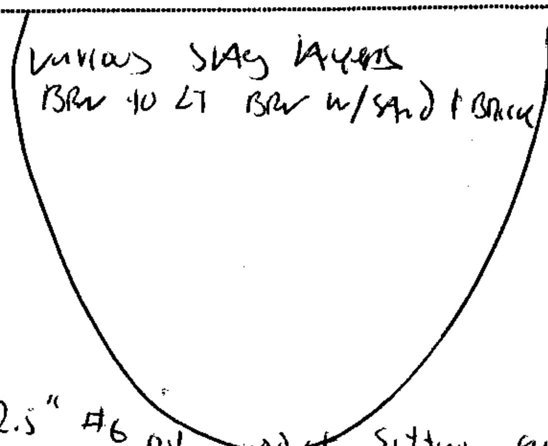
FIELD TEST PIT LOG

Test Pit No.:	A1-BB-B2	**Project:**	LTV- AREA-1
Location:		**Project No:**	0002-005
Date:	8/4/97	**Logged By:**	RCD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

0-9.5'



various slag layers
BRN to LT BRN w/sand & brick

1-2.5" #6 oil product sitting above native
grey silty clay.

PIC #12 #13

Top of
Native
@ 9.5

TOT DEPTH - 10.5'

slight odor detected

5ppm - PID reading

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-B2a	**Project:**	Area 1 Invest.
Location:	Subarea B ~100' SE of A1-TP-B1	**Project No:**	0002-005
Date:	8/4/99	**Logged By:**	BLD
Excavation Method:	Liebhor 932		

Test Pit Profile

grade

Pict 14

PID=0

No odors

not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

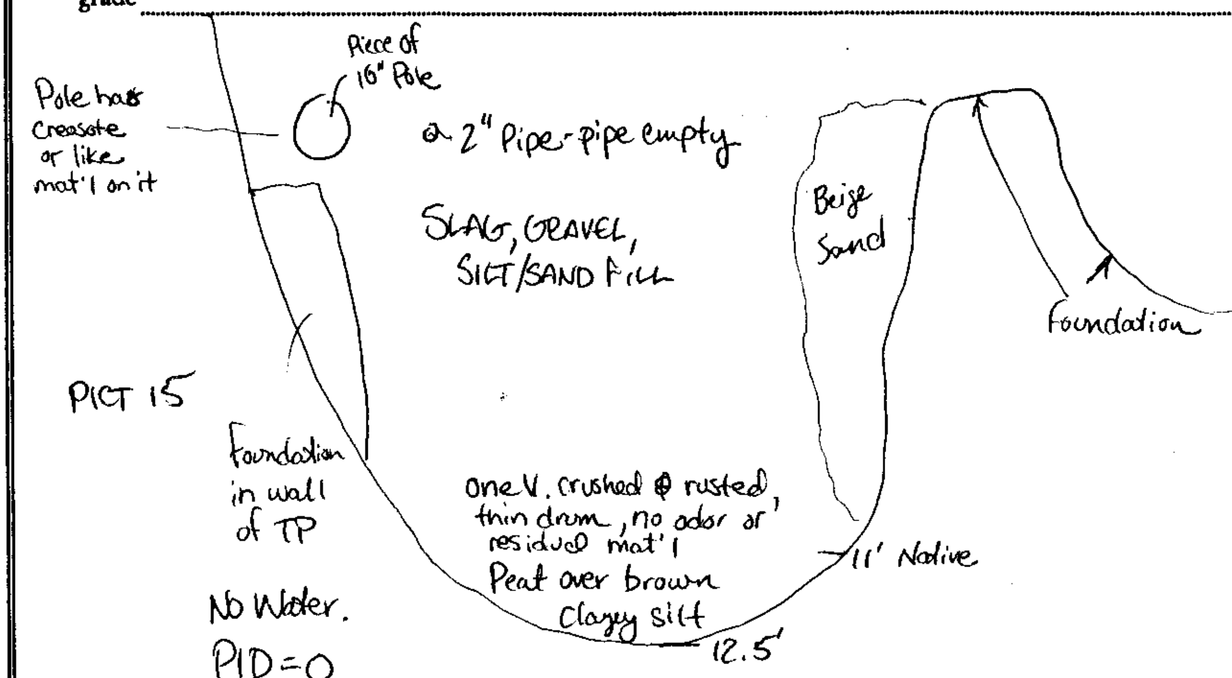
Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-B2b	**Project:**	Area 1 Invest.
Location:	Adjacent to A1-SB-B3 ~60' to the West	**Project No:**	0002-005
Date:	8/4/99	**Logged By:**	JMD
Excavation Method:	Liebherr 932		

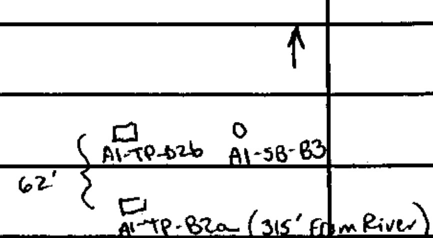
Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth



TurnKey Environmental Restoration, LLC

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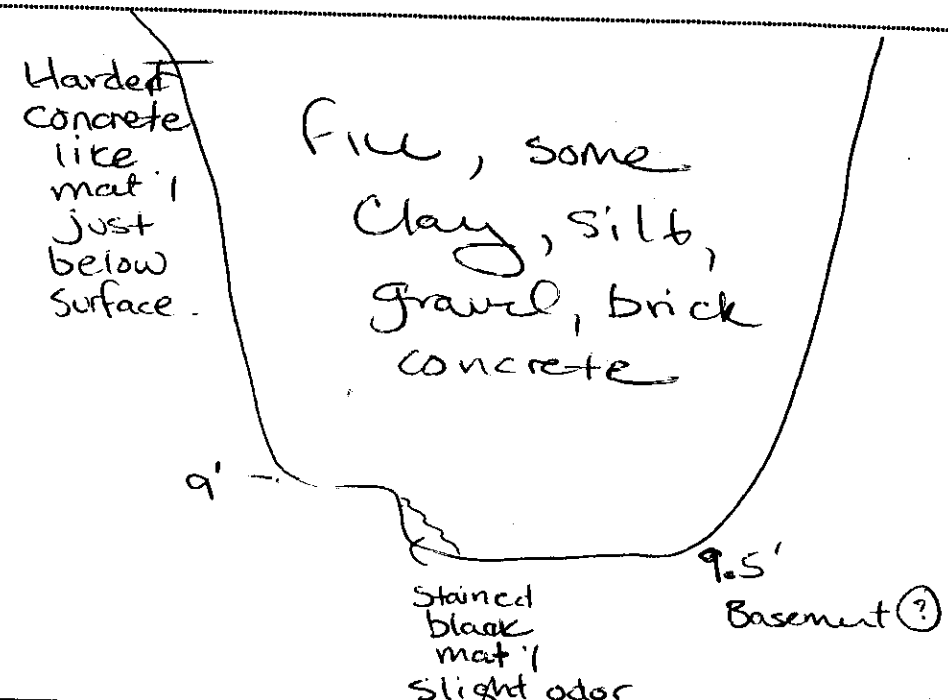
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-B2c	**Project:**	Area 1 Invest.
Location:	75' SW of A1-SB-B1	**Project No:**	0002-005
Date:	8/4/99	**Logged By:**	DMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

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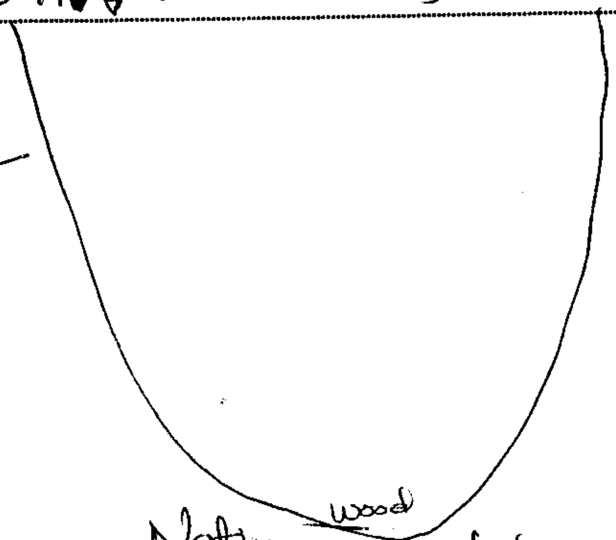
FIELD TEST PIT LOG

Test Pit No.:	Al-TP-B1a	**Project:**	Area 1 Lovest
Location:	LAST Hole	**Project No:**	0002-005
Date:	8/5/99	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile 87' W of Al-SB-B1, 105' S of River

grade



Pict 22

PID = 0

Brown silt/sand Slag, hard digging brick

wood

Native @ 9.5

10' deep

Black peat (~1") over gray clayey silt

No water at completion

not to scale

Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth
	CLEAN!		

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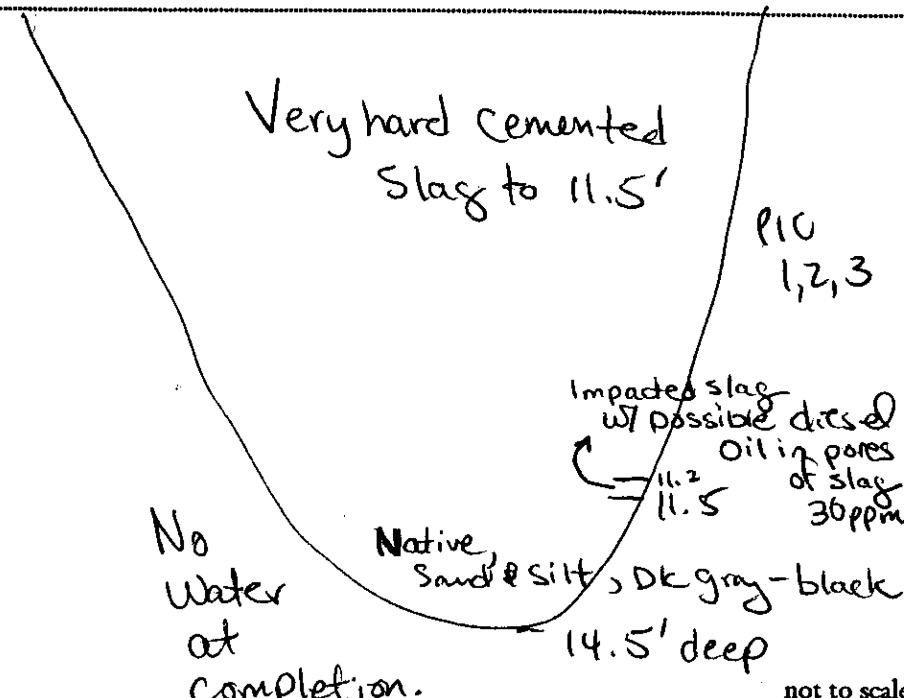
FIELD TEST PIT LOG

Test Pit No.:	A1-[illegible]-C1	**Project:**	Area 1 Invest
Location:		**Project No:**	0002.005
Date:	8/2/99	**Logged By:**	JMA
Excavation Method:	Liebher 932		

Test Pit Profile

grade



not to scale

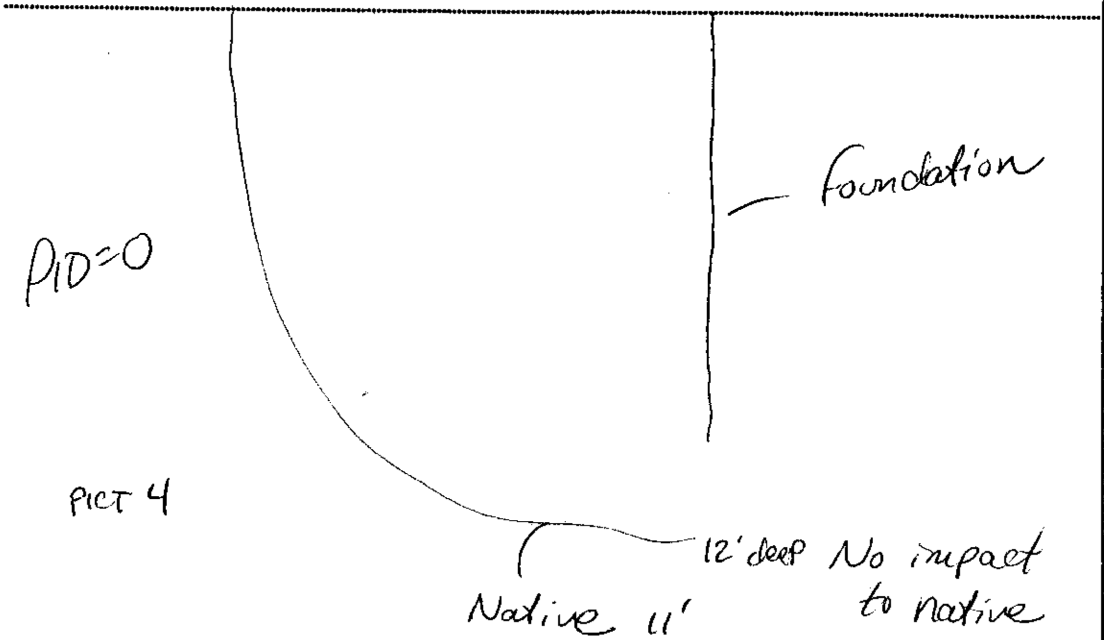
Depth bgs	Soil Description	Samples-Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-C1a	**Project:**	Area 1 Invest.
Location:	by river edge ~100' SW of C1	**Project No:**	0002-005
Date:	8/2/99	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples--Depth	Comments include Water entering pit w/depth

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-D3	Project:	Area 1 Invest.
Location:	Subarea D	Project No:	0002-005
Date:	7/16/99	Logged By:	TMA
Excavation Method:	Liebher 932		

Test Pit Profile

grade

At A1-SB-D3, test pit total depth 14'.
At 10', native, gray w/ v. high gasoline content to at least 14'.

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FAX

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

REGION 9

DATE: August 5, 1999

NUMBER OF PAGES BEING SENT: 3 (INCLUDING THIS ONE)

SENT TO: Jeanne Asquith, Turnkey Environmental

FAX NUMBER: 716-856-0583

FROM: Maurice Moore, NYSDEC - Buffalo

MESSAGE: Here are my notes you wanted. If you have any questions let me know.
Maurice

CONFIDENTIALITY NOTICE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
270 MICHIGAN AVENUE, BUFFALO, NEW YORK 14203-2999
(716)851-7220, TELECOPY(716)851-7226

37-00-1 (6/85)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB NUMBER	FILE NUMBER	SHEET NUMBER	CHECKED BY	DATE
LTV		3		7/16/99
			COMPUTED BY	DATE

@ 10:35 AITPP11 Pic 16 & 17 R2

0-8 Soil/slag

8-18 Rusty sandy material (smattering of brick wood & slag..)

18-24 DARK Brown sand.

24-36 crusty grey slag

36-48 TAN SAND

48-84 DARK Brown SAND

84-96 NATIVE BOH

@ 11:40 AITPP10 Pic 18 & 19 R2

0-6 Soil

6-12 Asphalt w/ TAR (some little)

12-36 Brown sandy material

42 B o hole

Refusal

1st time Refusal TURN ~40° NE TRY AgAIN

Pic 18-19 R2

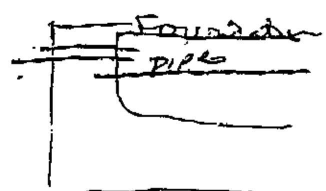
2nd time Refusal TURN 90° SE from 1st

Very hard right off crusty

foundation on both sides of hole. bottom hard (concrete?)

Pic 20 BAD

AITS TANK (1000 est) Pic 21 22 23 & 24 R2



0-3' fill soil/slag.

3-4 TAN SANDS

4-8' whitish light sand. maybe CaCo3 from process

Collected @ sample of white material only

found foundation of Pickling Heat Treat Bldg.

did not find tank T5, will HAVE surveyor MARK boring & Try to locate later. - Kept digging because we found boring dug a pit corresponding to AISBD3

08/05/99 THU 03:44 FAX 716 851 7226 NYS DEC--DER/SHM 003

START dig @ 7:15 digging @ 8:

37-00-1 (6/85)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB NUMBER	FILE NUMBER	SHEET NUMBER	CHECKED BY	DATE
LTV		4		7/16/99
			COMPUTED BY	DATE

Fax to [illegible]

@ 2:00 A1SBD3 ~~Pics~~ 1-4 R3 here

TOTAL Depth of hole = 14'
NATIVE ~ 10' — there is a
Rust colored Layer above
Native with dark black silty
material over ~~NATIVE~~ Noted gasoline
smell to soil here Test pit will be
continued @ 90° to 1st hole to try to
delineate the extent. STOPPED Test pit
will delineate w/probes or borings

@ 250 A1TPP9 Pic 4 & 5 R3

0-6 Soil
6-18 whitish slag
18-30 hard slag rusty brown.
30-60 - TAN SAND.
60-96 - Blackish sand.
96-120 NATIVE
bottom of hole.

A1TPP8 Pic

1st hole Refusal? Turn South 45° 2nd hole
Refusal: 3rd hole ~ 20' N of 1st hole

0-18 Soil w/slag
24 18-24 ~~Crust~~ 24
↓ TAN SAND 48
60 Red foundry sand 72
72 cinders/sand

12 1/2' NATIVE

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

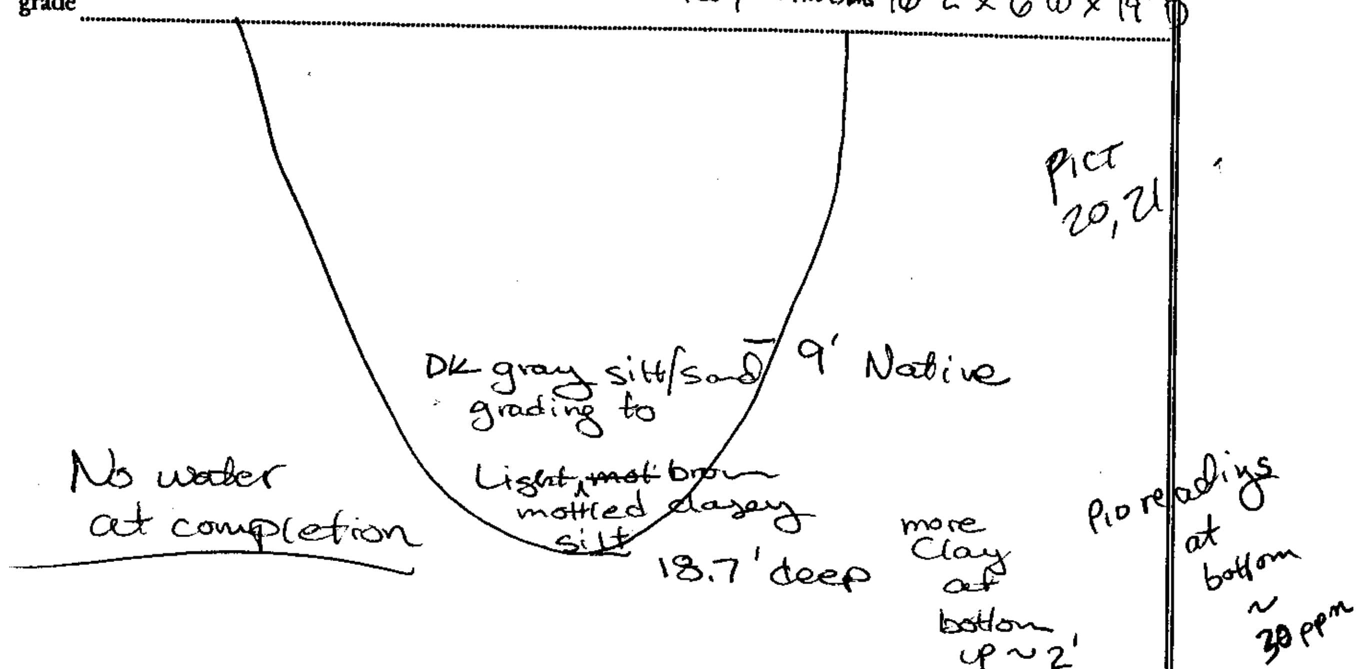
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-D3a	**Project:**	Area I Invest.
Location:	Subarea D, just SW of A1-SB-D3	**Project No:**	0002-005
Date:	8/5/99	**Logged By:**	[illegible]
Excavation Method:	Liebherr 932		

Test Pit Profile

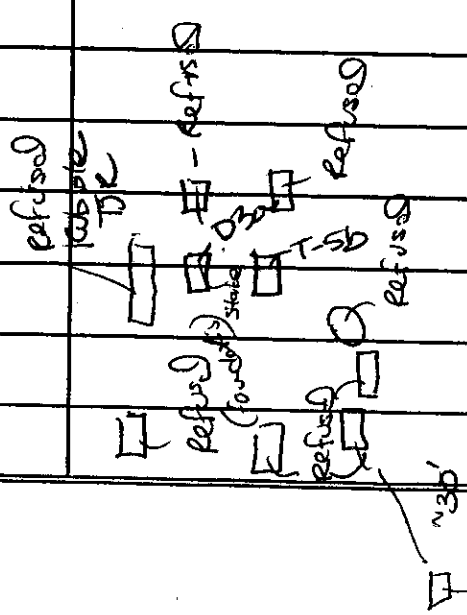
grade

Testpit Dimensions - 16' L x 6' W x 19' D



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
	80' x 80'		



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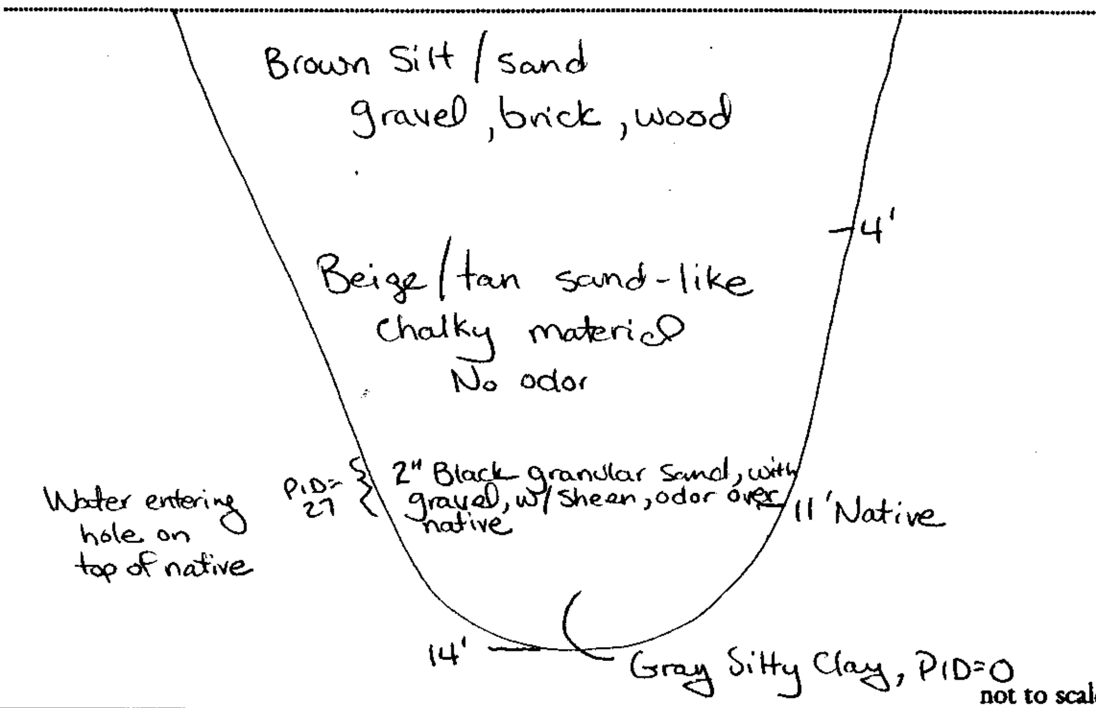
FIELD TEST PIT LOG

Test Pit No.:	A1-TP-T5a	**Project:**	Area 1 Invest.
Location:	Subarea D	**Project No:**	0002-005
Date:	8/5/99	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

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FIELD TEST PIT LOG

Test Pit No.:	A1-TP-J2	**Project:**	Area 1 Forest
Location:		**Project No:**	0002-005
Date:	7/27/99	**Logged By:**	SMM/ELD
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

0-3' CONCRETE FOUNDATION ON NORTH & EAST WALL

3-5' SLAG COBBLES W/ BRN SAND MIX & SMALL ANGULAR GRAVEL (FILL)

5-8' GREY SLAG LAYER

OIL PRODUCT OBSERVED AT 8'

* WATER AT 8'

8' NATIVE GREY SILTY CLAY

8'

not to scale

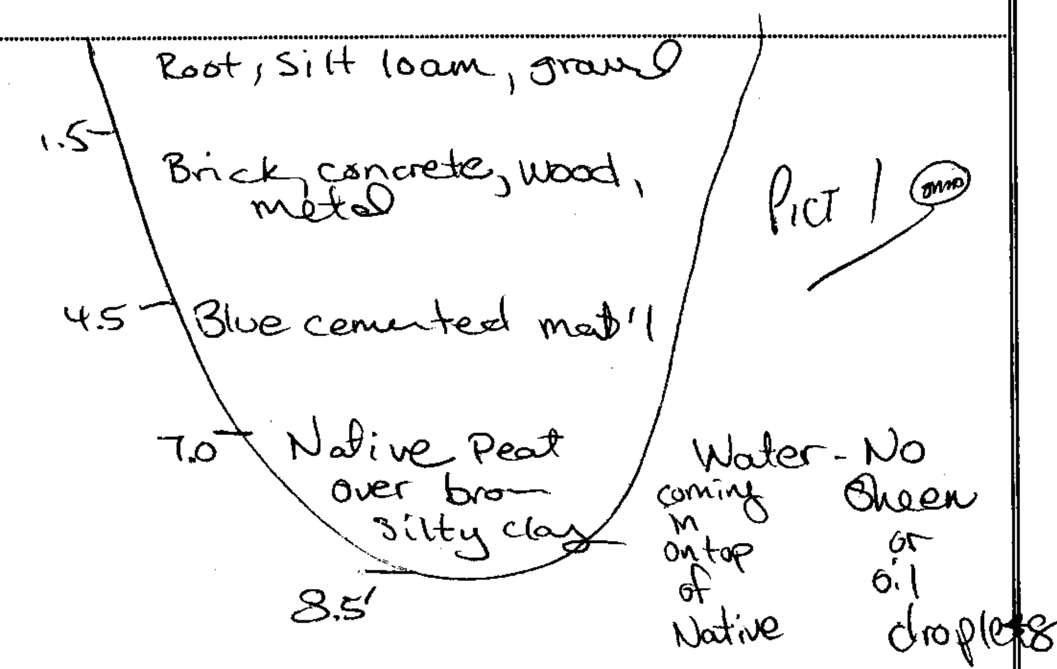
Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-J2a	Project:	Area 1 Invest.
Location:	~20' South of J2	Project No:	0032-005
Date:	7/27/99	Logged By:	JMA / RLD
Excavation Method:	Liebherr 932		late pm / early in am

Test Pit Profile

grade



not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
J2c	115' WSW of J2a		
	75' N of (in line with J2a)		
	Native at 7'		
	Peat over silty clay		
	water coming in on top		
	No sheen, no odor		
J2[illegible]	By fence as shown on map.		

9.5' deep
Native at ~8.5-9
Water at 5.5, No odor, no product.

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

FIELD TEST PIT LOG

Test Pit No.:	A1-TP-J2b	**Project:**	Area I Invest.
Location:	50' W of J2	**Project No:**	0002-005
Date:	7/27/99	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

Took sample of upper mat'l.

Reddish brown Silt/Sand, slag, gravel, brick

3" Pipe

6.5' — Black w/ strong creosote/oil odor, stained — 20 ppm

7.5' — Native

8.5' ~~Silty clay~~, gray & brown

Water coming in v. slow on top of native

not to scale

Depth bgs	Soil Description	Samples-- Depth	Comments include Water entering pit w/depth
	A1-TP-J2c, 25' W of J2b		
	5.5 to native		0.1' thick on top of native
	6' deep		w/water

VOLUNTARY CLEANUP SITE ASSESSMENT REPORT-ADDENDUM 2 AREA I-REPUBLIC STEEL PLANT PARCEL

FORMER STEEL MANUFACTURING SITE BUFFALO, NY

January 2000

0002-005-200

Prepared for:

LTV Steel Company, Inc.
Cleveland, OH; and

The Hanna Furnace Corporation
Mishawaka, IN

VOLUNTARY CLEANUP SITE ASSESSMENT REPORT-
ADDENDUM 2
AREA I – REPUBLIC STEEL PLANT PARCEL

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ADDENDUM 2
AREA I – REPUBLIC STEEL PLANT PARCEL

LIST OF FIGURES

LIST OF ATTACHMENTS

1.0 INTRODUCTION

This addendum has been prepared to present additional data collected in Area I of the Former Steel Manufacturing Site to supplement the April 1999 Voluntary Cleanup Site Assessment Report and Addendum 1 (References 1 & 2) to that same report. This additional data was collected to delineate the lateral and vertical extent of elevated inorganic concentrations in Subareas S and Q subsurface soil/fill. An investigation plan was approved by the NYSDEC in November 1999. (See Attachment 1). A Data Usability Report, currently being performed by Data Validation Services, will be submitted to the NYSDEC and NYSDOH upon completion.

2.0 FIELD OBSERVATIONS

2.1 Background

Elevated inorganic concentrations (i.e., above SSALs) were previously detected at six locations in Area I including one test pit location in Subarea S and five locations in Subarea Q. Specific inorganic constituents above SSALs included: mercury at one location in Subarea S; chromium at two locations in Subarea Q; lead at two locations in Subarea Q; and arsenic at one location in Subarea Q. Forty five additional borings and three test pits were completed to further investigate the six subareas.

2.2 Description of Target Locations

The locations of each original test pit where elevated inorganics were detected are shown (in orange) on Figure 1 along with investigatory sampling locations (in pink). A minimum of four boreholes were initially completed around each target location. If elevated inorganics were encountered in the first four boreholes, additional boreholes were performed radially outward until soil/fill concentrations were determined to be less than SSALs. Boreholes were completed to native soil, if possible. Field borehole logs are located in Attachment 2.

Up to three discrete analytical samples were collected from each borehole and analyzed for the target inorganic analyte. Analytical results are summarized on Tables 1 through 6 with exceedances of SSALs shaded on the tables. Each subarea is discussed separately below:

Subarea S9- The original soil/fill sample, A1-TP-S9 contained elevated concentrations of mercury with respect to the SSAL. Four borings were performed around the target test pit. Continuous soil samples were inspected for any visible layering and described on field borehole logs. Three samples from each borehole were collected and submitted for analytical testing. Laboratory results were all significantly less than the SSAL for mercury and ranged in values from nondetect to

1.3 mg/kg as shown on Table 1. This indicates that the result from the original test pit location was an anomalous result and that no remediation of soil/fill is necessary in Subarea S9 due to inorganics.

Subarea Q2- At A1-TP-Q2, the chromium concentration in (ie. 1050mg/kg) subsurface soil/fill was slightly elevated with respect to the SSAL (ie. 1000mg/kg). Similar to Subarea S9, four borings were performed around the target location. Discrete samples collected from different layers were submitted to the laboratory for analysis of chromium. Resulting concentrations summarized on Table 2 were all less than or equal to the SSAL for chromium (i.e., 1000 mg/kg). This indicates that no remediation of soil/fill in Subarea Q2 due to inorganics.

Subarea Q5- Previous studies have shown that elevated chromium concentrations in site soils are likely a result of extensive quantities of BOF and blast furnace slag fill accumulated on the site from steel making operations (See Appendix A of Reference 1). Twelve borings and three test pits were performed around the original test location (A1-TP-Q5) to delineate the extent of subsurface soil/fill contamination. Table 3 summarizes chromium concentrations from each sampling location. The lateral extent of the impacted area is shown on Figure 2.

During performance of borehole A1-SB-Q5-6, a slight oil-stained residue was noted in a layer from 5 to 6.5 feet below grade. Soil/fill from this layer was collected and analyzed for SVOCs. The concentration of total SVOCs was 7.29 mg/kg, well below the SSAL for SVOCs of 500 mg/kg. Analytical data is included as Attachment 3.

Subarea Q14- Arsenic concentrations that exceeded the SSAL were previously detected in soil/fill from A1-TP-Q14. Of the four additional boreholes sampled around that location only, one sample, collected from 5 to 8 feet below grade at location A1-SB-Q14-1, was elevated with respect to arsenic. Two additional borings (A1-SB-Q14-5 and A1-SB-Q14-6) were then performed outward from borehole location A1-SB-Q14-1 to better determine the lateral extent of elevated arsenic. Resulting concentrations from those boreholes were less than the SSAL for arsenic. This subarea with the impacted lateral extent of contamination is shown on Figure 2. Analytical results are shown in Table 4.

Subarea Q18- Test pit location A1-TP-Q18 is within a former building foundation. The foundation was encountered during initial test pit excavation at approximately 17 feet below grade. During plant demolition, miscellaneous building debris was placed into the foundation in and around A1-TP-Q18. Concentrations of lead within the fill were elevated with respect to the SSAL. Twelve additional borings were performed to delineate the lateral and vertical extent of elevated lead concentrations. Table 5 summarizes analytical results from the additional borehole samples. Figure 2 shows the locations of borings and the lateral extent of contamination in excess of SSALs.

Subarea Q19- Six additional boreholes were performed around A1-TP-Q19. One layer from 0.5 to 3 feet below grade within borehole A1-SB-Q19-4 was elevated with respect to SSALs for lead as shown on Table 6. The area was delineated and is shown on Figure 2.

3.0 REFERENCES

1. Former Steel Manufacturing Site: Area I – Republic Steel Plant Parcel, Voluntary Cleanup Site Assessment Report, TurnKey Environmental Restoration, April 1999.

2. Former Steel Manufacturing Site: Area I-Republic Steel Plant Parcel and GasHolder Subarea of Area II, Voluntary Cleanup Site Assessment Report- Addendum 1, TurnKey Environmental Restoration, October 1999.

Table 1

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - ELEVATED MERCURY AREA

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Level	Sample Locations											
		A1-SB-S9-1			A1-SB-S9-2			A1-SB-S9-3			A1-SB-S9-4		
		0-2'	2-4'	4-5'	0-2'	2-6'	6-7'	0-2'	2-4.5'	4.5-6'	0.3-2'	2-4'	4-4.5'
		1	2	3	1	2	3	1	2	3	1	2	3
Mercury	10	0.26	0.64	0.23	0.27	0.33	0.27	0.35	0.23	0.006 U	0.630	1.3	0.56

NOTES:

1. Investigation performed in November, 1999
2. U=Indicates compound was analyzed for but not detected.

TurnKey Environmental Restoration, LLC

Table 2

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - ELEVATED CHROMIUM AREA

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Level	Sample Locations										
		A1-SB-Q2-1			A1-SB-Q2-2			A1-SB-Q2-3		A1-SB-Q2-4		
		0-4'	4-6'	10-10.5'	0-2'	2-4'	4-9'	2-4'	4-6'	0-2.5'	4-6'	6-11'
		1	2	3	1	2	3	1	2	1	2	3
Chromium	1000	523	571	446	540	330	331	1000	620	880	183	622

NOTES: 1. Investigation performed in November, 1999

0002-005
12/3/99
Subarea Q

Table 3

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - ELEVATED CHROMIUM AREA

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Level	Sample Locations													
		A1-SB-Q5-1			A1-SB-Q5-2			A1-SB-Q5-3			A1-SB-Q5-4			A1-SB-Q5-5	
		0-2'	2-4'	4-7'	0-2'	2-4'	4-10'	0-4'	4-8'	8-12.2'	2-4'	4-6'	6-8'	4-6'	6-8'
		1	2	3	1	2	3	1	2	3	1	2	3	1	2
Chromium	1000	550	981	1700	808	987	2400	957	1420	597	1140	591	732	575	722

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Level	Sample Locations											
		A1-SB-Q5-6	A1-SB-Q5-7	A1-SB-Q5-8	A1-SB-Q5-9	A1-SB-Q5-10		A1-SB-Q5-11	A1-SB-Q5-12		A1-TP-Q5-13	A1-TP-Q5-14	A1-TP-Q5-15
		2-5'	2-4'	5-8'	3-4.5'	4-6'	6-10'	4-8'	4-6'		2-8'	2-8'	3-8'
		1	1	1	1	1	2	1	1	2	1	1	1
Chromium	1000	222	40.8	23.1	41.3	80.2	1220	1250	619	1390	1140	708	724

NOTES:
1. Investigation performed in November, 1999
2. Shading indicates that the concentration exceeds the Site Specific Action Level.

TURNKEY ENVIRONMENTAL RESTORATION, LLC

Table 4

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - ELEVATED ARSENIC AREA

Area I Additional Investigation[(1)]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Level	Sample Locations																
		A1-SB-Q14-1			A1-SB-Q14-2			A1-SB-Q14-3			A1-SB-Q14-4		A1-SB-Q14-5			A1-SB-Q14-6		
		1-3.5'	3-5'	5-8'	1-4'	4-6'	6-7'	2-4'	4-6'	6-8'	0-4'	4-6'	3-4'	4-7'	7-8.5'	3-5'	5-7'	7-8'
		1	2	3	1	2	3	1	2	3	1	2	1	2	3	1	2	3
Arsenic	75	10 U	31.2	119	10 U	10 U	16.2	30.2	19.7	10 U	18.6	10 U	10.5	10 U	53.2	65.6	13.5	10 U

NOTES:
1. Investigation performed in November, 1999
2. U=Indicates compound was analyzed for but not detected.
3. Shading indicates that the concentration exceeds the Site Specific Action Level.

Table 5

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - ELEVATED LEAD AREA

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameter (mg/kg)	Proposed Site-Specific Action Level	Sample Locations													
		A1-SB-Q18-1			A1-SB-Q18-2			A1-SB-Q18-3		A1-SB-Q18-4			A1-SB-Q18-5		
		0-2'	2-8'	8-13'	0-6'	8-10'	10-14'	0-2'	2-3'	0-4'	4-6'	14-16'	0-4'	4-10'	12-14'
		1	2	3	1	2	3	1	2	1	2	3	1	2	3
Lead	1000	173	362	434	2230	1090	1170	120	401	213	12400	2320	307	528	746

Inorganic Parameter (mg/kg)	Proposed Site-Specific Action Level	Sample Locations												
		A1-SB-Q18-6			A1-SB-Q18-7			A1-SB-Q18-8			A1-SB-Q18-9	A1-SB-Q18-10	A1-SB-Q18-11	A1-SB-Q18-12
		0-4'	4-8'	8-14'	4-9'	11-15.5'	16-17'	3-4'	4-8'	12-14'	4-6'	0-4'	4-8'	4-8'
		1	2	3	2	3	4	1	2	3	1	1	1	1
Lead	1000	718	1300	1420	143	278	29.3	271	8420	725	53.4	154	99.1	843

NOTES:
1. Investigation performed in November, 1999
2. Shading indicates that the concentration exceeds the Site Specific Action Level.

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Table 6

SUBSURFACE SOIL/FILL ANALYTICAL SUMMARY - ELEVATED LEAD AREA

Area I Additional Investigation[1]

LTV Steel Company

Inorganic Parameters (mg/kg)	Proposed Site Specific Action Level	Sample Locations														
		A1-SB-Q19-1			A1-SB-Q19-2			A1-SB-Q19-3			A1-SB-Q19-4			A1-SB-Q19-5		A1-SB-Q19-6
		0-2'	2-4'	6-10'	2-4'	4-6'	10-10.5'	0-2'	2-4'	6-10'	0.5-3'	3-4'	4-6'	0-2.5'	3.5-6'	0-2.5'
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	1
Chromium	1000	910	194	47.9	268	58.6	30.9	26.4	375	20.6	16700	25	5 U	159	104	90.1

NOTES:
1. Investigation performed in November, 1999
2. U=Indicates compound was analyzed for but not detected.
3. Shading indicates that the concentration exceeds the Site Specific Action Level.

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Attachment 1

LTV STEEL/HANNA FURNACE SITE
VOLUNTARY CLEANUP

Plan for:

ADDITIONAL INVESTIGATION FOR AREA I SOIL/FILL WITH ELEVATED INORGANICS

INTRODUCTION

A total of 146 test pits were performed in Area I to characterize fill for chemical constituents. Analytical results were tabulated and compared to Site Specific Action Levels (SSALs). Inorganic concentrations were elevated (i.e. above SSALs) at six locations including one test pit location in Subarea S and five locations in Subarea Q (see Figure 1). Specific inorganic constituents above SSALs include: mercury at one location in Subarea S; chromium at two locations in Subarea Q; lead at two locations in Subarea Q; and arsenic at one location in Subarea Q (see Table 1). This additional investigation is prepared to delineate the vertical and horizontal extent of the elevated inorganic concentrations in Subareas S and Q. Additional soil/fill samples will be collected in the proximity of the six identified locations for analysis of the elevated inorganic constituent of interest at each location.

INVESTIGATION PLAN

A minimum of four soil borings will be located around each target test pit of concern as shown on the attached figure. Borings were selected as the means of investigation so that the disturbance to the ground is limited, however if there are either poor recoveries or significant refusals, test pits may be used. At location A1-TP-Q18 refusal was encountered on a concrete slab, likely a basement foundation, at 17-feet below grade. Since the elevated lead is present within the brick fill inside the basement foundation; the additional borings will be within the foundation to characterize the material within the basement. At the remaining locations, the boring will be completed approximately 12 inches into the top of native soil, if possible.

Soils and fill will be field-logged and photo documented by a project hydrogeologist. Actual boring locations will be tied to the site grid for mapping purposes. NYSDEC Region 9 will be notified several days in advance of scheduling and will be given the opportunity to observe and split samples.

PROPOSED SAMPLING PLAN

Soil/fill will be field-logged to indicate the condition of the soil/fill and water table, if the water table is encountered. Since compositing of the entire depth of the original test pits was performed, discrete layers will be sampled at each borehole location. Four borings will be performed spaced roughly equidistant away from the original test pit location at a distance of approximately 10 feet away. A maximum of three samples will be collected from each boring to account for any visible layering to characterize the soil/fill to the top of native soil and submitted to the laboratory for analysis. The analytical laboratory will provide 24-hour turnaround so that additional boreholes can be extended radially outward in approximate 10-foot increments from any locations exhibiting elevated concentrations. This procedure will continue until inorganic concentrations do not exceed SSALs or another previous sampling location is encountered.

Samples submitted to the laboratory will be analyzed for the parameter indicated on Table 1 using approved SW-846 methodology (Method number 6010B) and 7471 for mercury. Turnaround of analytical data will be approximately 24-hours. A data usability report will be prepared once analytical data is finalized.

REPORTING

An addendum to the Area I Site Assessment Report will be prepared to summarize the findings of this investigation. The addendum will include analytical soil/fill data in tabular form compared to SSALs, a map showing the location of soil/fill borings, and borehole logs.

TABLE 1

Original Test Pit Location	Parameter of Concern	Original Description of Fill in Test Pit Depth range, ft below grade	Method Number
A1-TP-S9	Mercury	0-2.5' Sand, whole brick, metal building debris 2.5-6.5' Sand with gravel and brick fragments	7471
A1-TP-Q2	Chromium	0-10' Railroad ballast, brick, iron ore, slag, metal, wood	6010B
A1-TP-Q5	Chromium	0-6' Brick, metal, 2-gal metal pail, rail, wood, heavy porous asphalt like material, slag, cable, iron ore, sheen on coarse material	6010B
A1-TP-Q14	Arsenic	0-2' Sand and slag 2-2.5' gray slag, hard 2.5-4.5' Orangish brown cinder-like sand and dark brown cinder-like sandy silt 4.5-9' Dark brown cinder-like sand, silt	6010B
A1-TP-Q18	Lead	0-2' Grayish powdery silt with slag, iron ore, brick 2-17' Whole brick, firebrick, concrete blocks, tile (cast iron pipes), iron pipe (small), large iron pier	6010B
A1-TP-Q19	Lead	0-4' Gray & brown silt, slag, brick, ore and 1' gravel, slag, concrete to 4' 4-9' Dark brown cinder-like sand, brick, concrete, wood	6010B

Attachment 2

FIELD BOREHOLE LOG

Page ____ of ____

Borehole No.: A1-SB-S9-1	Project: LTV -Area 1,Inorgs	Surface Elev.:	
Location: 10' E Toward SP.	Project No: 0002-005	Ref. Elev.	
Date(s): 11/17/99	Logged By: JMA		
Drilling Method: Acker Rig	Drilling Co.: SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		8	13"		6" Dk brown cinder like sand, loose, moist			
		7			7" Broken brick, light colored sand, 1 piece bluish		1	
		15			slag, some dk brown sand/cinder material			
		29						
2		20	8"		8" A/A, wet			
		17					2	
		17						
		48						
4		8	19"		10" Black cinders, moist, loose to compact			
		9			9" Gray mottling just 2", clayey silt, laminated		3	
		7			moist			
		8						
6								
8								

9:20

- Just Fill

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FIELD BOREHOLE LOG

Page ____ of ____

Borehole No.:	A1-SB-S9-2	**Project:**	LTV -Area 1,Inorgs
Location:	10' S	**Project No:**	0002-005
Date(s):	11/17/99	**Logged By:**	JMA
Drilling Method:	Acker Rig	**Drilling Co.:**	SJB

Surface Elev.: ____

Ref. Elev. ____

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %	
0		8	13"		8" DK brown cinder-like sand, moist				
		7			4" Tan fire brick moist		1		9:40
		10			1" Red brick, moist				
		14	—						
2		9	3"		3" DK brown cinder-like sand, w/ little fire		2		9:42
		4			brick, one chunk porous slag, wet				
		2							
		1							
4		5	1"		wet, A/A				
		4							
		3							
		2							
6		5	11"		3" wet A/A				
		7			8" Ext moist clayey silt, brown mottles, w/		3		Just fill
		8			gray, laminated				9:45
		9							

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FIELD BOREHOLE LOG

Page ____ of ____

Borehole No.:	A1-SB-S9-3	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' W	Project No:	0002-005	Ref. Elev.	
Date(s):	11/17/99	Logged By:	JMA		
Drilling Method:	Acker	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %	
0		12	8"		Dk brn to black moist cinder-like sand		1		
		14			little Red brick fragments, little gravel				P2 10:10
		22			loose when dist.				
		15							
2		14	7"		A/A No brick, w/coal/coke fragments, moist,		2		
		15			loose when disturbed				P1 10:15
		12							to 4.5'
		2							
4		3	15"		6" A/A wet				
		4			6" Brn silt sand & gravel wet, loose		3		10:20
		13			3" Gray weathered cement w/ gravel ext moist				
		50/4"			(or concrete)				
6					Refusal w/ augers at 6.5'				

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FIELD BOREHOLE LOG

Page ______ of ______

Borehole No.:	A1-SB-59-4	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	N of TP-59, 10'	Project No:	0002-005	Ref. Elev.	
Date(s):	11/17/99	Logged By:	JMA		
Drilling Method:	Acker Drill	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		20	16		3" Dk brown cinder-like sand, gravel, moist			
		25			13" Red Brick, Fire brick, dark brown silt, sand, glass		1	
		15			moist			
		45						
2		40	8"		8" Dk brown w/ fire brick sand/gravel, moist		2	
		11						
		12						
		25						
4		6	18"		6" Dk brown cinder-like sand w/ little red		3	
		3			brick			
		3			12" Dk gray-black clayey silt w/ trace			
		3			peat/organics, ~~wet~~ moist			
6								

P3

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-QZ-1	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' W	Project No:	0002-005	Ref. Elev.	
Date(s):	11/19/99	Logged By:	JMA		
Drilling Method:	Acker 4¼" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		18	15"		Dk brown sand & slag, gravel, loose, moist		1	
		50						
		50/2						
2		25	15"		Dk brown sand, silt, slag, ore, gravel, slightly			
		38			compact, moist			
		40						
		50/3						
4		50	9"		A/A		2	
		50						
		50/2						
6		50/2	0"		Easy drilling		X	
8		50/4	0		Easy drilling, wet		X	
10		10	4		3" Sandy gravel/slag		3	
		5			1" Gray silty clay, laminated, ~~sat~~ moist-			
		5			wet			
		5						

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FIELD BOREHOLE LOG

Page ____ of ____

Borehole No.:	Al-SB-Q2-2	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' N	Project No:	0002-005	Ref. Elev.	
Date(s):	11/19/99	Logged By:	JMA		
Drilling Method:	Acker, 4¼" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		8	13"		Dk grayish brown sand, silt, iron, gravel,			
		13			slag, moist, compact		1	
		45						
		46						
2		49	17"		A/A w/ increased iron staining			
		15					2	
		16						
		50/6						
4		44	18"		Dk brownish gray sand, trace silt, slag, gravel		3	
		49			loose, wet bottom 3"			
		29						
		20						
6		14	3"		A/A, more tan (trace)			
		10						
		9						
		16						
8		26	16"		10" Reddish sand (little) and slag A/A			
		24			3" Peat layer wood			
		4			3" Gray & brown clayey silt			
		3						

PID 14

▽ 9.0'

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FIELD BOREHOLE LOG

Page ______ of ______

Borehole No.:	A1-SB-QZ-3	**Project:**	LTV -Area 1,Inorgs	**Surface Elev.:**	
Location:	10'S	**Project No:**	0002-005	**Ref. Elev.**	
Date(s):	11/19/99	**Logged By:**	JMA		
Drilling Method:	Acker 4¼" HSA	**Drilling Co.:**	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0	1	50/4	4"		Bro— silt, sand, gravel, slag, slightly moist, loose		X	
2	2	50/2	3"		A/A		1	
4	3	26 / 23	3"		Slag, sand-site		2	
5	4	50/4	3"		A/A, moist			
6								

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q2-4	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' E	Project No:	0002-005	Ref. Elev.	
Date(s):	11/19/99	Logged By:	JMA		
Drilling Method:	Acker 4 1/4" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %	
0		10	17"		Dk brown sand, gravel, slag, trace silt,		1		2.5'
		15			loose, moist				
		16							
		50/4							
2		50/3	3"		Brown broke up slag				
4		13	18"		Dk brown w/rust staining iron, sand-to-cemented		2		5' PID 15
		8			porous slag				
		10							
		7							
6		26	12"		wet slag, w/trace silt, trace sand-size.		3		
		37							
		28							
		41							
8		13	10"		wet slag & sand-size				
		11							
		15							
		19							
10		25	15		A/A				
		13							
		47							
		13							
12		8	11"		6" slag				
		5			5" Peat & silty clay				
		4							
		3							

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FIELD BOREHOLE LOG

Page ____ of ____

Borehole No.:	Al-SB-Q5-1-'	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' W	Project No:	0002-005	Ref. Elev.	
Date(s):	11/19/99	Logged By:	JMA		
Drilling Method:	Acker, 4¼" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %	
0	1	14	10"		Brown sand, silt, gravel, porous slag, moist		1		8:58
		37							
		37							
		50/4							
2	2	50/4	4"		~~Brown~~ Gray a/a, slag caught ~~in shoe~~, ext moist		2		9:00 PICT 12
4	3	50/4	4"		A/A		3		9:05
5	4	50/4	4"		wet				
6	5	50/3	4"						
7	6	50/0	0		Refusal at 7'				

FIELD BOREHOLE LOG

Page ____ of ____

Borehole No.:	A1-SB-QS-2	Project:	LTV -Area 1,Inorgs	Surface Elev.:
Location:	10' N	Project No:	0002-005	Ref. Elev.
Date(s):	11/19/99	Logged By:	JMA	
Drilling Method:	Acker, 4 1/4" HSA	Drilling Co.:	SJB	

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		5	14"		7" Dk brown loam w/ gravel & slag, moist			
		28			7" Slag & Fire brick, ext moist		1	
		13						
		20						
2		50/4	4"		4" Gray wet porous slag, some silt & sand			
					size fragments		2	
		50			7" Dk Gray silt and sand size mat'l w/ porous slag, moist			
		50/2						
4		23	16"		16" wet, more slag, A/A			
		40					3	
		41						
		30						
6		38	12"		A/A			
		58						
		24						
		20						
8		7	4"		A/A, piece slag stuck in shoe			
		10						
		7						
		7						
					Augers getting jammed in hole. Boring complete at 10			

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FIELD BOREHOLE LOG

Page ___ of ___

Borehole No.:	A-SB-QS-3	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' E	Project No:	0002-005	Ref. Elev.	
Date(s):	11/19/99	Logged By:	JMA		
Drilling Method:	Acker 4 1/4" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		8	19"		Dk brown gravelly sand silt, w/ slag & pisiron(?)		1	
		38			moist, compact			
		40						
		41						
2		50	7"		Dk gray slag & broken sand & silt size pieces.			
		50/2			ext moist, loose			
4		50	7"		Dk Brown silty sand w/ some slag & gravel, wet		2	
		50/3						
6		50/2	2"		A/A, mostly slag			
8		38	14"		A/A		3	12'
		49						
		50/3						
10		50	24"		Brown & dk brown mostly chunks of slag, gravel			
		50			coarse sand			
		19						
		18						
12		2	14"		2" A/A			
		5			12" Brown and gray clayey silt, laminated, wet			
		6			little fine sand			
		8						
14		4	16"		16" A/A			
		4						
		3						
		3						

FIELD BOREHOLE LOG

Borehole No.:	A1-88-05-4	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' S	Project No:	0002-005	Ref. Elev.	
Date(s):	11/19/99	Logged By:	JMA		
Drilling Method:	Acker, 4 1/4" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		8	13"		2" Brown silt, sand & Slag/gravel moist			
		28			11" Gray gravel, slag, sand & silt, moist			
		28						
		27						
2		18	13"		Dk grayish brown sand size slag, silt &		1	
		30			slag, wet			
		30						
		26			Auger refusal at 2.5', Move back 3' & another			
4		25	12"		attempt			
		38			Dk Gray very compact silt, sand, Slag, gravel,		2	
		50			~~wet~~ ext moist			
		45						
6		30	16"		A/A, w/ chunk of coal			
		50					3	
		50/4						
8		9	17"		Grayish brown clayey silt, ext moist, laminated			
		4						
		5						
		5						

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FIELD BOREHOLE LOG

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Borehole No.:	Al-SB-QS-5	Project:	LTV -Area 1,Inorgs
Location:		Project No:	0002-005
Date(s):	11/29/99	Logged By:	JMA
Drilling Method:	4¼" HSA, CME 550 ATV	Drilling Co.:	SJB

Surface Elev.: ____
Ref. Elev. ____

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0	1	4	10"		Dk brown silty sand and gravel/slag, moist,			
		11			loose			
		50/6						
2	2	8	12"		Dk brownish gray sand-size and gravel size slag, wet.			
		19						
		21						
		20						
4	3	87	1"		DK gray sand, wet, poor recovery			
		114			w/little slag (grav-size)		1	
5	4	160/3	5"		A/A			
6	5	10	11"		A/A			
		23					2	
		15						
		15						
8	6	14	9"		Red brick, fire brick, gravel, loose, trace sand			
		12			wet			
		5						
		12						
10		25	8"		Red brick, gravel, slag, loose, trace silty sand,			
		12			wet			
		17						
		15						

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FIELD BOREHOLE LOG

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Borehole No.: A1-SB-Q5-6
Project: LTV -Area 1,Inorgs
Surface Elev.:
Location:
Project No: 0002-005
Ref. Elev.
Date(s): 11/29/99
Logged By: JMA
Drilling Method: 4¼" HSA, CME 550
Drilling Co.: SJB

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		5	13"		Brom - Dk brow ~~ext~~ moist gravelly silty sand,			
		12			Slightly compact			
		31						
		15						
2		8	14"		7" wet reddish bro— sand & gravel loose,			
		19			7" DK bro— w/ coal chunk sand & gravel,		1	
		20			loose, wet			
		18						
4		16	17"		10" Gray sand, gravel, slag, wet			
		21			7" A/A, w/ trace oil drops, no odor,		—	
		27			slight residue	0		
		27						
6		30	15'		6" Gray sand, little - trace gravel, trace			
		14			oil drops, no odor, wet, slight residue of oil	0	2	
		7			9" Gray native silt w/ trace clay, laminated			
		10						

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FIELD BOREHOLE LOG

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Borehole No.: A1-SB-Q8-7	**Project:** LTV-Areal Inorgs	**Surface Elev.:**	
Location:	**Project No:** 0002-005	**Ref. Elev.**	
Date(s): 11/29/99	**Logged By:** JMA		
Drilling Method: 4 1/4" HSA, CME 550	**Drilling Co.:** SJB		

SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	Soil Description	PID HDSP (ppm)	Samples	Moisture %
0		3	14"		5" Brown loam w/roots, moist			
		3			9" Olive gray sand, trace silt w/gravel &			
		3			slag			
		3						
2		24	10"		Brown sand & gravel, slag, iron ore		1	
		18			wet, loose.			
		15						
		14						
4		18	11"		Gray, slightly compact silt, sand, gravel,		—	
		40			ore, slag, wet			
		50/3						
6		17	17"		A/A			
		20						
		14						
		11						
8		5	16"		3" A/A			
		4			13" Gray silty clay, ext moist, laminated			
		3						
		4						

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q5-8	Project:	LTV -Area 1,Inorgs
Location:		Project No:	0002-005
Date(s):	11/29/99	Logged By:	JMA
Drilling Method:	4¼" HSA, CME 550	Drilling Co.:	SJB

Surface Elev.:

Ref. Elev.

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		10	14"		5" Bro — silt, sand, little gravel, slag, ore,			
		12			moist, loose			
		12			4" Dk Bro — cinder, coarse sand size			
		14			5" Bro — silt w/sand, little gravel, slag, ore, moist			
2		17	18"		Gray sand w/slag, gravel, moist, wet Bottom			
		35			limestone			
		28						
		35						
4		22	16"		8" Bro — silty sand, compact, w/ gravel, slag			
		20			wet			
		23			8" Gray sand & slag gravel, limestone, wet,			
		60/3			loose, trace silt		1	
6		70	11"		11" A/A			
		37						
		11						
		5						
8		7	7"		Brownish gray silty clay, thin layer peat w/			
		2			wood on top, moist in clay, laminated,			
		2						
		3						

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FIELD BOREHOLE LOG

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Borehole No.: A-SB-Q5-9	Project: LTV-Areal Invgs	Surface Elev.:	
Location:	Project No: 0002-005	Ref. Elev.	
Date(s): 11/29/99	Logged By: JMA		
Drilling Method: 4 1/4" HSA, CME 550	Drilling Co.: SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		17	13"		1" Brown silt, sand, little gravel, slag, moist, loose.			
		24			12" Brown & gray sand & gravel, slag, ore			
		17			loose, slightly compact, trace - little silt			
		18						
2		14	18"		9" Lightish gray sand & gravel, slag, slightly			
		30			compact, trace - little silt, wet			
		30			9" Gray sand & gravel slag, trace silt,			
		25			Slightly compact, wet		1	
4		20	24"		6" A/A grading to			
		18			6" Brownish gray sand & gravel w/ coal		—	
		14			& cinders, wet			
		17			12" Dk brown cinders, coal, trace slag, wet			
6		12	19"		15" Brown & gray laminated silty clay &			
		12			Sandy silt, very compact, moist			
		14			4" Red brick with black sand			
		15						
8		7	20"		6" A/A			
		3			14" Olive gray silty clay tending toward			
		4			clayey silt, moist, laminated			
		7						

FIELD BOREHOLE LOG

Borehole No.:	A1-SB-Q5-10	**Project:**	LTV -Area 1,Inorgs
Location:		**Project No:**	0002-005
Date(s):	11/29/99	**Logged By:**	JMA
Drilling Method:	CME 550, 4¼" HSA	**Drilling Co.:**	SJB

Surface Elev.: ____
Ref. Elev.: ____

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		7	18"		8" Brown sand w/ some gravel, slag,			
		10			cinders, moist			
		9			10" Olive brownish gray sand w/ slag, gravel,			
		14			cinders, wet bottom 2", ore			
2		19	7"		7" A/A			
		50/4						
4		57	9"		9" Dk gray sand w/ slag, gravel, ore,		1	
		60/3			wet, little silt, compact upper 4"			
6		14	12"		12" Dk gray gravel w/ sand, slag, ore,		2	
		4			wet, loose			
		11						
		7						
8		27	13"		13" A/A			
		7						
		7						
		21						
10		14	11"		11" Gray sand w/ gravel, trace silt,			
		14			Slightly compact, wet			
		27						
		25						
12		30	16"		16" A/A			
		28						
		17						
		12						
14		37	2"		2" A/A			
		49						
		37						
		44						
16		22	18"		13" A/A			
		15			5" Olive gray clayey silt, v. stiff			
		17						
		50						

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FIELD BOREHOLE LOG

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Borehole No.:	AL-SB-05-11	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:		Project No:	0002-005	Ref. Elev.	
Date(s):	11/29/99	Logged By:	JMA		
Drilling Method:	CME 550, 4 1/4" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		12	15"		Dk brown silty sand w/ gravel, slag, moist			
		18			cinders, concrete			
		10						
		21						
2		5	0"		Brown wet gravel, slag, cinders, little			
		7			Sand			
		5						
		7						
4		32	8"		Dk Gray gravel, slag, brick, ore, wet		1	
		38			loose			
		50						
		35						
6		34	9"		A/A			
		12						
		35						
		27						
8		31			Dk brown cinders, slag, fire brick, ore, wet		—	
		41			Slightly compact			
					Auger advancement too hard - rig is			
					chattering - refusal.			

FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-QS-12	**Project:**	LTV- Area I Inorgs
Location:		**Project No:**	0002-005
Date(s):	11/29/99	**Logged By:**	JMA
Drilling Method:	CME 550, 4¼" HSA	**Drilling Co.:**	SJB
Surface Elev.:		**Ref. Elev.:**	

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	**SOIL DESCRIPTION:** Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		11	18"		6" Brown silty sand w/some gravel, slag, cinders			
		19			12" Dk brown sand w/some gravel, trace silt,			
		47			slag, cinders, ore.			
		37						
2		48	14"		14" A/A, w/little-trace silt, slightly compact			
		33						
		15						
		37						
4		15	18"		18" Dark brownish gray silty sand w/			
		22			some gravel, slag, cinders, ore,		1	
		20			wet, compact			
		31						
6		50/3	3"		A/A		—	
7		40	7"		7" Brown sand, slag, ore, wet			
		50/3						
					Auger & spoon refusal @ 7.7'.			

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10 -4-8 1280
11 -4-8 1280
12 6-8 1390
of
10

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FIELD TEST PIT LOG

Test Pit No.:	A1 - TP - Q5-13	**Project:**	LTV Steel, Area I ~~H Flowable Inv.~~ Morgs
Location:	10' E of A1-SR-Q5-12	**Project No:**	0002-003-200
Date:	12/7/99	**Logged By:**	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade

Dk grayish brown
Sand mixed w/,
significant quantity
of building demo,
brick, wire, rebar,
concrete

Refusal at 8' bg

Test Pit Plan View (North Top of Page) not to scale

Notes: not to scale

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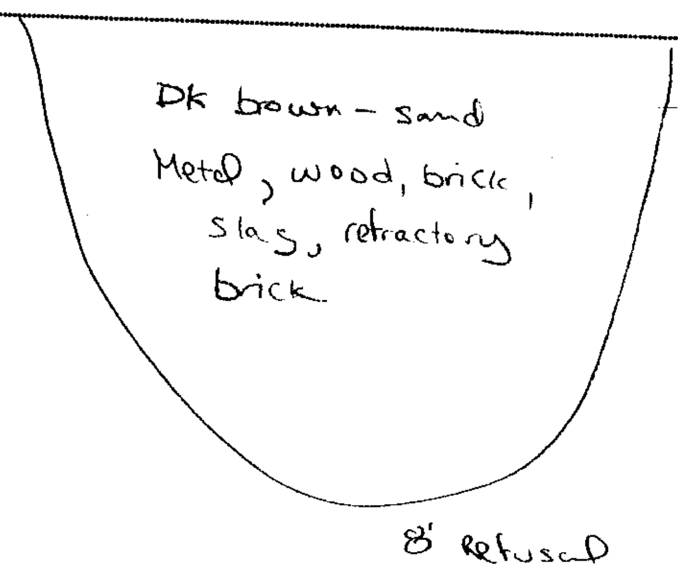
FIELD TEST PIT LOG

I Inorgs

Test Pit No.:	A1-TP-Q5-14	Project:	LTV Steel, Area II Flowable Inv.
Location:	10' NE of A1-SB-Q5-11	Project No:	0002-008-200
Date:	12/7/99	Logged By:	JMA
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



Hard metallic slag

Test Pit Plan View (North Top of Page) not to scale

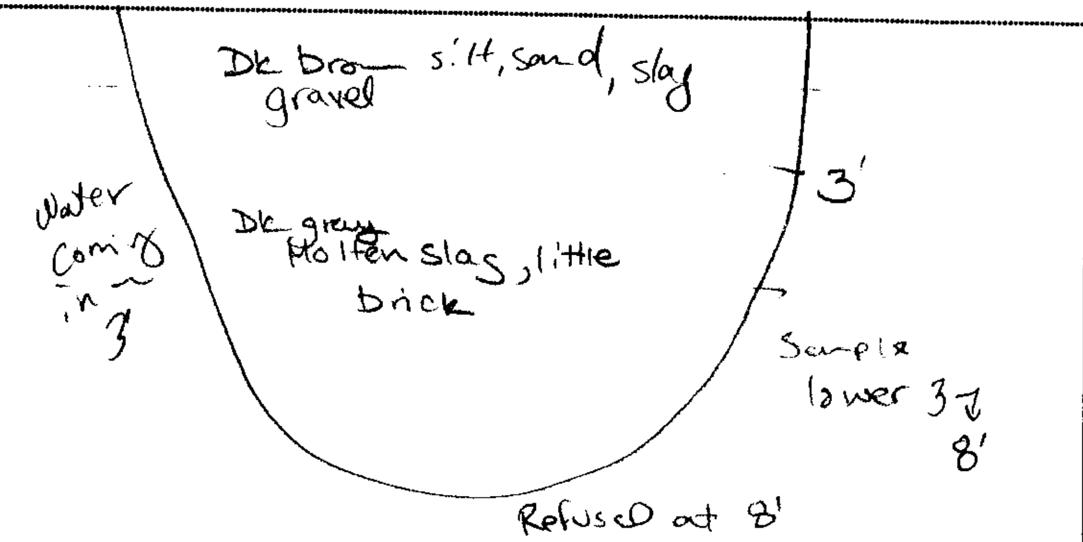
Notes: not to scale

FIELD TEST PIT LOG

Test Pit No.:	A-TP-Q5-15	**Project:**	LTV Steel, Area I Inorgs ~~N Flowable Inv.~~
Location:	10' N of A-SB-Q5-10	**Project No:**	0002-003-200
Date:	12/7/99	**Logged By:**	JMA 5
Excavation Method:	Liebherr 932		

Test Pit Profile

grade



not to scale

Test Pit Plan View (North Top of Page)

not to scale

Notes:			

FIELD BOREHOLE LOG

Page ___ of ___

Borehole No.:	A1-SB-Q14-1	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' N	Project No:	0002-005	Ref. Elev.	
Date(s):	11/17/99	Logged By:	JMA		
Drilling Method:	Hoker Drill	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %	
0		4	16"		8" Dk brown cinder like sand w/ gravel, coal				
		8			8" Slag, some pieces porous				
		40					1		11:55
		50/1							
2		32	17"		10" Slag				12:00
		19			7" Reddish bro - sand, moist				
		11					2		PS
		15							
4		26	16"		13" slag gray & light bro				
		40			3" Dk gray sand & gravel, wet				
		39					3		to 8' 12:05
		15							
6		39	9"		9" A/A				
		50/2							
8		3	5"		5" Ext moist-wet gray clayey silt, trace peat,				
		3							
		2							
		1							

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q14-2	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' W	Project No:	0002-005	Ref. Elev.	
Date(s):	11/17/99	Logged By:	JMA		
Drilling Method:	Acker Drill 4 1/4" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %	
0		8	24"		2" Brn — loam w/ roots				
		6			11" Slag, gravel, dk brn silt, coal, moist				
		10			11" Tan & Gray Sand, loose when dist. moist		1		to 4.1' 1:00
		15							
2		10	17"		17" A/A, w/ little blue slag within				
		15							
		32							
		50/3"							
4		15	19"		2" A/A				Pict
		10			13" yellow, rust colored & light brn sand slightly		2		6
		6			cemented, can be busted w/ pressure of hand				1:05
		6			4" Brn over reddish silt, sand, gravel, wet				
6		16	12"		1" A/A, wet				
		10			8" Dk brn — black sand & gravel, rust coloring within		3		1:1
		10			1" Brn sand				
		3			2" Dk gray, trace peat & clayey silt, ext moist				

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FIELD BOREHOLE LOG

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Borehole No.: A1-SB-Q14-3	**Project:** LTV -Area 1,Inorgs	**Surface Elev.:**	
Location: 10' S of Q14	**Project No:** 0002-005	**Ref. Elev.:**	
Date(s): 11/17/99	**Logged By:** JMA		
Drilling Method: Ackes 4 1/4" HSA	**Drilling Co.:** SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %	
0		5	0		No Recovery				
		7							
		16							
		11							
2		3	10"		Dk brn — sand, gravel, coal, loose, moist		1		13:30
		3							
		3							
		3							
4		7	6"		Dk brn — A/A, wet		2		fict 13:35
		9							
		4							
		21							
6		14	15"		Dk Gray slag pieces, gravel, sand, wet loose		3		13:40
		10							
		18							
		31							
8		2	18"		Gray w/ br — mottles, ext moist, laminated				
		3							
		3							
		2							

FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q14-4	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' W	Project No:	0002-005	Ref. Elev.	
Date(s):	11/17/99	Logged By:	JMA		
Drilling Method:	Acker 4¼" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		5	20"		3" Dk br ~ silt, sand, gravel, coal		1	
		10			17" slag			
		15						
		15						
2		50/1	0					
4		50/4	4"		light gray slag		2	
6		43	7"		light gray weathered cent, wet		3	
		50/1						
8		3	1"		Gray w/ trace peat, ext moist			
		3						
		4						
		5						

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FIELD BOREHOLE LOG

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Borehole No.:	A1-~~SB~~-Q14-5	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' NE of Q14-1	Project No:	0002-005	Ref. Elev.	
Date(s):	11/22/99	Logged By:	JMA		
Drilling Method:	Acker, 4 1/4" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		10	14"		9" Dk brown sand, slag & gravel, trace silt,			
		11			ext moist			
		49			5" Gray sand size slag and slag			
		50/2						
2		17	14"		10" A/A wet bottom 2"			
		27			4" Reddish brown sand size and slag (porous)			
		26			wet		1	
		24						
4		30	11"		11" wet gray sand-size & trace slag, mostly		2	
		29			limestone, wet			
		50						
		50/2						
6		33	17"		7" A/A			
		13			4" Gray & brown & tan sand, slag, gravel, wet			
		22			6" Dk brown to black sand, trace silt, wet			
		15					3	
8		3	10"		4" A/A			
		5			6" Gray silty clay, laminated, ext moist			
		6						
		8						

PID 16

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q14-6	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	~10' NW of Q14-1	Project No:	0002-005	Ref. Elev.	
Date(s):	11/22/99	Logged By:	JMA		
Drilling Method:	Acker, 4 1/4" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0	1	5	12"		12" Dk brown sand, slag & gravel, trace silt			
		5			ext moist			
		50/4						
2	2	50/2	3"		3" NA			
3	3	13	12"		Brown & dk brown to black sand, slag, limestone		1	
		7			coal, ext moist			
		5						
		6						
5	4	4	4"		Brown sand, slag		2	PICT 17
		1						
		8						
		17						
7		47	10"		5" ~~Dk~~ reddish tan ~~brown~~ sand, trace slag,		3	
		39			wet			
		7			4" Brown sand and gravel			8'
		6			1" Gray silty clay, ext moist			

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FIELD BOREHOLE LOG

Borehole No.: A1-SB-Q18-1	Project: LTV -Area 1,Inorgs	Surface Elev.:	
Location: 10' S	Project No: 0002-005	Ref. Elev.	
Date(s): 11/17/99	Logged By: JMA		
Drilling Method: Acker 4 1/4" HSA	Drilling Co.: SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		5	15		10" Dk brown silt, sand, gravel, slag, roots-top moist		1	
		27						
		17			2" Reddish brown clay			
		34			3" Dk brown silt, sand, gravel, slag, moist			
2		10	11"		11" Red brick, moist, little brn sand & silt		2	
		13						
		19						
		17						
4		26	10"		A/A, little chunk wood			
		19						
		14						
		17						
6		8	4"		A/A, piece of slag			
		14						
		11						
		10						
8		8	1"		A/A, wet		3	
		3						
		4						
		7						
10		8	4"		A/A, wet			
		8						
		10						
		5						
12		6	2"					
		5						
		50/0			Cannot advance augers past 13'. Attempt spoon. Spoon refusal again.			

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q18-Z-	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' W	Project No:	0002-005	Ref. Elev.	
Date(s):	11/18/99	Logged By:	JMA		
Drilling Method:	Acker 4¼" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %	
0		23	18"		Dk brown silt w/ sand and gravel, slag, compact		1	9:05	↓
		33			moist				6'
		38							
		24							
2		28	12"		A/A				
		34			trace of brick bottom 3"				
		34							
		44							
4		24	20"		A/A				
		23			little red brick & fire brick, soil still compact				PICT
		33			moist				8
		19							
6		8	5"		Mostly brick, slag, becoming ext moist		X		
		13							
		15							
		8							
8		14	10		Tan and orangish sand w/ trace silt, wet, loose		2		PICT
		4			when disturbed. Sand is slightly cemented.			9:25	9
		3							
		2							
10		2	7"		A/A Tan and reddish orange sand, wet		3		9:30
		2							
		1							
		3							
12		8	14"		A/A				
		3							
		2							
		50/1							
		50/6			Spoon & auger refusal @ 14' bg. Hole filled w/				
					water ~~to~~ ~ 8' bg				

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q18-3	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' N	Project No:	0002-005	Ref. Elev.	
Date(s):	11/18/99	Logged By:	JMA		
Drilling Method:	Acker, 4¼" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		14	19"		Dk bro— silt, sand, gravel, slag, moist, compact		1	
		40						
		50						
		50/1						
2		27	17"		Bro— silt, san, gravel, red brick, slag, moist, compact		2	
		40						
		50/1						
					Auger refusal @ 3.2' bg			

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q18-4	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' E	Project No:	0002-005	Ref. Elev.	
Date(s):	11/18/99	Logged By:	JMA		
Drilling Method:	Acker, 4¼" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		8	19"		Dk bro- silt and sand w/ slag & gravel,			
		20			compact, moist, occ fire brick		1	
		50						
		37						
2		37	14"		Dk bro- silt and sand w/ slag, brick, trace			
		45			gravel moist			
		47						
		8						
4		25	10"		Red brick, trace sand, ext moist			
		21					2	
		14						
		13						
6		9	5"		A/A, wet, plastic		X	
		9						
		6						
		7						
8		5	1"		Slag caught in shoe, wet		X	
		6						
		4						
		4						
10		9	3"		Broke-up sandstone cobble, wet		X	
		17						
		6						
		4						
12		4	4"		Broke-up reddish sandstone, wet		X	
		3						
		2						
		2						
14		1	4"		A/A			
		1					3	11:12
		11						
		50/4						

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FIELD BOREHOLE LOG

Page ______ of ______

Borehole No.:	A1-SB-Q18-5	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' NW of Q18-2	Project No:	0002-005	Ref. Elev.	
Date(s):	11/22/99	Logged By:	JMA		
Drilling Method:	Acker, 4¼" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		15	13"		Brown silty sand w/ slag, gravel, moist		1	
		27						
		50/2						
2		15	24"		A/A w/ red brick bottom 6", moist			
		11						
		47						
		42						
4		22	13"		3" Yellow brick sand size mat'l, moist			
		14			4" Olive gray sand, slag, limestone, moist		2	
		17			6" Red brick fragments, sand size, moist			
		18						
6		17	2"		Slag (iron ore) in shoe			
		16						
		11						
		11						
8		6	4"		Red brick sand size & fire brick (yellow) sand size and fine gravel size, wet			
		5						
		4						
		3						
10		6	1"		A/A		X	
		6						
		6						
		6						
12		10	13"		8" A/A			
		40			5" Black sand, slight odor		3	
		24						
		50/4						
14		50/6			Auger & spoon refusal at 14'			

Pict 18

Pict 19

Pict 20

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FIELD BOREHOLE LOG

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Borehole No.: A1-BB-Q18-6 | Project: LTV -Area 1,Inorgs | Surface Elev.:
Location: 10' SW of Q18-2 | Project No: 0002-005 | Ref. Elev.
Date(s): 11/22/99 | Logged By: JMA
Drilling Method: Acker, 4 1/4" HSA | Drilling Co.: SJB

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		14	13		Brown silty sand w/gravel, slag, trace red brick,		1	
		48			moist, loose			
		50/2						
2		31	18"		16" A/A, compact			
		30			2" wood & red brick			
		47						
		20						
4		28	11"		11" Red Brick, slag, gravel, silty sand, moist		2	
		22						
		20						
		11						
6		8	8"		8" A/A, w/ fire brick			
		5						
		8						
		6						
8		13	7"		7" wet A/A			
		6					3	
		2						
		3						
10		2	8"		8" A/A			
		1						
		4						
		3						
12		1	2"		2" A/A			
		1						
		1						
		1						
14		50/4	4"		4" A/A			

Pict 21

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q18-17	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' NE of Q18-4	Project No:	0002-005	Ref. Elev.	
Date(s):	11/22/99	Logged By:	JMA		
Drilling Method:	Acker, 4¼" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0	1	10	16"		Brown Sand w/ some gravel, slag, limestone,		1	— No Sample
		30			moist, loose			
		28						
		24						
2	2	30	6"		A/A			
		35						
		35						
		37						
4	3	10	21"		Tan & Pinkish tan sand, angular, moist some			Pict 22
		8			is cemented together, one chunk has		2	
		15			very flat surface like floor			
		50/3						
6	4	50/0	0		Auger & Spoon refusal at 6', continue to advance auger, hard drilling, manage to break through			
7	5	19	7"		Pinkish tan, tan, and rust colored sand,			
		44			A/A, wet			Pict 23
		30						
		5						
9					VOID to 11'			
11		5	2"		Cement/Concrete, yellow, tan & red brick		3	
		5			wet			
		3						
		2						
13		6	7"		A/A w/ 2" ~~Bk~~ grayish brown sand, trace gravel			
		5			concrete mat'l is yellow, wet			
		50/2						
15		50/4	4"		A/A			
16		50/4			Black & gray slag, gravel fill, sand-size also		4	
17		50/6			Spoon & auger refusal at 17'			

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q18-8	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' SE of Q18-4	Project No:	0002-005	Ref. Elev.	
Date(s):	11/22/99	Logged By:	JMA		
Drilling Method:	Acker 4 1/4" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		10	10"		3" Dk bro gravelly sandy loam, roots, ext moist			
		45						
		50/0			7" Slag mixed w/ bro silty sand, moist Coal			
2		15	15"		4" A/A			
		25			11" Tan brown sand red brick, gray sand, gravel, Slag, moist			
		26					1	
		16						
4		30	9"		9" Sand size and chunks broken red brick moist		2	
		20						
		20						
		11						
6		13	5"		A/A, wet			
		9						
		10						
		5						
8		7	0		—			
		5					X	
		3						
		6						
10		3	2		Slag, brick, wood, wet			
		8					X	
		4						
		3						
12		2	6"		Brown silty sand w/ coarse sand-tan trace pieces of red brick, wet		3	
		4						
		7						
		50/2						
14		50/0			Auger and spoon refusal			

Pic 24

Pic 25

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FIELD BOREHOLE LOG

Page 1 of

Borehole No.: A1-SB-Q18-9	Project: LTV-Area 1, ~~under berm~~	Surface Elev.:	
Location:	Project No: 0002-005 Inorgs	Ref. Elev.	
Date(s): 11/29/99 / 11/30/99	Logged By: JMA		
Drilling Method: CME 550, 4 1/4" HSA	Drilling Co.: SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
2		10	14"		Dk brown sand & silt w/trace gravel, 1 large			
		14			piece red brick, moist, compact			
		50/3						
4		13			Brown sand & gravel, slag, ore, trace-no			
		50/3			red brick, moist, loose		1	
11/30								
6		50/0			Auger & Spoon refusal. Cannot advance either.			

FIELD BOREHOLE LOG

Page ____ of ____

Borehole No.:	A1-SB-Q18-10	**Project:**	LTV -Area ~~under berm~~	**Surface Elev.:**	
Location:		**Project No:**	0002-005	**Ref. Elev.:**	
Date(s):	11/30/09	**Logged By:**	JMA		
Drilling Method:	CME 550, 4¼" HSA	**Drilling Co.:**	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		50/3			Dk bro — silty sand and gravel, slag,			
					brick (yellowish), moist		1	
					Advance augers through v. hard material			
2		14	14"		Dk brown sandy silt w/some gravel, slag,			
		10			trace red brick, limestone, moist			
		20						
		50/2						
4		50/1			Auger attempt ~ ½ hr, only able to go 0.5'.		2	
					Spoon had concrete in it.			
					Refusal at 4.5'			

Scoop of auger cuttings

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FIELD BOREHOLE LOG

Borehole No.: AI-SB-Q18-11 Project: LTV ~~Area~~, ~~under berm~~ Page ___ of ___
Location: ______ Project No: 0002-0/5 Inorgs Surface Elev.: ______
Date(s): 11/30/99 Logged By: JMA Ref. Elev. ______
Drilling Method: CME 550, 4¼" HSA Drilling Co.: SJB

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		20	17"		Dk brown silty sand w/slag, trace brick, gravel, moist, v. slightly compact			
		34						
		17						
		12						
2		17	0		No Recovery			
		18						
		18						
		17						
4		9	9	10"	Brownish gray concrete, silty sand, slag, ext moist, loose when disturbed			
		17	17				1	
		7						
		4						
6		5	3"		A/A, ext moist			
		22						
		31						
		37						
8		10	5"		Wood, wet		—	
		5						
		2						
		2						
10		4			Brown wet gravel, slag, wood, trace sand & silt, loose			
		5						
		5						
		2						
12		5			A/A			
		7						
		12						
		40						
					Auger refusal @ 14.0'			

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FIELD BOREHOLE LOG

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Borehole No.: A1-SB-Q18-R	Project: LTV-Area ~~B, under berm~~ Inorgc	Surface Elev.:
Location:	Project No: 0002-0085	Ref. Elev.:
Date(s): 11/30/99	Logged By: JMA	
Drilling Method: CME 550, 4¼" HSA	Drilling Co.: SJB	

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
					Advanced augers to 2' prior to sampling			
2		20	16"		14" Dk brown sandy silt, ~~little~~ gravel & slag, brick, moist compact			
		27			2" Tan Sand, moist, loose			
		20						
		24						
4		8	8"		Fire brick, gravel, red brick, wet, loose		1	
		6						
		5						
		9						
6		5			A/A, 1			
		3						
		5						
		5						
					Complete @ 8'			

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q19-1	Project:	LTV -Area 1,Inorgs
Location:	10' N	Project No:	0002-005
Date(s):	11/18/99	Logged By:	JMA
Drilling Method:	Acker, 4 1/4" HSA	Drilling Co.:	SJB

Surface Elev.: ____
Ref. Elev. ____

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		25	13"		Dk brown silty sand w/ gravel, slag, moist			
		24					1	
		50/3						
2		3	16"		A/A			
		24					2	
		40						
		50/3						
4		50/3	0					
							X	
6			50/4	2"	Slag			
							3	
8		39	2"		Dk brown sand, silt & slag, wet			
		9						
		7						
		6						
10		2	16"		1" A/A			
		4			15" Gray clayey silt, trace peat/organic, moist, laminated			10.1'
		4						
		6						

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FIELD BOREHOLE LOG

Borehole No.: A1-SB-Q19-2	Project: LTV -Area 1,Inorgs	Surface Elev.:	
Location: 10' W	Project No: 0002-005	Ref. Elev.	
Date(s): 11/18/99	Logged By: JMA		
Drilling Method: Acker, 4-1/4" HSA	Drilling Co.: SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		27	14"		7" Bro – silty sand w/gravel, moist			
		34			7" Slag			
		27						
		31						
2		21	13"		11" Dk bro– silt and sand w/coal, slag, moist, compact		1	
		15			2" Yellowish tan sand, moist			
		13						
		50/1						
4		31	15"		6" Slag mixed w/bro– silty sand, moist		2	
		38			9" Slag, coke, rust colored mat'l, slag			
		21						
		15						
6		7	3"		A/A, wet		X	
		8						
		10						
		12						
8		21	11"		Gravel & slag, wet, loose, no sand or silt size, no sample		X	
		31						
		24						
		15						
10		19	10"		6" A/A		3	
		12			4" Gray silty clay laminated, ext moist			
		4						
		5						

PID 10

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q19-3	Project:	LTV -Area 1,Inorgs
Location:	10' S	Project No:	0002-005
Date(s):	11/18/99	Logged By:	JMA
Drilling Method:	Acker 4¼" HSA	Drilling Co.:	SJB

Surface Elev.: ____
Ref. Elev.: ____

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		13	12"		Brown sandy gravelly slag, fill, loose, moist			
		47					1	
		50/2						
2		12	14"		DK brown sand and silt w/ coal, slag, brick, moist			
		14					2	
		32						
		17						
4		16	11"		A/A, wet			
		47						
		36						
		14						
6		20	10"		Porous slag, wet			
		17					3	
		14						
		13						
8		11	0					
		17						
		5						
		3						
10		7	13"		3" Black and tan sand, wet			
		4			w/ small pieces brick			
		3			10" Gray silty clay, laminated			
		3						

1
10.2'

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FIELD BOREHOLE LOG

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Borehole No.:	A1-SB-Q19-4	Project:	LTV -Area 1,Inorgs	Surface Elev.:	
Location:	10' E	Project No:	0002-005	Ref. Elev.	
Date(s):	11/18/99	Logged By:	JMA		
Drilling Method:	Acker 4 1/4" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		8	17		3" Dk brown moist silt, sand & slag			
		6			14" Slag, silt, sand, wood, compact, moist		1	
		36						
		31						
2		21	18		12" A/A			
		25			6" Tan sand and brown silt and sand		2	
		50			Fill			
		25						
4		7	20		10" A/A		3	
		10			10" Blue sandy slag, ext moist			
		26						
		13						
6		9	6		3" Brown silt, sand, slag, ext moist			
		7			3" Brown clayey silt, ext moist			
		5						
		6						

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FIELD BOREHOLE LOG

Borehole No.: A1-SB-Q19-5
Location: 10' SE of Q19-4
Date(s): 11/24/99
Drilling Method: Acker, 4 1/4" HSA

Project: LTV - Area II
Project No: 0002-005
Logged By: MMA
Drilling Co.: SJB

Page ____ of ____
Surface Elev.: ____
Ref. Elev.: ____

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		10	10"		Dark brown Silt and Sand w/ gray slag, gravel			
		35			moist		1	
		50/4						
2		50/2	2"		A/A			
3		46	12"		5" Dk brown silt, sand & gravel / slag			
		30			3" Gray sand-size slag, limestone, moist			
		15			4" Dk brown cinder-like sand, trace red brick,		2	
		16			moist			
5		18	13"		1" A/A			
		19			12" Blue slag (sand-size) & gravel size, mixed w/			
		19			rust colored same			
		38						
7		4	11"		11" Gray Silty clay, ext moist, laminated			
		3						
		7						
		8						

Pic 19

Pic 20

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FIELD BOREHOLE LOG

Borehole No.:	A1-SB-Q19-6	Project:	LTV - Area I	Surface Elev.:	
Location:		Project No:	0002-005	Ref. Elev.	
Date(s):	11/24/99	Logged By:	JMA		
Drilling Method:	Acker, 4¼" HSA	Drilling Co.:	SJB		

Depth (bgs)	Sample No.	Blows (per 6")	Recovery	PID Scan (ppm)	SOIL DESCRIPTION: Color, Moisture Condition, Texture, Soil Type, Plasticity, Fabric, Bedding, Other	PID HDSP (ppm)	Samples	Moisture %
0		11	16"		Dark brown, brown & gray sand & gravel, little		1	
		48			silt, slag, moist			
		33						
		25						
2		50/4	2"		A/A		✓	
3		44	17"		7" Orange brick			
		30			3" Dark brown silty sand cinders, moist			
		30			3" Blue slag			
		33			4" Tan slag			
5		25	12"		2" A/A			
		10			8" Blue slag			
		15			2" Gray clayey silt, ext. moist, laminated			
		13						

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Attachment 3

Sample ID: A1-SB-Q5-6-2
Lab Sample ID: A9810804
Date Collected: 11/29/1999
Time Collected: 10:00

Date Received: 11/30/1999
Project No: NY9A8496
Client No: L11208
Site No:

Parameter	Result	Flag	Detection Limit	Units	Method	Date/Time Analyzed	Analyst
SOIL-SW8463 8270 - TCL SVOA ORGANICS							
1,2,4-Trichlorobenzene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
1,2-Dichlorobenzene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
1,3-Dichlorobenzene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
1,4-Dichlorobenzene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
2,2'-Oxybis(1-Chloropropane)	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
2,4,5-Trichlorophenol	ND		800	UG/KG	8270	12/16/1999 05:35	RCS
2,4,6-Trichlorophenol	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
2,4-Dichlorophenol	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
2,4-Dimethylphenol	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
2,4-Dinitrophenol	ND		1600	UG/KG	8270	12/16/1999 05:35	RCS
2,4-Dinitrotoluene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
2,6-Dinitrotoluene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
2-Chloronaphthalene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
2-Chlorophenol	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
2-Methylnaphthalene	150	J	760	UG/KG	8270	12/16/1999 05:35	RCS
2-Methylphenol	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
2-Nitroaniline	ND		1600	UG/KG	8270	12/16/1999 05:35	RCS
2-Nitrophenol	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
3,3'-Dichlorobenzidine	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
3-Nitroaniline	ND		1600	UG/KG	8270	12/16/1999 05:35	RCS
4,6-Dinitro-2-methylphenol	ND		1600	UG/KG	8270	12/16/1999 05:35	RCS
4-Bromophenyl phenyl ether	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
4-Chloro-3-methylphenol	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
4-Chloroaniline	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
4-Chlorophenyl phenyl ether	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
4-Methylphenol	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
4-Nitroaniline	ND		1600	UG/KG	8270	12/16/1999 05:35	RCS
4-Nitrophenol	ND		1600	UG/KG	8270	12/16/1999 05:35	RCS
Acenaphthene	82	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Acenaphthylene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Anthracene	130	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Benzo(a)anthracene	530	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Benzo(a)pyrene	510	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Benzo(b)fluoranthene	430	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Benzo(ghi)perylene	300	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Benzo(k)fluoranthene	140	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Benzoic acid	ND		1600	UG/KG	8270	12/16/1999 05:35	RCS
Benzyl alcohol	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Bis(2-chloroethoxy) methane	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Bis(2-chloroethyl) ether	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Bis(2-ethylhexyl) phthalate	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Butyl benzyl phthalate	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Chrysene	1100		760	UG/KG	8270	12/16/1999 05:35	RCS
Di-n-butyl phthalate	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Di-n-octyl phthalate	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Dibenzo(a,h)anthracene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Dibenzofuran	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Diethyl phthalate	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Dimethyl phthalate	ND		760	UG/KG	8270	12/16/1999 05:35	RCS

Turnkey Environmental Restoration, LLC
Turnkey Environmental Restoration, LLC
TurnKey Environmental Restoration, LLC (soils)

Sample ID: A1-SB-Q5-6-2
Lab Sample ID: A9810804
Date Collected: 11/29/1999
Time Collected: 10:00

Date Received: 11/30/1999
Project No: NY9A8496
Client No: L11208
Site No:

Parameter	Result	Flag	Detection Limit	Units	Method	Date/Time Analyzed	Analyst
SOIL-SW8463 8270 - TCL SVOA ORGANICS							
Fluoranthene	300	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Fluorene	87	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Hexachlorobenzene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Hexachlorobutadiene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Hexachlorocyclopentadiene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Hexachloroethane	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Indeno(1,2,3-cd)pyrene	210	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Isophorone	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
N-Nitroso-Di-n-propylamine	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
N-nitrosodiphenylamine	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Naphthalene	570	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Nitrobenzene	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Pentachlorophenol	ND		1600	UG/KG	8270	12/16/1999 05:35	RCS
Phenanthrene	550	J	760	UG/KG	8270	12/16/1999 05:35	RCS
Phenol	ND		760	UG/KG	8270	12/16/1999 05:35	RCS
Pyrene	2200		760	UG/KG	8270	12/16/1999 05:35	RCS

Attachment #3
(Appendix F with Analytical Data)

The following is a listing of documents submitted to the NYSDEC over the course of 2003 in relation to the air monitoring program. Documentation Air Sampling Reports have been included under this cover. All associated analytical data attachments have been included in electronic format as Attachment 3 to this document. The Community Air Monitoring Reports (CAMP) have also been included under this cover.

Documentation Air Sampling Results

Event Date	Title	Date Submitted
5/6/2003	Documentation Air Sampling Results - May 6-8, 2003	6/10/2003
7/8/2003	Documentation Air Sampling Results - July 8, 2003	8/5/2003
8/21/2003	Documentation Air Sampling Results - August 2003	10/2/2003
9/18/2003	Documentation Air Sampling Results - September 18, 2003	10/7/2003
9/22/2003	Documentation Air Sampling Results - September 22, 2003	10/28/2003
10/17/2003	Documentation Air Sampling Results - October 17, 2003	12/4/2003
11/5/2003	Documentation Air Sampling Results - November 5, 2003	11/25/2003
12/12/2003	Documentation Air Sampling Results - December 12, 2003	12/30/2003

Community Air Monitoring Reports (CAMP)

Month	Title	Date Submitted
Jul-03	Community Air Monitoring Report - Project start - July 2003	9/2/2003
Aug-03	Community Air Monitoring Report - August 2003	9/12/2003
Sep-03	Community Air Monitoring Report - September 2003	10/13/2003
Oct-03	Community Air Monitoring Report - October 2003	11/13/2003
Nov-03	Community Air Monitoring Report - November 2003	12/19/2003

TurnKey Environmental Restoration, LLC

June 10, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site during the period of May 6th through May 8th, 2003. The documentation air monitoring work was performed concurrent with the start of significant earthwork in Area I, as required under the September 2002 Voluntary Cleanup Remedial Design/Remedial Action (RD/RA) Work Plan for the Site.

The monitoring involved collection of samples at three (3) monitoring stations on each of three (3) consecutive days. The approximate locations of the monitoring stations are shown on Figure 1. Downwind stations were comprised of wooden platforms with 5-foot high canopies to protect the pumps. A canopied pump control panel on the southwest corner of the terminal basin served as the upwind station.

At the time of the monitoring, petroleum-impacted soil/fill was being removed from Subarea D of the Site. As such, documentation air samples were collected for total particulate analysis per the RD/RA Work Plan. Sample collection equipment at each station consisted of a Gilian™ air sampling pump fitted with a nylon Dorr-Oliver cyclone filter to remove particulate matter greater than 10 microns (i.e., non-respirable particulates) followed by a 0.5 um pre-weighed PVC filter cartridge as specified under NIOSH Method 0600. The pumps were calibrated on a daily basis prior to the start of sampling against a target airflow rate of 1.7 liters per minute. Following calibration, the pumps and filters were transported to the monitoring stations. The intake tubing was positioned and tethered on the outside of the station canopies at a height of approximately 5-feet above grade to collect air at an elevation representative of the breathing zone. Pumps were activated and allowed to run for approximately 8 hours. The filter cartridges were then removed, sample collection times were recorded, and the volume of air passed through the filter (based on calibrated air flow rate and collection times) was calculated to allow determination of the particulate concentration by the analytical laboratory. Filter cartridges were transported to PSC Analytical Services in Reading, PA for analysis of respirable particulate matter per NIOSH Method 0600.

50 Fountain Plaza, Suite 1350 | Buffalo, NY 14202 | phone: (716)856-0635 | fax: (716)856-0583

Table 1 presents a summary of the daily calibrated flow rates, sample collection times, and volume of sample collected at each monitoring station. Weather conditions experienced during the monitoring period are also presented.

Analytical results are presented in Attachment 1. As indicated, no respirable particulate matter was present above the analytical detection limit (i.e., 50 ug/m^3) on any of the samples collected during this Documentation Air Monitoring event. Accordingly, the documentation air sampling results support the real time particulate monitoring data, which consistently show no exceedance of the Community Air Monitoring Plan respirable particulate limits of 150 ug/m^3 above background.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

TABLE 1
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
MAY 6 - MAY 8, 2003
SAMPLE DURATION AND VOLUME

Date	Weather Conditions	Sample Station	Pump Flow Rate (L/min)	Sample Start Time	Sample Stop Time	Duration (hrs/minutes)	Sample Volume (L)
5/6/2003	Mostly Sunny	Downwind So. - Pump #1	1.718	8:05	15:50	7:45	798.87
	55-70 F	Downwind No. - Pump #2	1.707	8:10	15:55	7:45	793.76
	Wind from W/SW, 2-6 MPH	Upwind - Pump #3	1.73	8:25	16:20	7:55	821.75
5/7/2003	Partly Sunny	Downwind So. - Pump #1	1.717	7:49	15:25	7:36	782.95
	42-68 F	Downwind No. - Pump #2	1.702	7:53	15:28	7:35	774.41
	Wind from W/NW, 3-5 MPH	Upwind - Pump #3	1.712	7:59	15:33	7:34	777.25
5/8/2003	Overcast	Downwind So. - Pump #1	1.711	7:43	15:05	7:22	756.26
	55-70 F	Downwind No. - Pump #2	1.712	7:49	15:10	7:21	754.99
	Wind from N, 3-5 MPH	Upwind - Pump #3	1.731	8:00	15:15	7:15	752.99

ATTACHMENT 1
DOCUMENTATION AIR MONITORING RESULTS

LABORATORY ANALYTICAL REPORT

DOCUMENTATION AIR SAMPLING RESULTS

AREA I
PROJECT KICKOFF (SUBAREA D & GAS HOLDER WORK)
MAY 2003

PSC ANALYTICAL SERVICES
4418 Pottsville Pike Reading, PA 19605
(Tel) 610-921-8833 (Fax) 610-921-9667

INDUSTRIAL HYGIENE | ENVIRONMENTAL TESTING
•EPA PA-00136
•AIHA ACCREDITATION NO. 100439
•NC DENR 599
•NY DOH/NELAC 10903
•PA DEP 06-353
•NJ DEP PA020
•CT DPH PH-0238

May 21, 2003

Thomas E. Forbes
Benchmark EES, PLCC
50 Fountain Plaza
Suite 1350
Buffalo, NY 14202

TEL: (716) 856-0599
FAX (716) 856-0583

Order No.: R03050377

RE: Steel Fields - VOL Cleanup

Dear Thomas E. Forbes:

PSC Analytical Services received 9 samples on 5/14/03 8:15:00 AM for the analyses presented in the following Certificate of Analytical Results.

The analyses and all data for associated QC met regulatory and/or laboratory specifications. Exceptions will be noted in an enclosed Case Narrative.

The results on the attached Certificate of Analytical results relate only to items tested or to the samples as received by the laboratory. This Certificate of Analytical Results shall not be reproduced, except in full, without the written approval of PSC Analytical, Reading, PA.

Please note that any unused portion of the samples will be disposed of 30 days following issuance of report, unless you have requested otherwise.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Wendy Beard
Project Manager

PSC ANALYTICAL SERVICES
4418 Pottsville Pike Reading, PA 19605
(Tel) 610-921-8833 (Fax) 610-921-9667

INDUSTRIAL HYGIENE | ENVIRONMENTAL TESTING

•EPA PA-00136
•AIHA ACCREDITATION NO. 100439
•NC DENR 599
•NY DOH/NELAC 10903
•PA DEP 06-353
•NJ DEP PA020
•CT DPH PH-0238

Certificate of Analytical Results
for
Benchmark EES, PLCC

WorkOrder: R03050377

Client Reference: Steel Fields - VOL Cleanup

Analyte	Concentration (ug)	Concentration (mg/m³)	Concentration (ppm)	Limit of Detection (ug)	Test Method	Date Analyzed /Analyst	
Client ID: Downwind South Pump #1	**Lab ID:** -01A	**Date Sampled:** 5/6/03		**Matrix:** Filter		**Air Vol.(L):** 798.87	
Total Particulate Matter	<50.0	<0.0626	--	50	N0500	05/20/2003	TEN
Client ID: Downwind North Pump #2	**Lab ID:** -02A	**Date Sampled:** 5/6/03		**Matrix:** Filter		**Air Vol.(L):** 793.755	
Total Particulate Matter	<50.0	<0.0630	--	50	N0500	05/20/2003	TEN
Client ID: Upwind Pump #3	**Lab ID:** -03A	**Date Sampled:** 5/6/03		**Matrix:** Filter		**Air Vol.(L):** 821.75	
Total Particulate Matter	<50.0	<0.0608	--	50	N0500	05/20/2003	TEN
Client ID: Downwind South - Pump #1	**Lab ID:** -04A	**Date Sampled:** 5/7/03		**Matrix:** Filter		**Air Vol.(L):** 782.952	
Total Particulate Matter	<50.0	<0.0639	--	50	N0500	05/20/2003	TEN
Client ID: Downwind North Pump #2	**Lab ID:** -05A	**Date Sampled:** 5/7/03		**Matrix:** Filter		**Air Vol.(L):** 774.41	
Total Particulate Matter	<50.0	<0.0646	--	50	N0500	05/20/2003	TEN
Client ID: Upwind Pump #3	**Lab ID:** -06A	**Date Sampled:** 5/7/03		**Matrix:** Filter		**Air Vol.(L):** 777.248	
Total Particulate Matter	<50.0	<0.0643	--	50	N0500	05/20/2003	TEN
Client ID: Downwind South Pump #1	**Lab ID:** -07A	**Date Sampled:** 5/8/03		**Matrix:** Filter		**Air Vol.(L):** 756.262	
Total Particulate Mattor	<50.0	<0.0661	--	50	N0500	05/20/2003	TEN
Client ID: Downwind North Pump #2	**Lab ID:** -08A	**Date Sampled:** 5/8/03		**Matrix:** Filter		**Air Vol.(L):** 754.992	
Total Particulate Matter	<50.0	<0.0662	--	50	N0500	05/20/2003	TEN
Client ID: Upwind Pump #3	**Lab ID:** -09A	**Date Sampled:** 5/8/03		**Matrix:** Filter		**Air Vol.(L):** 752.985	
Total Particulate Matter	<50.0	<0.0664	--	50	N0500	05/20/2003	TEN

PSC ANALYTICAL SERVICES
4418 Pottsville Pike Reading, PA 19605
(Tel) 610-921-8833 (Fax) 610-921-8667

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

•EPA PA-00136
•AIHA ACCREDITATION NO. 100439
•NC DENR 599
•NY DOH/NELAC 10908
•PA DEP 06-353
•NJ DEP PA020
•CT DPH PH-0238

Certificate of Analytical Results
for
Benchmark EES, PLCC

WorkOrder: R03050377

Client Reference: Steel Fields - VOL Cleanup

Analyte	Concentration			Limit of Detection	Test Method	Date Analyzed /Analyst
	(ug)	(mg/m³)	(ppm)	(ug)		

General Notes:
<: Less than the indicated limit of detection (LOD).
--: Information not available or not applicable.
Concentrations are calculated based on air volumes provided by the client

PSC ANALYTICAL SERVICES
4418 Pottsville Pike phone: (610) 921-8833
Reading, PA 19605 fax: (610) 921-9667

AIR SAMPLING CHAIN OF CUSTODY

PSC Work Order # R0305037?
Page 1 of 1

Report Results To:
PO # Quote #
Name: Tom Forbes
Company: Turnkey Environmental Restoration, LLC
Mailing Address: 50 Fountain Plaza Suite 1350
City: Buffalo State: NY ZIP: 14202
Telephone #: 716-856-0635 Fax #: 716-856-0583

Submit Invoice To:
Name / Company: SAME
Mailing Address
City State ZIP
Telephone # Fax #
Credit Card Info (include exp. date)

COMMON MATRIX TYPES

1. Badge (OVM/Passive Monitor)
2. Tube (specify type: charcoal, silica, XAD, etc)
3. Train (filter + tube, 2 tubes in series, etc)
4. Filter/Cassette (specify PVC, MCE, GFF, etc.)
5. Impinger Solutions (specify components)
6. Wipe (specify type)
7. Tedlar Bag
8. Summa Can
9. PUF/Resin/XAD
10. Other (list details):

Job/Project Name: Steel Fields - VOL Cleanup
Sampler's Name(s): Rick Dubisz / Tom Forbes
Sampling Location (Specify State): AREA-1 Excavation - N.Y.
Due Date (Rush results requires Lab approval):

REPORTING REQUIREMENTS (Circle all that apply):
Full Data Package Reduced Deliverables Pkg Electronic Data Deliverables

ITEM #	SAMPLE DESCRIPTION (ID must match container labels)	MATRIX (see above list)	MEDIA (list catalog number)	FINAL AIR VOLUME (specify: Liters, minutes, etc)	SAMPLE DATE	SAMPLE TIMES Start	SAMPLE TIMES Stop	FLOW RATES (specify units: mL/min) Initial	Final	Average	ANALYSIS REQUESTED Use attachments if necessary. Please specify method requirements.
1	Downwind South Pump #1	4	PVC	798.87 L	5/6/03	0805	1550			1.718	Total Particulate Matter
2	Downwind North Pump #2	4	PVC	793.76 L	5/6/03	080	1555			1.707	
3	Upwind - Pump #3	4	PVC	821.75 L	5/6/03	0825	1620			1.730	
4	Downwind South - Pump #1	4	PVC	762.34 L	5/7/03	0749	1525			1.717	
5	Downwind - North Pump #2	4	PVC	757.39 L	5/7/03	0753	1528			1.702	
6	~~Downwind~~ Upwind - Pump #3	4	PVC	763.55 L	5/7/03	0759	1533			1.712	
7	Downwind South Pump #1	4	PVC	756.26 L	5/8/03	0743	1565			1.711	
8	Downwind North Pump #2	4	PVC	785.80 L	5/8/03	0749	1510			1.712	
9	Upwind - Pump #3	4	PVC	752.98 L	5/8/03	0800	1515			1.731	
10											

(1) Relinquished by: [signature]	Date 5/9/03	Time	(2) Received by:	Date	Time
(3) Relinquished by:	Date	Time	(4) Received by: D. K. B	Date 5/14/03	Time 0815

Method of Delivery: UPS FED-EX PSC Courier Client US Mail Other Airborne

August 5, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results- July 2003
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site on July 8, 2003. The documentation air monitoring work was performed concurrent with the performance of significant excavation of tar and petroleum impacted soil/fill at SubArea K & L in Area I and associated stockpiling and grading of this material at the Area III Biopad location. This documentation monitoring event was conducted at the request of the NYSDEC as a one day event based on the short-term nature of the work at the biopile and as required under the September 2002 Voluntary Cleanup Remedial Design/Remedial Action (RD/RA) Work Plan for the Site.

The monitoring involved collection of samples at three (3) monitoring stations on one day, July 8, 2003. The approximate locations of the monitoring stations are shown on Figure 1. Downwind stations were comprised of wooden platforms with 5-foot high canopies to protect the pumps and summa canisters. A canopied pump control panel on the southwest corner of the terminal basin served as the upwind station.

At the time of the monitoring, tar and petroleum-impacted soil/fill was being removed from Subarea K & L of the Site. As such, documentation air samples were collected for volatile organic compounds and total particulate analysis per the RD/RA Work Plan. Sample collection equipment at each station consisted of:

- a Gilian™ air sampling pump fitted with a nylon Dorr-Oliver cyclone filter to remove particulate matter greater than 10 microns (i.e., non-respirable particulates) followed by a 0.5 um pre-weighed PVC filter cartridge as specified under NIOSH Method 0600. The pumps for particulate sampling were calibrated prior to the start of sampling against a target airflow rate of 1.7 liters per minute. Following calibration, the pumps and filters were transported to the monitoring stations. The intake tubing was positioned and tethered on the outside of the station canopies at a height of approximately 5-feet above grade to collect air at an elevation representative of the breathing zone. Pumps were activated and allowed to run for approximately 8 hours. The filter cartridges were then removed, sample collection times were recorded, and the volume of air passed through the filter (based on calibrated air flow rate and collection times) was calculated to allow determination of the particulate concentration by the analytical laboratory. Table 1 presents a summary of the daily calibrated flow rates, sample collection times, and volume of sample collected at each monitoring station. Weather conditions experienced during the monitoring period are also presented. Filter cartridges were transported via Severn Trent Laboratories (STL) to Galson Laboratories in Syracuse, New York for analysis of respirable particulate matter per NIOSH Method 0600.

- a Summa canister under vacuum fitted with a preset inlet regulator valve to draw a continuous air sample for 8 hours. Sample collection was initiated by TurnKey on the morning of July 8, 2003 and terminated after 8 hours of sample collection. The valves on the canisters were shut tight and the collection port was sealed. The samples were then transported, under chain-of-custody command, to Severn Trent laboratories (STL) in Burlington, VT for analysis of Target Compound List (TCL) volatile organic compounds (VOCs) in accordance with USEPA Method TO-15.

Table 2, attached, summarizes the analytical data for the detected compounds. The documentation air sampling results support the real time particulate and PID monitoring data, which consistently show no exceedance of the Community Air Monitoring Plan respirable particulate limits of 150 ug/m^3 or total VOC threshold of 5ppm above background.

The Analytical laboratory reports are presented in Attachment 1. Field records identifying work completed at the site on July 8th, meteorological data, and equipment calibration records are presented as Attachment 2.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

TABLE 1
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
JULY 8, 2003
PARTICULATE SAMPLE DURATION AND VOLUME

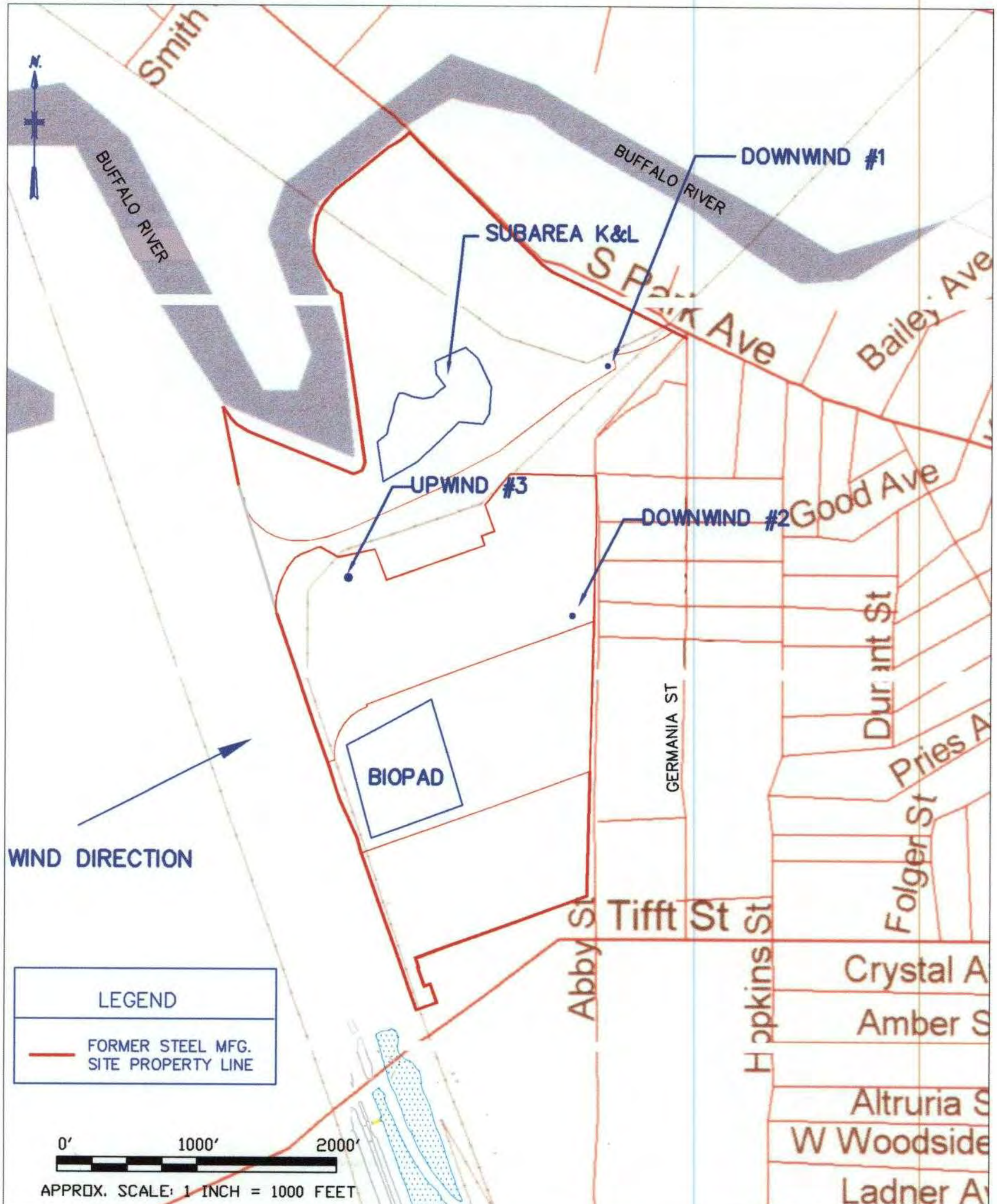
Date	Weather Conditions	Sample Station	Pump Flow Rate (L/min)	Sample Start Time	Sample Stop Time	Duration (hrs/minutes)	Sample Volume (L)
7/8/2003	Partly to Mostly Sunny	Downwind K & L - Pump #1	1.704	7:12	15:27	8:15	843.48
	74-80 F	Downwind Biopad - Pump #2	1.709	7:32	15:43	8:11	839.12
	Wind from W/SW, 6-18 MPH	Upwind - Pump #3	1.708	7:47	15:50	8:03	824.96

TABLE 2

STEELFIELDS SITE DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
JULY 8, 2003

PARAMETER	SAMPLE LOCATIONS					
	Downwind K & L		Downwind Biopad		Upwind	
	(PPBV)	ug/M3	(PPBV)	ug/M3	(PPBV)	ug/M3
VOCS - METHOD TO15						
Dichlorodifluoromethane	0.58	2.92	0.6	3.02	0.6	3.02
Chloromethane	0.73	1.53	0.73	1.53	0.76	1.60
Acetone	ND	ND	6.6	15.97	6.3	15.25
Particulates - NIOSH 0600	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**
Respirable particulates	<0.05	<0.06	<0.05	<0.06	<0.05	<0.06

DATE: ____________________ FIGURE 1



TurnKey Environmental Restoration, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

JULY 2003 DOCUMENTATION AIR MONITORING

MONITORING STATION LOCATIONS

ATTACHMENT 1
DOCUMENTATION AIR MONITORING RESULTS

LABORATORY ANALYTICAL REPORT

JULY 8, 2003 SAMPLING EVENT

SEVERN TRENT STL

ANALYTICAL REPORT

Job#: A03-6740

STL Project#: NY3A9063
Site Name: Steelfields - Former LTV Steel site
Task: Air Monitoring

Mr. Tom Forbes
Benchmark Environmental
50 Fountain Plaza, Ste 1350
Buffalo, NY 14202

STL Buffalo

Brian J. Fischer
Project Manager

07/23/2003

NON-CONFORMANCE SUMMARY

Job#: A03-6740

STL Project#: NY3A9063
Site Name: Steelfields - Former LTV Steel site

General Comments

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

Sample Receipt Comments

A03-6740

Sample Cooler(s) were received at the following temperature(s); NA °C

Volatile analyses were performed by STL Burlington, VT. All data is included in this report as Appendix A.

Particulate analyses were performed by Galson Laboratories, Inc. All data is included in this report as Appendix B.

****

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

Appendix A

STL Burlington
Colchester, Vermont

Sample Data Summary Package

SDG: 94689

SEVERN TRENT STL

July 21, 2003

Mr. Brian Fischer
Severn Trent Laboratories
10 Hazelwood Drive
Suite 106
Amherst, NY 14228

Re: Laboratory Project No. 23012
Case: 23012; SDG: 94689 Job: Steelfield

Dear Mr. Fischer:

Enclosed are the analytical results of samples received intact by Severn Trent Laboratories on July 10, 2003. Laboratory numbers have been assigned and designated as follows:

Lab ID	Client Sample ID	Sample Date	Sample Matrix
	Received: 07/10/03 ETR No: 94689		
533720	DOWNWIND#1 K0L	07/08/03	Air
533721	DOWNWIND#2 BIOPAD	07/08/03	Air
533722	UPWIND#3	07/08/03	Air

Documentation that identifies the condition of the samples at the time of sample receipt and the issues arising at the time of sample log-in is included in the Sample Handling section of this submittal.

Method TO-15 - Volatile Organics:
The volatile organic analyses of the blank spike samples G8LCS exhibited percent recoveries for select target compounds that were marginally below the control limits (70-130%).

The response for the target compound Tetrachloroethene in the initial calibration check acquisition, which exceeded the relative standard deviation criterion. This compound was not detected in the field samples of this delivery group.

Please note that manual integrations were performed for the processing of volatile organic data files. Documentation of these integrations can be found in the supporting documentation section of the data package.

If there are any questions regarding this submittal, please contact Ron Pentkowski at (802) 655-1203.

This report shall not be reproduced, except in full, without the written approval of the laboratory.
This report is sequentially numbered starting with page 0001 and ending with page 0142.

Mr. Brian Fischer
July 21, 2003
Page 2 of 2

I certify that this package is in compliance with the NELAC requirements, both technically and for completeness, for other than the conditions detailed above. The release of the data contained in this hardcopy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Sincerely,

Michael Wheeler

Michael F. Wheeler, Ph. D.
Laboratory Director

Enclosure

OC01B- last alpha

SEVERN TRENT STL
SEVERN TRENT LABORATORIES, INC.

STL Burlington
208 South Park Drive, Suite 1
Colchester, VT 05446 Tel 802 655 1203

CHAIN OF CUSTODY RECORD

Report to:
Company: Turnkey Env Restoration, LLC
Address: 50 Fountain Plaza
Suite 1350, Bflo NY 14202
Contact: Tom Forbes
Phone: 716-856-0635
Fax: 716-856-0583
Contract/ Quote:

Invoice to:
Company:
Address: SAME
Contact:
Phone:
Fax:

ANALYSIS REQUESTED

Lab Use Only
Due Date:
Temp. of coolers when received (C°): 1 2 3 4 5
Custody Seal N / Y
Intact N / Y
Screened For Radioactivity ☐

Sampler's Name: Rick Dubisz
Sampler's Signature:

Proj. No.:
Project Name: Steelfields - Air Monitoring

Matrix¹	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	VOA	A/G 1 Lt.	250 ml	P/O	Lab/Sample ID (Lab Use Only)
Air	5/8/03	1527	X		Downwind #1 (KOL) - Subarea				Summa	
Air	5/8/03	1543	X		Downwind #2 (Biopad)				↓	
Air	5/7/03	1350	X		Upwind #3 (Terminal Basin)				↓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	7/4/03	1135		7/9/03	1137
STL Buffalo	7/9/03	1650	Angela Henry	7/10/03	0930

Remarks

Client's delivery of samples constitutes acceptance of Severn Trent Laboratories terms and conditions contained in the Price Schedule.

¹Matrix WW - Wastewater W - Water S - Soil L - Liquid A - Air bag C - Charcoal Tube SL - Sludge O - Oil
²Container VOA - 40 ml vial A/G - Amber / Or Glass 1 Liter 250 ml - Glass wide mouth P/O - Plastic or other ______

STL cannot accept verbal changes. Please Fax written changes to (802) 655-1248

SEVERN TRENT STL

METHOD TO-15

SAMPLE DATA SUMMARY PACKAGE

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

STLNYB SAMPLE NO.

DWNWD1 K0L

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix: (soil/water) AIR Lab Sample ID: 533720

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 533720

Level: (low/med) LOW Date Received: 07/10/03

% Moisture: not dec. ________ Date Analyzed: 07/14/03

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.58	
74-87-3	Chloromethane	0.73	
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon TF	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon Tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
1330-20-7	Xylene (m,p)	0.50	U
100-42-5	Styrene	0.50	U
95-47-6	Xylene (o)	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

STLNYB SAMPLE NO.

DWNWD1 K0L

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix: (soil/water) AIR Lab Sample ID: 533720

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 533720

Level: (low/med) LOW Date Received: 07/10/03

% Moisture: not dec. ________ Date Analyzed: 07/14/03

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
87-68-3	Hexachlorobutadiene	0.50	U
108-67-8	1,3,5-Trimethylbenzene	0.50	U
95-63-6	1,2,4-Trimethylbenzene	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.50	U
106-93-4	1,2-Dibromoethane	0.50	U
106-99-0	1,3-Butadiene	0.50	U
75-15-0	Carbon Disulfide	0.50	U
67-64-1	Acetone	5.0	U
67-63-0	Isopropyl Alcohol	5.0	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
110-82-7	Cyclohexane	0.50	U
124-48-1	Dibromochloromethane	0.50	U
78-93-3	Methyl Ethyl Ketone	0.50	U
123-91-1	1,4-Dioxane	5.0	U
108-10-1	Methyl Isobutyl Ketone	0.50	U
591-78-6	Methyl Butyl Ketone	0.50	U
75-25-2	Bromoform	0.50	U
75-27-4	Bromodichloromethane	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
622-96-8	4-Ethyltoluene	0.50	U
107-05-1	3-Chloropropene	0.50	U
540-84-1	2,2,4-Trimethylpentane	0.50	U
593-60-2	Bromoethene	0.50	U
95-49-8	2-Chlorotoluene	0.50	U
110-54-3	n-Hexane	0.50	U
109-99-9	Tetrahydrofuran	5.0	U
142-82-5	n-Heptane	0.50	U
540-59-0	1,2-Dichloroethene (total)	0.50	U
1330-20-7	Xylene (total)	0.50	U
75-65-0	tert-Butyl Alcohol	5.0	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

STLNYB SAMPLE NO.

DWNWD2BIOPAD

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix: (soil/water) AIR Lab Sample ID: 533721

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 533721

Level: (low/med) LOW Date Received: 07/10/03

% Moisture: not dec. ________ Date Analyzed: 07/14/03

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.60	
74-87-3	Chloromethane	0.73	
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon TF	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon Tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
1330-20-7	Xylene (m,p)	0.50	U
100-42-5	Styrene	0.50	U
95-47-6	Xylene (o)	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

STLNYB SAMPLE NO.

DWNWD2BIOPAD

Lab Name: STL BURLINGTON   Contract: 23012

Lab Code: STLVT   Case No.: 23012   SAS No.:   SDG No.: 94689

Matrix: (soil/water) AIR   Lab Sample ID: 533721

Sample wt/vol: 200.0 (g/mL) ML   Lab File ID: 533721

Level: (low/med) LOW   Date Received: 07/10/03

% Moisture: not dec. ________   Date Analyzed: 07/14/03

GC Column: RTX-624 ID: 0.32 (mm)   Dilution Factor: 1.0

Soil Extract Volume: ________ (uL)   Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
87-68-3	Hexachlorobutadiene	0.50	U
108-67-8	1,3,5-Trimethylbenzene	0.50	U
95-63-6	1,2,4-Trimethylbenzene	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.50	U
106-93-4	1,2-Dibromoethane	0.50	U
106-99-0	1,3-Butadiene	0.50	U
75-15-0	Carbon Disulfide	0.50	U
67-64-1	Acetone	6.6	
67-63-0	Isopropyl Alcohol	5.0	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
110-82-7	Cyclohexane	0.50	U
124-48-1	Dibromochloromethane	0.50	U
78-93-3	Methyl Ethyl Ketone	0.50	U
123-91-1	1,4-Dioxane	5.0	U
108-10-1	Methyl Isobutyl Ketone	0.50	U
591-78-6	Methyl Butyl Ketone	0.50	U
75-25-2	Bromoform	0.50	U
75-27-4	Bromodichloromethane	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
622-96-8	4-Ethyltoluene	0.50	U
107-05-1	3-Chloropropene	0.50	U
540-84-1	2,2,4-Trimethylpentane	0.50	U
593-60-2	Bromoethene	0.50	U
95-49-8	2-Chlorotoluene	0.50	U
110-54-3	n-Hexane	0.50	U
109-99-9	Tetrahydrofuran	5.0	U
142-82-5	n-Heptane	0.50	U
540-59-0	1,2-Dichloroethene (total)	0.50	U
1330-20-7	Xylene (total)	0.50	U
75-65-0	tert-Butyl Alcohol	5.0	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

STLNYB SAMPLE NO.

UPWIND 3

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix: (soil/water) AIR Lab Sample ID: 533722

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 533722

Level: (low/med) LOW Date Received: 07/10/03

% Moisture: not dec. ________ Date Analyzed: 07/15/03

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.60	
74-87-3	Chloromethane	0.76	
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon TF	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon Tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
1330-20-7	Xylene (m,p)	0.50	U
100-42-5	Styrene	0.50	U
95-47-6	Xylene (o)	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

STLNYB SAMPLE NO.

UPWIND 3

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix: (soil/water) AIR Lab Sample ID: 533722

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 533722

Level: (low/med) LOW Date Received: 07/10/03

% Moisture: not dec. ________ Date Analyzed: 07/15/03

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
87-68-3	Hexachlorobutadiene	0.50	U
108-67-8	1,3,5-Trimethylbenzene	0.50	U
95-63-6	1,2,4-Trimethylbenzene	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.50	U
106-93-4	1,2-Dibromoethane	0.50	U
106-99-0	1,3-Butadiene	0.50	U
75-15-0	Carbon Disulfide	0.50	U
67-64-1	Acetone	6.3	
67-63-0	Isopropyl Alcohol	5.0	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
110-82-7	Cyclohexane	0.50	U
124-48-1	Dibromochloromethane	0.50	U
78-93-3	Methyl Ethyl Ketone	0.50	U
123-91-1	1,4-Dioxane	5.0	U
108-10-1	Methyl Isobutyl Ketone	0.50	U
591-78-6	Methyl Butyl Ketone	0.50	U
75-25-2	Bromoform	0.50	U
75-27-4	Bromodichloromethane	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
622-96-8	4-Ethyltoluene	0.50	U
107-05-1	3-Chloropropene	0.50	U
540-84-1	2,2,4-Trimethylpentane	0.50	U
593-60-2	Bromoethene	0.50	U
95-49-8	2-Chlorotoluene	0.50	U
110-54-3	n-Hexane	0.50	U
109-99-9	Tetrahydrofuran	5.0	U
142-82-5	n-Heptane	0.50	U
540-59-0	1,2-Dichloroethene (total)	0.50	U
1330-20-7	Xylene (total)	0.50	U
75-65-0	tert-Butyl Alcohol	5.0	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ABLKG8

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix: (soil/water) AIR Lab Sample ID: ABLKG8

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: AGB002E

Level: (low/med) LOW Date Received: ________

% Moisture: not dec. ________ Date Analyzed: 07/14/03

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon TF	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon Tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
1330-20-7	Xylene (m,p)	0.50	U
100-42-5	Styrene	0.50	U
95-47-6	Xylene (o)	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ABLKG8

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix: (soil/water) AIR Lab Sample ID: ABLKG8

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: AGB002E

Level: (low/med) LOW Date Received: ________

% Moisture: not dec. ________ Date Analyzed: 07/14/03

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
87-68-3	Hexachlorobutadiene	0.50	U
108-67-8	1,3,5-Trimethylbenzene	0.50	U
95-63-6	1,2,4-Trimethylbenzene	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.50	U
106-93-4	1,2-Dibromoethane	0.50	U
106-99-0	1,3-Butadiene	0.50	U
75-15-0	Carbon Disulfide	0.50	U
67-64-1	Acetone	5.0	U
67-63-0	Isopropyl Alcohol	5.0	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
110-82-7	Cyclohexane	0.50	U
124-48-1	Dibromochloromethane	0.50	U
78-93-3	Methyl Ethyl Ketone	0.50	U
123-91-1	1,4-Dioxane	5.0	U
108-10-1	Methyl Isobutyl Ketone	0.50	U
591-78-6	Methyl Butyl Ketone	0.50	U
75-25-2	Bromoform	0.50	U
75-27-4	Bromodichloromethane	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
622-96-8	4-Ethyltoluene	0.50	U
107-05-1	3-Chloropropene	0.50	U
540-84-1	2,2,4-Trimethylpentane	0.50	U
593-60-2	Bromoethene	0.50	U
95-49-8	2-Chlorotoluene	0.50	U
110-54-3	n-Hexane	0.50	U
109-99-9	Tetrahydrofuran	5.0	U
142-82-5	n-Heptane	0.50	U
540-59-0	1,2-Dichloroethene (total)	0.50	U
1330-20-7	Xylene (total)	0.50	U
75-65-0	tert-Butyl Alcohol	5.0	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

G8LCS

Lab Name: STL BURLINGTON   Contract: 23012

Lab Code: STLVT   Case No.: 23012   SAS No.:   SDG No.: 94689

Matrix: (soil/water) AIR   Lab Sample ID: G8LCS

Sample wt/vol: 200.0 (g/mL) ML   Lab File ID: AG010EQ

Level: (low/med) LOW   Date Received: ________

% Moisture: not dec. ________   Date Analyzed: 07/14/03

GC Column: RTX-624   ID: 0.32 (mm)   Dilution Factor: 1.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	12	
74-87-3	Chloromethane	12	
75-01-4	Vinyl Chloride	12	
74-83-9	Bromomethane	11	
75-00-3	Chloroethane	11	
75-69-4	Trichlorofluoromethane	12	
76-13-1	Freon TF	12	
75-35-4	1,1-Dichloroethene	12	
75-09-2	Methylene Chloride	11	
75-34-3	1,1-Dichloroethane	12	
156-59-2	cis-1,2-Dichloroethene	12	
67-66-3	Chloroform	12	
71-55-6	1,1,1-Trichloroethane	11	
56-23-5	Carbon Tetrachloride	12	
71-43-2	Benzene	11	
107-06-2	1,2-Dichloroethane	12	
79-01-6	Trichloroethene	10	
78-87-5	1,2-Dichloropropane	12	
10061-01-5	cis-1,3-Dichloropropene	11	
108-88-3	Toluene	11	
10061-02-6	trans-1,3-Dichloropropene	11	
79-00-5	1,1,2-Trichloroethane	11	
127-18-4	Tetrachloroethene	10	
108-90-7	Chlorobenzene	10	
100-41-4	Ethylbenzene	10	
1330-20-7	Xylene (m,p)	21	
100-42-5	Styrene	9.5	
95-47-6	Xylene (o)	10	
79-34-5	1,1,2,2-Tetrachloroethane	7.3	
541-73-1	1,3-Dichlorobenzene	7.5	
106-46-7	1,4-Dichlorobenzene	7.3	
95-50-1	1,2-Dichlorobenzene	6.9	
120-82-1	1,2,4-Trichlorobenzene	6.1	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

G8LCS

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix: (soil/water) AIR Lab Sample ID: G8LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: AG010EQ

Level: (low/med) LOW Date Received: ________

% Moisture: not dec. ________ Date Analyzed: 07/14/03

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
87-68-3	Hexachlorobutadiene	7.6	
108-67-8	1,3,5-Trimethylbenzene	9.4	
95-63-6	1,2,4-Trimethylbenzene	8.5	
76-14-2	1,2-Dichlorotetrafluoroethan	12	
106-93-4	1,2-Dibromoethane	10	
106-99-0	1,3-Butadiene	12	
75-15-0	Carbon Disulfide	11	
67-64-1	Acetone	11	
67-63-0	Isopropyl Alcohol	11	
1634-04-4	Methyl tert-Butyl Ether	12	
110-82-7	Cyclohexane	12	
124-48-1	Dibromochloromethane	10	
78-93-3	Methyl Ethyl Ketone	12	
123-91-1	1,4-Dioxane	11	
108-10-1	Methyl Isobutyl Ketone	12	
591-78-6	Methyl Butyl Ketone	11	
75-25-2	Bromoform	8.4	
75-27-4	Bromodichloromethane	11	
156-60-5	trans-1,2-Dichloroethene	12	
622-96-8	4-Ethyltoluene	9.1	
107-05-1	3-Chloropropene	12	
540-84-1	2,2,4-Trimethylpentane	12	
593-60-2	Bromoethene	12	
95-49-8	2-Chlorotoluene	8.8	
110-54-3	n-Hexane	12	
109-99-9	Tetrahydrofuran	12	
142-82-5	n-Heptane	12	
540-59-0	1,2-Dichloroethene (total)	23	
1330-20-7	Xylene (total)	32	
75-65-0	tert-Butyl Alcohol	11	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

G8LCSD

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix: (soil/water) AIR Lab Sample ID: G8LCSD

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: AG010EQD

Level: (low/med) LOW Date Received: ________

% Moisture: not dec. ________ Date Analyzed: 07/14/03

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	11	
74-87-3	Chloromethane	11	
75-01-4	Vinyl Chloride	11	
74-83-9	Bromomethane	11	
75-00-3	Chloroethane	11	
75-69-4	Trichlorofluoromethane	11	
76-13-1	Freon TF	11	
75-35-4	1,1-Dichloroethene	11	
75-09-2	Methylene Chloride	10	
75-34-3	1,1-Dichloroethane	11	
156-59-2	cis-1,2-Dichloroethene	10	
67-66-3	Chloroform	11	
71-55-6	1,1,1-Trichloroethane	10	
56-23-5	Carbon Tetrachloride	11	
71-43-2	Benzene	11	
107-06-2	1,2-Dichloroethane	11	
79-01-6	Trichloroethene	10	
78-87-5	1,2-Dichloropropane	11	
10061-01-5	cis-1,3-Dichloropropene	11	
108-88-3	Toluene	10	
10061-02-6	trans-1,3-Dichloropropene	10	
79-00-5	1,1,2-Trichloroethane	10	
127-18-4	Tetrachloroethene	9.5	
108-90-7	Chlorobenzene	9.6	
100-41-4	Ethylbenzene	9.8	
1330-20-7	Xylene (m,p)	20	
100-42-5	Styrene	8.9	
95-47-6	Xylene (o)	9.4	
79-34-5	1,1,2,2-Tetrachloroethane	6.8	
541-73-1	1,3-Dichlorobenzene	6.9	
106-46-7	1,4-Dichlorobenzene	6.7	
95-50-1	1,2-Dichlorobenzene	6.4	
120-82-1	1,2,4-Trichlorobenzene	5.4	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

G8LCSD

Lab Name: STL BURLINGTON   Contract: 23012

Lab Code: STLVT   Case No.: 23012   SAS No.:   SDG No.: 94689

Matrix: (soil/water) AIR   Lab Sample ID: G8LCSD

Sample wt/vol: 200.0 (g/mL) ML   Lab File ID: AG010EQD

Level: (low/med) LOW   Date Received: ________

% Moisture: not dec. ________   Date Analyzed: 07/14/03

GC Column: RTX-624 ID: 0.32 (mm)   Dilution Factor: 1.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
87-68-3	Hexachlorobutadiene	7.2	
108-67-8	1,3,5-Trimethylbenzene	9.0	
95-63-6	1,2,4-Trimethylbenzene	8.0	
76-14-2	1,2-Dichlorotetrafluoroethan	11	
106-93-4	1,2-Dibromoethane	9.6	
106-99-0	1,3-Butadiene	11	
75-15-0	Carbon Disulfide	11	
67-64-1	Acetone	10	
67-63-0	Isopropyl Alcohol	10	
1634-04-4	Methyl tert-Butyl Ether	11	
110-82-7	Cyclohexane	11	
124-48-1	Dibromochloromethane	9.6	
78-93-3	Methyl Ethyl Ketone	11	
123-91-1	1,4-Dioxane	10	
108-10-1	Methyl Isobutyl Ketone	11	
591-78-6	Methyl Butyl Ketone	9.7	
75-25-2	Bromoform	7.8	
75-27-4	Bromodichloromethane	11	
156-60-5	trans-1,2-Dichloroethene	11	
622-96-8	4-Ethyltoluene	8.4	
107-05-1	3-Chloropropene	11	
540-84-1	2,2,4-Trimethylpentane	11	
593-60-2	Bromoethene	11	
95-49-8	2-Chlorotoluene	8.2	
110-54-3	n-Hexane	11	
109-99-9	Tetrahydrofuran	11	
142-82-5	n-Heptane	11	
540-59-0	1,2-Dichloroethene (total)	22	
1330-20-7	Xylene (total)	30	
75-65-0	tert-Butyl Alcohol	10	

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix Spike - Sample No.: G8LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	10		12	120	70-130
Chloromethane	10		12	120	70-130
Vinyl Chloride	10		12	120	70-130
Bromomethane	10		11	110	70-130
Chloroethane	10		11	110	70-130
Trichlorofluoromethane	10		12	120	70-130
Freon TF	10		12	120	70-130
1,1-Dichloroethene	10		12	120	70-130
Methylene Chloride	10		11	110	70-130
1,1-Dichloroethane	10		12	120	70-130
cis-1,2-Dichloroethene	10		12	120	70-130
Chloroform	10		12	120	70-130
1,1,1-Trichloroethane	10		11	110	70-130
Carbon Tetrachloride	10		12	120	70-130
Benzene	10		11	110	70-130
1,2-Dichloroethane	10		12	120	70-130
Trichloroethene	10		10	100	70-130
1,2-Dichloropropane	10		12	120	70-130
cis-1,3-Dichloropropene	10		11	110	70-130
Toluene	10		11	110	70-130
trans-1,3-Dichloroprope	10		11	110	70-130
1,1,2-Trichloroethane	10		11	110	70-130
Tetrachloroethene	10		10	100	70-130
Chlorobenzene	10		10	100	70-130
Ethylbenzene	10		10	100	70-130
Xylene (m,p)	20		21	105	70-130
Styrene	10		9.5	95	70-130
Xylene (o)	10		10	100	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS:

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix Spike - Sample No.: G8LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
1,1,2,2-Tetrachloroetha	10		7.3	73	70-130
1,3-Dichlorobenzene	10		7.5	75	70-130
1,4-Dichlorobenzene	10		7.3	73	70-130
1,2-Dichlorobenzene	10		6.9	69*	70-130
1,2,4-Trichlorobenzene	10		6.1	61*	70-130
Hexachlorobutadiene	10		7.6	76	70-130
1,3,5-Trimethylbenzene	10		9.4	94	70-130
1,2,4-Trimethylbenzene	10		8.5	85	70-130
1,2-Dichlorotetrafluoro	10		12	120	70-130
1,2-Dibromoethane	10		10	100	70-130
1,3-Butadiene	10		12	120	70-130
Carbon Disulfide	10		11	110	70-130
Acetone	10		11	110	70-130
Isopropyl Alcohol	10		11	110	70-130
Methyl tert-Butyl Ether	10		12	120	70-130
Cyclohexane	10		12	120	70-130
Dibromochloromethane	10		10	100	70-130
Methyl Ethyl Ketone	10		12	120	70-130
1,4-Dioxane	10		11	110	70-130
Methyl Isobutyl Ketone	10		12	120	70-130
Methyl Butyl Ketone	10		11	110	70-130
Bromoform	10		8.4	84	70-130
Bromodichloromethane	10		11	110	70-130
trans-1,2-Dichloroethen	10		12	120	70-130
4-Ethyltoluene	10		9.1	91	70-130
3-Chloropropene	10		12	120	70-130
2,2,4-Trimethylpentane	10		12	120	70-130
Bromoethene	10		12	120	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: ______________________

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix Spike - Sample No.: G8LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
2-Chlorotoluene	10		8.8	88	70-130
n-Hexane	10		12	120	70-130
Tetrahydrofuran	10		12	120	70-130
n-Heptane	10		12	120	70-130
1,2-Dichloroethene (tot	20		23	115	70-130
Xylene (total)	30		32	107	70-130
tert-Butyl Alcohol	10		11	110	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: ______________________________

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix Spike - Sample No.: G8LCS

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	10	11	110	9	40	70-130
Chloromethane	10	11	110	9	40	70-130
Vinyl Chloride	10	11	110	9	40	70-130
Bromomethane	10	11	110	0	40	70-130
Chloroethane	10	11	110	0	40	70-130
Trichlorofluoromethane	10	11	110	9	40	70-130
Freon TF	10	11	110	9	40	70-130
1,1-Dichloroethene	10	11	110	9	40	70-130
Methylene Chloride	10	10	100	10	40	70-130
1,1-Dichloroethane	10	11	110	9	40	70-130
cis-1,2-Dichloroethene	10	10	100	18	40	70-130
Chloroform	10	11	110	9	40	70-130
1,1,1-Trichloroethane	10	10	100	10	40	70-130
Carbon Tetrachloride	10	11	110	9	40	70-130
Benzene	10	11	110	0	40	70-130
1,2-Dichloroethane	10	11	110	9	40	70-130
Trichloroethene	10	10	100	0	40	70-130
1,2-Dichloropropane	10	11	110	9	40	70-130
cis-1,3-Dichloropropene	10	11	110	0	40	70-130
Toluene	10	10	100	10	40	70-130
trans-1,3-Dichloroprope	10	10	100	10	40	70-130
1,1,2-Trichloroethane	10	10	100	10	40	70-130
Tetrachloroethene	10	9.5	95	5	40	70-130
Chlorobenzene	10	9.6	96	4	40	70-130
Ethylbenzene	10	9.8	98	2	40	70-130
Xylene (m,p)	20	20	100	5	40	70-130
Styrene	10	8.9	89	6	40	70-130
Xylene (o)	10	9.4	94	6	40	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: ______________________

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix Spike - Sample No.: G8LCS

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1,2,2-Tetrachloroetha	10	6.8	68*	7	40	70-130
1,3-Dichlorobenzene	10	6.9	69*	8	40	70-130
1,4-Dichlorobenzene	10	6.7	67*	8	40	70-130
1,2-Dichlorobenzene	10	6.4	64*	8	40	70-130
1,2,4-Trichlorobenzene	10	5.4	54*	12	40	70-130
Hexachlorobutadiene	10	7.2	72	5	40	70-130
1,3,5-Trimethylbenzene	10	9.0	90	4	40	70-130
1,2,4-Trimethylbenzene	10	8.0	80	6	40	70-130
1,2-Dichlorotetrafluoro	10	11	110	9	40	70-130
1,2-Dibromoethane	10	9.6	96	4	40	70-130
1,3-Butadiene	10	11	110	9	40	70-130
Carbon Disulfide	10	11	110	0	40	70-130
Acetone	10	10	100	10	40	70-130
Isopropyl Alcohol	10	10	100	10	40	70-130
Methyl tert-Butyl Ether	10	11	110	9	40	70-130
Cyclohexane	10	11	110	9	40	70-130
Dibromochloromethane	10	9.6	96	4	40	70-130
Methyl Ethyl Ketone	10	11	110	9	40	70-130
1,4-Dioxane	10	10	100	10	40	70-130
Methyl Isobutyl Ketone	10	11	110	9	40	70-130
Methyl Butyl Ketone	10	9.7	97	12	40	70-130
Bromoform	10	7.8	78	7	40	70-130
Bromodichloromethane	10	11	110	0	40	70-130
trans-1,2-Dichloroethen	10	11	110	9	40	70-130
4-Ethyltoluene	10	8.4	84	8	40	70-130
3-Chloropropene	10	11	110	9	40	70-130
2,2,4-Trimethylpentane	10	11	110	9	40	70-130
Bromoethene	10	11	110	9	40	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: ______________________________

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Matrix Spike - Sample No.: G8LCS

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
2-Chlorotoluene	10	8.2	82	7	40	70-130
n-Hexane	10	11	110	9	40	70-130
Tetrahydrofuran	10	11	110	9	40	70-130
n-Heptane	10	11	110	9	40	70-130
1,2-Dichloroethene (tot	20	22	110	4	40	70-130
Xylene (total)	30	30	100	7	40	70-130
tert-Butyl Alcohol	10	10	100	10	40	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 63 outside limits
Spike Recovery: 7 out of 126 outside limits

COMMENTS: ____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

ABLKG8

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Lab File ID: AGB002E Lab Sample ID: ABLKG8

Date Analyzed: 07/14/03 Time Analyzed: 1225

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

Instrument ID: B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	G8LCS	G8LCS	AG010EQ	0957
02	G8LCSD	G8LCSD	AG010EQD	1040
03	DWNWD1 K0L	533720	533720	2251
04	DWNWD2BIOPAD	533721	533721	2334
05	UPWIND 3	533722	533722	0016
06				
07				
08				
09				
10				
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COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Lab File ID: BAG001P BFB Injection Date: 07/08/03

Instrument ID: B BFB Injection Time: 0835

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	11.2
75	30.0 - 66.0% of mass 95	39.2
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.6 (0.7)1
174	50.0 - 120.0% of mass 95	82.7
175	4.0 - 9.0% of mass 174	5.7 (6.9)1
176	93.0 - 101.0% of mass 174	78.7 (95.2)1
177	5.0 - 9.0% of mass 176	5.2 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0005	ASTD0005	AG0005	07/08/03	0907
02	ASTD010	ASTD010	AG010	07/08/03	1034
03	ASTD015	ASTD015	AG015	07/08/03	1117
04	ASTD005	ASTD005	AG005I2	07/08/03	1200
05	ASTD020	ASTD020	AG020	07/08/03	1244
06	ASTD040	ASTD040	AG040	07/08/03	1328
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Lab File ID: BAG006P BFB Injection Date: 07/14/03

Instrument ID: B BFB Injection Time: 0810

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	11.9
75	30.0 - 66.0% of mass 95	39.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	80.5
175	4.0 - 9.0% of mass 174	4.8 (6.0)1
176	93.0 - 101.0% of mass 174	77.5 (96.3)1
177	5.0 - 9.0% of mass 176	5.1 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD010	ASTD010	AG010E	07/14/03	0906
02	G8LCS	G8LCS	AG010EQ	07/14/03	0957
03	G8LCSD	G8LCSD	AG010EQD	07/14/03	1040
04	ABLKG8	ABLKG8	AGB002E	07/14/03	1225
05	DWNWD1 K0L	533720	533720	07/14/03	2251
06	DWNWD2BIOPAD	533721	533721	07/14/03	2334
07	UPWIND 3	533722	533722	07/15/03	0016
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6A
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Instrument ID: B Calibration Date(s): 07/08/03 07/08/03

Heated Purge: (Y/N) N Calibration Time(s): 0907 1328

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.5=AG0005 RRF5 =AG005I2
RRF10 =AG010 RRF20 =AG020 RRF40 =AG040

COMPOUND	RRF0.5	RRF5	RRF10	RRF20	RRF40	RRF	% RSD
Dichlorodifluoromethane	2.160	2.695	1.843	2.420	2.306		
Chloromethane	0.536	0.570	0.402	0.516	0.498		
Vinyl Chloride	0.693	0.790	0.582	0.711	0.689		
Bromomethane	0.767	0.893	0.654	0.835	0.742		
Chloroethane	0.403	0.470	0.331	0.431	0.384		
Trichlorofluoromethane	2.352	2.911	2.000	2.606	2.475		
Freon TF	1.801	2.272	1.540	1.949	1.872		
1,1-Dichloroethene	0.829	1.056	0.722	0.936	0.899		
Methylene Chloride	0.992	0.838	0.559	0.713	0.703		
1,1-Dichloroethane *	1.313	1.642	1.115	1.450	1.429		*
cis-1,2-Dichloroethene	1.068	1.305	0.848	1.111	1.097		
Chloroform	1.743	2.195	1.468	1.892	1.852		
1,1,1-Trichloroethane	0.449	0.436	0.287	0.348	0.330		
Carbon Tetrachloride	0.348	0.461	0.304	0.375	0.356		
Benzene	0.487	0.566	0.376	0.449	0.428		
1,2-Dichloroethane	0.190	0.238	0.157	0.194	0.186		
Trichloroethene	0.305	0.266	0.174	0.209	0.198		
1,2-Dichloropropane	0.142	0.175	0.115	0.137	0.130		
cis-1,3-Dichloropropene	0.271	0.338	0.223	0.271	0.262		
Toluene	0.464	0.537	0.358	0.433	0.428		
trans-1,3-Dichloropropene	0.226	0.294	0.195	0.242	0.236		
1,1,2-Trichloroethane	0.189	0.228	0.151	0.184	0.181		
Tetrachloroethene	0.596	0.442	0.291	0.331	0.318		
Chlorobenzene *	0.588	0.698	0.451	0.532	0.508		*
Ethylbenzene	0.983	1.162	0.755	0.906	0.877		
Xylene (m,p)	0.394	0.472	0.307	0.356	0.334		
Styrene	0.557	0.721	0.472	0.558	0.534		
Xylene (o)	0.378	0.455	0.295	0.341	0.323		
1,1,2,2-Tetrachloroethane	0.436	0.532	0.355	0.431	0.422		
1,3-Dichlorobenzene	0.584	0.699	0.460	0.555	0.548		
1,4-Dichlorobenzene	0.589	0.679	0.448	0.551	0.535		
1,2-Dichlorobenzene	0.528	0.608	0.402	0.488	0.483		
1,2,4-Trichlorobenzene	0.381	0.322	0.206	0.268	0.270		
Hexachlorobutadiene	0.358	0.386	0.244	0.294	0.283		
1,3,5-Trimethylbenzene	0.864	1.167	0.785	0.985	0.882		
1,2,4-Trimethylbenzene	0.897	1.111	0.739	0.902	0.884		
1,2-Dichlorotetrafluoroethan	2.198	2.756	1.880	2.412	2.291		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

6A
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: STL BURLINGTON   Contract: 23012

Lab Code: STLVT   Case No.: 23012   SAS No.:   SDG No.: 94689

Instrument ID: B   Calibration Date(s): 07/08/03   07/08/03

Heated Purge: (Y/N) N   Calibration Time(s): 0907   1328

GC Column: RTX-624   ID: 0.32   (mm)

LAB FILE ID: RRF0.5=AG0005   RRF5 =AG005I2
RRF10 =AG010   RRF20 =AG020   RRF40 =AG040

COMPOUND	RRF0.5	RRF5	RRF10	RRF20	RRF40	RRF	% RSD
1,2-Dibromoethane	0.361	0.461	0.303	0.377	0.368		
1,3-Butadiene	0.476	0.590	0.448	0.539	0.520		
Carbon Disulfide	2.259	2.896	1.966	2.600	2.515		
Acetone		1.215	0.802	1.061	1.081		
Isopropyl Alcohol		1.342	0.882	1.206	1.253		
Methyl tert-Butyl Ether	2.374	3.070	2.063	2.733	2.734		
Cyclohexane	0.194	0.245	0.156	0.185	0.173		
Dibromochloromethane	0.393	0.529	0.350	0.438	0.427		
Methyl Ethyl Ketone	2.772	3.169	2.075	2.785	2.800		
1,4-Dioxane		0.140	0.089	0.114	0.113		
Methyl Isobutyl Ketone	0.255	0.333	0.215	0.268	0.266		
Methyl Butyl Ketone	0.299	0.369	0.236	0.305	0.312		
Bromoform	0.344	0.474	0.314	0.390	0.378		
Bromodichloromethane	0.324	0.420	0.278	0.342	0.329		
trans-1,2-Dichloroethene	1.038	1.289	0.875	1.139	1.122		
4-Ethyltoluene	1.214	1.454	0.953	1.112	1.146		
3-Chloropropene	0.715	0.897	0.596	0.789	0.795		
2,2,4-Trimethylpentane	0.631	0.762	0.498	0.593	0.569		
Bromoethene	0.778	1.023	0.702	0.901	0.839		
2-Chlorotoluene	0.859	1.061	0.704	0.860	0.831		
n-Hexane	1.146	1.408	0.936	1.207	1.168		
Tetrahydrofuran		0.058	0.037	0.044	0.043		
n-Heptane	0.200	0.233	0.149	0.179	0.170		
1,2-Dichloroethene (total)	1.053	1.297	0.862	1.125	1.110		
Xylene (total)	0.378	0.455	0.295	0.341	0.323		
tert-Butyl Alcohol		2.063	1.340	1.821	1.874		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

6A
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Instrument ID: B Calibration Date(s): 07/08/03 07/08/03

Heated Purge: (Y/N) N Calibration Time(s): 0907 1328

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF15 =AG015

COMPOUND	RRF15					$\overline{RRF}$	% RSD
Dichlorodifluoromethane						2.285	13.8
Chloromethane						0.504	12.5
Vinyl Chloride						0.693	10.7
Bromomethane						0.778	11.7
Chloroethane						0.404	12.9
Trichlorofluoromethane						2.469	13.5
Freon TF						1.887	14.0
1,1-Dichloroethene						0.888	14.0
Methylene Chloride						0.761	21.4
1,1-Dichloroethane *						1.390	13.9*
cis-1,2-Dichloroethene						1.086	15.0
Chloroform						1.830	14.4
1,1,1-Trichloroethane						0.370	18.9
Carbon Tetrachloride						0.369	15.7
Benzene						0.461	15.4
1,2-Dichloroethane						0.193	15.1
Trichloroethene						0.230	23.2
1,2-Dichloropropane						0.140	15.8
cis-1,3-Dichloropropene						0.273	15.2
Toluene						0.444	14.7
trans-1,3-Dichloropropene						0.239	15.0
1,1,2-Trichloroethane						0.187	14.8
Tetrachloroethene						0.396	31.8
Chlorobenzene *						0.555	16.9*
Ethylbenzene						0.937	16.1
Xylene (m,p)						0.373	17.1
Styrene						0.568	16.2
Xylene (o)						0.358	17.3
1,1,2,2-Tetrachloroethane						0.435	14.5
1,3-Dichlorobenzene						0.569	15.1
1,4-Dichlorobenzene						0.560	15.0
1,2-Dichlorobenzene						0.502	14.9
1,2,4-Trichlorobenzene						0.289	22.7
Hexachlorobutadiene						0.313	18.4
1,3,5-Trimethylbenzene						0.937	15.7
1,2,4-Trimethylbenzene						0.907	14.6
1,2-Dichlorotetrafluoroethan						2.307	13.8

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

6A
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Instrument ID: B Calibration Date(s): 07/08/03 07/08/03

Heated Purge: (Y/N) N Calibration Time(s): 0907 1328

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF15 =AG015

COMPOUND	RRF15					$\overline{RRF}$	% RSD
1,2-Dibromoethane						0.374	15.2
1,3-Butadiene						0.515	10.7
Carbon Disulfide						2.447	14.4
Acetone	1.171					1.066	15.1
Isopropyl Alcohol	1.352					1.207	15.9
Methyl tert-Butyl Ether						2.595	14.9
Cyclohexane						0.191	17.7
Dibromochloromethane						0.427	15.5
Methyl Ethyl Ketone						2.720	14.6
1,4-Dioxane	0.133					0.118	16.6
Methyl Isobutyl Ketone						0.267	15.9
Methyl Butyl Ketone						0.304	15.5
Bromoform						0.380	15.8
Bromodichloromethane						0.339	15.2
trans-1,2-Dichloroethene						1.093	13.9
4-Ethyltoluene						1.176	15.5
3-Chloropropene						0.758	14.7
2,2,4-Trimethylpentane						0.611	16.0
Bromoethene						0.849	14.4
2-Chlorotoluene						0.863	14.8
n-Hexane						1.173	14.3
Tetrahydrofuran	0.052					0.047	17.4
n-Heptane						0.186	17.1
1,2-Dichloroethene (total)						1.089	14.4
Xylene (total)						0.358	17.3
tert-Butyl Alcohol	2.046					1.829	16.0

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Instrument ID: B Calibration Date: 07/14/03 Time: 0906

Lab File ID: AG010E Init. Calib. Date(s): 07/08/03 07/08/03

Heated Purge: (Y/N) N Init. Calib. Times: 0907 1328

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	2.285	2.831	0.01	23.9	30.0
Chloromethane	0.504	0.639	0.01	26.8	30.0
Vinyl Chloride	0.693	0.862	0.01	24.4	30.0
Bromomethane	0.778	0.922	0.01	18.5	30.0
Chloroethane	0.404	0.477	0.01	18.1	30.0
Trichlorofluoromethane	2.469	2.931	0.01	18.7	30.0
Freon TF	1.887	2.298	0.01	21.8	30.0
1,1-Dichloroethene	0.888	1.096	0.01	23.4	30.0
Methylene Chloride	0.761	0.854	0.01	12.2	30.0
1,1-Dichloroethane	1.390	1.702	0.1	22.4	30.0
cis-1,2-Dichloroethene	1.086	1.303	0.01	20.0	30.0
Chloroform	1.830	2.168	0.01	18.5	30.0
1,1,1-Trichloroethane	0.370	0.419	0.01	13.2	30.0
Carbon Tetrachloride	0.369	0.445	0.01	20.6	30.0
Benzene	0.461	0.546	0.01	18.4	30.0
1,2-Dichloroethane	0.193	0.227	0.01	17.6	30.0
Trichloroethene	0.230	0.256	0.01	11.3	30.0
1,2-Dichloropropane	0.140	0.168	0.01	20.0	30.0
cis-1,3-Dichloropropene	0.273	0.325	0.01	19.0	30.0
Toluene	0.444	0.522	0.01	17.6	30.0
trans-1,3-Dichloropropene	0.239	0.283	0.01	18.4	30.0
1,1,2-Trichloroethane	0.187	0.218	0.01	16.6	30.0
Tetrachloroethene	0.396	0.424	0.01	7.1	30.0
Chlorobenzene	0.555	0.645	0.3	16.2	30.0
Ethylbenzene	0.937	1.087	0.01	16.0	30.0
Xylene (m,p)	0.373	0.440	0.01	18.0	30.0
Styrene	0.568	0.666	0.01	17.2	30.0
Xylene (o)	0.358	0.421	0.01	17.6	30.0
1,1,2,2-Tetrachloroethane	0.435	0.500	0.01	14.9	30.0
1,3-Dichlorobenzene	0.569	0.661	0.01	16.2	30.0
1,4-Dichlorobenzene	0.560	0.648	0.01	15.7	30.0
1,2-Dichlorobenzene	0.502	0.577	0.01	14.9	30.0
1,2,4-Trichlorobenzene	0.289	0.304	0.01	5.2	30.0
Hexachlorobutadiene	0.313	0.356	0.01	13.7	30.0
1,3,5-Trimethylbenzene	0.937	1.148	0.01	22.5	30.0
1,2,4-Trimethylbenzene	0.907	1.060	0.01	16.9	30.0
1,2-Dichlorotetrafluoroethan	2.307	2.905	0.01	25.9	30.0

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Instrument ID: B Calibration Date: 07/14/03 Time: 0906

Lab File ID: AG010E Init. Calib. Date(s): 07/08/03 07/08/03

Heated Purge: (Y/N) N Init. Calib. Times: 0907 1328

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
1,2-Dibromoethane	0.374	0.438	0.01	17.1	30.0
1,3-Butadiene	0.515	0.649	0.01	26.0	30.0
Carbon Disulfide	2.447	3.002	0.01	22.7	30.0
Acetone	1.066	1.342	0.01	25.9	30.0
Isopropyl Alcohol	1.207	1.500	0.01	24.3	30.0
Methyl tert-Butyl Ether	2.595	3.142	0.01	21.1	30.0
Cyclohexane	0.191	0.236	0.01	23.6	30.0
Dibromochloromethane	0.427	0.510	0.01	19.4	30.0
Methyl Ethyl Ketone	2.720	3.284	0.01	20.7	30.0
1,4-Dioxane	0.118	0.141	0.01	19.5	30.0
Methyl Isobutyl Ketone	0.267	0.331	0.01	24.0	30.0
Methyl Butyl Ketone	0.304	0.369	0.01	21.4	30.0
Bromoform	0.380	0.462	0.01	21.6	30.0
Bromodichloromethane	0.339	0.402	0.01	18.6	30.0
trans-1,2-Dichloroethene	1.093	1.340	0.01	22.6	30.0
4-Ethyltoluene	1.176	1.341	0.01	14.0	30.0
3-Chloropropene	0.758	0.943	0.01	24.4	30.0
2,2,4-Trimethylpentane	0.611	0.744	0.01	21.8	30.0
Bromoethene	0.849	1.035	0.01	21.9	30.0
2-Chlorotoluene	0.863	1.008	0.01	16.8	30.0
n-Hexane	1.173	1.442	0.01	22.9	30.0
Tetrahydrofuran	0.047	0.056	0.01	19.1	30.0
n-Heptane	0.186	0.227	0.01	22.0	30.0
1,2-Dichloroethene (total)	1.089	1.321	0.01	21.3	30.0
Xylene (total)	0.358	0.421	0.01	17.6	30.0
tert-Butyl Alcohol	1.829	2.150	0.01	17.6	30.0

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: STL BURLINGTON Contract: 23012

Lab Code: STLVT Case No.: 23012 SAS No.: SDG No.: 94689

Lab File ID (Standard): AG010E Date Analyzed: 07/14/03

Instrument ID: B Time Analyzed: 0906

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

		IS1 (BCM) AREA #	RT #	IS2 (CBZ) AREA #	RT #	IS3 (DFB) AREA #	RT #
	12 HOUR STD	394337	9.66	1978617	12.80	2363488	10.44
	UPPER LIMIT	552072	9.99	2770064	13.13	3308883	10.77
	LOWER LIMIT	236602	9.33	1187170	12.47	1418093	10.11
	CLIENT SAMPLE NO.						
01	G8LCS	382454	9.66	1951127	12.80	2298733	10.44
02	G8LCSD	386117	9.66	1944468	12.80	2294051	10.44
03	ABLKG8	392100	9.66	1948850	12.80	2255473	10.44
04	DWNWD1 K0L	401147	9.66	1992055	12.80	2310280	10.44
05	DWNWD2BIOPAD	386066	9.66	1917659	12.80	2213868	10.44
06	UPWIND 3	378554	9.66	1890746	12.80	2179642	10.44
07							
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IS1 (BCM) = Bromochloromethane
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DFB) = 1,4-Difluorobenzene

AREA UPPER LIMIT = + 40% of internal standard area
AREA LOWER LIMIT = - 40% of internal standard area
RT UPPER LIMIT = + 0.33 minutes of internal standard RT
RT LOWER LIMIT = - 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

GALSON
LABORATORIES

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(315) 432-5227
Fax: (315) 437-0571
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JUL 14 2003

Mr. Brian Fischer
Severn Trent Laboratories
10 Hazelwood Drive
Suite 106
Amherst, NY 14228

July 11, 2003

DOH ELAP# 11626 Account# 12074 Login# L94721

Dear Mr. Fischer:

Enclosed are the analytical results of the samples received by our laboratory July 10, 2003. All test results meet the quality control requirements of AIHA and NELAC unless otherwise stated in this report.

Results in this report are based on the sampling data provided by the client and refer only to items tested. Unless otherwise requested, all samples will be discarded thirty days from the date of this report.

Please contact your client service representative, Tonya McGuiggan at (877) 482-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

FOR:

F. Joseph Unangst
Laboratory Director

Enclosure(s)

GALSON
LABORATORIES

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : NS

Date Sampled : 08-JUL-03
Date Received : 10-JUL-03
Date Analyzed : 11-JUL-03

Account No.: 12074
Login No. : L94721

Respirable Dust

Sample ID	Lab ID	Air Vol m3	Total mg	Conc mg/m3
DOWN WIND #1 SUBAREA	L94721-1	0.84348	<0.05	<0.06
DOWN WIND #2 BLOPAD	L94721-2	0.83911	<0.05	<0.06
UPWIND#3 TERM. BASIN	L94721-3	0.82496	<0.05	<0.06
LAB BLANK	L94721-4	NA	<0.05	NA

COMMENTS: PNOR = Particulates Not Otherwise Regulated.

Level of quantitation: 0.05 mg
Analytical Method : NIOSH 0600; GRAV
OSHA PEL (TWA) : PNOR 5 mg/m3
Collection Media : PVC PW

Submitted by: bm
Approved by : OVK
Date : 11-JUL-03
QC by:
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

Galson Laboratories
6601 Kirkville Road
P.O. Box 369
E. Syracuse, NY 13057-0369
Tel: (315) 437-7252 888-577-Labs (5227)
Fax: (315) 437-0571

Request For Industrial Hygiene Analysis

Company Name:
Account #: 12074
Site Name:
Sampled By:
Project #:

☐ Check if Change of Address

Report to: STL BUFFALO
10 HAZELWOOD DR.
Suite 106
Amherst, NY 14228
Phone: (716) 691-2600

Invoice to: Same
ATTN: Brian Fischer (Both)
Phone: ( )

☒ Purchase order number: 1821396
☐ Verbal Authorization:
☐ Credit Card (type):
Card #:
Exp Date:

☒ Standard Turn-Around Time (5 business days)
☐ Same Day (SD) Next Day(ND) ☐ 12PM ☐ 5PM ☐ 2 Day ☐ 3 Day ☐ 4 Day
Surcharges: SD = 200% ND by 12PM = 150% ND by 5PM = 100% 2 Day= 75% 3 Day = 50% 4 Day = 35%

☒ Fax Results to: B. Fischer
Fax #: (716) 691-7991
☐ Email Results to:

Sample Identification	Date Sampled	Sample Medium Catalog # / Lot #	Air Sample Volume (liters)*	Analysis Requested	Method Reference
✓ Downwind #1 KOL-Subarea	7/8/03	Sw PVC Preweighed #181635	Final Air Vol = 843.48L 495 min x 1.704	Tot Particulate Matter Respirable Dust	NIOSH 0600
✓ Downwind #2 Biopad	7/8/03	Sw PVC Preweighed #181634	Final Air Vol = 839.11L 491 min x 1.709	↓	↓
✓ Upwind #3 -Terminal Basin	7/8/03	Sw PVC Preweighed #181639	Final Air Vol = 824.96L 483 min x 1.708	↓	↓

If blanks are not submitted, our policy states that a laboratory blank will be added for each analyte and it will be charged at the normal rate. IF YOU DO NOT WANT A LABORATORY BLANK ADDED PLEASE CHECK BOX Yes ☒

*For passive monitors please list time exposed in minutes.

Comments (Please list any known interferences present in sampling area):

Chain of Custody	Print Name	Signature	Date/Time
Relinquished by:	Rick Abisz		7/9/03
Received by LAB:	Ryan VanDette		7/9/03 11:37

Samples received after 3pm will be considered as next day's business.

Relinquished: Kenneth P. Kirecki — 7/9/03 1650
Received: Art Graf

07-10-03 A11:02 IN

ATTACHMENT 2
DOCUMENTATION AIR MONITORING RESULTS

FIELD DATA/FORMS

JULY 8, 2003 SAMPLING EVENT

DOCUMENTATION AIR MONITORING
AT THE FORMER STEEL MANUFACTURING SITE

DAILY CALIBRATION RECORD FOR GILIAN AIR SAMPLING PUMPS

Date 9/8/03

Pump 1 Serial No. 15270 Calibrated Flowrate (L/min): 1.704
Pump 2 Serial No. 15271 Calibrated Flowrate (L/min): 1.709
Pump 3 Serial No. 15272 Calibrated Flowrate (L/min): 1.708
Pump 4 Serial No.______ Calibrated Flowrate (L/min):______
Pump 5 Serial No.______ Calibrated Flowrate (L/min):______
Pump 6 Serial No.______ Calibrated Flowrate (L/min):______
Calibrations Performed by RLD

Date______

Pump 1 Serial No.______ Calibrated Flowrate (L/min):______
Pump 2 Serial No.______ Calibrated Flowrate (L/min):______
Pump 3 Serial No.______ Calibrated Flowrate (L/min):______
Pump 4 Serial No.______ Calibrated Flowrate (L/min):______
Pump 5 Serial No.______ Calibrated Flowrate (L/min):______
Pump 6 Serial No.______ Calibrated Flowrate (L/min):______
Calibrations Performed by______

Date______

Pump 1 Serial No.______ Calibrated Flowrate (L/min):______
Pump 2 Serial No.______ Calibrated Flowrate (L/min):______
Pump 3 Serial No.______ Calibrated Flowrate (L/min):______
Pump 4 Serial No.______ Calibrated Flowrate (L/min):______
Pump 5 Serial No.______ Calibrated Flowrate (L/min):______
Pump 6 Serial No.______ Calibrated Flowrate (L/min):______
Calibrations Performed by______

Additional Comments:

TurnKey Environmental Restoration, LLC

TurnKey Environmental Restoration, LLC

Sheet ______ of ______
Project No. ______ Date ______
By ______ Date ______
Checked ______
Subject ______

7/8/03 Setup Downwind #1 (K&L) at 0712 – OFF @ 1527
Setup Downwind #2 (BIOPAD) at 0732 OFF @ 1543
Setup upwind #3 (Terminal Basin) at 0747 OFF @ 1550

Downwind #1 8 hrs 15 min = 495 min x 1.704 = 843.48 L

Downwind #2 8 hrs 11 min = 491 min x 1.709 = 839.11 L

Upwind #3 8 hrs 3 mins = 483 min x 1.708 = 824.96 L

DAILY LOG of WORK ACTIVITIES - LTV STEEL

Date: 7/8/2003

Temp:
Low 74
High 80

Weather:
Morning Partly Sunny and warm
Afternoon Mostly sunny and windy

Personnel: Supervisor: J. Plewniak
H&S Officer: C. Demchic
Surveyors:

Operators: 5
Laborers: 2
Drivers: 2

Visitors & Subs
1. Rick Dubuis
2. Gary Smith
3. Jim Tuk
4. Greg Sutton
5. John McConnell
6.
7.
8.

Equipment:
1. D6M Dozer (mobbed)
2. D6R Dozer
3.
4. Water Truck
5. Cat Smooth Drum
6. DJB 504
7. LCA Tandem (2)
8. Cat 345 Excavator
9. Loader 980
10. Excavator 225
11. DJB 505
12.

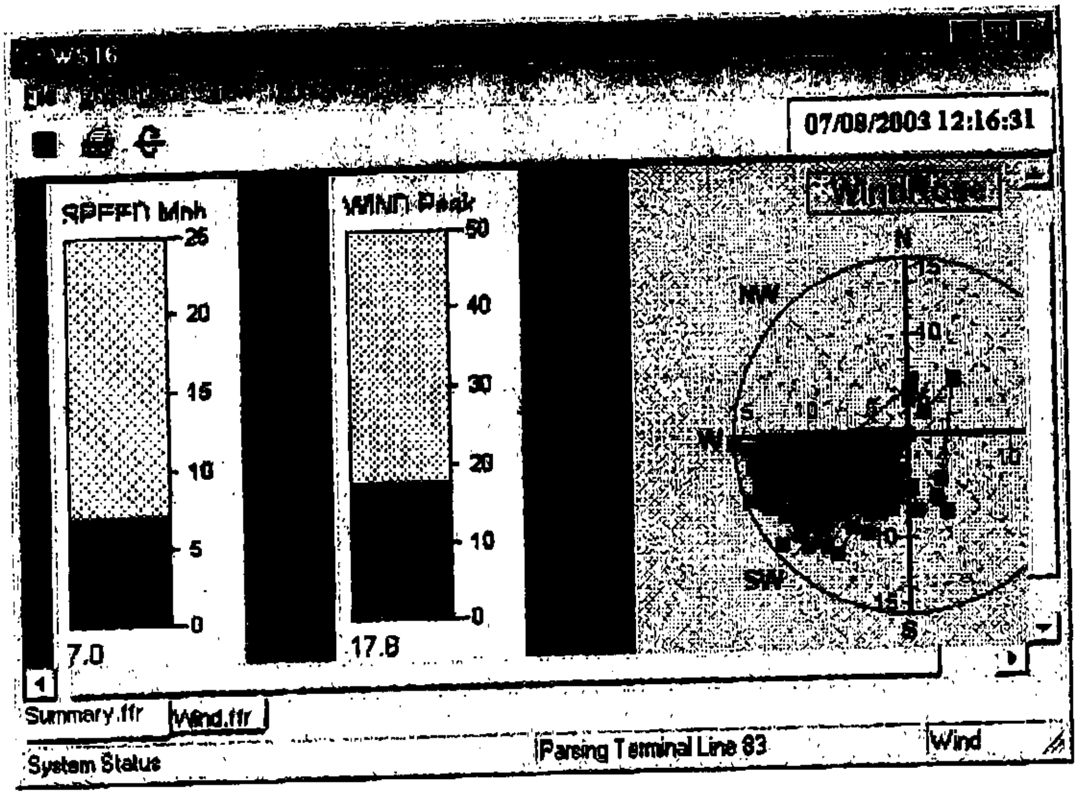
Daily Fuel Usage: gallons

Daily Work Activities:
Modern mechanic on site to repair pump motor on water truck. 345 completeing north east side of Area K&, with three trucks hauling soil to bio-pad. Eight tandems hauling soil fill in from W. Seneca for fill material in Area K&L. D6R placing soil fill. D6M gradingtar pile in bio-pad. Water truck operating by 8:00 pm. I left site for about 1 hour in am. Buffalo water dept on site inform Modern not to use hydrant on Baraga Street because of problems with water line breaking, water fill operation moved to hydrant on S. Park Ave. Jim Tuk on site late morning and complaining that Modern is removing to much soil from north side of K&L. Operator informed me before noon that tandem dump had tipped on side in bio-pad. Rick DuBuis and Jim Tuk sampled north wall and floor area in Sub Area "K&L", also obtained sample on west wall but appeared to still be contaminated. 345 continued on west side of area K&L. Two trucks hauling soil to bio-pad. Tandems hauling fill material to K&L for afternoon. No major issues discuss at meeting other than dust complaint. D6M grading piles on bio-pad. All work at site completed by 3:30 pm. Rick Dubuis back on site in afternoon to pick canister air monitors. I left site about 4:30 pm. LCA tandem demobbed to shop.

Project Supervisor: [signature]
Modern Construction, LLC

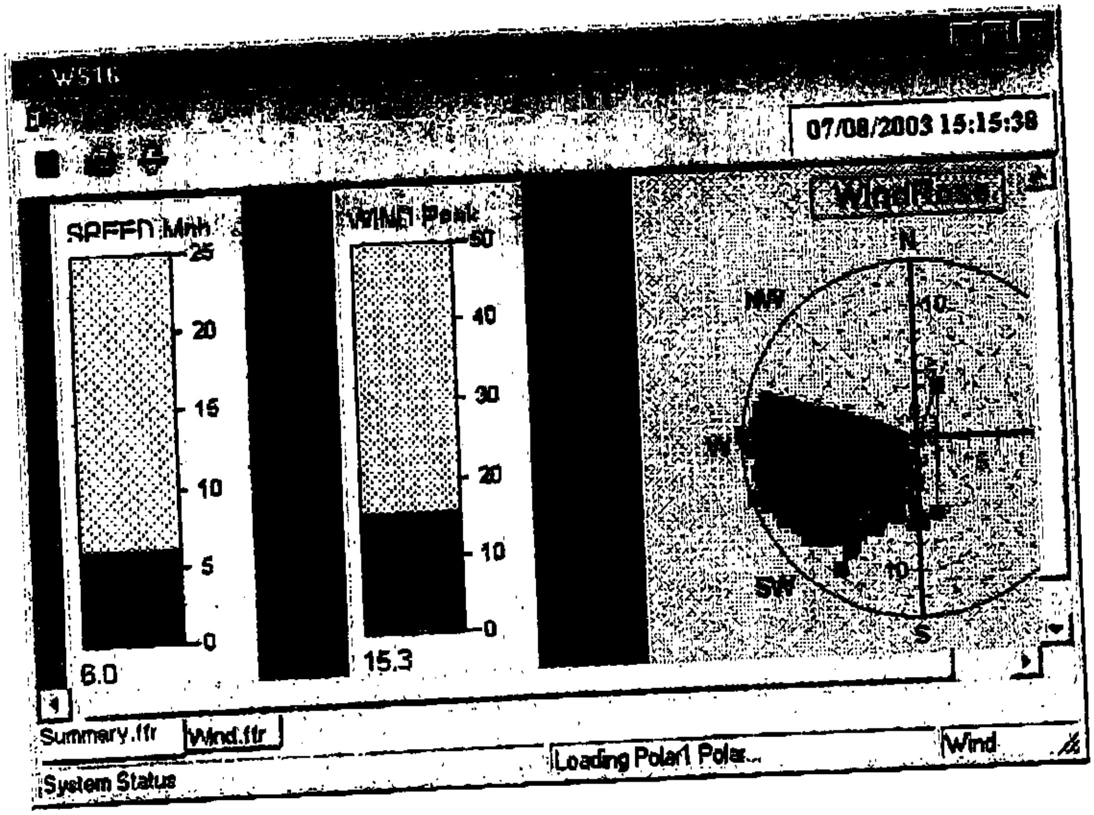
WS16 Report
WS16
Print Form

07/08/03 12:16:31



WS16 Report
WS16
Print Form

07/08/03 15:15:38



TurnKey Environmental Restoration, LLC

October 2, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results (Evening Monitoring Event) - August 2003 Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site on August 21, 2003 through August 22, 2003. The documentation air monitoring work was initiated during the evening on August 21st following tilling of the biopad in Area III. This documentation monitoring event was conducted at the request of the NYSDEC.

The monitoring involved collection of samples at three (3) monitoring stations. The approximate locations of the stations are shown on Figure 1. Based on the westerly wind direction two downwind stations were placed on the eastern side of the biopad. The upwind station was located on the western side of the biopad. NYSDEC was present to observe the set up. Each summa canister was placed on a ladder to elevate the intake 5 feet above ground level.

The Summa canisters were fitted with preset inlet regulator valve to draw a continuous air sample for 8 hours. Sample collection was initiated by TurnKey Environmental Restoration at approximately 1600 hours on August 22, 2003 and terminated after 8 hours of sample collection. The samples were then transported, under chain-of-custody command, to Severn Trent Laboratories Inc. (STL) in Knoxville, TN for analysis of Target Compound List (TCL) volatile organic compounds (VOCs) as well as naphthalene in accordance with USEPA Method TO-15.

Table 1, attached, summarizes the analytical data for the detected compounds. The analytical laboratory report is presented in Attachment 1. As indicated, only a small number of compounds were detected at trace levels, with the upwind (background) sample showing many of the same parameters as the downwind station. The documentation air sampling results support the real time PID monitoring data for August 2003, which consistently show no exceedance of the Community Air Monitoring Plan total VOC threshold of 5ppm above background.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: C. O'Connor (NYSDOH)

File: 0062-008-100, CG

TABLE 1

DOCUMENTATION AIR MONITORING RESULTS

SUMMARY OF DOCUMINTATION AIR SAMPLING RESULTS

AUGUST 21 THROUGH 22, 2003 SAMPLING EVENT

TABLE 1

STEELFIELDS Ltd. DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
AUGUST 22, 2003

	SAMPLE LOCATIONS					
	Upwind #1		Downwind #2		Downwind #1	
PARAMETER	(PPBV)	ug/M3	(PPBV)	ug/M3	(PPBV)	ug/M3
VOCS - METHOD TO15						
Dichlorodifluoromethane	0.68	3.42	0.64	3.22	0.57	2.87
Toluene	0.65	2.49	0.49	1.48	0.41	1.57
Trichlorofluoromethane	0.38	2.17	0.31	1.77	ND < 0.31	ND < 0.31
Napthalene	ND < 0.32	ND < 0.32	0.39	2.08	0.66	3.52

FIGURE 1

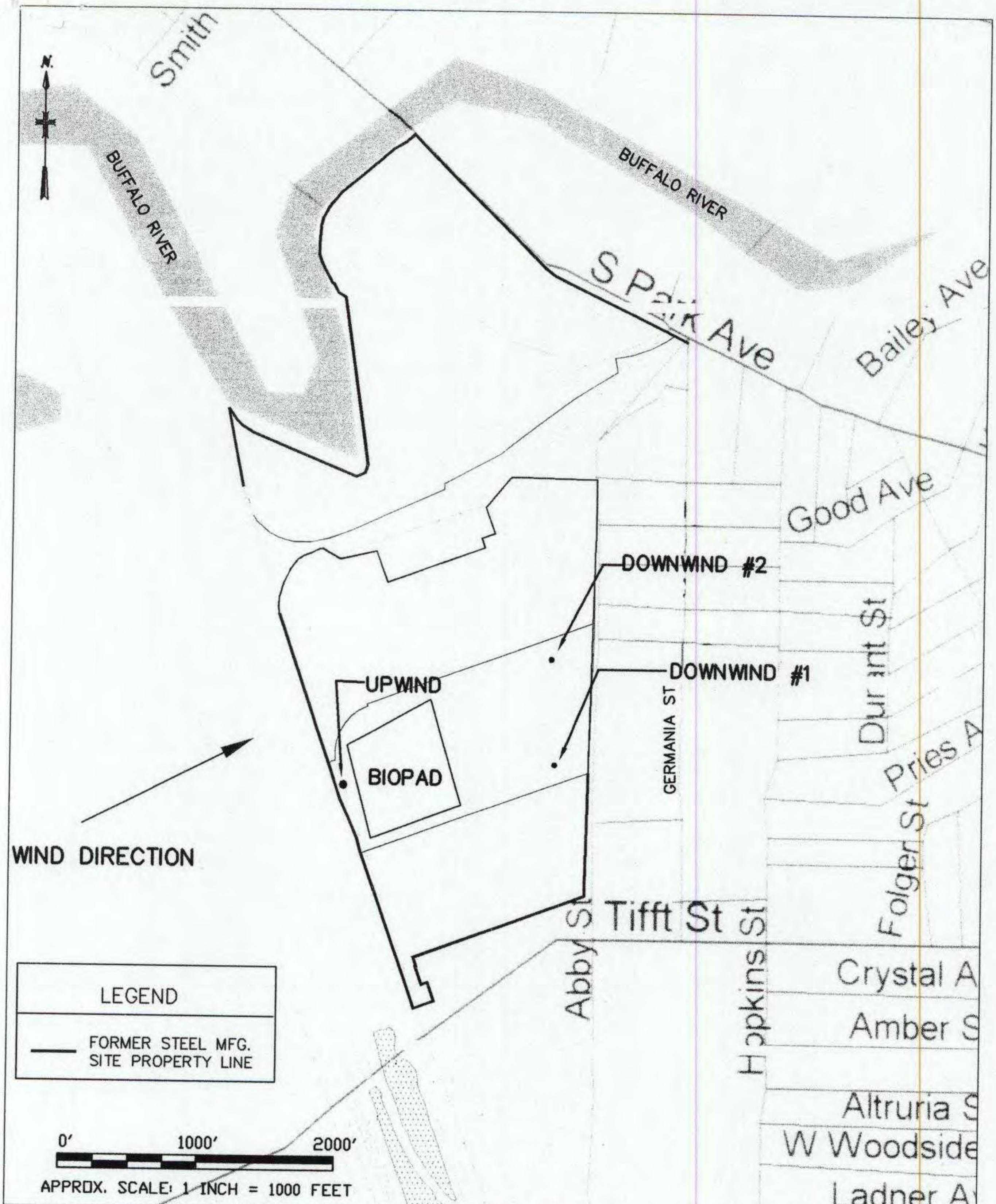
DOCUMENTATION AIR MONITORING RESULTS

SITE MAP WITH SAMPLE LOCATIONS

AUGUST 21 THROUGH 22, 2003 SAMPLING EVENT

DATE: ______________________________

FIGURE 1



TurnKey Environmental Restoration, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

AUGUST 22-23 2003 DOCUMENTATION AIR MONITORING

STATION LOCATIONS

ATTACHMENT 1

DOCUMENTATION AIR MONITORING RESULTS

LABORATORY ANALYTICAL REPORT

AUGUST 21 THROUGH 22, 2003 SAMPLING EVENT

SEVERN TRENT STL

ANALYTICAL REPORT

Job#: A03-9083

STL Project#: NY3A9063
Site Name: Steelfields - Former LTV Steel site
Task: Air Monitoring

Mr. Tom Forbes
Benchmark Environmental
50 Fountain Plaza, Ste 1350
Buffalo, NY 14202

STL Buffalo

Brian J. Fischer
Project Manager

09/23/2003

NON-CONFORMANCE SUMMARY

Job#: A03-9083

STL Project#: NY3A9063
Site Name: Steelfields - Former LTV Steel site

General Comments

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

Sample Receipt Comments

A03-9083

Sample Cooler(s) were received at the following temperature(s); NA °C

Volatile analyses were performed by STL Knoxville, TN. All data is included in this report as Appendix A.

****

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

Appendix A

Original Chain of Custody Documentation

H3H270257

Chain of Custody Record

SEVERN TRENT SERVICES Severn Trent Laboratories, Inc.

STL-4124 (0700)

Client	Turnkey
Address	50 Fountain Plaza, Suite 1350
City	Buffalo
State	NY
Zip Code	14202
Project Name and Location (State)	STEELFIELDS Buffalo NY Job # 0062-005-100
Contract/Purchase Order/Quote No.	
Project Manager	Tom Forbes
Telephone Number (Area Code)/Fax Number	Turnkey (716) 691-2600 / STL Buffalo (716) 691-2600
Site Contact	Tom Forbes
Lab Contact	Brian Fischer
Carrier/Waybill Number	
Date	8/25/03
Chain of Custody Number	007890
Lab Number	
Page	1 of 1

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H2SO4	HNOS	HCl	NaOH	ZnAc/NaOH		Analysis (Attach list if more space is needed): TO-15*	Special Instructions/Conditions of Receipt
Upwind # 1	8/22/03	1612	X					X							1	* Include
Downwind # 1	↓	1550	X					X							1	Naphthalene
Downwind # 2	↓	1602	X					X							1	on report
No custody seals 08-27-03																
Received Temp: ~~2°C~~ ADF 08-27-03 Ambient																
1 COOLER / Airborne																
T# 3153830654																
ADF 08-27-03																

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STD

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Thomas L Bell	8/25/03	0814	1. Received By: Andrew D. Fears	08-27-03	10:30 ~~09:~~ ADF 08-27-03
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

5/26

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

SEVERN TRENT STL

STL Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921

Tel: 865 291 3000 Fax: 865 584 4315
www.stl-inc.com

ANALYTICAL REPORT

TO15

Lot #: H3H270257

Ryan Vandette

STL Buffalo
10 Hazelwood Drive
Amherst, NY 14228

SEVERN TRENT LABORATORIES, INC.

Jamie A. McKinney

Jamie A. McKinney
Project Manager

September 16, 2003

ANALYTICAL METHODS SUMMARY

H3H270257

PARAMETER	ANALYTICAL METHOD
Volatile Organics by TO15	EPA-2 TO-15

References:

EPA-2 "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA-625/R-96/0106, January 1997.

SAMPLE SUMMARY

H3H270257

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
FW48N	001	UPWIND #1	08/22/03	16:12
FW480	002	DOWNWIND #1	08/22/03	15:50
FW482	003	DOWNWIND #2	08/22/03	16:02

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PROJECT NARRATIVE
H3H270257

The results reported herein are applicable to the samples submitted for analysis only.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation is included with this report.

Sample Receipt

There were no custody seals present upon receipt.

Quality Control

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

STL Knoxville maintains the following certifications, approvals and accreditations: Arkansas DEQ Cert. # 03-049-0, California DHS ELAP Cert. #2423, Colorado DPHE, Connecticut DPH Cert. #PH-0223, Florida DOH Cert. #E87177, Georgia DNR Cert. #906, Hawaii DOH, Illinois EPA Cert. # 000687, Indiana DOH Cert. #C-TN-02, Kansas DHE Cert. # E-10349, Kentucky DEP Lab ID #90101, Louisiana DEQ Cert. #03079, Louisiana DOHH Cert. #LA030024, Maryland DHMH Cert. #277, Massachusetts DEP Cert. #M-TN009, Michigan DEQ Lab ID #9933, New Jersey DEP Cert. #TN001, New York DOH Lab #10781, North Carolina DPH Lab ID #21705, North Carolina DEHNR Cert. #64, Oklahoma DEQ ID #9415, Pennsylvania DEP Cert. # 68-576, South Carolina DHEC Lab ID #84001001, Tennessee DOH Lab ID #02014, Utah DOH Cert. #QUAN3, Virginia DGS Lab ID #00165, Washington DOE Lab #C120, Wisconsin DNR Lab ID #998044300, US Army Corps of Engineers, Naval Facilities Engineering Service Center, US EPA Perchlorate Approval and USDA Soil Permit #S-46424. This list of approvals is subject to change and does not imply that laboratory certification is available for all parameters reported in this environmental sample data report.

STL BUFFALO

Client Sample ID: UPWIND #1

GC/MS Volatiles

Lot-Sample #...:	H3H270257-001	**Work Order #...:**	FW48N1AA	**Matrix.........:**	AIR
Date Sampled...:	08/22/03	**Date Received..:**	08/27/03		
Prep Date......:	09/08/03	**Analysis Date..:**	09/08/03		
Prep Batch #...:	3254304				
Dilution Factor:	1.58	**Method.........:**	EPA-2 TO-15		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	0.32	ppb(v/v)
Dichlorodifluoromethane	**0.68**	**0.32**	**ppb(v/v)**
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.32	ppb(v/v)
Chloromethane	ND	0.79	ppb(v/v)
Vinyl chloride	ND	0.32	ppb(v/v)
Bromomethane	ND	0.32	ppb(v/v)
Chloroethane	ND	0.32	ppb(v/v)
Trichlorofluoromethane	**0.38**	**0.32**	**ppb(v/v)**
1,1-Dichloroethene	ND	0.32	ppb(v/v)
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.32	ppb(v/v)
Methylene chloride	ND	0.79	ppb(v/v)
1,1-Dichloroethane	ND	0.32	ppb(v/v)
cis-1,2-Dichloroethene	ND	0.32	ppb(v/v)
Chloroform	ND	0.32	ppb(v/v)
1,1,1-Trichloroethane	ND	0.32	ppb(v/v)
Carbon tetrachloride	ND	0.32	ppb(v/v)
Benzene	ND	0.32	ppb(v/v)
1,2-Dichloroethane	ND	0.32	ppb(v/v)
Trichloroethene	ND	0.32	ppb(v/v)
1,2-Dichloropropane	ND	0.32	ppb(v/v)
cis-1,3-Dichloropropene	ND	0.32	ppb(v/v)
Toluene	**0.65**	**0.32**	**ppb(v/v)**
trans-1,3-Dichloropropene	ND	0.32	ppb(v/v)
1,1,2-Trichloroethane	ND	0.32	ppb(v/v)
Tetrachloroethene	ND	0.32	ppb(v/v)
1,2-Dibromoethane (EDB)	ND	0.32	ppb(v/v)
Chlorobenzene	ND	0.32	ppb(v/v)
Ethylbenzene	ND	0.32	ppb(v/v)
m-Xylene & p-Xylene	ND	0.32	ppb(v/v)
o-Xylene	ND	0.32	ppb(v/v)
Styrene	ND	0.32	ppb(v/v)
1,1,2,2-Tetrachloroethane	ND	0.32	ppb(v/v)
1,3,5-Trimethylbenzene	ND	0.32	ppb(v/v)
1,2,4-Trimethylbenzene	ND	0.32	ppb(v/v)
1,3-Dichlorobenzene	ND	0.32	ppb(v/v)
1,4-Dichlorobenzene	ND	0.32	ppb(v/v)
1,2-Dichlorobenzene	ND	0.32	ppb(v/v)

(Continued on next page)

STL BUFFALO

Client Sample ID: UPWIND #1

GC/MS Volatiles

Lot-Sample #...: H3H270257-001 Work Order #...: FW48N1AA Matrix.........: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzyl chloride	ND	0.32	ppb(v/v)
1,2,4-Trichloro-benzene	ND	0.32	ppb(v/v)
Hexachlorobutadiene	ND	0.32	ppb(v/v)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	107	(70 - 130)
Toluene-d8	107	(70 - 130)
4-Bromofluorobenzene	106	(70 - 130)

STL BUFFALO

Client Sample ID: DOWNWIND #1

GC/MS Volatiles

Lot-Sample #...: H3H270257-002 Work Order #...: FW4801AA Matrix.........: AIR
Date Sampled...: 08/22/03 Date Received..: 08/27/03
Prep Date......: 09/09/03 Analysis Date..: 09/09/03
Prep Batch #...: 3254533
Dilution Factor: 1.56 Method.........: EPA-2 TO-15

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	**0.66**	**0.31**	**ppb(v/v)**
Dichlorodifluoromethane	**0.57**	**0.31**	**ppb(v/v)**
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.31	ppb(v/v)
Chloromethane	ND	0.78	ppb(v/v)
Vinyl chloride	ND	0.31	ppb(v/v)
Bromomethane	ND	0.31	ppb(v/v)
Chloroethane	ND	0.31	ppb(v/v)
Trichlorofluoromethane	ND	0.31	ppb(v/v)
1,1-Dichloroethene	ND	0.31	ppb(v/v)
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.31	ppb(v/v)
Methylene chloride	ND	0.78	ppb(v/v)
1,1-Dichloroethane	ND	0.31	ppb(v/v)
cis-1,2-Dichloroethene	ND	0.31	ppb(v/v)
Chloroform	ND	0.31	ppb(v/v)
1,1,1-Trichloroethane	ND	0.31	ppb(v/v)
Carbon tetrachloride	ND	0.31	ppb(v/v)
Benzene	ND	0.31	ppb(v/v)
1,2-Dichloroethane	ND	0.31	ppb(v/v)
Trichloroethene	ND	0.31	ppb(v/v)
1,2-Dichloropropane	ND	0.31	ppb(v/v)
cis-1,3-Dichloropropene	ND	0.31	ppb(v/v)
Toluene	**0.41**	**0.31**	**ppb(v/v)**
trans-1,3-Dichloropropene	ND	0.31	ppb(v/v)
1,1,2-Trichloroethane	ND	0.31	ppb(v/v)
Tetrachloroethene	ND	0.31	ppb(v/v)
1,2-Dibromoethane (EDB)	ND	0.31	ppb(v/v)
Chlorobenzene	ND	0.31	ppb(v/v)
Ethylbenzene	ND	0.31	ppb(v/v)
m-Xylene & p-Xylene	ND	0.31	ppb(v/v)
o-Xylene	ND	0.31	ppb(v/v)
Styrene	ND	0.31	ppb(v/v)
1,1,2,2-Tetrachloroethane	ND	0.31	ppb(v/v)
1,3,5-Trimethylbenzene	ND	0.31	ppb(v/v)
1,2,4-Trimethylbenzene	ND	0.31	ppb(v/v)
1,3-Dichlorobenzene	ND	0.31	ppb(v/v)
1,4-Dichlorobenzene	ND	0.31	ppb(v/v)
1,2-Dichlorobenzene	ND	0.31	ppb(v/v)

(Continued on next page)

STL BUFFALO

Client Sample ID: DOWNWIND #1

GC/MS Volatiles

Lot-Sample #...: H3H270257-002 Work Order #...: FW4801AA Matrix.........: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzyl chloride	ND	0.31	ppb(v/v)
1,2,4-Trichloro-benzene	ND	0.31	ppb(v/v)
Hexachlorobutadiene	ND	0.31	ppb(v/v)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	106	(70 - 130)
Toluene-d8	108	(70 - 130)
4-Bromofluorobenzene	104	(70 - 130)

STL BUFFALO

Client Sample ID: DOWNWIND #2

GC/MS Volatiles

Lot-Sample #...: H3H270257-003 **Work Order #...:** FW4821AA **Matrix.........:** AIR
Date Sampled...: 08/22/03 **Date Received..:** 08/27/03
Prep Date......: 09/08/03 **Analysis Date..:** 09/08/03
Prep Batch #...: 3254304
Dilution Factor: 1.53 **Method.........:** EPA-2 TO-15

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	**0.39**	**0.31**	**ppb(v/v)**
Dichlorodifluoromethane	**0.64**	**0.31**	**ppb(v/v)**
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.31	ppb(v/v)
Chloromethane	ND	0.76	ppb(v/v)
Vinyl chloride	ND	0.31	ppb(v/v)
Bromomethane	ND	0.31	ppb(v/v)
Chloroethane	ND	0.31	ppb(v/v)
Trichlorofluoromethane	**0.31**	**0.31**	**ppb(v/v)**
1,1-Dichloroethene	ND	0.31	ppb(v/v)
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.31	ppb(v/v)
Methylene chloride	ND	0.76	ppb(v/v)
1,1-Dichloroethane	ND	0.31	ppb(v/v)
cis-1,2-Dichloroethene	ND	0.31	ppb(v/v)
Chloroform	ND	0.31	ppb(v/v)
1,1,1-Trichloroethane	ND	0.31	ppb(v/v)
Carbon tetrachloride	ND	0.31	ppb(v/v)
Benzene	ND	0.31	ppb(v/v)
1,2-Dichloroethane	ND	0.31	ppb(v/v)
Trichloroethene	ND	0.31	ppb(v/v)
1,2-Dichloropropane	ND	0.31	ppb(v/v)
cis-1,3-Dichloropropene	ND	0.31	ppb(v/v)
Toluene	**0.49**	**0.31**	**ppb(v/v)**
trans-1,3-Dichloropropene	ND	0.31	ppb(v/v)
1,1,2-Trichloroethane	ND	0.31	ppb(v/v)
Tetrachloroethene	ND	0.31	ppb(v/v)
1,2-Dibromoethane (EDB)	ND	0.31	ppb(v/v)
Chlorobenzene	ND	0.31	ppb(v/v)
Ethylbenzene	ND	0.31	ppb(v/v)
m-Xylene & p-Xylene	ND	0.31	ppb(v/v)
o-Xylene	ND	0.31	ppb(v/v)
Styrene	ND	0.31	ppb(v/v)
1,1,2,2-Tetrachloroethane	ND	0.31	ppb(v/v)
1,3,5-Trimethylbenzene	ND	0.31	ppb(v/v)
1,2,4-Trimethylbenzene	ND	0.31	ppb(v/v)
1,3-Dichlorobenzene	ND	0.31	ppb(v/v)
1,4-Dichlorobenzene	ND	0.31	ppb(v/v)
1,2-Dichlorobenzene	ND	0.31	ppb(v/v)

(Continued on next page)

STL BUFFALO

Client Sample ID: DOWNWIND #2

GC/MS Volatiles

Lot-Sample #...: H3H270257-003 Work Order #...: FW4821AA Matrix.........: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzyl chloride	ND	0.31	ppb(v/v)
1,2,4-Trichloro-benzene	ND	0.31	ppb(v/v)
Hexachlorobutadiene	ND	0.31	ppb(v/v)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	106	(70 - 130)
Toluene-d8	107	(70 - 130)
4-Bromofluorobenzene	105	(70 - 130)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: H3H270257
MB Lot-Sample #: H3I110000-304

Work Order #...: FX3751AA

Matrix.........: AIR

Analysis Date..: 09/08/03
Dilution Factor: 1

Prep Date......: 09/08/03
Prep Batch #...: 3254304

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Naphthalene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Dichlorodifluoromethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloromethane	ND	0.50	ppb(v/v)	EPA-2 TO-15
Vinyl chloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
Bromomethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Trichlorofluoromethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1-Dichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Methylene chloride	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,1-Dichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
cis-1,2-Dichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloroform	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,1-Trichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Carbon tetrachloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
Benzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Trichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloropropane	ND	0.20	ppb(v/v)	EPA-2 TO-15
cis-1,3-Dichloropropene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Toluene	ND	0.20	ppb(v/v)	EPA-2 TO-15
trans-1,3-Dichloropropene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2-Trichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Tetrachloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dibromoethane (EDB)	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Ethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
m-Xylene & p-Xylene	ND	0.20	ppb(v/v)	EPA-2 TO-15
o-Xylene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Styrene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2,2-Tetrachloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,3,5-Trimethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2,4-Trimethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,3-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,4-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Benzyl chloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2,4-Trichloro-benzene	ND	0.20	ppb(v/v)	EPA-2 TO-15

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: H3H270257 Work Order #...: FX3751AA Matrix.........: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Hexachlorobutadiene	ND	0.20	ppb(v/v)	EPA-2 TO-15

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	98	(70 - 130)
Toluene-d8	105	(70 - 130)
4-Bromofluorobenzene	101	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: H3H270257   Work Order #...: FX3751AC   Matrix.........: AIR
LCS Lot-Sample#: H3I110000-304
Prep Date......: 09/08/03   Analysis Date..: 09/08/03
Prep Batch #...: 3254304
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
1,1-Dichloroethene	**107**	**(70 - 130)**	**EPA-2 TO-15**
Benzene	**102**	**(70 - 130)**	**EPA-2 TO-15**
Trichloroethene	**105**	**(70 - 130)**	**EPA-2 TO-15**
Toluene	**103**	**(70 - 130)**	**EPA-2 TO-15**
Chlorobenzene	**105**	**(70 - 130)**	**EPA-2 TO-15**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	97	(70 - 130)
Toluene-d8	98	(70 - 130)
4-Bromofluorobenzene	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: H3H270257 **Work Order #...:** FX3751AC **Matrix.........:** AIR
LCS Lot-Sample#: H3I110000-304
Prep Date......: 09/08/03 **Analysis Date..:** 09/08/03
Prep Batch #...: 3254304
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
1,1-Dichloroethene	**10.0**	**10.7**	**ppb(v/v)**	**107**	**EPA-2 TO-15**
Benzene	**10.0**	**10.2**	**ppb(v/v)**	**102**	**EPA-2 TO-15**
Trichloroethene	**10.0**	**10.5**	**ppb(v/v)**	**105**	**EPA-2 TO-15**
Toluene	**10.0**	**10.3**	**ppb(v/v)**	**103**	**EPA-2 TO-15**
Chlorobenzene	**10.0**	**10.5**	**ppb(v/v)**	**105**	**EPA-2 TO-15**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	97	(70 - 130)
Toluene-d8	98	(70 - 130)
4-Bromofluorobenzene	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: H3H270257
MB Lot-Sample #: H3I110000-533
Work Order #...: FX5G91AA
Matrix.........: AIR

Analysis Date..: 09/09/03
Dilution Factor: 1
Prep Date......: 09/09/03
Prep Batch #...: 3254533

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Naphthalene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Dichlorodifluoromethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloromethane	ND	0.50	ppb(v/v)	EPA-2 TO-15
Vinyl chloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
Bromomethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Trichlorofluoromethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1-Dichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Methylene chloride	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,1-Dichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
cis-1,2-Dichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloroform	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,1-Trichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Carbon tetrachloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
Benzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Trichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloropropane	ND	0.20	ppb(v/v)	EPA-2 TO-15
cis-1,3-Dichloropropene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Toluene	ND	0.20	ppb(v/v)	EPA-2 TO-15
trans-1,3-Dichloropropene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2-Trichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Tetrachloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dibromoethane (EDB)	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Ethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
m-Xylene & p-Xylene	ND	0.20	ppb(v/v)	EPA-2 TO-15
o-Xylene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Styrene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2,2-Tetrachloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,3,5-Trimethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2,4-Trimethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,3-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,4-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Benzyl chloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2,4-Trichloro-benzene	ND	0.20	ppb(v/v)	EPA-2 TO-15

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: H3H270257 Work Order #...: FX5G91AA Matrix.........: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Hexachlorobutadiene	ND	0.20	ppb(v/v)	EPA-2 TO-15

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	104	(70 - 130)
Toluene-d8	108	(70 - 130)
4-Bromofluorobenzene	102	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: H3H270257 **Work Order #...:** FX5G91AC **Matrix.........:** AIR
LCS Lot-Sample#: H3I110000-533
Prep Date......: 09/09/03 **Analysis Date..:** 09/09/03
Prep Batch #...: 3254533
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
1,1-Dichloroethene	**91**	**(70 - 130)**	**EPA-2 TO-15**
Benzene	**92**	**(70 - 130)**	**EPA-2 TO-15**
Trichloroethene	**93**	**(70 - 130)**	**EPA-2 TO-15**
Toluene	**91**	**(70 - 130)**	**EPA-2 TO-15**
Chlorobenzene	**92**	**(70 - 130)**	**EPA-2 TO-15**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	101	(70 - 130)
Toluene-d8	100	(70 - 130)
4-Bromofluorobenzene	100	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: H3H270257 **Work Order #...:** FX5G91AC **Matrix.........:** AIR
LCS Lot-Sample#: H3I110000-533
Prep Date......: 09/09/03 **Analysis Date..:** 09/09/03
Prep Batch #...: 3254533
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
1,1-Dichloroethene	**10.0**	**9.06**	**ppb(v/v)**	**91**	**EPA-2 TO-15**
Benzene	**10.0**	**9.25**	**ppb(v/v)**	**92**	**EPA-2 TO-15**
Trichloroethene	**10.0**	**9.31**	**ppb(v/v)**	**93**	**EPA-2 TO-15**
Toluene	**10.0**	**9.13**	**ppb(v/v)**	**91**	**EPA-2 TO-15**
Chlorobenzene	**10.0**	**9.24**	**ppb(v/v)**	**92**	**EPA-2 TO-15**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	101	(70 - 130)
Toluene-d8	100	(70 - 130)
4-Bromofluorobenzene	100	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

H3H270257

Chain of Custody Record

STL-4124 (0700)

SEVERN TRENT SERVICES

Severn Trent Laboratories, Inc.

Client: Turnkey

Address: 50 Fountain Plaza, Suite 1350

City: Buffalo | State: NY | Zip Code: 14202

Project Name and Location (State): STEELFIELDS Buffalo NY Job # 0062-003-100

Contract/Purchase Order/Quote No.:

Project Manager: Tom Forbes

Telephone Number (Area Code)/Fax Number: Turnkey (716) 691-2600 / STL Buffalo (716) 691-2600

Site Contact: Tom Forbes

Lab Contact: Brian Fischer

Carrier/Waybill Number:

Date: 8/25/03

Lab Number:

Chain of Custody Number: 007890

Page 1 of 1

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: TO-15*	Special Instructions/Conditions of Receipt
Upwind # 1	8/22/03	1612	X				X						1	* Include
Downwind # 1	↓	1550	X				X						1	Naphthalene
Downwind # 2	↓	1602	X				X						1	on report

No custody seals ADF 08-27-03

Received Temp: ~~2°c~~ Ambient

1 COOLER / Airborne

T# 3153830654

ADF 08-27-03

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STD

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished By: Thomas [signature]	8/25/03	0814	1. Received By: Andrew D. Fearns	08-27-03	10:30 ~~09:10~~ ADF 08-27-03
2. Relinquished By:			2. Received By:		
3. Relinquished By:			3. Received By:		

Comments:

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

STL KNOXVILLE
SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

CLIENT: Turkney PROJECT: Steelfields Lot No.: K3H270257

TO BE COMPLETED BY SAMPLE RECEIPT ASSOCIATE:

1. Sample Receipt:	YES	NO	NA
a. Do sample container labels match COC? (IDs, Dates, Times)	✓		
b. Is the cooler temperature within acceptance limits? (NOTE: North Carolina, 1668, 1613B: 0-4°C; VOST: 10°C)			✓
c. Were samples received with correct chemical preservative (excluding Encore)?	~~✓~~ 08-15-15		✓
d. Were custody seals present/intact on cooler and/or containers?	~~✓~~	✓	
e. Were all of the samples listed on the COC received?	✓		
f. Were all of the sample containers received intact?	✓		
g. Were containers received for VOAs received without headspace?			✓
h. Were samples received in the appropriate containers?	✓		
i. Did you check for residual chlorine, if necessary?			✓
j. Were samples received within 1/2 of the holding time?	✓		
k. Were samples screened for radioactivity?			✓
l. For aqueous samples for SOG tests (i.e., 1613B, 1668A, 8290, LR PAHs), does the sample(s) have visible solids present?			✓
If yes, was SOG staff notified?			✓
m. Were client's sample documents (RFA/COC) received?	✓		
n. Has the RFA/COC been relinquished? (Signed, Dated, Timed)	✓		
o. Are test/parameters listed for each sample?	✓		
p. Is the matrix of the samples noted?	✓		
q. Is the date/time of sample collection noted?	✓		
r. Is the client and project name/No. identified?	✓		
s. Was the sampler identified on the RFA/COC?		✓	

SAMPLE RECEIVING ASSOCIATE: Andrew D. Flores DATE: 08-27-03

TO BE COMPLETED BY PROJECT MANAGER :

1. Project manager "Sample Greet":	YES	NO	NA
a. Quote number to be logged-in under 54662			
b. Informed Login associates of special instructions ?			X

PROJECT MANAGER : JM DATE: 9/2/03

Client Sample ID	Analysis Requested	Condition (see legend)	Comments/Action

☐ Client informed on __________ by _________. Person contacted: ____________.
☐ Noted actions in comments section above.
☐ No action necessary; process as is.
Project Manager: ________________ Date: __________

QA026R12.doc, 8/11/03

TurnKey Environmental Restoration, LLC

October 7, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results- September2003
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site on September 18, 2003. The documentation air monitoring work was performed concurrent with the performance of significant excavation of Coke in Area IV.

The monitoring involved collection of samples for respirable particulates at three (3) monitoring stations. The approximate locations of the monitoring stations are shown on Figure 1. Downwind stations were comprised of Gilian™ Pumps placed on ladders on the Western Side of the excavation. The upwind pump was placed on a ladder on the Eastern side of the excavation.

Sample collection equipment at each station consisted of a Gilian™ air sampling pump fitted with a nylon Dorr-Oliver cyclone filter to remove particulate matter greater than 10 microns (i.e., non-respirable particulates) followed by a 0.5 um pre-weighed PVC filter cartridge as specified under NIOSH Method 0600. The pumps for particulate sampling were calibrated prior to the start of sampling against a target airflow rate of 1.7 liters per minute. Following calibration, the pumps and filters were transported to the monitoring stations. The intake tubing was positioned and tethered to the ladder at a height approximately 5-feet above grade to collect air at an elevation representative of the breathing zone. Pumps were activated and allowed to run for approximately 8 hours. The filter cartridges were then removed, sample collection times were recorded, and the volume of air passed through the filter (based on calibrated air flow rate and collection times) was calculated to allow determination of the particulate concentration by the analytical laboratory. Table 1 presents a summary of the daily calibrated flow rates, sample collection times, and volume of sample collected at each monitoring station. Weather conditions experienced during the monitoring period are also presented. Filter cartridges were transported via Severn Trent Laboratories (STL) to Galson Laboratories in Syracuse, New York for analysis of respirable particulate matter per NIOSH Method 0600.

Table 2, attached, summarizes the analytical data for the detected respirable particulates. The documentation air sampling results support the real time particulate monitoring data, which with limited exception consistently show no exceedance of the Community Air Monitoring Plan respirable particulate limits of 150 ug/m^3 above background.

The Analytical laboratory reports are presented in Attachment 1. Field records identifying work completed at the site on September 18th, meteorological data, and equipment calibration records are presented as Attachment 2.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: C. O'Connor (NYSDOH)

File: 0062-008-100, CG

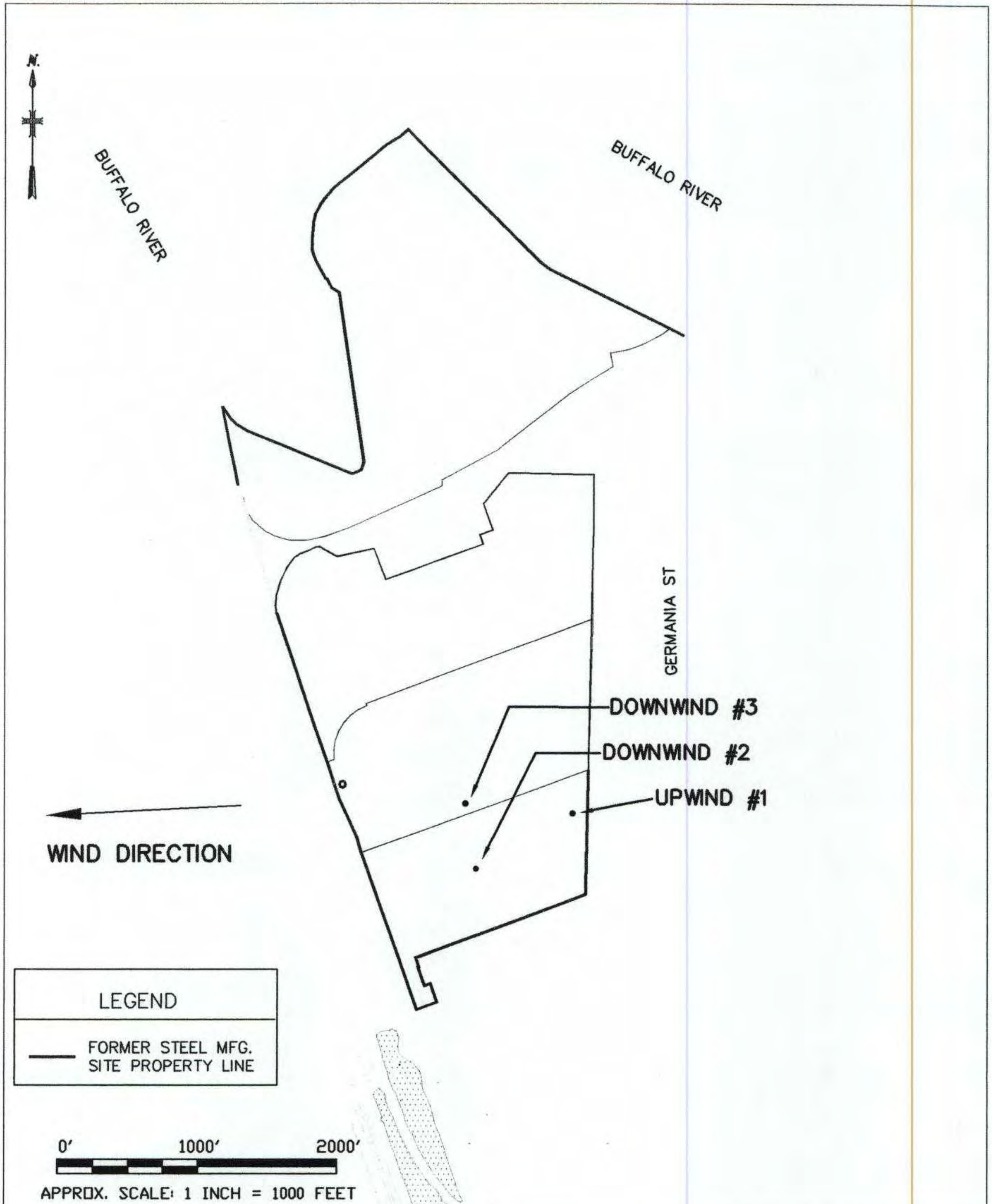
FIGURE 1

DOCUMENTATION AIR MONITORING

SITE MAP WITH SAMPLE LOCATIONS

SEPTEMBER 18, 2003 SAMPLING EVENT

DATE: ______________________ FIGURE 1



TurnKey Environmental Restoration, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

SEPTEMBER 18, 2003 DOCUMENTATION AIR MONITORING

STATION LOCATIONS

TABLE 1
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
18-Sep-03
SAMPLE DURATION AND VOLUME

Date	Weather Conditions	Sample Station	Pump Flow Rate (L/min)	Sample Start Time	Sample Stop Time	Duration (hrs/minutes)	Sample Volume (L)
9/18/2003	Partly Cloudy	Downwind - Pump #3	1.7	7:20	15:30	8:10	833.00
	62-70 F	Downwind - Pump #2	1.71	7:13	15:25	8:12	841.32
	Wind from E, 5 - 22 MPH	Upwind - Pump #1	1.69	6:57	15:18	8:21	846.69

TABLE 2

STEELFIELDS SITE DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
18-Sep-03

PARAMETER	SAMPLE LOCATIONS					
	Downwind # 3		Downwind # 2		Upwind # 1	
Particulates - NIOSH 0600	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**
Respirable particulates	<0.05	<0.06	<0.05	<0.06	<0.05	<0.06

ATTACHMENT 1
DOCUMENTATION AIR MONITORING RESULTS

LABORATORY ANALYTICAL REPORT

SEPTEMBER 18, 2003 SAMPLING EVENT

GALSON
LABORATORIES

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

Mr. Tom Forbes
Turnkey Environmental
50 Fountain Plaza
Suite 1350
Buffalo, NY 14202

September 25, 2003

DOH ELAP# 11626 Account# 12074 Login# L97109

Dear Mr. Forbes:

Enclosed are the analytical results of the samples received by our laboratory September 22, 2003. All test results meet the quality control requirements of AIHA and NELAC unless otherwise stated in this report.

Results in this report are based on the sampling data provided by the client and refer only to items tested. Unless otherwise requested, all samples will be discarded thirty days from the date of this report.

Please contact your client service representative, Tonya McGuiggan at (877) 482-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

F. Joseph Unangst
Laboratory Director

Enclosure(s)

COOLEY

The white copy will be returned with your report. Please retain pink copy for your records.

Galson Laboratories
6601 Kirkville Road
P.O. Box 369
E. Syracuse, NY 13057-0369
Tel: (315) 437-7252 888-577-Labs (5227)
Fax: (315) 437-0571

Request For Industrial Hygiene Analysis

Company Name: Turnkey Account #:

Site Name: Steelfields

Sampled By: Tom Behrendt Project #:

☐ Check if Change of Address

Report to: Turnkey Environmental
50 Fountain Plaza, Suite 1350
Buffalo NY, 14202
ATTN: Tom Forbes
Phone: (716) 856-0635

Invoice to: Severn Trent Laboratories
10 Hazelwood Dr
Amherst NY,
ATTN: Brain Fischer
Phone: (716) 691-2600

☐ Purchase order number: ☐ Verbal Authorization:

☐ Credit Card (type): Card #: Exp Date:

☒ Standard Turn-Around Time (5 business days)

☐ Same Day (SD) Next Day(ND) ☐ 12PM ☐ 5PM ☐ 2 Day ☐ 3 Day ☐ 4 Day

Surcharges: SD = 200% ND by 12PM = 150% ND by 5PM = 100% 2 Day= 75% 3 Day = 50% 4 Day = 35%

☐ Fax Results to: Fax #: ( )

☐ Email Results to:

Sample Identification	Date Sampled	Sample Medium Catalog # / Lot #	Air Sample Volume (liters)*	Analysis Requested	Method Reference
✓ Upwind #1	9/18/03	181636 PW PVC	846.69 L	Respirable particulates	NIOSH 0600
✓ Downwind #2	9/18/03	181637	841.32 L	respirable particulates	NIOSH 0600
✓ Downwind #3	9/18/03	181641	833 L	respirable particulates	NIOSH 0600

If blanks are not submitted, our policy states that a laboratory blank will be added for each analyte and it will be charged at the normal rate. IF YOU DO NOT WANT A LABORATORY BLANK ADDED PLEASE CHECK BOX ☐

*For passive monitors please list time exposed in minutes.

Comments (Please list any known interferences present in sampling area):

Chain of Custody	Print Name	Signature	Date/Time
Relinquished by:	Thomas A Behrendt	Thomas A Behrendt	9/19/03 0950
Received by LAB.	[illegible]	[illegible]	

GALSON LABORATORIES

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Turnkey, Steelfields

Date Sampled : 18-SEP-03
Date Received : 22-SEP-03
Date Analyzed : 24-SEP-03

Account No.: 12074
Login No. : L97109

Respirable Dust

Sample ID	Lab ID	Air Vol m3	Total mg	Conc mg/m3
UPWIND #1	L97109-1	0.84669	<0.05	<0.06
DOWNWIND #2	L97109-2	0.84132	<0.05	<0.06
DOWNWIND #3	L97109-3	0.833	<0.05	<0.06

COMMENTS: PNOR = Particulates Not Otherwise Regulated.

Level of quantitation: 0.05 mg
Analytical Method : NIOSH 0600; GRAV
OSHA PEL (TWA) : PNOR 5 mg/m3
Collection Media : PVC PW

Submitted by: jc/kk
Approved by : OVK
Date : 25-SEP-03
QC by: GK
NYS DOH # : 11626

< -Less Than
> -Greater Than
NA -Not Applicable
mg -Milligrams
ug -Micrograms
ND -Not Detected
m3 -Cubic Meters
l -Liters
ppm -Parts per Million
kg -Kilograms
NS -Not Specified

ATTACHMENT 2
DOCUMENTATION AIR MONITORING RESULTS

FIELD DATA/FORMS

SEPTEMBER 18, 2003 SAMPLING EVENT

DOCUMENTATION AIR MONITORING
AT THE FORMER STEEL MANUFACTURING SITE

DAILY CALIBRATION RECORD FOR GILIAN AIR SAMPLING PUMPS

For Area IV coke excavation

Date 9/17/03

Pump 1 Serial No. 15270/cart # 181636 Calibrated Flowrate (L/min): 1.69
Pump 2 Serial No. 15271/cart # 181637 Calibrated Flowrate (L/min): 1.71
Pump 3 Serial No. 15272/cart # 181641 Calibrated Flowrate (L/min): 1.70
Pump 4 Serial No.________ Calibrated Flowrate (L/min):________
Pump 5 Serial No.________ Calibrated Flowrate (L/min):________
Pump 6 Serial No.________ Calibrated Flowrate (L/min):________

Calibrations Performed by________

Date________

Pump 1 Serial No.________ Calibrated Flowrate (L/min):________
Pump 2 Serial No.________ Calibrated Flowrate (L/min):________
Pump 3 Serial No.________ Calibrated Flowrate (L/min):________
Pump 4 Serial No.________ Calibrated Flowrate (L/min):________
Pump 5 Serial No.________ Calibrated Flowrate (L/min):________
Pump 6 Serial No.________ Calibrated Flowrate (L/min):________

Calibrations Performed by________

Date________

Pump 1 Serial No.________ Calibrated Flowrate (L/min):________
Pump 2 Serial No.________ Calibrated Flowrate (L/min):________
Pump 3 Serial No.________ Calibrated Flowrate (L/min):________
Pump 4 Serial No.________ Calibrated Flowrate (L/min):________
Pump 5 Serial No.________ Calibrated Flowrate (L/min):________
Pump 6 Serial No.________ Calibrated Flowrate (L/min):________

Calibrations Performed by________

Additional Comments:

TurnKey Environmental Restoration LLC

DOCUMENTATION AIR MONITORING
FORMER STEEL MANUFACTURING SITE

GILIAN AIR SAMPLING PUMP DATA RECORD

Date 9/18/03
Designated Location upwind #1
Area IV Coke excavation

Pump #1 Serial Number 15270/cart# 181636 Parameter Respirable particulates
Initial Pumping Rate (L/min) 1.69 Start Time 0657

Time	Pumping Rate (L/min)

End Time 1518

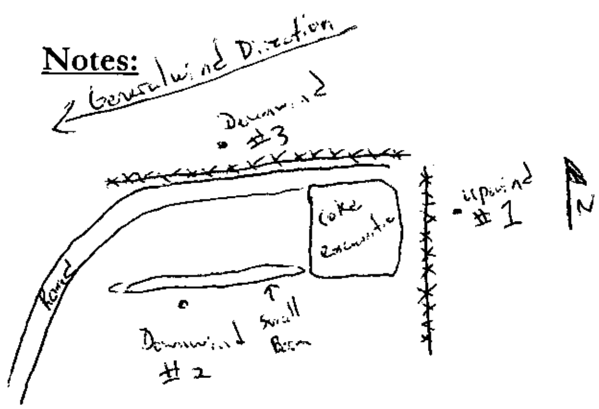
Pump #2 Serial Number 15271/cart# 181637 Parameter Respirable particulates
Initial Pumping Rate (L/min) 1.71 Start Time 0713

Downwind #2

Time	Pumping Rate (L/min)

End Time 1525

Notes:



DOCUMENTATION AIR MONITORING
FORMER STEEL MANUFACTURING SITE

GILIAN AIR SAMPLING PUMP DATA RECORD

Date 9/18/03
Designated Location Downwind #3
Area IV coke, excavation

Pump #3 Serial Number 15272/ cart # 18/641 Parameter respirable particulates
Initial Pumping Rate (L/min) 1.70 Start Time 0720

Dunn

Time	Pumping Rate (L/min)

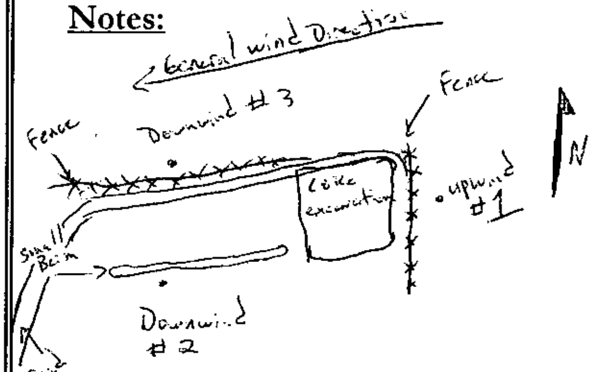
End Time 1530

Pump #4 Serial Number________ Parameter________
Initial Pumping Rate (L/min)________ Start Time________

Time	Pumping Rate (L/min)

End Time________

Notes:



GALSON
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FAX (315) 437 0571
www.galsonlabs.com

Mr. Tom Forbes
Turnkey Environmental
50 Fountain Plaza
Suite 1350
Buffalo, NY 14202

September 25, 2003

DOH ELAP# 11626 Account# 12074 Login# L97109

Dear Mr. Forbes:

Enclosed are the analytical results of the samples received by our laboratory September 22, 2003. All test results meet the quality control requirements of AIHA and NELAC unless otherwise stated in this report.

Results in this report are based on the sampling data provided by the client and refer only to items tested. Unless otherwise requested, all samples will be discarded thirty days from the date of this report.

Please contact your client service representative, Tonya McGuiggan at (877) 482-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

F. Joseph Unangst
Laboratory Director

Enclosure(s)

COOLEY

The white copy will be returned with your report. Please retain pink copy for your records.

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6601 Kirkville Road
P.O. Box 369
E. Syracuse, NY 13057-0369
Tel: (315) 437-7252 888-577-Labs (5227)
Fax: (315) 437-0571

Request For Industrial Hygiene Analysis

Company Name: Turnkey   Account #:
Site Name: Steelfields
Sampled By: Tom Behrendt   Project #:

☐ Check if Change of Address

Report to: Turnkey Environmental
50 Fountain Plaza, Suite 1350
Buffalo NY, 14202
Attn: Tom Forbes
Phone: (716) 856-0635

Invoice to: Severn Trent Laboratories
10 Hazelwood Dr
Amherst NY,
Attn: Brain Fischer
Phone: (716) 691-2600

☐ Purchase order number: ☐ Verbal Authorization:
☐ Credit Card (type): Card #: Exp Date:

☒ Standard Turn-Around Time (5 business days)
☐ Same Day (SD) Next Day(ND) ☐ 12PM ☐ 5PM ☐ 2 Day ☐ 3 Day ☐ 4 Day
Surcharges: SD = 200% ND by 12PM = 150% ND by 5PM = 100% 2 Day= 75% 3 Day = 50% 4 Day = 35%

☐ Fax Results to: Fax #: ( )
☐ Email Results to:

Sample Identification	Date Sampled	Sample Medium Catalog # / Lot #	Air Sample Volume (liters)*	Analysis Requested	Method Reference
✓ Upwind #1	9/18/03	181636 PW PVC	846.69 L	Respirable particulates	NIOSH 0600
✓ Downwind #2	9/18/03	181637	841.32 L	respirable particulates	NIOSH 0600
✓ Downwind #3	9/18/03	181641 AG	833 L	respirable particulates	NIOSH 0600

If blanks are not submitted, our policy states that a laboratory blank will be added for each analyte and it will be charged at the normal rate. IF YOU DO NOT WANT A LABORATORY BLANK ADDED PLEASE CHECK BOX ☐

*For passive monitors please list time exposed in minutes.

Comments (Please list any known interferences present in sampling area):

Chain of Custody	Print Name	Signature	Date/Time
Relinquished by:	Thomas A Behrendt	Thomas A Behrendt	9/19/03 0950
Received by LAB.	[illegible]	[illegible]	

Samples received af...

GALSON LABORATORIES

660 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Turnkey, Steelfields

Date Sampled : 18-SEP-03
Date Received : 22-SEP-03
Date Analyzed : 24-SEP-03

Account No.: 12074
Login No. : L97109

Respirable Dust

Sample ID	Lab ID	Air Vol m3	Total mg	Conc mg/m3
UPWIND #1	L97109-1	0.84669	<0.05	<0.06
DOWNWIND #2	L97109-2	0.84132	<0.05	<0.06
DOWNWIND #3	L97109-3	0.833	<0.05	<0.06

COMMENTS: PNOR = Particulates Not Otherwise Regulated.

Level of quantitation: 0.05 mg
Analytical Method : NIOSH 0600; GRAV
OSHA PEL (TWA) : PNOR 5 mg/m3
Collection Media : PVC PW

Submitted by: jc/kk
Approved by : OVK
Date : 25-SEP-03
QC by:
NYS DOH # : 11626

< -Less Than
> -Greater Than
NA -Not Applicable
mg -Milligrams
ug -Micrograms
ND -Not Detected
m3 -Cubic Meters
l -Liters
ppm -Parts per Million
kg -Kilograms
NS -Not Specified

TurnKey Environmental Restoration, LLC

October 28, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results- September 2003
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site on September 22, 2003. The documentation air monitoring work was completed during the day on September 22nd during tilling of the biopad in Area III. This documentation monitoring event was conducted at the request of the NYSDEC.

The monitoring involved collection of samples at three (3) monitoring stations for particulate, volatile organic compound (VOC) and naphthalene analysis. The approximate locations of the monitoring stations are shown on Figure 1. Based on the westerly wind direction recorded at the start of the monitoring event, downwind stations were placed on the eastern side of the biopad while the upwind station was placed on the western side of the biopad. Particulate stations consisted of Gilian™ air sampling pumps fitted with a nylon Dorr-Oliver cyclone filter to remove particulate matter greater than 10 microns (i.e., non-respirable particulates) followed by a 0.5 um pre-weighed PVC filter cartridge as specified under NIOSH Method 0600. The pumps for particulate sampling were calibrated prior to the start of sampling against a target airflow rate of 1.7 liters per minute. Following calibration, the pumps and filters were transported to the monitoring stations. The intake tubing was positioned and tethered to the ladder at a height of approximately 5-feet above grade to collect air at an elevation representative of the breathing zone. Pumps were activated and allowed to run for approximately 8 hours. Samples for VOCs and naphthalene analysis were collected using laboratory-supplied, evacuated summa canisters under fitted with a preset inlet regulator valve to draw a continuous air sample for 8 hours.

During the course of the sampling, wind direction shifted from west to southwesterly. The downwind stations were therefore moved to the positions shown on Figure 2. While relocating the downwind stations, the Gillian pumps were turned off and the valves on summa canisters were shut tight. The amount of time that the pumps and canisters were temporarily shut down for relocation was recorded and subtracted from the overall sample collection times to assure that particulate concentrations were properly calculated.

Following completion of the sampling event, the filter cartridges were removed, net sample collection times were recorded, and the volume of air passed through the filter (based on calibrated air flow rate and net collection times) was calculated to allow determination of the particulate concentration by the analytical laboratory[1]. Table 1 presents a summary of the calibrated flow rates, sample collection times, and volume of sample collected at each monitoring station. Weather conditions experienced during the monitoring period are also presented. Filter cartridges were transported via Severn Trent Laboratories (STL) to Galson Laboratories in Syracuse, New York for analysis of respirable particulate matter per NIOSH Method 0600. Concurrent with shut down of the Gillian Pumps, valves on the canisters were shut tight and the collection port was sealed. The summa canisters were then transported, under chain-of-custody command, to Severn Trent laboratories (STL) in Knoxville, TN for analysis of Target Compound List (TCL) volatile organic compounds (VOCs) and naphthalene in accordance with USEPA Method TO-15.

Table 2, attached, summarizes the analytical data for the detected compounds. As indicated, the documentation air sampling results support the real time particulate and PID monitoring data, which consistently show no exceedance of the Community Air Monitoring Plan respirable particulate limits of 150 ug/m^3 or total VOC threshold of 5ppm above background.

The Analytical laboratory reports are presented in Attachment 1. Field records identifying and equipment calibration records are presented as Attachment 2.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: C. O'Connor

[1] Upon retrieval of the sampling devices it was discovered that the wind had knocked over Downwind #2 and Upwind #3. This appeared to occur shortly before termination of the sampling, therefore it was not believed that sample integrity was significantly compromised.

TABLE 1
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
22-Sep-03
SAMPLE DURATION AND VOLUME

Date	Weather Conditions	Sample Station	Pump Flow Rate (L/min)	Sample Start Time	Sample Stop Time	Duration (hrs/minutes)	Sample Volume (L)
9/22/2003	60-70 F Wind from ENE, 0 - 8 MPH	Downwind - Pump #1	1.72	6:50	13:54	6:56*	715.52
		Downwind - Pump #2	1.71	6:56	13:59	6:51*	702.81
		Upwind - Pump #3	1.69	7:03	14:07	7:04	716.56

* Wind changed direction during sampling. Pumps were temporarily stopped during relocation and then re-started. Duration represents net operating time.

TABLE 2

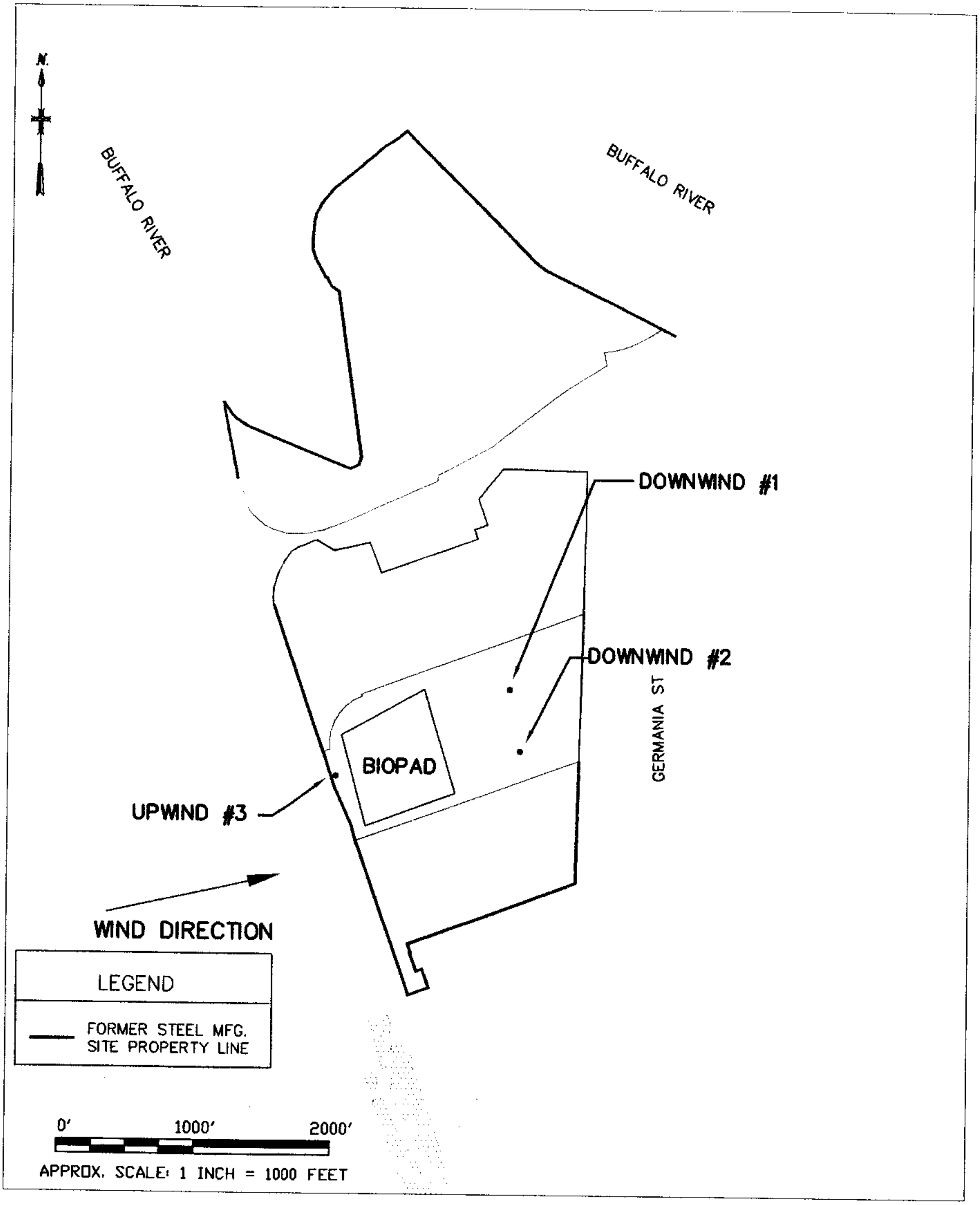
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
22-Sep-03

PARAMETER	SAMPLE LOCATIONS					
	Downwind # 1		Downwind # 2		Upwind # 3	
Particulates - NIOSH 0600	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**
Respirable particulates	<0.05	<0.07	<0.05	<0.07	0.052	0.073

PARAMETER	SAMPLE LOCATIONS					
	Downwind # 1		Downwind # 2		Upwind # 3	
VOCS - METHOD TO-15	**(PPBV)**	**ug/M3**	**(PPBV)**	**ug/M3**	**(PPBV)**	**ug/M3**
Dichlorodifluoromethane	0.7	3.52	0.72	3.62	0.66	3.32
Benzene	0.64	2.08	0.65	2.11	0.74	2.41
Toluene	1.3	4.98	1.4	5.36	1.3	4.98
m/p-Xylenes	0.76	3.35	0.8	3.53	0.76	3.35
NAPHTHALENE (TO-15)	ND < 0.42	-	ND < 0.42	-	ND < 0.42	-

DATE: ______________________

FIGURE 1



TURNKEY ENVIRONMENTAL RESTORATION, LLC

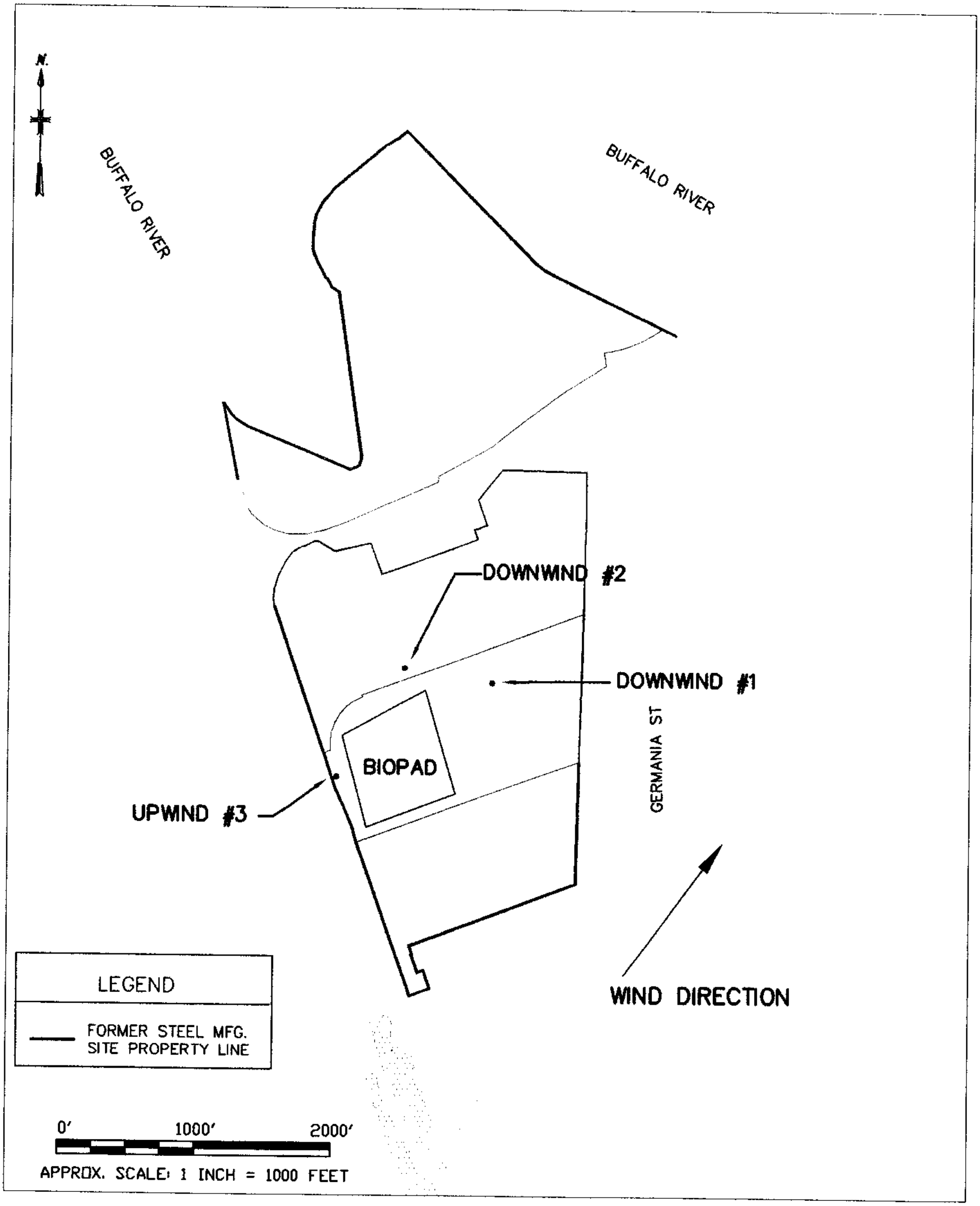
STEELFIELDS, LTD.
BUFFALO, NEW YORK

9/22/03 DOCUMENTATION AIR MONITORING

MORNING MONITORING STATION LOCATIONS

DATE: ____________________

FIGURE 2



TURNKEY ENVIRONMENTAL RESTORATION, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

9/22/03 DOCUMENTATION AIR MONITORING

AFTERNOON MONITORING STATION LOCATIONS

ATTACHMENT 1
DOCUMENTATION AIR MONITORING RESULTS

LABORATORY ANALYTICAL DATA

SEPTEMBER 22, 2003 SAMPLING EVENT

GALSON
LABORATORIES

660 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

Mr. Tom Forbes
Turnkey Environmental
50 Fountain Plaza
Suite 1350
Buffalo, NY 14202

September 26, 2003

DOH ELAP# 11626 Account# 12074 Login# L97173

Dear Mr. Forbes:

Enclosed are the analytical results of the samples received by our laboratory September 24, 2003. All test results meet the quality control requirements of AIHA and NELAC unless otherwise stated in this report.

Results in this report are based on the sampling data provided by the client and refer only to items tested. Unless otherwise requested, all samples will be discarded thirty days from the date of this report.

Please contact your client service representative, Tonya McGuiggan at (877) 482-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

FOR:

F. Joseph Unangst
Laboratory Director

Enclosure(s)

COOLEY

The white copy will be returned with your report. Please retain pink copy for your records.

Galson Laboratories
6601 Kirkville Road
P.O. Box 369
E. Syracuse, NY 13057-0369
Tel: (315) 437-7252 888-577-Labs (5227)
Fax: (315) 437-0571

Request For Industrial Hygiene Analysis

Company Name: Turnkey Account #:

Site Name: Steelfields

Sampled By: Tom Behrendt Project #:

☐ Check if Change of Address

Report to: Turnkey Environmental
50 Fountain Plaza, Suite 1350
Buffalo NY, 14202
Attn: Tom Forbes
Phone: (716) 856-0635

Invoice to: Severn Trent Laboratories, Inc.
10 Hazelwood Drive Suite 106
Amherst NY 14228
ATTN: Brian Fischer
Phone: (716) 691-2600

☐ Purchase order number: ☐ Verbal Authorization:

☐ Credit Card (type): Card #: Exp Date:

☐ Standard Turn-Around Time (5 business days)

☐ Same Day (SD) Next Day(ND) ☐ 12PM ☐ 5PM ☐ 2 Day ☐ 3 Day ☐ 4 Day

Surcharges: SD = 200% ND by 12PM = 150% ND by 5PM = 100% 2 Day= 75% 3 Day = 50% 4 Day = 35%

☐ Fax Results to: Fax #: ( )

☐ Email Results to:

Sample Identification	Date Sampled	Sample Medium Catalog # / Lot #	Air Sample Volume (liters)*	Analysis Requested	Method Reference
✓ Downwind # 1	9/22/03	181638 PW PVC	715.52 L	respirable particulates	NIOSH 0600
✓ Downwind # 2	9/22/03	181645	702.81 L	respirable particulates	NIOSH 0600
✓ Upwind # 3	9/22/03	181643 AG	716.56 L	respirable particulates	NIOSH 0600

If blanks are not submitted, our policy states that a laboratory blank will be added for each analyte and it will be charged at the normal rate. IF YOU DO NOT WANT A LABORATORY BLANK ADDED PLEASE CHECK BOX ☐

*For passive monitors please list time exposed in minutes.

Comments (Please list any known interferences present in sampling area):

Chain of Custody	Print Name	Signature	Date/Time
Relinquished by:	Thomas A Behrendt	Thomas A Behrendt	9/22/03 1600
Received by LAB.	A. Graf	A. Graf	

GALSON LABORATORIES

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Steelfields

Date Sampled : 22-SEP-03
Date Received : 24-SEP-03
Date Analyzed : 26-SEP-03

Account No.: 12074
Login No. : L97173

Respirable Dust

	Sample ID	Lab ID	Air Vol m3	Total mg	Conc mg/m3
*	DOWNWIND #1	L97173-1	0.71552	<0.05	<0.07
*	DOWNWIND #2	L97173-2	0.70281	<0.05	<0.07
*	UPWIND #3	L97173-3	0.71656	0.052	0.073
	LAB BLANK	L97173-4	NA	<0.05	NA

COMMENTS: PNOR = Particulates Not Otherwise Regulated.
* The filters were tared on 5/20/03.
We recommend using filters within 3 months of the initial tare weighing.

Level of quantitation: 0.05 mg
Analytical Method : NIOSH 0600; GRAV
OSHA PEL (TWA) : PNOR 5 mg/m3
Collection Media : PVC PW

Submitted by: jc/kk
Approved by : OVK
Date : 26-SEP-03
QC by:
NYS DOH #: 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

STL BUFFALO

Client Sample ID: DOWN WIND #1

GC/MS Volatiles

Lot-Sample #...:	H3I240132-001	**Work Order #...:**	F012H1AD	**Matrix........:**	AIR
Date Sampled...:	09/22/03	**Date Received..:**	09/24/03		
Prep Date......:	10/20/03	**Analysis Date..:**	10/20/03		
Prep Batch #...:	3294223				
Dilution Factor:	2.09	**Method.........:**	EPA-2 TO-15		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	0.42	ppb(v/v)
Dichlorodifluoromethane	**0.70**	**0.42**	**ppb(v/v)**
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.42	ppb(v/v)
Chloromethane	ND	1.0	ppb(v/v)
Vinyl chloride	ND	0.42	ppb(v/v)
Bromomethane	ND	0.42	ppb(v/v)
Chloroethane	ND	0.42	ppb(v/v)
Trichlorofluoromethane	ND	0.42	ppb(v/v)
1,1-Dichloroethene	ND	0.42	ppb(v/v)
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.42	ppb(v/v)
Methylene chloride	ND	1.0	ppb(v/v)
1,1-Dichloroethane	ND	0.42	ppb(v/v)
cis-1,2-Dichloroethene	ND	0.42	ppb(v/v)
Chloroform	ND	0.42	ppb(v/v)
1,1,1-Trichloroethane	ND	0.42	ppb(v/v)
Carbon tetrachloride	ND	0.42	ppb(v/v)
Benzene	**0.64**	**0.42**	**ppb(v/v)**
1,2-Dichloroethane	ND	0.42	ppb(v/v)
Trichloroethene	ND	0.42	ppb(v/v)
1,2-Dichloropropane	ND	0.42	ppb(v/v)
cis-1,3-Dichloropropene	ND	0.42	ppb(v/v)
Toluene	**1.3**	**0.42**	**ppb(v/v)**
trans-1,3-Dichloropropene	ND	0.42	ppb(v/v)
1,1,2-Trichloroethane	ND	0.42	ppb(v/v)
Tetrachloroethene	ND	0.42	ppb(v/v)
1,2-Dibromoethane (EDB)	ND	0.42	ppb(v/v)
Chlorobenzene	ND	0.42	ppb(v/v)
Ethylbenzene	ND	0.42	ppb(v/v)
m-Xylene & p-Xylene	**0.76**	**0.42**	**ppb(v/v)**
o-Xylene	ND	0.42	ppb(v/v)
Styrene	ND	0.42	ppb(v/v)
1,1,2,2-Tetrachloroethane	ND	0.42	ppb(v/v)
1,3,5-Trimethylbenzene	ND	0.42	ppb(v/v)
1,2,4-Trimethylbenzene	ND	0.42	ppb(v/v)
1,3-Dichlorobenzene	ND	0.42	ppb(v/v)
1,4-Dichlorobenzene	ND	0.42	ppb(v/v)
1,2-Dichlorobenzene	ND	0.42	ppb(v/v)

(Continued on next page)

STL BUFFALO

Client Sample ID: DOWN WIND #1

GC/MS Volatiles

Lot-Sample #...: H3I240132-001 **Work Order #...: F012H1AD** **Matrix.........: AIR**

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzyl chloride	ND	0.42	ppb(v/v)
1,2,4-Trichloro-benzene	ND	0.42	ppb(v/v)
Hexachlorobutadiene	ND	0.42	ppb(v/v)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	110	(70 - 130)
Toluene-d8	105	(70 - 130)
4-Bromofluorobenzene	110	(70 - 130)

STL BUFFALO

Client Sample ID: DOWN WIND #2

GC/MS Volatiles

Lot-Sample #...: H3I240132-002 **Work Order #...:** F012K1AD **Matrix........:** AIR
Date Sampled...: 09/22/03 **Date Received..:** 09/24/03
Prep Date......: 10/20/03 **Analysis Date..:** 10/20/03
Prep Batch #...: 3294223
Dilution Factor: 2.25 **Method.........:** EPA-2 TO-15

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	0.45	ppb(v/v)
Dichlorodifluoromethane	**0.72**	**0.45**	**ppb(v/v)**
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.45	ppb(v/v)
Chloromethane	ND	1.1	ppb(v/v)
Vinyl chloride	ND	0.45	ppb(v/v)
Bromomethane	ND	0.45	ppb(v/v)
Chloroethane	ND	0.45	ppb(v/v)
Trichlorofluoromethane	ND	0.45	ppb(v/v)
1,1-Dichloroethene	ND	0.45	ppb(v/v)
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.45	ppb(v/v)
Methylene chloride	ND	1.1	ppb(v/v)
1,1-Dichloroethane	ND	0.45	ppb(v/v)
cis-1,2-Dichloroethene	ND	0.45	ppb(v/v)
Chloroform	ND	0.45	ppb(v/v)
1,1,1-Trichloroethane	ND	0.45	ppb(v/v)
Carbon tetrachloride	ND	0.45	ppb(v/v)
Benzene	**0.65**	**0.45**	**ppb(v/v)**
1,2-Dichloroethane	ND	0.45	ppb(v/v)
Trichloroethene	ND	0.45	ppb(v/v)
1,2-Dichloropropane	ND	0.45	ppb(v/v)
cis-1,3-Dichloropropene	ND	0.45	ppb(v/v)
Toluene	**1.4**	**0.45**	**ppb(v/v)**
trans-1,3-Dichloropropene	ND	0.45	ppb(v/v)
1,1,2-Trichloroethane	ND	0.45	ppb(v/v)
Tetrachloroethene	ND	0.45	ppb(v/v)
1,2-Dibromoethane (EDB)	ND	0.45	ppb(v/v)
Chlorobenzene	ND	0.45	ppb(v/v)
Ethylbenzene	ND	0.45	ppb(v/v)
m-Xylene & p-Xylene	**0.80**	**0.45**	**ppb(v/v)**
o-Xylene	ND	0.45	ppb(v/v)
Styrene	ND	0.45	ppb(v/v)
1,1,2,2-Tetrachloroethane	ND	0.45	ppb(v/v)
1,3,5-Trimethylbenzene	ND	0.45	ppb(v/v)
1,2,4-Trimethylbenzene	ND	0.45	ppb(v/v)
1,3-Dichlorobenzene	ND	0.45	ppb(v/v)
1,4-Dichlorobenzene	ND	0.45	ppb(v/v)
1,2-Dichlorobenzene	ND	0.45	ppb(v/v)

(Continued on next page)

STL BUFFALO

Client Sample ID: DOWN WIND #2

GC/MS Volatiles

Lot-Sample #...: H3I240132-002 **Work Order #...:** F012K1AD **Matrix.........:** AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzyl chloride	ND	0.45	ppb(v/v)
1,2,4-Trichloro-benzene	ND	0.45	ppb(v/v)
Hexachlorobutadiene	ND	0.45	ppb(v/v)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	113	(70 - 130)
Toluene-d8	105	(70 - 130)
4-Bromofluorobenzene	110	(70 - 130)

STL BUFFALO

Client Sample ID: UP WIND #3

GC/MS Volatiles

Lot-Sample #...: H3I240132-003 Work Order #...: F012N1AD Matrix.........: AIR
Date Sampled...: 09/22/03 Date Received..: 09/24/03
Prep Date......: 10/20/03 Analysis Date..: 10/20/03
Prep Batch #...: 3294223
Dilution Factor: 1.99 Method.........: EPA-2 TO-15

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	0.40	ppb(v/v)
Dichlorodifluoromethane	**0.66**	**0.40**	**ppb(v/v)**
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.40	ppb(v/v)
Chloromethane	ND	1.0	ppb(v/v)
Vinyl chloride	ND	0.40	ppb(v/v)
Bromomethane	ND	0.40	ppb(v/v)
Chloroethane	ND	0.40	ppb(v/v)
Trichlorofluoromethane	ND	0.40	ppb(v/v)
1,1-Dichloroethene	ND	0.40	ppb(v/v)
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.40	ppb(v/v)
Methylene chloride	ND	1.0	ppb(v/v)
1,1-Dichloroethane	ND	0.40	ppb(v/v)
cis-1,2-Dichloroethene	ND	0.40	ppb(v/v)
Chloroform	ND	0.40	ppb(v/v)
1,1,1-Trichloroethane	ND	0.40	ppb(v/v)
Carbon tetrachloride	ND	0.40	ppb(v/v)
Benzene	**0.74**	**0.40**	**ppb(v/v)**
1,2-Dichloroethane	ND	0.40	ppb(v/v)
Trichloroethene	ND	0.40	ppb(v/v)
1,2-Dichloropropane	ND	0.40	ppb(v/v)
cis-1,3-Dichloropropene	ND	0.40	ppb(v/v)
Toluene	**1.3**	**0.40**	**ppb(v/v)**
trans-1,3-Dichloropropene	ND	0.40	ppb(v/v)
1,1,2-Trichloroethane	ND	0.40	ppb(v/v)
Tetrachloroethene	ND	0.40	ppb(v/v)
1,2-Dibromoethane (EDB)	ND	0.40	ppb(v/v)
Chlorobenzene	ND	0.40	ppb(v/v)
Ethylbenzene	ND	0.40	ppb(v/v)
m-Xylene & p-Xylene	**0.76**	**0.40**	**ppb(v/v)**
o-Xylene	ND	0.40	ppb(v/v)
Styrene	ND	0.40	ppb(v/v)
1,1,2,2-Tetrachloroethane	ND	0.40	ppb(v/v)
1,3,5-Trimethylbenzene	ND	0.40	ppb(v/v)
1,2,4-Trimethylbenzene	ND	0.40	ppb(v/v)
1,3-Dichlorobenzene	ND	0.40	ppb(v/v)
1,4-Dichlorobenzene	ND	0.40	ppb(v/v)
1,2-Dichlorobenzene	ND	0.40	ppb(v/v)

(Continued on next page)

STL BUFFALO

Client Sample ID: UP WIND #3

GC/MS Volatiles

Lot-Sample #...: H3I240132-003 **Work Order #...:** F012N1AD **Matrix.........:** AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzyl chloride	ND	0.40	ppb(v/v)
1,2,4-Trichloro-benzene	ND	0.40	ppb(v/v)
Hexachlorobutadiene	ND	0.40	ppb(v/v)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	113	(70 - 130)
Toluene-d8	106	(70 - 130)
4-Bromofluorobenzene	109	(70 - 130)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: H3I240132
MB Lot-Sample #: H3J210000-223

Work Order #...: F22HL1AA

Matrix.........: AIR

Analysis Date..: 10/20/03
Dilution Factor: 1

Prep Date......: 10/20/03
Prep Batch #...: 3294223

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Naphthalene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Dichlorodifluoromethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloromethane	ND	0.50	ppb(v/v)	EPA-2 TO-15
Vinyl chloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
Bromomethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Trichlorofluoromethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1-Dichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Methylene chloride	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,1-Dichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
cis-1,2-Dichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloroform	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,1-Trichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Carbon tetrachloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
Benzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Trichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloropropane	ND	0.20	ppb(v/v)	EPA-2 TO-15
cis-1,3-Dichloropropene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Toluene	ND	0.20	ppb(v/v)	EPA-2 TO-15
trans-1,3-Dichloropropene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2-Trichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Tetrachloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dibromoethane (EDB)	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Ethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
m-Xylene & p-Xylene	ND	0.20	ppb(v/v)	EPA-2 TO-15
o-Xylene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Styrene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2,2-Tetrachloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,3,5-Trimethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2,4-Trimethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,3-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,4-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Benzyl chloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2,4-Trichloro-benzene	ND	0.20	ppb(v/v)	EPA-2 TO-15

(Continued on next page)

ATTACHMENT 2
DOCUMENTATION AIR MONITORING RESULTS

FIELD DATA/FORMS

SEPTEMBER 22, 2003 SAMPLING EVENT

COOLEY

The white copy will be returned with your report. Please retain pink copy for your records.

Galson Laboratories
6601 Kirkville Road
P.O. Box 369
E. Syracuse, NY 13057-0369
Tel: (315) 437-7252 888-577-Labs (5227)
Fax: (315) 437-0571

Request For Industrial Hygiene Analysis

Company Name: Turnkey   Account #:
Site Name: Steelfields
Sampled By: Tom Behrendt   Project #:

☐ Check if Change of Address

Report to: Turnkey Environmental
50 Fountain Plaza, Suite 1350
Buffalo NY, 14202
Attn: Tom Forbes
Phone: (716) 856-0635

Invoice to: Severn Trent Laboratories, Inc.
10 Hazelwood Drive, Suite 106
Amherst NY 14228
ATTN: Brian Fischer
Phone: (716) 691-2600

☐ Purchase order number: ____ ☐ Verbal Authorization: ____
☐ Credit Card (type): ____ Card #: ____ Exp Date: ____
☐ Standard Turn-Around Time (5 business days)
☐ Same Day (SD) Next Day(ND) ☐ 12PM ☐ 5PM ☐ 2 Day ☐ 3 Day ☐ 4 Day
Surcharges: SD = 200% ND by 12PM = 150% ND by 5PM = 100% 2 Day= 75% 3 Day = 50% 4 Day = 35%
☐ Fax Results to: ____ Fax #: (____)
☐ Email Results to: ____

Sample Identification	Date Sampled	Sample Medium Catalog # / Lot #	Air Sample Volume (liters)*	Analysis Requested	Method Reference
Downwind # 1	9/22/03	181638	715.52 L	respirable particulates	N405H 0600
Downwind # 2	9/22/03	181645	702.81 L	respirable particulates	N405H 0600
Upwind # 3	9/22/03	181643	716.56 L	respirable particulates	N405H 0600

If blanks are not submitted, our policy states that a laboratory blank will be added for each analyte and it will be charged at the normal rate. IF YOU DO NOT WANT A LABORATORY BLANK ADDED PLEASE CHECK BOX ☐

*For passive monitors please list time exposed in minutes.

Comments (Please list any known interferences present in sampling area): ____

Chain of Custody	Print Name	Signature	Date/Time
Relinquished by:	Thomas A Behrendt	Thomas A Be[illegible]	9/22/03 1600
Received by LAB.			

Samples received af...

Biopad turned 9/22/03

DOCUMENTATION AIR MONITORING
AT THE FORMER STEEL MANUFACTURING SITE

DAILY CALIBRATION RECORD FOR GILIAN AIR SAMPLING PUMPS

Date 9/19/03

Pump 1 Serial No. 15270 / Cart # 181638 Calibrated Flowrate (L/min): 1.72
Pump 2 Serial No. 15271 / Cart # 181645 Calibrated Flowrate (L/min): 1.71
Pump 3 Serial No. 15272 / Cart # 181643 Calibrated Flowrate (L/min): 1.69
Pump 4 Serial No. ~~[illegible]~~ Calibrated Flowrate (L/min):
Pump 5 Serial No. Calibrated Flowrate (L/min):
Pump 6 Serial No. Calibrated Flowrate (L/min):
Calibrations Performed by

Date

Pump 1 Serial No. Calibrated Flowrate (L/min):
Pump 2 Serial No. Calibrated Flowrate (L/min):
Pump 3 Serial No. Calibrated Flowrate (L/min):
Pump 4 Serial No. Calibrated Flowrate (L/min):
Pump 5 Serial No. Calibrated Flowrate (L/min):
Pump 6 Serial No. Calibrated Flowrate (L/min):
Calibrations Performed by

Date

Pump 1 Serial No. Calibrated Flowrate (L/min):
Pump 2 Serial No. Calibrated Flowrate (L/min):
Pump 3 Serial No. Calibrated Flowrate (L/min):
Pump 4 Serial No. Calibrated Flowrate (L/min):
Pump 5 Serial No. Calibrated Flowrate (L/min):
Pump 6 Serial No. Calibrated Flowrate (L/min):
Calibrations Performed by

Additional Comments:

TurnKey Environmental Restoration, LLC

DOCUMENTATION AIR MONITORING
FORMER STEEL MANUFACTURING SITE

GILIAN AIR SAMPLING PUMP DATA RECORD

Date 9/22/03
Designated Location Downwind # 1

Pump #1 Serial Number 15270/ Cust # 181638 Parameter respirable particulates
Initial Pumping Rate (L/min) 1.72 Start Time # 1 0650 End # 1 1112

Start # 2 $\boxed{1120}$
End # 2 $\boxed{1354}$
~~End # 2 1354~~

Time	Pumping Rate (L/min)

End Time ______
Air Sample Volume (liters) 715.52

Pump #2 Serial Number 15271/ Cust # 181645 Parameter respirable particulates
Initial Pumping Rate (L/min) 1.71 Start Time # 1 0656 End # 1 1114

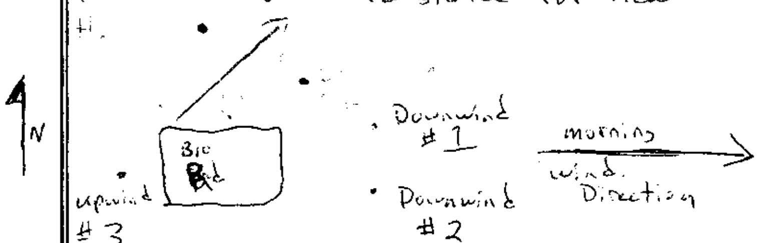
Downwind # 2

Start # 2 1126
End # 2 1359

Time	Pumping Rate (L/min)

End Time ______
Air Sample Volume (Liters) 702.81L

Notes: - Downwind station # 1 Was knocked Down by wind
- During 2nd collection time
- @ 1120 and 1126 was the new times DW station # 1 & # 2 were re started for new Downwind positions



DOCUMENTATION AIR MONITORING
FORMER STEEL MANUFACTURING SITE

GILIAN AIR SAMPLING PUMP DATA RECORD

Date 9/22/03
Designated Location Upwind # 3

Pump #3 Serial Number 15272/Cart 181643 Parameter respirable Particulates
Initial Pumping Rate (L/min) 1.69 Start Time 0703

Time	Pumping Rate (L/min)

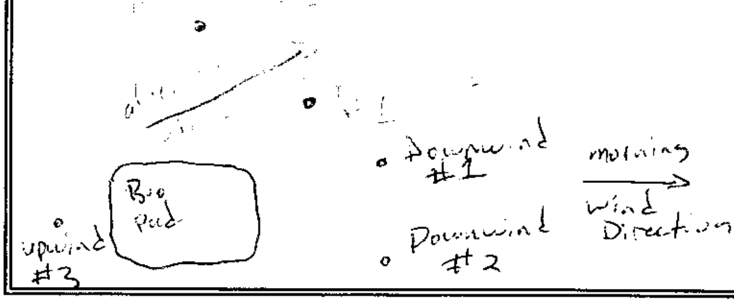
End Time 1407 Air Sample volume 716.56 Liters

Pump #4 Serial Number ______ Parameter ______
Initial Pumping Rate (L/min) ______ Start Time ______

Time	Pumping Rate (L/min)

End Time ______

Notes: - Durning 2nd collection time upwind station #3 was Knocked Down caused by wind



White: To accompany samples | Yellow: Field copy

STL Knoxville

5815 Middlebrook Pike • Knoxville, TN 37921-5947
Phone: (865) 291-3000 • Fax: (865) 584-4315
Receiving: (865) 291-3031

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No.
Page 1 of ____

Project Name/No. [1] ____
Sample Team Members [2] Tom Behrendt
Profit Center No. [3] ____
Project Manager [4] Tom Forbes
Purchase Order No. [6] ____
Required Report Date [11] ____

Samples Shipment Date [7] 9/22/03
Lab Destination [8] ____
Lab Contact [9] ____
Project Contact / Phone [12] ____
Carrier / Waybill No. [13] ____

Bill to: [5] Severn Trent Laboratories
10 Hazelwood Dr, Suite 106
Amherst NY 14228
Attn: Brian Fischer (716) 691-2600

Report to: [10] Turnkey Environmental
50 Fountain Plaza, Suite 1350
Buffalo NY 14202
Attn: Tom Forbes (716) 856-0635

ONE CONTAINER PER LINE

Sample [14] Number	Sample [15] Type	Date/Time [16] Collected	Container [17] Type	Sample [18] Volume	Pre- [19] servative	Requested Testing [20] Program
Downwind #1	Air	9/22/03 1354	Summa	8hr regulator	—	TO15 + Naphthalene
Downwind #2	Air	9/22/03 1359	Summa	8hr regulator	—	TO15 + Napthalene
upwind #3	Air	9/22/03 1407	Summa	8hr regulator	—	TO15 + Napthalene

Condition on Receipt [21] Lab use only
Custody seals intact Y N NA
Temperature received at ____
Received by ____ Date ____
Number of packages ____
Tracking # ____

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-Hazard ☒ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive ____ (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature / Affiliation) Thomas [signature] Turnkey Date: 9/22/03 Time: 1600

1. Received by [28] (Signature / Affiliation) Date: ____ Time: ____

1. Relinquished by (Signature / Affiliation) Date: ____ Time: ____

1. Received by (Signature / Affiliation) Date: ____ Time: ____

Comments: [29]

SEVERN TRENT STL

ANALYTICAL REPORT

Job#: A03-A364

STL Project#: NY3A9063
Site Name: Steelfields - Former LTV Steel site
Task: Air Monitoring

Mr. Tom Forbes
Benchmark Environmental
50 Fountain Plaza, Ste 1350
Buffalo, NY 14202

STL Buffalo

Brian J. Fischer
Project Manager

10/28/2003

NON-CONFORMANCE SUMMARY

Job#: A03-A364

STL Project#: NY3A9063
Site Name: Steelfields - Former LTV Steel site

General Comments

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

Sample Receipt Comments

A03-A364

Sample Cooler(s) were received at the following temperature(s); NA °C

Volatile analyses were performed by STL Knoxville, TN.

****

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

Original Chain of Custody Documentation

NY3A9063 Task 3 #3I240132

STL Knoxville
5815 Middlebrook Pike • Knoxville, TN 37921-5947
Phone: (865) 291-3000 • Fax: (865) 584-4315
Receiving: (865) 291-3031

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No.
Page 1 of ____

White: To accompany samples
Yellow: Field copy

Project Name/No. [1] ____
Sample Team Members [2] Tom Behrendt
Profit Center No. [3] ____
Project Manager [4] Tom Forbes
Purchase Order No. [6] ____
Required Report Date [11] ____

Samples Shipment Date [7] 9/22/03
Lab Destination [8] ____
Lab Contact [9] ____
Project Contact / Phone [12] ____
Carrier / Waybill No. [13] ____

Bill to: [5] Severn Trent Laboratories
10 Hazelwood Dr, Suite 106
Amherst NY 14228
Attn Brian Fischer (716) 691-2600

Report to: [10] Turnkey Environmental
50 Fountain Plaza, Suite 1350
Buffalo NY 14202
Attn: Tom Forbes (716) 856-0635

ONE CONTAINER PER LINE

Sample [14] Number	Sample [15] Type	Date/Time [16] Collected	Container [17] Type	Sample [18] Volume	Pre- [19] servative	Requested Testing [20] Program
Downwind #1	Air	9/22/03 1354	Summa	8hr regulator	—	TO15 + Naphthalene
Downwind #2	Air	9/22/03 1359	Summa	8hr regulator	—	TO15 + Napthalene
upwind #3	Air	9/22/03 1407	Summa	8hr regulator	—	TO15 + Napthalene

Condition on Receipt [21] Lab use only
Custody seals intact Y N NA
Temperature received at Ambient
Received by MFH Date 9-24-03
Number of packages 1
Tracking # 3153831553

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-Hazard ☒ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive ____ (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature / Affiliation) Thomas Behrendt Turnkey Date: 9/22/03 Time: 1600

1. Received by [28] (Signature / Affiliation) Matthew Hamm Date: 9-24-03 Time: 11:00

1. Relinquished by (Signature / Affiliation) Date: ____ Time: ____

1. Received by (Signature / Affiliation) Date: ____ Time: ____

Comments: [29]

SEVERN TRENT STL

STL Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921

Tel: 865 291 3000 Fax: 865 584 4315
www.stl-inc.com

ANALYTICAL REPORT

TO15

Lot #: H3I240132

Brian Fischer

STL Buffalo
10 Hazelwood Drive
Amherst, NY 14228

SEVERN TRENT LABORATORIES, INC.

Jamie A. McKinney
Project Manager

October 23, 2003

ANALYTICAL METHODS SUMMARY

H3I240132

PARAMETER	ANALYTICAL METHOD
Volatile Organics by TO15	EPA-2 TO-15

References:

EPA-2 "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA-625/R-96/0106, January 1997.

SAMPLE SUMMARY

H3I240132

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
F012H	001	DOWN WIND #1	09/22/03	13:54
F012K	002	DOWN WIND #2	09/22/03	13:59
F012N	003	UP WIND #3	09/22/03	14:07

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PROJECT NARRATIVE
H3I240132

The results reported herein are applicable to the samples submitted for analysis only.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation is included with this report.

Sample Receipt

There were no custody seals present upon receipt.

Quality Control

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

STL BUFFALO

Client Sample ID: DOWN WIND #1

GC/MS Volatiles

Lot-Sample #...: H3I240132-001 **Work Order #...:** F012H1AD **Matrix.........:** AIR
Date Sampled...: 09/22/03 **Date Received..:** 09/24/03
Prep Date......: 10/20/03 **Analysis Date..:** 10/20/03
Prep Batch #...: 3294223
Dilution Factor: 2.09 **Method.........:** EPA-2 TO-15

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	0.42	ppb(v/v)
Dichlorodifluoromethane	**0.70**	**0.42**	**ppb(v/v)**
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.42	ppb(v/v)
Chloromethane	ND	1.0	ppb(v/v)
Vinyl chloride	ND	0.42	ppb(v/v)
Bromomethane	ND	0.42	ppb(v/v)
Chloroethane	ND	0.42	ppb(v/v)
Trichlorofluoromethane	ND	0.42	ppb(v/v)
1,1-Dichloroethene	ND	0.42	ppb(v/v)
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.42	ppb(v/v)
Methylene chloride	ND	1.0	ppb(v/v)
1,1-Dichloroethane	ND	0.42	ppb(v/v)
cis-1,2-Dichloroethene	ND	0.42	ppb(v/v)
Chloroform	ND	0.42	ppb(v/v)
1,1,1-Trichloroethane	ND	0.42	ppb(v/v)
Carbon tetrachloride	ND	0.42	ppb(v/v)
Benzene	**0.64**	**0.42**	**ppb(v/v)**
1,2-Dichloroethane	ND	0.42	ppb(v/v)
Trichloroethene	ND	0.42	ppb(v/v)
1,2-Dichloropropane	ND	0.42	ppb(v/v)
cis-1,3-Dichloropropene	ND	0.42	ppb(v/v)
Toluene	**1.3**	**0.42**	**ppb(v/v)**
trans-1,3-Dichloropropene	ND	0.42	ppb(v/v)
1,1,2-Trichloroethane	ND	0.42	ppb(v/v)
Tetrachloroethene	ND	0.42	ppb(v/v)
1,2-Dibromoethane (EDB)	ND	0.42	ppb(v/v)
Chlorobenzene	ND	0.42	ppb(v/v)
Ethylbenzene	ND	0.42	ppb(v/v)
m-Xylene & p-Xylene	**0.76**	**0.42**	**ppb(v/v)**
o-Xylene	ND	0.42	ppb(v/v)
Styrene	ND	0.42	ppb(v/v)
1,1,2,2-Tetrachloroethane	ND	0.42	ppb(v/v)
1,3,5-Trimethylbenzene	ND	0.42	ppb(v/v)
1,2,4-Trimethylbenzene	ND	0.42	ppb(v/v)
1,3-Dichlorobenzene	ND	0.42	ppb(v/v)
1,4-Dichlorobenzene	ND	0.42	ppb(v/v)
1,2-Dichlorobenzene	ND	0.42	ppb(v/v)

(Continued on next page)

STL BUFFALO

Client Sample ID: DOWN WIND #1

GC/MS Volatiles

Lot-Sample #...: H3I240132-001 **Work Order #...:** F012H1AD **Matrix.........:** AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzyl chloride	ND	0.42	ppb(v/v)
1,2,4-Trichloro- benzene	ND	0.42	ppb(v/v)
Hexachlorobutadiene	ND	0.42	ppb(v/v)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	110	(70 - 130)
Toluene-d8	105	(70 - 130)
4-Bromofluorobenzene	110	(70 - 130)

STL BUFFALO

Client Sample ID: DOWN WIND #2

GC/MS Volatiles

Lot-Sample #...: H3I240132-002 **Work Order #...:** F012K1AD **Matrix.........:** AIR
Date Sampled...: 09/22/03 **Date Received..:** 09/24/03
Prep Date......: 10/20/03 **Analysis Date..:** 10/20/03
Prep Batch #...: 3294223
Dilution Factor: 2.25 **Method.........:** EPA-2 TO-15

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	0.45	ppb(v/v)
Dichlorodifluoromethane	**0.72**	**0.45**	**ppb(v/v)**
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.45	ppb(v/v)
Chloromethane	ND	1.1	ppb(v/v)
Vinyl chloride	ND	0.45	ppb(v/v)
Bromomethane	ND	0.45	ppb(v/v)
Chloroethane	ND	0.45	ppb(v/v)
Trichlorofluoromethane	ND	0.45	ppb(v/v)
1,1-Dichloroethene	ND	0.45	ppb(v/v)
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.45	ppb(v/v)
Methylene chloride	ND	1.1	ppb(v/v)
1,1-Dichloroethane	ND	0.45	ppb(v/v)
cis-1,2-Dichloroethene	ND	0.45	ppb(v/v)
Chloroform	ND	0.45	ppb(v/v)
1,1,1-Trichloroethane	ND	0.45	ppb(v/v)
Carbon tetrachloride	ND	0.45	ppb(v/v)
Benzene	**0.65**	**0.45**	**ppb(v/v)**
1,2-Dichloroethane	ND	0.45	ppb(v/v)
Trichloroethene	ND	0.45	ppb(v/v)
1,2-Dichloropropane	ND	0.45	ppb(v/v)
cis-1,3-Dichloropropene	ND	0.45	ppb(v/v)
Toluene	**1.4**	**0.45**	**ppb(v/v)**
trans-1,3-Dichloropropene	ND	0.45	ppb(v/v)
1,1,2-Trichloroethane	ND	0.45	ppb(v/v)
Tetrachloroethene	ND	0.45	ppb(v/v)
1,2-Dibromoethane (EDB)	ND	0.45	ppb(v/v)
Chlorobenzene	ND	0.45	ppb(v/v)
Ethylbenzene	ND	0.45	ppb(v/v)
m-Xylene & p-Xylene	**0.80**	**0.45**	**ppb(v/v)**
o-Xylene	ND	0.45	ppb(v/v)
Styrene	ND	0.45	ppb(v/v)
1,1,2,2-Tetrachloroethane	ND	0.45	ppb(v/v)
1,3,5-Trimethylbenzene	ND	0.45	ppb(v/v)
1,2,4-Trimethylbenzene	ND	0.45	ppb(v/v)
1,3-Dichlorobenzene	ND	0.45	ppb(v/v)
1,4-Dichlorobenzene	ND	0.45	ppb(v/v)
1,2-Dichlorobenzene	ND	0.45	ppb(v/v)

(Continued on next page)

STL BUFFALO

Client Sample ID: DOWN WIND #2

GC/MS Volatiles

Lot-Sample #...: H3I240132-002 **Work Order #...:** F012K1AD **Matrix.........:** AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzyl chloride	ND	0.45	ppb(v/v)
1,2,4-Trichloro-benzene	ND	0.45	ppb(v/v)
Hexachlorobutadiene	ND	0.45	ppb(v/v)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	113	(70 - 130)
Toluene-d8	105	(70 - 130)
4-Bromofluorobenzene	110	(70 - 130)

STL BUFFALO

Client Sample ID: UP WIND #3

GC/MS Volatiles

Lot-Sample #...: H3I240132-003 **Work Order #...:** F012N1AD **Matrix.........:** AIR
Date Sampled...: 09/22/03 **Date Received..:** 09/24/03
Prep Date......: 10/20/03 **Analysis Date..:** 10/20/03
Prep Batch #...: 3294223
Dilution Factor: 1.99 **Method.........:** EPA-2 TO-15

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	0.40	ppb(v/v)
Dichlorodifluoromethane	**0.66**	**0.40**	**ppb(v/v)**
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.40	ppb(v/v)
Chloromethane	ND	1.0	ppb(v/v)
Vinyl chloride	ND	0.40	ppb(v/v)
Bromomethane	ND	0.40	ppb(v/v)
Chloroethane	ND	0.40	ppb(v/v)
Trichlorofluoromethane	ND	0.40	ppb(v/v)
1,1-Dichloroethene	ND	0.40	ppb(v/v)
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.40	ppb(v/v)
Methylene chloride	ND	1.0	ppb(v/v)
1,1-Dichloroethane	ND	0.40	ppb(v/v)
cis-1,2-Dichloroethene	ND	0.40	ppb(v/v)
Chloroform	ND	0.40	ppb(v/v)
1,1,1-Trichloroethane	ND	0.40	ppb(v/v)
Carbon tetrachloride	ND	0.40	ppb(v/v)
Benzene	**0.74**	**0.40**	**ppb(v/v)**
1,2-Dichloroethane	ND	0.40	ppb(v/v)
Trichloroethene	ND	0.40	ppb(v/v)
1,2-Dichloropropane	ND	0.40	ppb(v/v)
cis-1,3-Dichloropropene	ND	0.40	ppb(v/v)
Toluene	**1.3**	**0.40**	**ppb(v/v)**
trans-1,3-Dichloropropene	ND	0.40	ppb(v/v)
1,1,2-Trichloroethane	ND	0.40	ppb(v/v)
Tetrachloroethene	ND	0.40	ppb(v/v)
1,2-Dibromoethane (EDB)	ND	0.40	ppb(v/v)
Chlorobenzene	ND	0.40	ppb(v/v)
Ethylbenzene	ND	0.40	ppb(v/v)
m-Xylene & p-Xylene	**0.76**	**0.40**	**ppb(v/v)**
o-Xylene	ND	0.40	ppb(v/v)
Styrene	ND	0.40	ppb(v/v)
1,1,2,2-Tetrachloroethane	ND	0.40	ppb(v/v)
1,3,5-Trimethylbenzene	ND	0.40	ppb(v/v)
1,2,4-Trimethylbenzene	ND	0.40	ppb(v/v)
1,3-Dichlorobenzene	ND	0.40	ppb(v/v)
1,4-Dichlorobenzene	ND	0.40	ppb(v/v)
1,2-Dichlorobenzene	ND	0.40	ppb(v/v)

(Continued on next page)

STL BUFFALO

Client Sample ID: UP WIND #3

GC/MS Volatiles

Lot-Sample #...: H3I240132-003 **Work Order #...:** F012N1AD **Matrix.........:** AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzyl chloride	ND	0.40	ppb(v/v)
1,2,4-Trichloro-benzene	ND	0.40	ppb(v/v)
Hexachlorobutadiene	ND	0.40	ppb(v/v)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	113	(70 - 130)
Toluene-d8	106	(70 - 130)
4-Bromofluorobenzene	109	(70 - 130)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: H3I240132 **Work Order #...:** F22HL1AA **Matrix.........:** AIR
MB Lot-Sample #: H3J210000-223
Prep Date......: 10/20/03
Analysis Date..: 10/20/03 **Prep Batch #...:** 3294223
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Naphthalene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Dichlorodifluoromethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloromethane	ND	0.50	ppb(v/v)	EPA-2 TO-15
Vinyl chloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
Bromomethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Trichlorofluoromethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1-Dichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Methylene chloride	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,1-Dichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
cis-1,2-Dichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chloroform	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,1-Trichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Carbon tetrachloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
Benzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Trichloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichloropropane	ND	0.20	ppb(v/v)	EPA-2 TO-15
cis-1,3-Dichloropropene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Toluene	ND	0.20	ppb(v/v)	EPA-2 TO-15
trans-1,3-Dichloropropene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2-Trichloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
Tetrachloroethene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dibromoethane (EDB)	ND	0.20	ppb(v/v)	EPA-2 TO-15
Chlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Ethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
m-Xylene & p-Xylene	ND	0.20	ppb(v/v)	EPA-2 TO-15
o-Xylene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Styrene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,1,2,2-Tetrachloroethane	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,3,5-Trimethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2,4-Trimethylbenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,3-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,4-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2-Dichlorobenzene	ND	0.20	ppb(v/v)	EPA-2 TO-15
Benzyl chloride	ND	0.20	ppb(v/v)	EPA-2 TO-15
1,2,4-Trichloro-benzene	ND	0.20	ppb(v/v)	EPA-2 TO-15

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: H3I240132 **Work Order #...:** F22HL1AA **Matrix.........:** AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Hexachlorobutadiene	ND	0.20	ppb(v/v)	EPA-2 TO-15

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	99	(70 - 130)
Toluene-d8	103	(70 - 130)
4-Bromofluorobenzene	102	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: H3I240132 **Work Order #...:** F22HL1AC **Matrix.........:** AIR
LCS Lot-Sample#: H3J210000-223
Prep Date......: 10/20/03 **Analysis Date..:** 10/20/03
Prep Batch #...: 3294223
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
1,1-Dichloroethene	**95**	**(70 - 130)**	**EPA-2 TO-15**
Benzene	**87**	**(70 - 130)**	**EPA-2 TO-15**
Trichloroethene	**93**	**(70 - 130)**	**EPA-2 TO-15**
Toluene	**87**	**(70 - 130)**	**EPA-2 TO-15**
Chlorobenzene	**94**	**(70 - 130)**	**EPA-2 TO-15**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	97	(70 - 130)
Toluene-d8	96	(70 - 130)
4-Bromofluorobenzene	95	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: H3I240132 **Work Order #...:** F22HL1AC **Matrix.........:** AIR
LCS Lot-Sample#: H3J210000-223
Prep Date......: 10/20/03 **Analysis Date..:** 10/20/03
Prep Batch #...: 3294223
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
1,1-Dichloroethene	**10.0**	**9.47**	**ppb(v/v)**	**95**	**EPA-2 TO-15**
Benzene	**10.0**	**8.69**	**ppb(v/v)**	**87**	**EPA-2 TO-15**
Trichloroethene	**10.0**	**9.29**	**ppb(v/v)**	**93**	**EPA-2 TO-15**
Toluene	**10.0**	**8.71**	**ppb(v/v)**	**87**	**EPA-2 TO-15**
Chlorobenzene	**10.0**	**9.45**	**ppb(v/v)**	**94**	**EPA-2 TO-15**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	97	(70 - 130)
Toluene-d8	96	(70 - 130)
4-Bromofluorobenzene	95	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

White: To accompany samples
Yellow: Field copy

#3I240132

STL Knoxville

5815 Middlebrook Pike • Knoxville, TN 37921-5947
Phone: (865) 291-3000 • Fax: (865) 584-4315
Receiving: (865) 291-3031

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No.
Page 1 of ____

Project Name/No. [1] ____
Sample Team Members [2] Tom Behrendt
Profit Center No. [3] ____
Project Manager [4] Tom Forbes
Purchase Order No. [6] ____
Required Report Date [11] ____

Samples Shipment Date [7] 9/22/03
Lab Destination [8] ____
Lab Contact [9] ____
Project Contact / Phone [12] ____
Carrier / Waybill No. [13] ____

Bill to: [5] Severn Trent Laboratories
10 Hazelwood Dr, Suite 106
Amherst NY 14228
Attn: Brain Fischer (716) 691-2600

Report to: [10] Turnkey Environmental
50 Fountain Plaza, Suite 1350
Buffalo NY 14202
ATTN: Tom Forbes (716) 856-0635

ONE CONTAINER PER LINE

Sample [14] Number	Sample [15] Type	Date/Time [16] Collected	Container [17] Type	Sample [18] Volume	Pre- [19] servative	Requested Testing [20] Program
Downwind #1	Air	9/22/03 1354	Summa	8hr regulator	—	TO15 + Naphthalene
Downwind #2	Air	9/22/03 1359	Summa	8hr regulator	—	TO15 + Napthalene
Upwind # 3	Air	9/22/03 1402	Summa	8hr regulator	—	TO15 + Napthalene

Condition on Receipt [21] Lab use only
Custody seals intact Y N NA
Temperature received at Ambient
Received by MFH Date 9-24-03
Number of packages 1
Tracking # 315 3831553

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-Hazard ☒ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive ____ (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature / Affiliation) Thomas A Behrendt Turnkey Date: 9/22/03 Time: 1600

1. Received by [28] (Signature / Affiliation) [signature] Date: 9-24-03 Time: 11:00

1. Relinquished by (Signature / Affiliation) Date: Time:

1. Received by (Signature / Affiliation) Date: Time:

Comments: [29]

STL KNOXVILLE
SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

CLIENT: ____________ PROJECT: ____________ Lot No.: #3I240132

TO BE COMPLETED BY SAMPLE RECEIPT ASSOCIATE:

	YES	NO	NA
1. Sample Receipt:			
a. Do sample container labels match COC? (IDs, Dates, Times)	✓		
b. Is the cooler temperature within acceptance limits? (NOTE: North Carolina, 1668, 1613B: 0-4°C; VOST: 10°C)			✓
c. Were samples received with correct chemical preservative (excluding Encore)?			✓
d. Were custody seals present/intact on cooler and/or containers?	✓		
e. Were all of the samples listed on the COC received?	✓		
f. Were all of the sample containers received intact?	✓		
g. Were containers received for VOAs received without headspace?			✓
h. Were samples received in the appropriate containers?	✓		
i. Did you check for residual chlorine, if necessary?			✓
j. Were samples received within 1/2 of the holding time?	✓		
k. Were samples screened for radioactivity?			✓
l. For aqueous samples for SOG tests (i.e., 1613B, 1668A, 8290, LR PAHs), does the sample(s) have visible solids present?			✓
If yes, was SOG staff notified?			✓
m. Were client's sample documents (RFA/COC) received?	✓		
n. Has the RFA/COC been relinquished? (Signed, Dated, Timed)	✓		
o. Are test/parameters listed for each sample?	✓		
p. Is the matrix of the samples noted?	✓		
q. Is the date/time of sample collection noted?	✓		
r. Is the client and project name/No. identified?	✓		
s. Was the sampler identified on the RFA/COC?	✓		

SAMPLE RECEIVING ASSOCIATE: Matthew J. Howard DATE: ~~9-1~~ 9-24-03 MF 9-24-03

TO BE COMPLETED BY PROJECT MANAGER :

	YES	NO	NA
1. Project manager "Sample Greet":			
a. Quote number to be logged-in under 54662			
b. Informed Login associates of special instructions ?			X

PROJECT MANAGER : ____________ pm DATE: 10/1/03

Client Sample ID	Analysis Requested	Condition (see legend)	Comments/Action

☐ Client informed on ________ by ________. Person contacted: ____________.

☐ Noted actions in comments section above.

☐ No action necessary; process as is.

Project Manager: ________________ Date: ____________

TurnKey Environmental Restoration, LLC

December 4, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results – October 17th, 2003
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of documentation air monitoring performed at the above-referenced site on October 17th, 2003. The documentation air monitoring event was requested by the NYSDEC to check air quality during slurry wall excavation and force main installation.

The monitoring involved collection of samples at three (3) monitoring stations. The approximate locations of the stations are shown on Figure 1. Based on the westerly wind direction two downwind stations were placed on the eastern side of the slurry wall excavation and force main installation. The upwind station was located on the western side of the slurry wall excavation and force main installation.

The Summa canisters were fitted with preset inlet regulator valves to draw a continuous air sample for 8 hours. Sample collection was initiated by TurnKey Environmental Restoration at approximately 1100 hours on October 17, 2003 and terminated after 6 hours of sample collection. The samples were then transported, under chain-of-custody command, to Severn Trent Laboratories Inc. (STL) in Knoxville, TN for analysis of Target Compound List (TCL) volatile organic compounds (VOCs) as well as naphthalene in accordance with USEPA Method TO-15.

Table 1, attached, summarizes the analytical data for the detected compounds. The analytical laboratory report is presented in Attachment 1. As indicated, only a small number of compounds were detected at trace levels. It should be recognized, however, that the October 17th documentation air monitoring was performed during "worst-case" conditions. Specifically, excavation work was being performed in soil/fill significantly-impacted by petroleum constituents and at a location close to the eastern perimeter of the site. Immediate efforts were undertaken to control odors from the soil/fill, including minimizing the excavation face, transporting the spoils to the western end of the biopad, and covering the excavated soil/fill with polyethylene sheeting. As such, the air impacts were of a short-term duration. The documentation air sampling results do, in fact, support the real time PID monitoring data for October 2003, which consistently show no exceedance of the Community Air Monitoring Plan total VOC threshold of 5ppm above background.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: C. O'Connor (NYSDOH)

File: 0062-008-100, CG

FIGURE 1

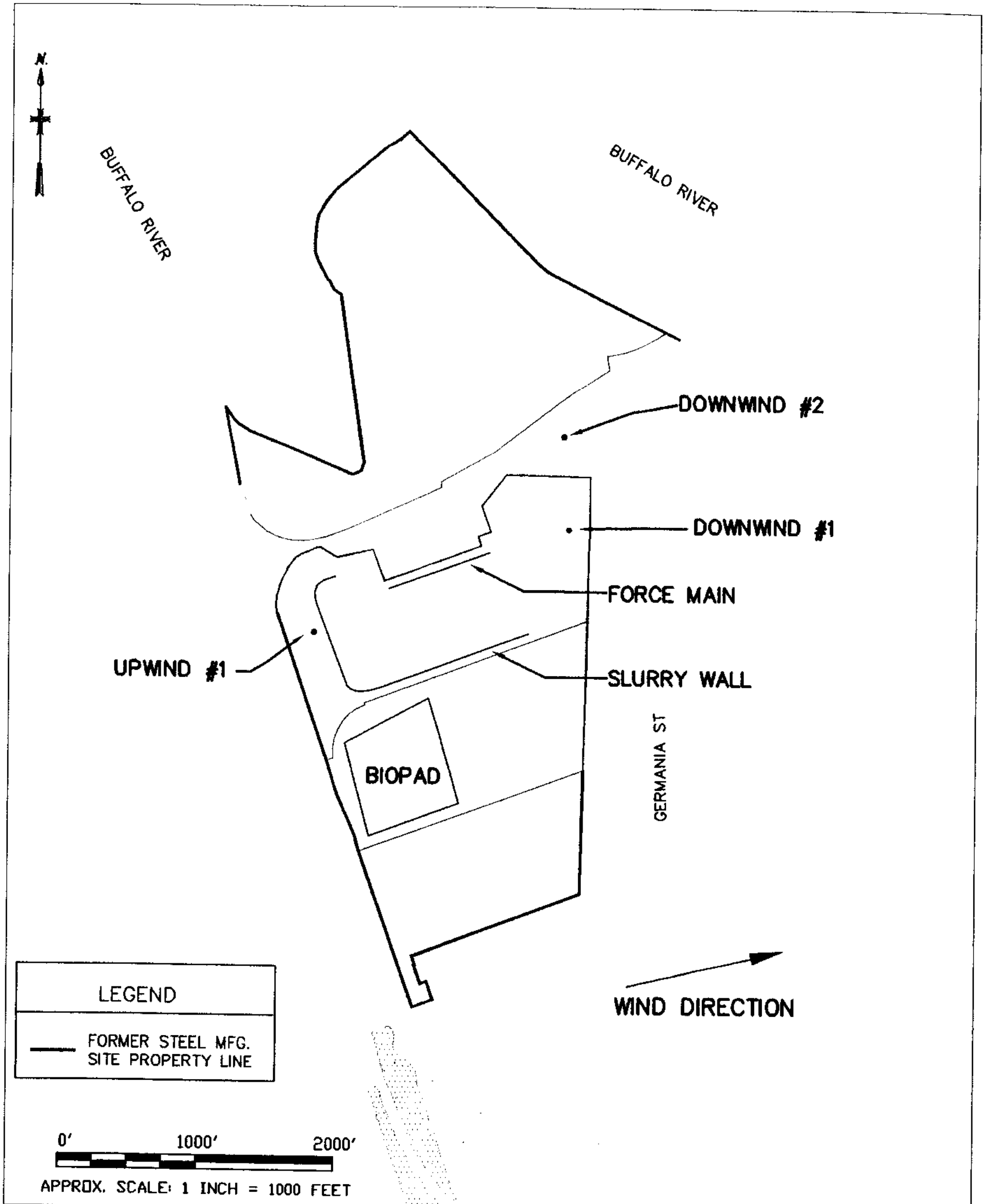
DOCUMENTATION AIR MONITORING RESULTS

SITE MAP WITH SAMPLE LOCATIONS

OCTOBER 17, 2003 SAMPLING EVENT

DATE: ____________________

FIGURE 1



TurnKey Environmental Restoration, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

10/17/03 DOCUMENTATION AIR MONITORING

MONITORING STATION LOCATIONS

TABLE 1

DOCUMENTATION AIR MONITORING RESULTS

SUMMARY OF DOCUMINTATION AIR SAMPLING RESULTS

OCTOBER 17, 2003 SAMPLING EVENT

TABLE 1

STEELFIELDS Ltd. DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
OCTOBER 17, 2003

	SAMPLE LOCATIONS					
	Upwind #1		Downwind #2		Downwind #1	
PARAMETER	(PPBV)	ug/M3	(PPBV)	ug/M3	(PPBV)	ug/M3
VOCS - METHOD TO15						
Benzene	ND < 0.54	ND < 0.54	1.3	4.23	ND < 0.51	ND < 0.51
Dichlorodifluoromethane	0.58	2.92	0.63	3.17	0.66	3.32
Ethylbenzene	ND < 0.54	ND < 0.54	ND < 0.50	ND < 0.50	0.73	3.22
Trichloroethene	ND < 0.54	ND < 0.54	0.76	4.15	ND < 0.51	ND < 0.51
Toluene	ND < 0.54	ND < 0.54	1.3	3.94	1.2	4.60
m/p-Xylenes	ND < 0.54	ND < 0.54	ND < 0.50	ND < 0.50	1.2	5.29
1,2,4 - Trimethylbenzene	0.76	3.80	ND < 0.50	ND < 0.50	1.5	7.50
Trichlorofluoromethane	ND < 0.54	ND < 0.54	0.54	3.08	ND < 0.51	ND < 0.51
Napthalene	ND < 0.54	ND < 0.54	ND < 0.50	ND < 0.50	1.3	6.93

ATTACHMENT 1

DOCUMENTATION AIR MONITORING RESULTS

LABORATORY ANALYTICAL REPORT

OCTOBER 17, 2003 SAMPLING EVENT

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

STL Buffalo
TO15

Lot #: H3J200107

Date Reported: 10/23/03

Client Sample ID: DOWNWIND #1
Sample #: 001 Date Sampled: 10/17/03 16:45 Date Received: 10/20/03 Matrix: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by TO15					Reviewed
Naphthalene	**1.3**	**0.51**	**ppb(v/v)**	**EPA-2 TO-15**	
Dichlorodifluoromethane	**0.66**	**0.51**	**ppb(v/v)**	**EPA-2 TO-15**	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Chloromethane	ND	1.3	ppb(v/v)	EPA-2 TO-15	
Vinyl chloride	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Bromomethane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Chloroethane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Trichlorofluoromethane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,1-Dichloroethene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Methylene chloride	ND	1.3	ppb(v/v)	EPA-2 TO-15	
1,1-Dichloroethane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
cis-1,2-Dichloroethene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Chloroform	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,1,1-Trichloroethane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Carbon tetrachloride	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Benzene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,2-Dichloroethane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Trichloroethene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,2-Dichloropropane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
cis-1,3-Dichloropropene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Toluene	**1.2**	**0.51**	**ppb(v/v)**	**EPA-2 TO-15**	
trans-1,3-Dichloropropene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,1,2-Trichloroethane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Tetrachloroethene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,2-Dibromoethane (EDB)	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Chlorobenzene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Ethylbenzene	**0.73**	**0.51**	**ppb(v/v)**	**EPA-2 TO-15**	
m-Xylene & p-Xylene	**1.2**	**0.51**	**ppb(v/v)**	**EPA-2 TO-15**	
o-Xylene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Styrene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,1,2,2-Tetrachloroethane	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,3,5-Trimethylbenzene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,2,4-Trimethylbenzene	**1.5**	**0.51**	**ppb(v/v)**	**EPA-2 TO-15**	
1,3-Dichlorobenzene	ND	0.51	ppb(v/v)	EPA-2 TO-15	

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

STL Buffalo
TO15

Lot #: H3J200107

Date Reported: 10/23/03

Client Sample ID: DOWNWIND #1
Sample #: 001 Date Sampled: 10/17/03 16:45 Date Received: 10/20/03 Matrix: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by TO15					Reviewed
1,4-Dichlorobenzene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,2-Dichlorobenzene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Benzyl chloride	ND	0.51	ppb(v/v)	EPA-2 TO-15	
1,2,4-Trichloro-benzene	ND	0.51	ppb(v/v)	EPA-2 TO-15	
Hexachlorobutadiene	ND	0.51	ppb(v/v)	EPA-2 TO-15	

Client Sample ID: DOWNWIND #2
Sample #: 002 Date Sampled: 10/17/03 16:52 Date Received: 10/20/03 Matrix: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by TO15					Reviewed
Naphthalene	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Dichlorodifluoromethane	**0.63**	**0.50**	**ppb(v/v)**	**EPA-2 TO-15**	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Chloromethane	ND	1.3	ppb(v/v)	EPA-2 TO-15	
Vinyl chloride	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Bromomethane	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Chloroethane	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Trichlorofluoromethane	**0.54**	**0.50**	**ppb(v/v)**	**EPA-2 TO-15**	
1,1-Dichloroethene	ND	0.50	ppb(v/v)	EPA-2 TO-15	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Methylene chloride	ND	1.3	ppb(v/v)	EPA-2 TO-15	
1,1-Dichloroethane	ND	0.50	ppb(v/v)	EPA-2 TO-15	
cis-1,2-Dichloroethene	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Chloroform	ND	0.50	ppb(v/v)	EPA-2 TO-15	
1,1,1-Trichloroethane	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Carbon tetrachloride	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Benzene	**1.3**	**0.50**	**ppb(v/v)**	**EPA-2 TO-15**	
1,2-Dichloroethane	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Trichloroethene	**0.76**	**0.50**	**ppb(v/v)**	**EPA-2 TO-15**	
1,2-Dichloropropane	ND	0.50	ppb(v/v)	EPA-2 TO-15	
cis-1,3-Dichloropropene	ND	0.50	ppb(v/v)	EPA-2 TO-15	
Toluene	**1.3**	**0.50**	**ppb(v/v)**	**EPA-2 TO-15**	
trans-1,3-Dichloropropene	ND	0.50	ppb(v/v)	EPA-2 TO-15	

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

STL Buffalo
TO15

Lot #: H3J200107

Date Reported: 10/23/03

Client Sample ID: DOWNWIND #2
Sample #: 002 Date Sampled: 10/17/03 16:52 Date Received: 10/20/03 Matrix: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Volatile Organics by TO15				Reviewed
1,1,2-Trichloroethane	ND	0.50	ppb(v/v)	EPA-2 TO-15
Tetrachloroethene	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,2-Dibromoethane (EDB)	ND	0.50	ppb(v/v)	EPA-2 TO-15
Chlorobenzene	ND	0.50	ppb(v/v)	EPA-2 TO-15
Ethylbenzene	ND	0.50	ppb(v/v)	EPA-2 TO-15
m-Xylene & p-Xylene	ND	0.50	ppb(v/v)	EPA-2 TO-15
o-Xylene	ND	0.50	ppb(v/v)	EPA-2 TO-15
Styrene	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,1,2,2-Tetrachloroethane	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,3,5-Trimethylbenzene	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,2,4-Trimethylbenzene	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,3-Dichlorobenzene	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,4-Dichlorobenzene	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,2-Dichlorobenzene	ND	0.50	ppb(v/v)	EPA-2 TO-15
Benzyl chloride	ND	0.50	ppb(v/v)	EPA-2 TO-15
1,2,4-Trichloro-benzene	ND	0.50	ppb(v/v)	EPA-2 TO-15
Hexachlorobutadiene	ND	0.50	ppb(v/v)	EPA-2 TO-15

Client Sample ID: UPWIND #1
Sample #: 003 Date Sampled: 10/17/03 17:00 Date Received: 10/20/03 Matrix: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Volatile Organics by TO15				Reviewed
Naphthalene	ND	0.54	ppb(v/v)	EPA-2 TO-15
Dichlorodifluoromethane	**0.58**	**0.54**	**ppb(v/v)**	**EPA-2 TO-15**
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.54	ppb(v/v)	EPA-2 TO-15
Chloromethane	ND	1.4	ppb(v/v)	EPA-2 TO-15
Vinyl chloride	ND	0.54	ppb(v/v)	EPA-2 TO-15
Bromomethane	ND	0.54	ppb(v/v)	EPA-2 TO-15
Chloroethane	ND	0.54	ppb(v/v)	EPA-2 TO-15
Trichlorofluoromethane	ND	0.54	ppb(v/v)	EPA-2 TO-15
1,1-Dichloroethene	ND	0.54	ppb(v/v)	EPA-2 TO-15
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	0.54	ppb(v/v)	EPA-2 TO-15
Methylene chloride	ND	1.4	ppb(v/v)	EPA-2 TO-15

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: H3J200107 — **STL Buffalo** TO15 — **Date Reported:** 10/23/03

Client Sample ID: UPWIND #1
Sample #: 003 Date Sampled: 10/17/03 17:00 Date Received: 10/20/03 Matrix: AIR

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by TO15					Reviewed
1,1-Dichloroethane	ND	0.54	ppb(v/v)	EPA-2 TO-15	
cis-1,2-Dichloroethene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Chloroform	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,1,1-Trichloroethane	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Carbon tetrachloride	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Benzene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,2-Dichloroethane	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Trichloroethene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,2-Dichloropropane	ND	0.54	ppb(v/v)	EPA-2 TO-15	
cis-1,3-Dichloropropene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Toluene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
trans-1,3-Dichloropropene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,1,2-Trichloroethane	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Tetrachloroethene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,2-Dibromoethane (EDB)	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Chlorobenzene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Ethylbenzene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
m-Xylene & p-Xylene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
o-Xylene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Styrene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,1,2,2-Tetrachloroethane	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,3,5-Trimethylbenzene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,2,4-Trimethylbenzene	**0.76**	**0.54**	**ppb(v/v)**	**EPA-2 TO-15**	
1,3-Dichlorobenzene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,4-Dichlorobenzene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,2-Dichlorobenzene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Benzyl chloride	ND	0.54	ppb(v/v)	EPA-2 TO-15	
1,2,4-Trichloro-benzene	ND	0.54	ppb(v/v)	EPA-2 TO-15	
Hexachlorobutadiene	ND	0.54	ppb(v/v)	EPA-2 TO-15	

TurnKey Environmental Restoration, LLC

November 25, 2003

Mr. Gregory Sutton, P.E.
Project Manager
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Documentation Air Sampling Results- September2003
Steelfields Site, Buffalo, NY

Dear Mr. Sutton:

TurnKey Environmental Restoration, LLC has prepared this correspondence on behalf of our Client, Steelfields, Ltd, to present the results of scheduled documentation air monitoring performed at the above-referenced site on November 5, 2003. The documentation air monitoring work was performed concurrent with the performance of significant excavation of sub area Q in Area I.

The monitoring involved collection of samples for respirable particulates, inorganic lead and total chromium at three (3) monitoring stations using six Gilian™ air sample pumps. The approximate locations of the monitoring stations are shown on Figure 1. Downwind stations were comprised of Gilian™ Pumps placed on ladders on the Eastern Side of the excavation. The upwind pump was placed on a ladder on the Western side of the excavation.

Sample collection for respirable particulates consisted of a Gilian™ air sampling pump fitted with a nylon Dorr-Oliver cyclone filter to remove particulate matter greater than 10 microns (i.e., non-respirable particulates) followed by a 0.5 um pre-weighed PVC filter cartridge as specified under NIOSH Method 0600. The pumps for particulate sampling were calibrated prior to the start of sampling against a target airflow rate of 1.7 liters per minute. Following calibration, the pumps and filters were transported to the monitoring stations. The intake tubing was positioned and tethered to the ladder at a height approximately 5-feet above grade to collect air at an elevation representative of the breathing zone. Pumps were activated and allowed to run for approximately 8 hours. The filter cartridges were then removed, sample collection times were recorded, and the volume of air passed through the filter (based on calibrated air flow rate and collection times) was calculated to allow determination of the particulate concentration by the analytical laboratory. Table 1 presents a summary of the daily calibrated flow rates, sample collection times, and volume of sample collected at each monitoring station. Weather conditions experienced during the monitoring period are also presented. Filter cartridges were transported via Severn Trent Laboratories (STL) to Galson Laboratories in Syracuse, New York for analysis of respirable particulate matter per NIOSH Method 0600.

Sample collection for total chromium and inorganic lead consisted of a Gilian™ air sampling pump followed by a 0.8 um cellulose ester filter cartridge as specified under NIOSH Method 7300. The pumps for total chromium and inorganic lead were calibrated prior to the start of sampling against a target airflow rate of 2.0 liters per minute. Following calibration, the pumps and filters were set up in the same manner as the respirable particulate pumps and cartridges. Filter Cartridges were transported via Severn Trent Laboratories (STL) to Galson Laboratories in Syracuse, New York for analysis of total chromium and inorganic lead per NIOSH Method 7300.

Table 2, attached, summarizes the analytical data for the detected respirable particulates, total chromium and inorganic lead. The documentation air sampling results support the real time particulate monitoring data, which with limited exception consistently show no exceedance of the Community Air Monitoring Plan respirable particulate limits of 150 ug/m^3 above background.

The Analytical laboratory reports are presented in Attachment 1. Field records identifying work completed at the site on November 5th, meteorological data, and equipment calibration records are presented as Attachment 2.

Please contact us if you have any questions or require additional information.

Sincerely,
TurnKey Environmental Restoration, LLC

Thomas H. Forbes, P.E.
Project Manager

C: C. O'Connor (NYSDOH)

File: 0062-008-100, CG

TurnKey Environmental Restoration, LLC

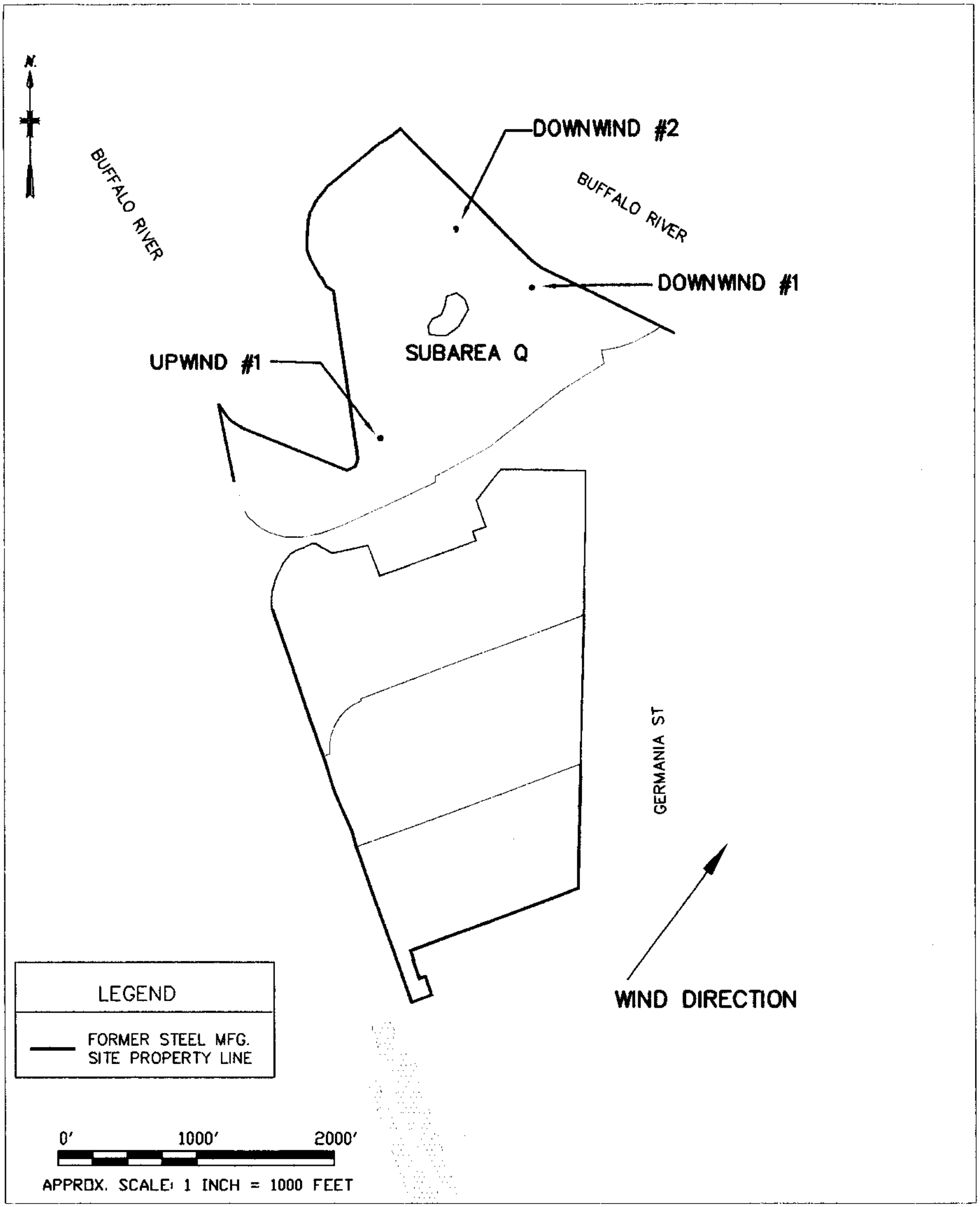
FIGURE 1

DOCUMENTATION AIR MONITORING

SITE MAP WITH SAMPLE LOCATIONS

NOVEMBER 5, 2003 SAMPLING EVENT

DATE: ______________________ FIGURE 1



TURNKEY ENVIRONMENTAL RESTORATION, LLC

STEELFIELDS, LTD.
BUFFALO, NEW YORK

11/05/03 DOCUMENTATION AIR MONITORING

AFTERNOON MONITORING STATION LOCATIONS

TABLE 1

DOCUMENTATION AIR MONITORING

SAMPLE DURATION AND VOLUME

NOVEMBER 5, 2003 SAMPLING EVENT

TABLE 1
STEELFIELDS SITE DOCUMENTATION AIR MONITORING
5-Nov-03
SAMPLE DURATION AND VOLUME

Date	Weather Conditions	Sample Station	Pump Flow Rate (L/min)	Sample Start Time	Sample Stop Time	Duration (hrs/minutes)	Sample Volume (L)
11/5/2003	58° - 65°F wind from SSW, 12 - 20 mph Intermittent rain	Downwind #1- Pump 2 (particulate)	1.7	7:12	15:23	8:11	834.70
11/5/2003		Downwind #1- Pump 5 (metals)	1.97	7:12	15:23	8:11	967.27
11/5/2003		Downwind #2 - Pump 6 (metals)	2.12	7:17	15:30	8:13	1045.16
11/5/2003		Downwind #2 - Pump 3 (particulate)	1.69	7:17	15:30	8:13	833.17
11/5/2003		Upwind #1- Pump 4 (metals)	2.03	7:00	15:12	8:12	998.76
11/5/2003		Upwind #1- Pump 1 (particulate)	1.72	7:00	15:12	8:12	846.24

TABLE 2

DOCUMENTATION AIR MONITORING

SUMMARY OF DOCUMINTATION AIR SAMPLING RESULTS

NOVEMBER 5, 2003 SAMPLING EVENT

TABLE 2

STEELFIELDS SITE DOCUMENTATION AIR MONITORING
SUMMARY OF DOCUMENTATION AIR SAMPLING RESULTS
5-Nov-03

PARAMETER	SAMPLE LOCATIONS					
	Downwind # 3		Downwind # 2		Upwind # 1	
Particulates - NIOSH 0600	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**	**Total mg**	**(mg/M3)**
Respirable particulates	<0.05	<0.06	<0.05	<0.06	<0.05	<0.06
Inorganic Lead	< 0.00038	< 0.0004	< 0.00038	< 0.0004	< 0.00038	< 0.0004
Total Chromium	<0.0015	<0.002	<0.0015	<0.001	<0.0015	<0.002

ATTACHMENT 1
DOCUMENTATION AIR MONITORING RESULTS

LABORATORY ANALYTICAL REPORT

NOVEMBER 5, 2003 SAMPLING EVENT

FAX

Galson Laboratories
6601 Kirkville Road
East Syracuse, NY 13057

Phone: 315-437-7252
Fax: 315-437-0571
www.galsonlabs.com

To: Mr. Tom Forbes

Company: Turnkey Environmental

Fax: 1-716-856-0583

From: Report Generation

Subject: Lab Results for L98879

Memo: Laboratory Results

IF THERE IS A PROBLEM WITH THIS TRANSMITTAL, OR IF YOU HAVE ANY QUESTIONS, PLEASE CALL (315) 437-7252, EXTENSION 239. THANK YOU!

Date: 11/18/03 **Time:** 11:59 AM EST **Pages Sent:** 4

Mr. Tom Forbes
Turnkey Environmental
50 Fountain Plaza
Suite 1350
Buffalo, NY 14202

November 18, 2003

DOH ELAP# 11626 Account# 12074 Login# L98879

Dear Mr. Forbes:

Enclosed are the analytical results of the samples received by our laboratory November 11, 2003. All test results meet the quality control requirements of AIHA and NELAC unless otherwise stated in this report.

Results in this report are based on the sampling data provided by the client and refer only to items tested. Unless otherwise requested, all samples will be discarded thirty days from the date of this report.

Please contact your client service representative, Tonya McGuiggan at (877) 482-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

F. Joseph Unangst
Laboratory Director

Enclosure(s)

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Steelfields

Date Sampled : 05-NOV-03
Date Received : 11-NOV-03
Date Analyzed : 17-NOV-03

Account No.: 12074
Login No. : L98879

Total Chromium

Sample ID	Lab ID	Air Vol liter	Total ug	Conc mg/m3
UPWIND #1	L98879-1	998.76	<1.5	<0.002
DOWNWIND #1	L98879-2	967.27	<1.5	<0.002
DOWNWIND #2	L98879-3	1045.16	<1.5	<0.001
LAB BLANK	L98879-4	NA	<1.5	NA

COMMENTS: OSHA PEL:
Chromium II and Chromium III - 0.5 mg/m3
Chromium metal (as Cr) - 1 mg/m3

Level of quantitation: 1.5 ug
Analytical Method : mod. NIOSH 7300; ICP-MS
OSHA PEL (TWA) : Varies, see above
Collection Media : Filter

Submitted by: SR
Approved by : LS
Date : 18-NOV-03
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Steelfields

Date Sampled : 05-NOV-03
Date Received : 11-NOV-03
Date Analyzed : 17-NOV-03

Account No.: 12074
Login No. : L98879

Inorganic Lead

Sample ID	Lab ID	Air Vol m3	Total ug	Conc ug/m3
UPWIND #1	L98879-1	0.99876	<0.38	<0.4
DOWNWIND #1	L98879-2	0.96727	<0.38	<0.4
DOWNWIND #2	L98879-3	1.04516	<0.38	<0.4
LAB BLANK	L98879-4	NA	<0.38	NA

Level of quantitation: 0.38 ug
Analytical Method : mod. NIOSH 7300; ICP-MS
OSHA PEL (TWA) : 50 ug/m3
Collection Media : Filter

Submitted by: SR
Approved by : LS
Date : 18-NOV-03
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

FAX

Galson Laboratories
6601 Kirkville Road
East Syracuse, NY 13057

Phone: 315-437-7252
Fax: 315-437-0571
www.galsonlabs.com

To: Mr. Tom Forbes

Company: Turnkey Environmental

Fax: 1-716-856-0583

From: Report Generation

Subject: Lab Results for L98747

Memo: Laboratory Results

IF THERE IS A PROBLEM WITH THIS TRANSMITTAL, OR IF YOU HAVE ANY QUESTIONS, PLEASE CALL (315) 437-7252, EXTENSION 239. THANK YOU!

Date: 11/07/03 **Time:** 04:53 PM EST **Pages Sent:** 3

Mr. Tom Forbes
Turnkey Environmental
50 Fountain Plaza
Suite 1350
Buffalo, NY 14202

November 07, 2003

DOH ELAP# 11626 Account# 12074 Login# L98747

Dear Mr. Forbes:

Enclosed are the analytical results of the samples received by our laboratory November 07, 2003. All test results meet the quality control requirements of AIHA and NELAC unless otherwise stated in this report.

Results in this report are based on the sampling data provided by the client and refer only to items tested. Unless otherwise requested, all samples will be discarded thirty days from the date of this report.

Please contact your client service representative, Tonya McGuiggan at (877) 482-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

F. Joseph Unangst
Laboratory Director

Enclosure(s)

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Steelfields

Date Sampled : 05-NOV-03
Date Received : 07-NOV-03
Date Analyzed : 07-NOV-03

Account No.: 12074
Login No. : L98747

Respirable Dust

Sample ID	Lab ID	Air Vol m3	Total mg	Conc mg/m3
UPWIND #1	L98747-1	0.84624	<0.05	<0.06
DOWNWIND #1	L98747-2	0.83470	<0.05	<0.06
DOWNWIND #2	L98747-3	0.83317	<0.05	<0.06
LAB BLANK	L98747-4	NA	<0.05	NA

COMMENTS: PNOR = Particulates Not Otherwise Regulated.

Level of quantitation: 0.05 mg
Analytical Method : NIOSH 0600; GRAV
OSHA PEL (TWA) : PNOR 5 mg/m3
Collection Media : PVC PW

Submitted by: kk
Approved by : OVK
Date : 07-NOV-03
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

ATTACHMENT 2
DOCUMENTATION AIR MONITORING RESULTS

FIELD DATA/FORMS

NOVEMBER 5, 2003 SAMPLING EVENT

DOCUMENTATION AIR MONITORING
AT THE FORMER STEEL MANUFACTURING SITE

DAILY CALIBRATION RECORD FOR GILIAN AIR SAMPLING PUMPS

Date 11/04/03

Pump 3 Serial No. 15272/ Cart # 181640 Calibrated Flowrate (L/min): 1.69
Pump 2 Serial No. 15271/ Cart # 181648 Calibrated Flowrate (L/min): 1.70
Pump 1 Serial No. 15270/ Cart # 181642 Calibrated Flowrate (L/min): 1.72
Pump 4 Serial No. 15273 Calibrated Flowrate (L/min): 2.03
Pump 5 Serial No. 15274 Calibrated Flowrate (L/min): 1.97
Pump 6 Serial No. 15145 Calibrated Flowrate (L/min): 2.12
Calibrations Performed by ______

Date ______

Pump 1 Serial No. ______ Calibrated Flowrate (L/min): ______
Pump 2 Serial No. ______ Calibrated Flowrate (L/min): ______
Pump 3 Serial No. ______ Calibrated Flowrate (L/min): ______
Pump 4 Serial No. ______ Calibrated Flowrate (L/min): ______
Pump 5 Serial No. ______ Calibrated Flowrate (L/min): ______
Pump 6 Serial No. ______ Calibrated Flowrate (L/min): ______
Calibrations Performed by ______

Date ______

Pump 1 Serial No. ______ Calibrated Flowrate (L/min): ______
Pump 2 Serial No. ______ Calibrated Flowrate (L/min): ______
Pump 3 Serial No. ______ Calibrated Flowrate (L/min): ______
Pump 4 Serial No. ______ Calibrated Flowrate (L/min): ______
Pump 5 Serial No. ______ Calibrated Flowrate (L/min): ______
Pump 6 Serial No. ______ Calibrated Flowrate (L/min): ______
Calibrations Performed by ______

Additional Comments:

TurnKey Environmental Restoration LLC

DOCUMENTATION AIR MONITORING
FORMER STEEL MANUFACTURING SITE

GILIAN AIR SAMPLING PUMP DATA RECORD

Date 11/5/03
Designated Location ____________________

Pump #1 Serial Number 1527C/SSI 181642 Parameter respirable particulates
Initial Pumping Rate (L/min) 1.72 Start Time 0700

Upwind 1
pump 1

Time	Pumping Rate (L/min)

End Time 1512

Pump #2 Serial Number 15271/SSI# 181698 Parameter respirable particulates
Initial Pumping Rate (L/min) 1.70 Start Time 0712

Downwind
#1
pump 2

Time	Pumping Rate (L/min)

End Time 1523

Notes:

DOCUMENTATION AIR MONITORING
FORMER STEEL MANUFACTURING SITE

GILIAN AIR SAMPLING PUMP DATA RECORD

Date 11/5/03
Designated Location ______

Pump #3 Serial Number 15272/ cat # 181640 Parameter respirable particulates
Initial Pumping Rate (L/min) 1.69 Start Time ~~[illegible]~~ 0717

Downwind #2 pump

Time	Pumping Rate (L/min)

End Time 1530

Pump #4 Serial Number ______ Parameter ______
Initial Pumping Rate (L/min) ______ Start Time ______

Time	Pumping Rate (L/min)

End Time ______

Notes:

DOCUMENTATION AIR MONITORING
FORMER STEEL MANUFACTURING SITE

GILIAN AIR SAMPLING PUMP DATA RECORD

Date 11/5/03
Designated Location ____________________

Pump # 4 Serial Number 15273 Parameter Chromium / Lead
Initial Pumping Rate (L/min) 2.03 Start Time 0700

Upwind
#1
Pump 4

Time	Pumping Rate (L/min)

End Time 1512

Pump # 5 Serial Number 15274 Parameter Chromium/Lead
Initial Pumping Rate (L/min) 1.97 Start Time 0712

Downwind
#2
Pump 5

Time	Pumping Rate (L/min)

End Time 1523

Notes:

DOCUMENTATION AIR MONITORING
FORMER STEEL MANUFACTURING SITE

GILIAN AIR SAMPLING PUMP DATA RECORD

Date 11/5/03
Designated Location ______

Pump # 6 Serial Number 15145 Parameter Chromium/Lead
Initial Pumping Rate (L/min) 2.12 Start Time 0717

Downwind #2
Pump 6

Time	Pumping Rate (L/min)

End Time 1530

Pump # Serial Number ______ Parameter ______
Initial Pumping Rate (L/min) ______ Start Time ______

Time	Pumping Rate (L/min)

End Time /

Notes:

GALSON
LABORATORIES

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
Fax: (315) 437 0571
www.galsonlabs.com

Mr. Tom Forbes
Turnkey Environmental
50 Fountain Plaza
Suite 1350
Buffalo, NY 14202

November 18, 2003

DOH ELAP# 11626 Account# 12074 Login# L98879

Dear Mr. Forbes:

Enclosed are the analytical results of the samples received by our laboratory November 11, 2003. All test results meet the quality control requirements of AIHA and NELAC unless otherwise stated in this report.

Results in this report are based on the sampling data provided by the client and refer only to items tested. Unless otherwise requested, all samples will be discarded thirty days from the date of this report.

Please contact your client service representative, Tonya McGuiggan at (877) 482-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

FOR

F. Joseph Unangst
Laboratory Director

Enclosure(s)

COOLEY

The white copy will be returned with your report. Please retain pink copy for your records.

SEVERN TRENT LABORATORIES
208 SOUTH PARK DR, SUITE 1
Colchester VT 05446
TEL # (802) 655-1203

Request For Industrial Hygiene Analysis

Company Name: TurnKey Account #:
Site Name: Steelfields
Sampled By: Tom Behrendt Project #:

☐ Check if Change of Address

Report to: Tom Forbes
TurnKey Environmental
50 Fountain Plaza, Suite 1350
Buffalo NY
Phone: (716) 856-0635

Invoice to: Brian Fischer
Severn Trent Laboratories
10 Hazelwood Dr
Amherst NY
Phone: (716) 691-2600

☐ Purchase order number: ☐ Verbal Authorization:
☐ Credit Card (type): Card #: Exp Date:

☒ Standard Turn-Around Time (5 business days)
☐ Same Day (SD) Next Day(ND) ☐ 12PM ☐ 5PM ☐ 2 Day ☐ 3 Day ☐ 4 Day
Surcharges: SD = 200% ND by 12PM = 150% ND by 5PM = 100% 2 Day= 75% 3 Day = 50% 4 Day = 35%

☐ Fax Results to: Fax #: ( )
☐ Email Results to:

Sample Identification	Date Sampled	Sample Medium Catalog # / Lot #	Air Sample Volume (liters)*	Analysis Requested	Method Reference
upwind # 1	11/5/03	3pc cassette not Gelman cart # 4	998.76	Chromium/Lead	NIOSH 7300
Downwind # 1	11/5/03	cart # 5	967.27	Chromium/Lead	NIOSH 7300
Downwind # 2	11/5/03	cart # 6 *	1045.16	Chromium/Lead	NIOSH 7300

If blanks are not submitted, our policy states that a laboratory blank will be added for each analyte and it will be charged at the normal rate. IF YOU DO NOT WANT A LABORATORY BLANK ADDED PLEASE CHECK BOX ☐

*For passive monitors please list time exposed in minutes.

Comments (Please list any known interferences present in sampling area):
* Blank Not Submitted

Chain of Custody	Print Name	Signature	Date/Time
Relinquished by:	Thomas A Behrendt	Thomas A Behrendt	
Received by LAB.	M. Krause	M. Krause	11/11/03 1030 AM

GALSON LABORATORIES

6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Steelfields

Date Sampled : 05-NOV-03
Date Received : 11-NOV-03
Date Analyzed : 17-NOV-03

Account No.: 12074
Login No. : L98879

Total Chromium

Sample ID	Lab ID	Air Vol liter	Total ug	Conc mg/m3
UPWIND #1	L98879-1	998.76	<1.5	<0.002
DOWNWIND #1	L98879-2	967.27	<1.5	<0.002
DOWNWIND #2	L98879-3	1045.16	<1.5	<0.001
LAB BLANK	L98879-4	NA	<1.5	NA

COMMENTS: OSHA PEL:
Chromium II and Chromium III - 0.5 mg/m3
Chromium metal (as Cr) - 1 mg/m3

Level of quantitation: 1.5 ug
Analytical Method : mod. NIOSH 7300; ICP-MS
OSHA PEL (TWA) : Varies, see above
Collection Media : Filter

Submitted by: SR
Approved by : LS
Date : 18-NOV-03
QC by:
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

GALSON LABORATORIES
6601 Kirkville Road
East Syracuse, NY 13057
(315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Steelfields

Date Sampled : 05-NOV-03
Date Received : 11-NOV-03
Date Analyzed : 17-NOV-03

Account No.: 12074
Login No. : L98879

Inorganic Lead

Sample ID	Lab ID	Air Vol m3	Total ug	Conc ug/m3
UPWIND #1	L98879-1	0.99876	<0.38	<0.4
DOWNWIND #1	L98879-2	0.96727	<0.38	<0.4
DOWNWIND #2	L98879-3	1.04516	<0.38	<0.4
LAB BLANK	L98879-4	NA	<0.38	NA

Level of quantitation: 0.38 ug
Analytical Method : mod. NIOSH 7300; ICP-MS
OSHA PEL (TWA) : 50 ug/m3
Collection Media : Filter

Submitted by: SR
Approved by : LS
Date : 18-NOV-03
QC by:
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

Mr. Tom Forbes
Turnkey Environmental
50 Fountain Plaza
Suite 1350
Buffalo, NY 14202

November 18, 2003

DOH ELAP# 11626 Account# 12074 Login# L98879

Dear Mr. Forbes:

Enclosed are the analytical results of the samples received by our laboratory November 11, 2003. All test results meet the quality control requirements of AIHA and NELAC unless otherwise stated in this report.

Results in this report are based on the sampling data provided by the client and refer only to items tested. Unless otherwise requested, all samples will be discarded thirty days from the date of this report.

Please contact your client service representative, Tonya McGuiggan at (877) 482-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

F. Joseph Unangst
Laboratory Director

Enclosure(s)

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Steelfields

Date Sampled : 05-NOV-03
Date Received : 11-NOV-03
Date Analyzed : 17-NOV-03

Account No.: 12074
Login No. : L98879

Total Chromium

Sample ID	Lab ID	Air Vol liter	Total ug	Conc mg/m3
UPWIND #1	L98879-1	998.76	<1.5	<0.002
DOWNWIND #1	L98879-2	967.27	<1.5	<0.002
DOWNWIND #2	L98879-3	1045.16	<1.5	<0.001
LAB BLANK	L98879-4	NA	<1.5	NA

COMMENTS: OSHA PEL:
Chromium II and Chromium III - 0.5 mg/m3
Chromium metal (as Cr) - 1 mg/m3

Level of quantitation: 1.5 ug
Analytical Method : mod. NIOSH 7300; ICP-MS
OSHA PEL (TWA) : Varies, see above
Collection Media : Filter

Submitted by: SR
Approved by : LS
Date : 18-NOV-03
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than
> -Greater Than
NA -Not Applicable
mg -Milligrams
ug -Micrograms
ND -Not Detected
m3 -Cubic Meters
l -Liters
ppm -Parts per Million
kg -Kilograms
NS -Not Specified

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Steelfields

Date Sampled : 05-NOV-03
Date Received : 11-NOV-03
Date Analyzed : 17-NOV-03

Account No.: 12074
Login No. : L98879

Inorganic Lead

Sample ID	Lab ID	Air Vol m3	Total ug	Conc ug/m3
UPWIND #1	L98879-1	0.99876	<0.38	<0.4
DOWNWIND #1	L98879-2	0.96727	<0.38	<0.4
DOWNWIND #2	L98879-3	1.04516	<0.38	<0.4
LAB BLANK	L98879-4	NA	<0.38	NA

Level of quantitation: 0.38 ug
Analytical Method : mod. NIOSH 7300; ICP-MS
OSHA PEL (TWA) : 50 ug/m3
Collection Media : Filter

Submitted by: SR
Approved by : LS
Date : 18-NOV-03
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than
> -Greater Than
NA -Not Applicable
mg -Milligrams
ug -Micrograms
ND -Not Detected
m3 -Cubic Meters
l -Liters
ppm -Parts per Million
kg -Kilograms
NS -Not Specified

FAX

Galson Laboratories
6601 Kirkville Road
East Syracuse, NY 13057

Phone: 315-437-7252
Fax: 315-437-0571
www.galsonlabs.com

To: Mr. Tom Forbes

Company: Turnkey Environmental

Fax: 1-716-856-0583

From: Report Generation

Subject: Lab Results for L98747

Memo: Laboratory Results

IF THERE IS A PROBLEM WITH THIS TRANSMITTAL, OR IF YOU HAVE ANY QUESTIONS, PLEASE CALL (315) 437-7252, EXTENSION 239. THANK YOU!

Date: 11/07/03 **Time:** 04:53 PM EST **Pages Sent:** 3

Mr. Tom Forbes
Turnkey Environmental
50 Fountain Plaza
Suite 1350
Buffalo, NY 14202

November 07, 2003

DOH ELAP# 11626 Account# 12074 Login# L98747

Dear Mr. Forbes:

Enclosed are the analytical results of the samples received by our laboratory November 07, 2003. All test results meet the quality control requirements of AIHA and NELAC unless otherwise stated in this report.

Results in this report are based on the sampling data provided by the client and refer only to items tested. Unless otherwise requested, all samples will be discarded thirty days from the date of this report.

Please contact your client service representative, Tonya McGuiggan at (877) 482-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

F. Joseph Unangst
Laboratory Director

Enclosure(s)

Galson Laboratories
6601 Kirkville Rd. E. Syracuse, NY 13057

LABORATORY ANALYSIS REPORT

Client : Severn Trent Laboratories
Site : Steelfields

Date Sampled : 05-NOV-03
Date Received : 07-NOV-03
Date Analyzed : 07-NOV-03

Account No.: 12074
Login No. : L98747

Respirable Dust

Sample ID	Lab ID	Air Vol m3	Total mg	Conc mg/m3
UPWIND #1	L98747-1	0.84624	<0.05	<0.06
DOWNWIND #1	L98747-2	0.83470	<0.05	<0.06
DOWNWIND #2	L98747-3	0.83317	<0.05	<0.06
LAB BLANK	L98747-4	NA	<0.05	NA

COMMENTS: PNOR = Particulates Not Otherwise Regulated.

Level of quantitation: 0.05 mg
Analytical Method : NIOSH 0600; GRAV
OSHA PEL (TWA) : PNOR 5 mg/m3
Collection Media : PVC PW

Submitted by: kk
Approved by : OVK
Date : 07-NOV-03
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

DOCUMENTATION AIR MONITORING
AT THE FORMER STEEL MANUFACTURING SITE

DAILY CALIBRATION RECORD FOR GILIAN AIR SAMPLING PUMPS

Date 11/04/03

Pump ~~1~~ 3 Serial No. 15272/ Cat# 181646 Calibrated Flowrate (L/min): 1.69
Pump 2 Serial No. 15271/ Cat# 181645 Calibrated Flowrate (L/min): 1.70
Pump ~~3~~ 1 Serial No. 15270/ Cat# 181642 Calibrated Flowrate (L/min): 1.72
Pump 4 Serial No. 15273 Calibrated Flowrate (L/min): 2.03
Pump 5 Serial No. 15274 Calibrated Flowrate (L/min): 1.97
Pump 6 Serial No. 15145 Calibrated Flowrate (L/min): 2.12
Calibrations Performed by__________

Date__________

Pump 1 Serial No.__________ Calibrated Flowrate (L/min):__________
Pump 2 Serial No.__________ Calibrated Flowrate (L/min):__________
Pump 3 Serial No.__________ Calibrated Flowrate (L/min):__________
Pump 4 Serial No.__________ Calibrated Flowrate (L/min):__________
Pump 5 Serial No.__________ Calibrated Flowrate (L/min):__________
Pump 6 Serial No.__________ Calibrated Flowrate (L/min):__________
Calibrations Performed by__________

Date__________

Pump 1 Serial No.__________ Calibrated Flowrate (L/min):__________
Pump 2 Serial No.__________ Calibrated Flowrate (L/min):__________
Pump 3 Serial No.__________ Calibrated Flowrate (L/min):__________
Pump 4 Serial No.__________ Calibrated Flowrate (L/min):__________
Pump 5 Serial No.__________ Calibrated Flowrate (L/min):__________
Pump 6 Serial No.__________ Calibrated Flowrate (L/min):__________
Calibrations Performed by__________

Additional Comments:

TurnKey Environmental Restoration LLC

Key Tower, Suite 1350
50 Fountain Plaza
Buffalo, New York 14202
Tel (716)856-0599
Fax (716)856-0583

Steelfields, LTD

Community Air Monitoring Summary Report

April 29, 2003 – July 31, 2003

Summary of Remedial Work Performed During the Period:

Excavation and removal of contaminated soil/fill from the following areas to the Area III biopad:

- Area I: K, L, D, A, N-14

Backfill and general grading of overburden soil/fill at the following areas:

- Area I: D, A, K&L (Partial)

Importation and placement of off-site borrow soils for backfill.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays) except for the following dates due to inclement weather: 5/12; 5/13; 5/16; 5/26; 6/5; 6/11; 6/13; 7/11.

Community Air Monitoring Program Results:

Daily logs (initiated on 6/30/03) are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring Plan perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., 5 ppm), except as described below.

- June 2nd, 2003 - A non-representative particulate reading was recorded during one 15-minute interval at the southernmost downwind station at the end of the day. The reading was attributed to inadvertent failure to de-energize the datalogger as the meter was being transported to the field trailer for downloading. No followup Documentation Air Monitoring was required due to the non-representative nature of the reading.

- July 3rd, 2003 - Elevated particulate measurements were recorded at the southern downwind station during one 15-minute period. The readings were attributed to truck traffic in close proximity to the monitoring equipment and inadequate watering of the site access roads due to mechanical breakdown of the water truck earlier in the day. NYSDEC was consulted and agreed that a Documentation Air Monitoring was not required based on the fact that the exceedances were attributed to truck traffic and no visible dust was observed emanating from the work areas.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- 5/6-5/8 – Performed concurrent with start of significant earthwork in Area I.

- 7/8 – Performed concurrent with excavation of tar and petroleum impacted soil/fill at SubArea K&L in Area I; also concurrent with stockpiling and grading of soils on the Area III biopad.

Documentation Air Monitoring reports for the above-described events were previously transmitted to NYSDEC and NYSDOH for review. As indicated in the reports, the results showed non-detectable concentrations or levels similar to background for all parameters.

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Steelfields, LTD

Community Air Monitoring Summary Report

August 1, 2003 – August 31, 2003

Summary of Remedial Work Performed During the Period:

- Completed backfill, grading and seeding of Area I: K, L, D, A, N-14
- Importation and placement of off-site borrow soils for backfill.
- Initiated slurry wall in Area II.
- Turned Biopad on (2) occasions.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays) except for the following dates due to inclement weather: 8/6; 8/26; 8/29.

Community Air Monitoring Program Results

Community air monitoring field records for the month of August are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring Plan perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., <5 ppm), except as described below.

- No exceedences reported for the month of August

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- 8/22 – 8/23 – Performed over night summa canister sampling for VOCs and naphthalene across the biopad

Documentation Air Monitoring reports for the above-described events will be prepared and transmitted to NYSDEC and NYSDOH for review upon receipt of the analytical results.

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Community Air Monitoring Summary Report

September 1, 2003 – September 30, 2003

Summary of Remedial Work Performed During the Period:

- Completed collection system pipe, manhole and pump station installation.
- Continued construction groundwater pre-treatment system.
- Metallurgical reclamation of coke initiated in Area IV.
- Turned Biopad on four occasions.
- Completed ORC injection in Sub-area K & L.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays) except for the following dates due to inclement weather: 9/2, 9/15[1], 9/19, 9/23, 9/29, 9/30.

Community Air Monitoring Program Results

Community air monitoring field records for the month of September are attached. As indicated, all monitoring results conformed to the September 2003 Community Air Monitoring Plan perimeter particulate thershold (i.e., <150 ug/m^3) and Volatile Organic Compound threshold (i.e., <5 ppm), except as described below.

- September 3rd , 2003 - Elevated PID readings of 6 - 8 ppm were recorded for an approximate ½ hour period. Checked the reading with a separate PID, which gave readings of < 1 ppm. Three attempts were needed to re-zero the original instrument, indicating sensor failure There were no odors detected. DEC stated that no documentation monitoring was needed.
- September 17th , 2003 - Elevated particulate measurements were recorded in Area IV on the first day of coke excavation during one 20-minute period. The readings were attributed to truck traffic in close proximity to the monitoring equipment and inadequate watering of the site access roads. NYSDEC was consulted and agreed that Documentation Air Monitoring was not required based on the fact that the exceedances

[1] Precipitation on this date was intermittent. Monitoring was therefore performed using handheld instruments only; portable stations were not used

were attributed to truck traffic and no visible dust was observed emanating from the excavation areas.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- 9/18 - Performed scheduled respirable particulate documentation air monitoring in Area IV during coke excavation

- 9/22 - Performed scheduled for VOCs, naphthalene and respirable particulates across the biopad during soil tilling work.

A Documentation Air Monitoring Report for the 9/18 event has been submitted to NYSDEC and the NYSDOH. A report for the 9/22 event will be prepared and transmitted to NYSDEC and NYSDOH for review upon receipt of the analytical results.

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Community Air Monitoring Summary Report

October 1, 2003 – October 31, 2003

Summary of Remedial Work Performed During the Period:

- Area 2 groundwater collection system construction is approximately 80% complete. Force Main was instaled and pressure tested.
- Slurry wall completed as of 11/1/03.
- Area II Groundwater Pretreatment Facility is 85% complete. Electrical, Mechanical and HVAC installation in progress. All of the pretreatment equipment has been received and is being installed.
- Sanitary Service was installed to Abby St.
- Bioremediation of petroleum-impacted soil/fill continued in Area III. Weekly mechanical agitation continued.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays), as well as Saturday October 18, 25, except for the following dates due to inclement weather: 10/1, 10/3, 10/20, 10/21, 10/22, 10/27, 10/29.

Community Air Monitoring Program Results:

Daily logs for the October monitoring period are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., 5 ppm), except as described below.

- Low voltage and/or power on the dust meter datalogger caused invalid readings on several occasions. These were attributable to an extended workday (10 hours), which approached the limit of the datalogger battery charge life. Dates on which false positive readings occurred included: October 13th, October 14th , 2003 October 23rd, and October 28th. No visible dust was observed leaving the work area during these periods. Handheld particulate meter readings confirmed that the readings were false positive due to equipment problems. NYSDEC was notified of the events and stated that Documentation Air Monitoring not required.

- October 15th , 2003 - A particulate value of 200 ug/m³ was recorded downwind of the slurry wall trench construction. Work was halted, and improvments were made to the system. The dust was from the dry bentonite being used to makeup the slurry, not from site soils. Accordingly, NYSDEC did not require Documentation Air Monitoring.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- October 17th, 2003 – Documentation Air Monitoring for VOCs and naphthalene was performed at the request of NYSDEC to monitor air quality during slurry wall excavation.

A Documentation Air Monitoring report for the above-described event was previously transmitted to NYSDEC and NYSDOH for review. As indicated in the report, the downwind results generally showed non-detectable concentrations or levels similar to background.

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Community Air Monitoring Summary Report

November 1, 2003 – November 30, 2003

Summary of Remedial Work Performed During the Period:

- Area II groundwater collection system was substantially completed
- Lab results for slurry wall quality assurance and quality control sampling show that all samples meet or exceed design and specifications.
- Mechanical, electrical, and HVAC installation substantially complete for Area II pretreatment Facility.
- Area III bio-pad and Area IV off-site parcel sampling was performed and results were received.
- Reclamation of metallurgical coke from Area IV continued.
- Excavation and backfilling of sub-area Q in Area I was completed.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays), as well as Saturday November 1, except for the following dates due to inclement weather: 11/1, 11/3, 11/5, 11/11, 11/12, 11/13, 11/14, 11/17, 11/19, 11/25. Monitoring was discontinued following the 11/25 event due to discontinuation of intrusive work at the site during the reminder of the month.

Community Air Monitoring Program Results:

Daily logs for the November monitoring period are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., 5 ppm), except as described below. It should be noted, however, that on 11/21/03 particulate data for the day was accidently deleted on the dataloggers. However, no visible dust was observed emanating from the work areas at any time during the course of the day.

- No exceedences reported for the month of November.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- November 5th, 2003 – Documentation Air Monitoring for respirable particulates, chromium and inorganic lead was performed at the request of NYSDEC to monitor air quality during sub-area Q excavation in Area I.

A Documentation Air Monitoring report for the above-described event was previously transmitted to NYSDEC and NYSDOH for review. As indicated in the report, the downwind results generally showed non-detectable concentrations or levels similar to background.

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Community Air Monitoring Summary Report

November 1, 2003 – November 30, 2003

Summary of Remedial Work Performed During the Period:

- Area II groundwater collection system was substantially completed
- Lab results for slurry wall quality assurance and quality control sampling show that all samples meet or exceed design and specifications.
- Mechanical, electrical, and HVAC installation substantially complete for Area II pretreatment Facility.
- Area III bio-pad and Area IV off-site parcel sampling was performed and results were received.
- Reclamation of metallurgical coke from Area IV continued.
- Excavation and backfilling of sub-area Q in Area I was completed.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays), as well as Saturday November 1, except for the following dates due to inclement weather: 11/1, 11/3, 11/5, 11/11, 11/12, 11/13, 11/14, 11/17, 11/19, 11/25. Monitoring was discontinued following the 11/25 event due to discontinuation of intrusive work at the site during the reminder of the month.

Community Air Monitoring Program Results:

Daily logs for the November monitoring period are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., 5 ppm), except as described below. It should be noted, however, that on 11/21/03 particulate data for the day was accidently deleted on the dataloggers. However, no visible dust was observed emanating from the work areas at any time during the course of the day.

- No exceedences reported for the month of November.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- November 5th, 2003 – Documentation Air Monitoring for respirable particulates, chromium and inorganic lead was performed at the request of NYSDEC to monitor air quality during sub-area Q excavation in Area I.

A Documentation Air Monitoring report for the above-described event was previously transmitted to NYSDEC and NYSDOH for review. As indicated in the report, the downwind results generally showed non-detectable concentrations or levels similar to background.

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Community Air Monitoring Summary Report

December 1, 2003 – December 23, 2003

Summary of Remedial Work Performed During the Period:

- Area II groundwater collection system was substantially completed.
- Final lab results for slurry wall quality assurance and quality control sampling have been received.
- Mechanical, electrical, and HVAC installation complete for Area II pretreatment Facility.
- Reclamation of metallurgical coke from Area IV discontinued.
- Relocation of tar-impacted soil/fill from Area III bio-pad into Area II containment cell was initiated.

Real Tme Community Air Monitoring Work Performed:

Monitoring completed on all working days (i.e. M-F, excluding holidays), with the exceptions of the following dates:

- December 1st – December 4th, 2003 – no intrusive work was performed on the site on these dates. As agreed by NYSDEC, no monitoring is required when only non-intrusive activities are being performed.
- December 19th – December 31st, 2003 – winter shutdown – no work performed during this period.
- The following dates due to precipitation and/or wet ground conditions - 12/11, 12/12, 12/15, 12/17, 12/18, 12/19.

Community Air Monitoring Program Results:

Daily logs for the December monitoring period are attached. As indicated, all monitoring results conformed to the August 2003 Community Air Monitoring perimeter particulate requirement (i.e., <150 ug/m^3) and Volatile Organic Compound requirement (i.e., 5 ppm), except as described below.

- December 8th – Truck traffic close to the downwind station created a short term (approximately 15 minutes) exceedence of the particulate limit, the haul road was subsequently regraded to bring moister soil to surface, which corrected the problem.

Documentation Air Monitoring Work Performed:

Documentation Air Monitoring Work is performed at the beginning of each new stage of work, following a significant change in the types of contaminants expected to be encountered, or when a Community Air monitoring Program threshold is exceeded. A summary of the documentation air monitoring events undertaken during the reporting period is presented below.

- December 12th and December 18th, 2003 – Documentation Air Monitoring for respirable particulates and volatile organic compounds, including naphthalene, was performed at the request of NYSDEC to monitor air quality during tar impacted soil relocation from the Area III biopad to the containment in Area II.

Documentation Air Monitoring reports for the above-described events were previously transmitted to NYSDEC and NYSDOH for review. As indicated in the reports, the downwind results generally showed non-detectable concentrations or levels similar to background.

SOIL/FILL MANAGEMENT PLAN
for
FORMER STEEL MANUFACTURING SITE

FORMER STEEL MANUFACTURING SITE
BUFFALO, NY

March 2000 0062-001-100
Revised September 2006
Revised April 2007

Prepared for:

Steelfields, LTD.
Buffalo, NY

SOIL/FILL MANAGEMENT PLAN FOR FORMER STEEL MANUFACTURING SITE

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SOIL/FILL MANAGEMENT PLAN FOR FORMER STEEL MANUFACTURING SITE

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1.0 INTRODUCTION

1.1 Background

LTV Steel Company owns, or co-owns with The Hanna Furnace Corporation, a vacant industrial property located along the Buffalo River in Buffalo, New York (See Figure 1-1 and Figure 1-2). The property, hereinafter referred to as the Former Steel Manufacturing Site or Site, is subdivided into four parcels (refer to Figure 1-3) totaling 219 acres, more or less, based on the operational and ownership history of each. The parcels are designated:

- Area I –Republic Steel Plant Parcel
- Area II –Donner-Hanna Coke Plant Parcel
- Area III –Republic Warehouse Parcel
- Area IV –Donner-Hanna Coke Yard Parcel

Two Voluntary Cleanup Site Assessment Reports (April, 1999) were prepared; one characterizing environmental conditions in Area I and the other characterizing the environmental conditions in Area II, III and IV. Two addendum reports to the Area I report (October 1999 and January 2000) and one to the Area II, III, and IV report (January 2000) were prepared to present supplemental site investigation data.

A voluntary cleanup of the Site will be performed in accordance with a Remedial Design/Remedial Action (RD/RA) Work Plan approved by the New York State Department of Environmental Conservation (NYSDEC). The voluntary cleanup program will render the Site suitable for planned redevelopment and use for commercial and industrial purposes.

1.2 Purpose and Scope

The purpose of this Soil/Fill Management Plan (S/FMP) is to protect both the

environment and human health during redevelopment of the Site, subsequent to completion of Voluntary Cleanup activities.

While an assessment of surface and subsurface soil/fill and groundwater at the Site has already been performed and additional off-site field investigations are planned in accordance with the RD/RA Work Plan, subsurface information is never 100 percent complete or accurate, especially on such a large site with a long and diverse manufacturing history. As such, it is not unreasonable to anticipate the possibility that some quantity of subsurface soil/fill contamination may be encountered after completion of the Voluntary Cleanup. In particular, soil/fill contamination may be encountered during development activities such as infrastructure construction (i.e. roads, waterline, sewers, electric cable etc.) or foundation excavation and site grading.

Compliance with this S/FMP is required to properly manage subsurface soil contamination. This S/FMP was developed and incorporated into the Voluntary Cleanup Agreement for the Site with the express purpose of addressing unknown subsurface contamination if and when encountered, thus maintaining the release and covenant not to sue by the NYSDEC. The S/FMP also facilitates the transfer of responsibilities with property ownership.

This S/FMP provides protocols for the proper handling of site soil/fill during development activities, including:

- excavation, grading, sampling and handling of site soils.
- acceptability of soils/fill from off-site sources for backfill or subgrade fill.
- erosion and dust control measures.
- fencing and other access controls.
- health and safety procedures for subsurface construction work and the protection of the surrounding community.
- acceptability and placement of final soil and vegetative cover.
- deed restrictions.

- rezoning of the property.
- program responsibilities.
- notification and reporting requirements.

1.3 Soil/Fill Management Program Responsibility

The developer, Steelfields, LLC and the property owner(s) will be responsible for all monitoring, implementation and reporting requirements of the S/FMP. The developer and owner will not perform, nor contract, nor permit their employees, agents, or assigns to perform any excavations or disturbance of site soils, except as delineated in this S/FMP. Any excavation, regrading or disturbance of on-site soils inconsistent with the provisions of the Plan may be grounds for NYSDEC to void its release from claims, actions, suits, proceeding by the Department against the site owner(s), successor(s) or assigns for environmental conditions on the Site. Such nonconformance with this S/FMP may also void or limit environmental insurance protection of the owner(s) and their successors and assigns in accordance with policy terms and conditions. The property owner(s) or their agents will be responsible for proper notification and reporting to regulatory agencies (i.e., NYSDEC Region 9, Division of Environmental Remediation and NYS Department of Health) prior to and following site development as described in Section 2.8.

The NYSDEC will provide periodic construction oversight and monitoring during site redevelopment activities to verify that the requirements of this S/FMP are adhered to.

2.0 SOIL/FILL MANAGEMENT

2.1 Excavation and Handling of On-Site Soil/Fill

TurnKey Environmental Restoration, LLC or a Professional Engineer with experience in environmental site investigations and the New York State Voluntary Cleanup Program will inspect soil/fill excavations or disturbances on behalf of the subject property owner. The soil/fill will be inspected for staining or discoloration, and will be field screened for the presence of volatile organic compounds (VOCs) with a photoionization detector (PID). The PID detector will be calibrated as per the manufacturer's requirements. Excavated soil/fill that is visibly petroleum or tar-stained, discolored or produces elevated PID readings (i.e. sustained readings of 5 ppm above background or greater) will be stockpiled in an area away from the primary work activities and then sampled for reuse, treatment or disposal. The length of time that potentially impacted soil can be temporarily stockpiled while awaiting analytical results shall be limited to 21 days. Sampling and analysis will be in accordance with the protocols delineated in Section 2.3. Analyzed soil/fill that is determined to contain one or more constituents in excess of the site-specific action levels (SSALs) and additional criteria shown in Table 2-1 shall be covered or treated on-site according to a NYSDEC-approved treatment plan or transported off-site to a permitted waste management facility for disposal. Soil/fill that exhibits no petroleum or tar staining, discoloration or elevated PID readings, or soil/fill, which has been analyzed and found to meet SSALs, may be reused on-site as subgrade backfill. No excavated soil/fill may be removed from the site except for off-site disposal at a permitted waste management facility.

2.2 Subgrade Material

Subgrade material used to backfill excavations or to increase site grades or elevations shall meet the following criteria:

- Excavated on-site soil/fill meeting the requirements of Section 2.1.

- On-site soil/fill treated in accordance with a NYSDEC-approved treatment plan and tested to meet the requirements of Table 2-1.

- Off-site soil/fill originating from known sources having no evidence of disposal or releases of hazardous substances, hazardous, toxic or radioactive wastes, or petroleum and tested to meet all SSALs.

- All off-site sources of material to be used as backfill must be tested in accordance with the Sampling and Analytical Protocol (Section 2.3), and found to contain concentrations less than criteria listed in Table 2-1 plus organic pesticides/herbicides and PCBs as defined in Appendix A of Technical and Administrative Guidance Memorandum (TAGM) Number 4046.

- No off-site materials meeting the definition of a solid waste as defined in 6 NYCRR, Part 360-1.2 (a) shall be used as backfill.

TABLE 2-1

PARAMETER	MAXIMUM CONCENTRATION IN SOIL/FILL (mg/kg) (1,2)
Individual VOC	1
Total VOCs (3)	10
Total SVOCs (4)	500
Total cPAHs (5)	10
Arsenic	75
Barium	1,000
Cadmium	15
Chromium	1,000
Lead	1,000
Mercury	10
Selenium	61
Silver	10
Cyanide (Total Amenable)	1,600

NOTES:

(1) Off-site backfill material shall also meet recommended soil cleanup objectives for organic pesticides/herbicides and PCBs as defined in TAGM 4046.
(2) All analyses shall be performed per USEPA SW-846 methodology or other methods acceptable to NYSDEC.
(3) NYSDEC STARS List VOCs per USEPA Method 8021
(4) Target Compound List (TCL) SVOCs per USEPA Method 8270

(5) Carcinogenic polynuclear aromatic hydrocarbons (i.e., benzo(a)anthracene, benzo(a)pyrene, dibenzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene per USEPA Method 8270.

2.3 Soil/Fill Sampling and Analysis Protocol

2.3.1 Excavated On-Site Soil/Fill

Excavated soil/fill that is visibly stained, discolored or produces elevated PID readings will be sampled and classified for reuse, treatment or off-site disposal. A tiered approach based upon the volume of soil/fill being excavated will be used to determine the frequency of sampling. A minimum of one composite sample will be collected for each 250 cubic yards up to1000 cubic yards of material excavated. If more than 1,000 cubic yards of soils are excavated from the same general vicinity and all samples of the first 1,000 cubic yards meet the SSALs in Table 2-1, the sample collection frequency may be reduced to one composite for each additional 1,000 cubic yards of soil from the same general vicinity, up to 5,000 cubic yards. For excavations that generate greater than 5,000 cubic yards, sampling frequency may be reduced to one sample per 5,000 cubic yards, providing all earlier samples met SSALs. A minimum of four grab samples will be collected for each composite sample. Approximately equal aliquots of the grab samples will be composited in the field using a stainless steel trowel and bowl. The trowel and bowl shall be decontaminated with detergent and tap water between sampling locations. The composite sample will be analyzed by a NYSDOH ELAP certified laboratory for the parameters listed on Table 2-1. VOCs may be excluded from the analysis provided that the soil/fill does not exhibit elevated PID readings.

Any excavated soil that produces elevated PID readings will be separately stockpiled in 1000 cubic yard or smaller piles. A single grab sample will be collected from the stockpile from the zone displaying the most elevated field PID reading. The grab sample will be analyzed by a NYSDOH ELAP certified laboratory for volatile organic compounds (EPA Method 8021). A composite sample shall also be prepared from each stockpile for analysis of the other parameters listed in Table 2-1.

If the analysis of the soil/fill samples reveals levels of parameters greater than one or more SSAL, then a duplicate sample will be analyzed by the Toxicity Characteristic Leaching Procedure (TCLP) method for the particular metal or compounds in question to determine the appropriate off-site disposal method. If TCLP hazardous waste characteristic values are exceeded, the soil/fill will be disposed of in a permitted hazardous waste disposal facility. If TCLP analytical results are below hazardous waste characteristic values, the soil/fill will be either disposed of off-site in a permitted sanitary landfill or possibly on-site within the Area II containment cell.

The containment cell may be used as an on-site disposal area only if:

- The groundwater collection, containment and treatment systems are fully functional,
- The final cover system construction has not been completed,
- There is sufficient space available based on the containment cell design, and
- Prior written approval is received from both the NYSDEC and owner/operator of the containment cell.

All soil/fill disposed of within the containment cell will be compacted in maximum twelve-inch lifts to specified density and uniformly graded to promote positive surface water runoff. Proper erosion and dust control methods as described in Section 2.5 will be implemented during soil placement activities.

2.4 Final Surface Coverage

Vegetative or other (e.g., asphalt, buildings, concrete) surface coverage over the entire redeveloped parcel will be required by the developer or owner as a pre-condition of occupancy.

Topsoil used for the final soil cover shall meet the following general specifications:

1. Fertile, friable, natural loam surface soil, capable of sustaining plant growth, free of, clods of hard earth, plants or roots, sticks or other extraneous material harmful to plant growth. Supply a well-graded topsoil with the following approximate analysis:

   (a)

Sieve Size	Percent Passing by Weight
3-inch	100
No. 4	>75
No. 200	>30
0.002 mm	<20

   (b) pH 5.5 to pH 7.6.

   (c) Minimum organic content of 2.5 percent as determined by ignition loss.

   (d) Soluble salt content not greater than 500 ppm.

2. Before delivery, collect soil samples for every 5,000 cubic yards of topsoil provided by Developer.

In addition to the above specifications, all topsoil must be tested and found to contain constituent concentrations less than those specified in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046.
TAGM 4046 establishes soil cleanup objectives for inorganics based on site background. The following background levels for heavy metals will be utilized for topsoil:

Parameter	Concentration (mg/kg)
Arsenic	25
Barium	1000
Cadmium	15
Chromium	350
Lead	400
Mercury	1.0
Selenium	5.0
Silver	5.0

(Note: The methodology used to develop background levels for the above described metals (except lead) is based on background concentrations throughout the Buffalo, N.Y. area as described in Appendix A of the April 1999 Site

Assessment Reports. The proposed limit for lead was derived from the February 1998 NYSDEC document entitled Guidelines for Petroleum Spill Inactivation.)

Grass seed used for the final soil cover shall meet the following general specifications:

1. Grass seed mixture: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.

2. The entire ground surface disturbed by construction operations shall be seeded with 100 lbs/acre of seed conforming to the following:

Name of Grass	Application Rate (lbs/acre)	Purity (%)	Germination (%)
Perennial Ryegrass	10	95	85
Kentucky Bluegrass	20	85	75
Strong Creeping Red Fescue	20	95	80
Chewings Fescue	20	95	80
Hard Fescue	20	95	80
White Clover	10	98	75

(a) Germination and purity percentages should equal or exceed the minimum seed standards listed. If it is necessary to use seed with a germination percentage less than the minimum recommended above, increase the seeding rate accordingly to compensate for the lower germinations.

(b) Weed seed content not over 0.25 percent and free of noxious weeds.

(c) All seed shall be rejected if the label lists any of the following grasses:
1) Sheep Fescue
2) Meadow Fescue
3) Canada Blue
4) Alta Fescue
5) Kentucky 31 Fescue
6) Bent Grass

3. In addition to the seed mixtures listed above, one bushel per acre of oats or rye seed shall be sowed over the entire area, including drainage ditches, to provide a quick shade cover and to prevent erosion during turf establishment.

2.5 Erosion Controls

An important element of soil and fill management on this site is the mitigation and control of surface erosion from stormwater runoff. For this reason a Master Erosion Control Plan to be used by all developers has been developed and incorporated as Attachment A2.

2.6 Dust Controls

Particulate monitoring will be performed along the downwind occupied perimeter of subareas or parcels during subgrade excavation, grading and handling activities in accordance with the Community Monitoring Plan further detailed in Section 3.0 as well as in accordance with NYSDEC TAGM 4031 (Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites) presented in Appendix A4.

Dust suppression techniques will be employed as necessary to mitigate fugitive dust from unvegetated or disturbed soil/fill to the extent practicable during post-remediation construction and redevelopment. Such techniques shall be employed even if the community air monitoring results indicate particulate levels are below action levels. Techniques to be utilized may include one or more of the following:

- Applying water on haul roads.
- Wetting equipment and excavation faces.
- Spraying water on buckets during excavation and dumping.
- Hauling materials in properly tarped containers or vehicles.
- Restricting vehicle speeds on-site.
- Covering excavated areas and materials after excavation activity ceases.
- Reducing the excavation size and/or number of excavations.

All reasonable attempts will be made to keep visible and/or fugitive dust to a minimum.

2.7 Fencing and Access Control

A 6-foot tall chain link fence currently surrounds Area I. Additional interior fencing shall be erected and maintained as necessary by the property owner as

remediation/redevelopment proceeds to control access to subdivided or undeveloped parcels and separate them from parcels in active use. Fencing will be relocated by the property owner(s) as necessary as development proceeds. The Area II containment cell and groundwater pretreatment system will be isolated from the remainder of the Site by a 6-foot chain link fence. All fencing around undeveloped areas will be posted with "No Trespassing" signs.

2.8 Property Use Limitations

Requirements for surface coverage over the site and limitations placed on the type of buildings to be constructed will be enforced through the issuance of building permits by the City of Buffalo. Obtaining a building permit from the City will be contingent upon agreeing to implement and comply with this S/FMP. Site limitations will be enforced through the same deed restrictions described in the Voluntary Cleanup Agreement. Deed restrictions shall be applicable to successors and assigns of the property. Specifically, the deed restrictions will be recorded with the Erie County Clerk and:

1. shall prohibit any parcel or subparcel of the Site from being used for purposes other than for the industrial, commercial, and recreational use (and designed) to preclude contact with contamination by humans without the express written waiver of such prohibition by the NYSDEC (Department), or if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department;

2. shall prohibit the use of the groundwater underlying any parcel or subparcel of the Site for drinking water, industrial, or other purposes;

3. shall require owner(s) or the site and subparcels thereof and their successors and assigns to continue in full force and effect any institutional controls, operation and maintenance, and/or soils management required by the Voluntary Cleanup Agreement (VCA), the RD/RA Work Plan (including the Soil/Fill Management Plan), and/or the O&M Plan;

4. shall provide that Volunteers, on behalf of themselves and their successors and assigns, consent to the enforcement by the Department, or if at such time the Department shall no longer exist, any New York State department, bureau, or

other entity replacing the Department, of the prohibitions and restrictions that the VCA requires to be recorded, and thereby covenant not to contest such enforcement.

5. the prohibitions described in the VCA shall be for the duration provided in that document and shall be enforceable only by the Department, or, if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department, but shall not be enforceable by any other party,

6. if there is performed on the Site an additional response action acceptable to the Department, or, if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department, such as to allow it to be used for residential or other purposes, the Department or its successor shall execute a document in recordable form terminating that portion of the instrument relating to the matter identified in the VCA for the area in the Site which the Department has determined may be used for residential purposes; and

7. in the event of a conflict between the above-described Deed Restrictions and those contained in or attached to the VCA, those contained in or attached to the VCA shall apply.

The industrial/commercial use of the site will also be controlled by the City through zoning restrictions. The responsibility for the operation and maintenance of the collection/cover system and groundwater monitoring shall remain with LTV Steel Company and the Hanna Furnace Corporation and/or their successors or assigns. Said responsibilities will be clearly described in any purchase or sale agreements between LTV Steel/The Hanna Furnace Corporation and possible future property owner(s).

Certain stormwater system design criteria will also be required to be implemented during site development. In areas with known groundwater impacts, subsurface injection of storm water from building and parking area stormwater systems could mobilize additional contaminants. In these areas, stormwater injection (drywells) will be prohibited on the Site and stormwater conveyance pipes will be required to have gasketed joints for water tightness to prevent the infiltration of impacted groundwater into the collection systems.

2.9 Notification and Reporting Requirements

The following minimum notification and reporting requirements shall be followed by the property owner prior to and following site development, as appropriate:

- The NYSDEC and NYSDOH will be notified that subgrade activities are being initiated a minimum of 5 working days in advance of construction.
- A construction certification report stamped by a NYS-licensed Professional Engineer, will be prepared and submitted to the NYSDEC and NYSDOH within 90 days after development of each parcel. At a minimum, the report will include:
    - An area map showing the parcel that was developed;
    - A topographic map of the developed property showing actual building locations and dimensions, roads, parking areas, utility locations, berms, fences, property lines, sidewalks, green areas, contours and other pertinent improvements and features;
    - Plans showing areas and depth of fill removal;
    - Copies of daily inspection reports;
    - Description of erosion control measures;
    - A text narrative describing the excavation activities performed, health and safety monitoring performed (both site specific and Community Air Monitoring), quantities and locations of soil/fill excavated, disposal locations for the soil/fill, soil sampling locations and results, a description of any problems encountered, location and acceptability test results for backfill sources, and other pertinent information necessary to document that the site activities were carried out properly;
    - Plans showing before and after survey elevations on a 100-foot grid system to document the thickness of the clean soil cover system; and
    - A certification that all work was performed in conformance with the S/FMP.
- The owners of developed parcels shall complete and submit to the New York State

Department of Environmental Conservation, an Annual Report by January 15th of the following year. This report shall contain certification that the institutional controls put in place, pursuit to the Soil/Fill Management Plan, are still in place, have not been altered and are still effective. The recommended NYSDEC Certification Form is included as Appendix A3, of this Soil/Fill Management Plan.

3.0 HEALTH AND SAFETY PROCEDURES

During redevelopment activities, the developer shall be responsible for implementing suitable procedures to prevent both site construction workers and the community from adverse exposure to residual parameters of concern and other potential hazards posed by the redevelopment work. This will be accomplished through adherence to a written, parcel-specific worker Health and Safety Plan, prepared in accordance with the regulations contained in OSHA 29CFR 1910.120 and the attached Community Air Monitoring Plan.

Although voluntary cleanup remedial measures are anticipated to reduce the potential for encountering parameters of concern above site-specific action levels, the redevelopment activities governed by this Soils Management Plan are a required element of the Voluntary Cleanup Agreement for the site. Thus, 29CFR 1910.120(a)(1)(iii) indicates that these activities are subject to OSHA's hazardous waste operations and emergency response (Hazwopper) standard. This includes the requirement for preparation and implementation of a site-specific worker Health and Safety Plan addressing the following items:

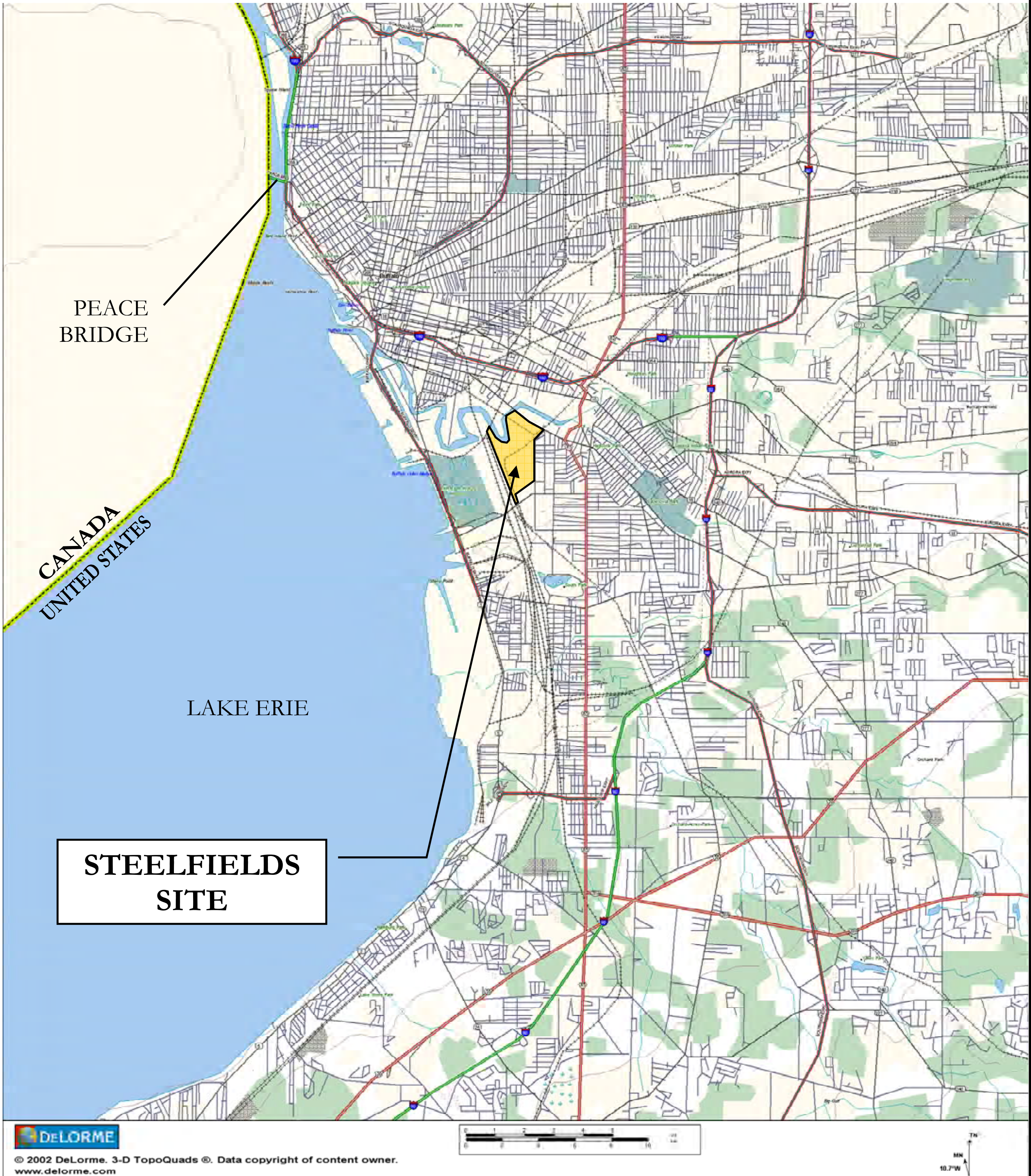
- A safety and health or hazard analysis for each site task and operation.
- Employee training requirements.
- Personal protective equipment (PPE) to be used by employees for the site tasks.
- Medical surveillance requirements.
- Frequency and type of air monitoring, personnel monitoring , and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of equipment.
- Site control measures.
- Decontamination procedures.
- An emergency response plan.
- Confined space entry procedures.

- A spill containment program.

As an integral component of the worker HASP, the developer or site/parcel owner will be responsible for implementing a Community Air Monitoring Plan designed to prevent the surrounding community from adverse exposures due to potential release/migration of airborne particulates or vapors. The community as referenced herein includes potential receptors located off-site (e.g., neighboring residents or businesses) as well as on-site receptors not directly involved in redevelopment activities (e.g. businesses or contractors occupying the site prior to final redevelopment). The Community Air Monitoring Plan presented as Attachment A will be implemented during redevelopment work involving disturbance or handling of Site fill soils. The Plan includes appropriate monitoring, mitigation and response measures consistent with NYSDOH and NYSDEC guidelines. The results of the Community Air Monitoring Plan must be documented to the NYSDEC as described in Section 2.8.

FIGURES

FIGURE 1-1



TurnKey Environmental Restoration, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-008-400

DATE: SEPTEMBER 2004

DRAFTED BY: BCH

SITE REGIONAL MAP

SOIL/FILL MANAGEMENT PLAN

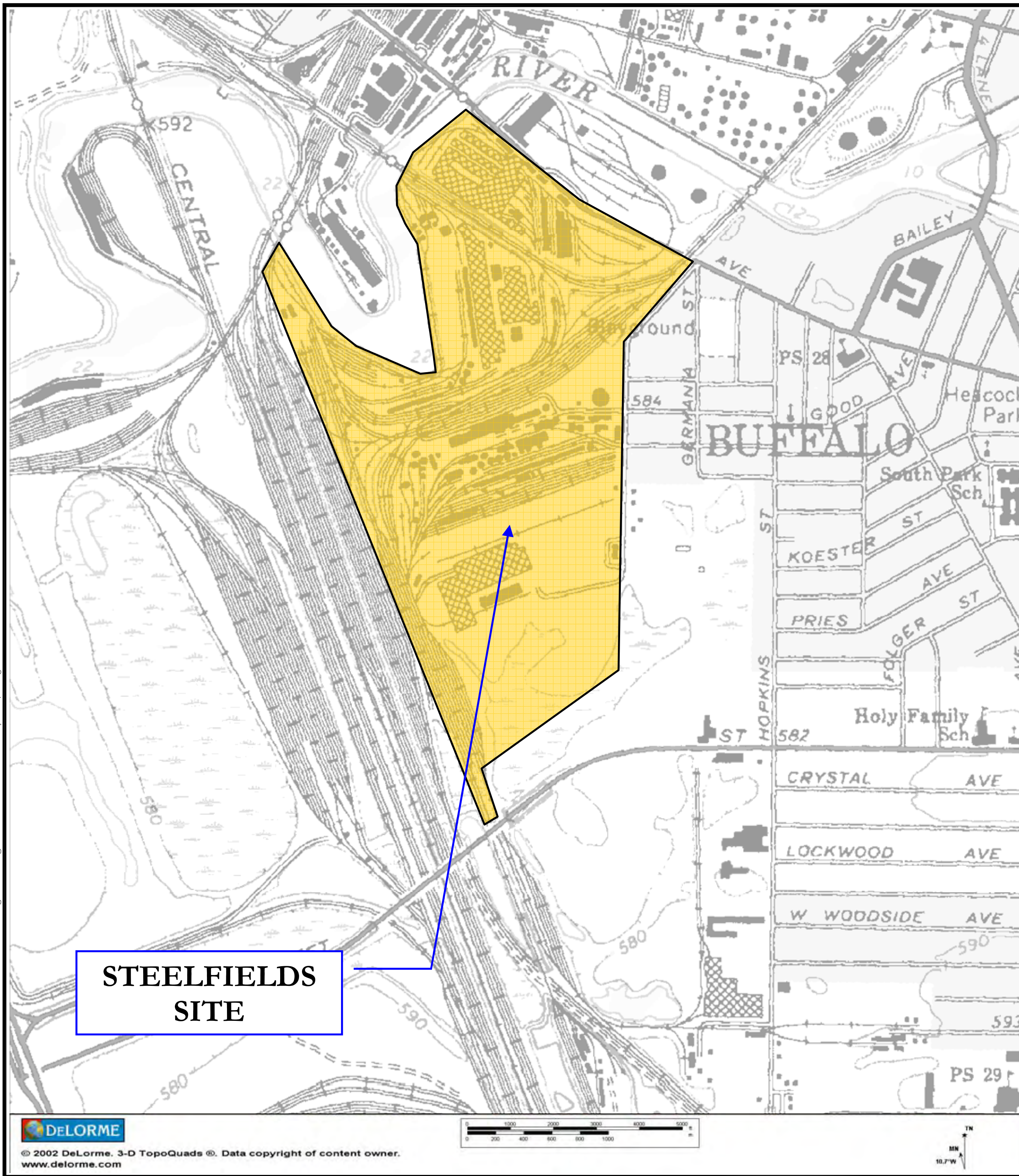
AREA I - FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR

STEELFIELDS, LTD.

FILEPATH:g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 1-1; site regional map.dwg

FIGURE 1-2



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PROJECT NO.: 0062-008-400

DATE: SEPTEMBER 2004

DRAFTED BY: BCH

SITE VICINITY MAP

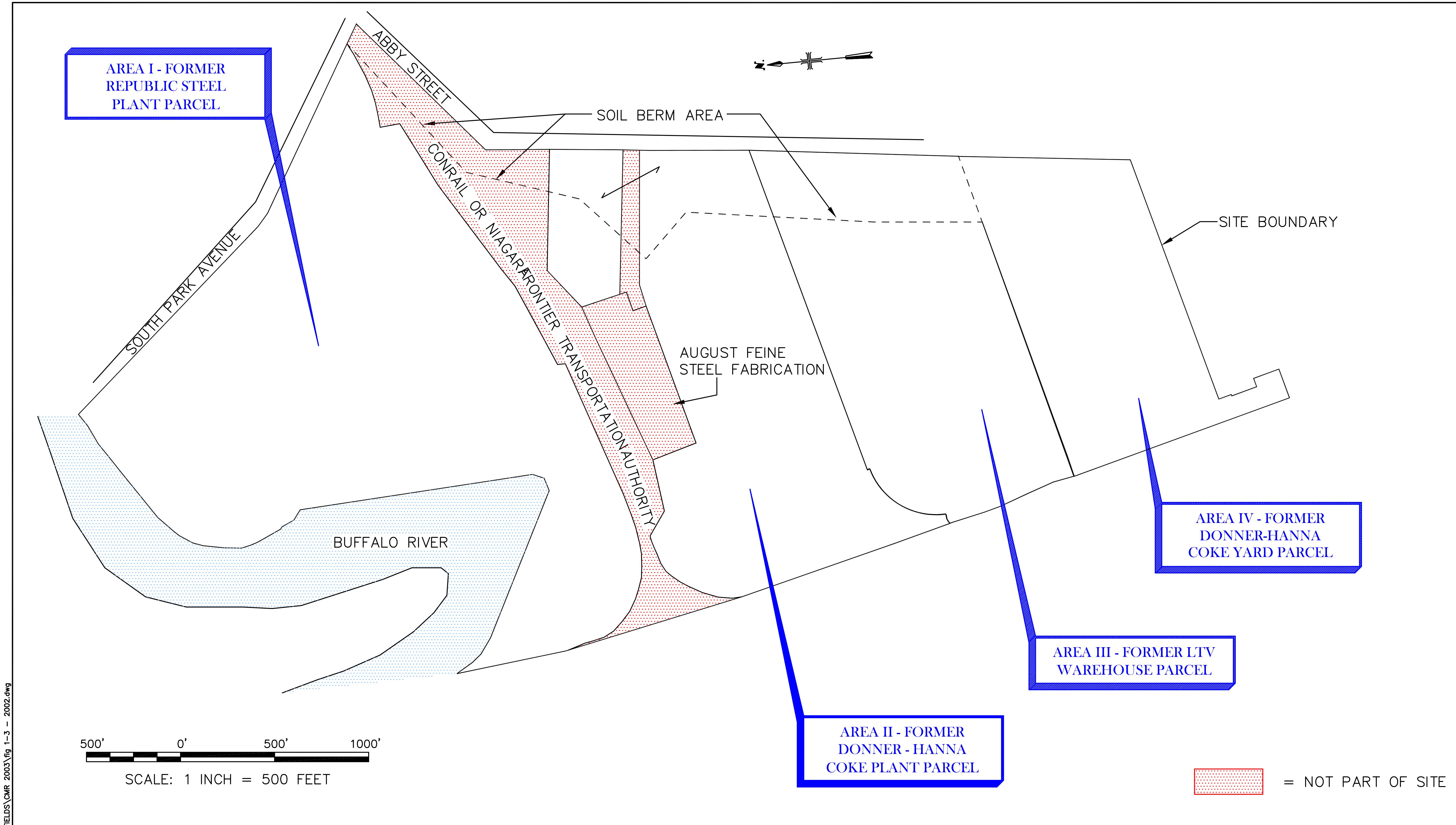
SOIL/FILL MANAGEMENT PLAN

AREA I - FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR

STEELFIELDS, LTD.

FILEPATH:g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 1-2; site vicinity map.dwg



DATE: JANUARY 2004
DRAFTED BY: BCH/WJM
FILEPATH: f:\turnkey\cad\STEELFIELDS\CMR 2003\fig 1-3 – 2002.dwg

TurnKey Environmental Restoration, LLC

FORMER STEEL MANUFACTURING SITE
SITE MAP
AREA I CLOSE-OUT REPORT
STEELFIELDS LTD

FIGURE 1-3

PROJECT NO.: 0062-008-400
PROJECT LOCATION: BUFFALO, NEW YORK

ATTACHMENT A1

Community Air Monitoring Documentation Forms

COMMUNITY AIR MONITORING PLAN:
PARTICULATE MONITORING RECORD

PROJECT: ____________________ **DATE/ TIME:** ____________

AIR MONITORING PERSONNEL: ____________________ **WEATHER:** ____________

____________________ **Temp:** ____________

AIR MONITORING EQUIPMENT: ____________________ **Wind:** ____________

____

DAILY INSTRUMENT CALIBRATION:

Calibration Time: ____________________

Type/Concentration of Calibration Standard(s): ____________________

Post-Calibration Meter Response: ____________________

Calibration Notes: ____________________

____

UPWIND PARTICULATE MONITORING RESULTS: (See Side 2 for Downwind Particulate Monitoring)

Location:	Time:	Result (ug/m^3):	Location:	Time:	Result (ug/m^3):

SKETCH OF WORK ZONE(S):

Monitoring Personnel Signature(s): ____________________

____

____

COMMUNITY AIR MONITORING PLAN:
PARTICULATE MONITORING RECORD (CONT.)

DOWNWIND PARTICULATE MONITORING RESULTS:

Location:	Time:	Result (ug/m^3):	Location:	Time:	Result (ug/m^3)

DESCRIPTION OF DUST SUPPRESSION TECHNIQUES EMPLOYED:

NOTES:

ATTACHMENT A2

Master Erosion Control Plan

MASTER EROSION CONTROL PLAN for FORMER STEEL MANUFACTURING SITE

FORMER STEEL MANUFACTURING SITE
BUFFALO, NY

April 2002
Revised July 2002

0062-001-100

Prepared for:

Steelfields LLC
Buffalo, NY

MASTER EROSION CONTROL PLAN
FORMER STEEL MANUFACTURING SITE

Table of Contents

<u>ATTACHMENTS</u>

1.0 INTRODUCTION

1.1 Background

LTV Steel Company owns, or co-owns with The Hanna Furnace Corporation, an industrial property located along the Buffalo River in Buffalo, New York (See Figure 1-1 and 1-2). The property, referred to as the Former Steel Manufacturing Site or Site, is subdivided into four parcels totaling 219 acres, more or less, based on the operational and ownership history of each. The parcels are designated:

- Area I – Republic Steel Plant Parcel
- Area II – Donner-Hanna Coke Plant Parcel
- Area III – Republic Warehouse Parcel
- Area IV – Donner-Hanna Coke Yard Parcel

A voluntary cleanup of the Site will be performed in accordance the Remedial Design/Remedial Action (RD/RA) Work Plan approved by the New York State Department of Environmental Conservation (NYSDEC). The voluntary cleanup program will render the Site suitable for planned redevelopment and use for commercial and industrial purposes.

1.2 Purpose and Scope

A Soil/Fill Management Plan (S/FMP) was prepared as part of the RD/RA Work Plan that describes protocols for the proper handling of site soil/fill during development activities. The property owner at the time of development will be responsible for all monitoring, implementation and reporting requirements of the S/FMP.

Since erosion control will be a critical component of preventing the potential migration of contaminants onto developed property or off-site during development of the site, this Master Erosion Control Plan (MECP) was prepared to provide guidance to developers during build-out activities on the properties. This MECP is a critical component of the S/FMP. This document is generic in nature and provides minimum erosion control practices to be utilized by site owners and/or developers. More specific plans for each parcel may be developed by the property owner(s) after the long-term development approach for each property has been determined.

2.0 GENERAL PERMIT REQUIREMENTS

Redevelopment of the Site will be in accordance with the S/FMP and Voluntary Cleanup Agreement. Since development activities will disturb more than five acres of land, the Federal Water Pollution Control Act (as amended, 33 U.S.C. 1251 et.seq.), and the New York State Environmental Conservation Law (Article 17, Titles 7 and 8, and Article 70) require that the project developer obtain coverage under the NYS Department of Environmental Conservation SPDES General Permit for Storm Water Discharges from Construction Activities that are classified as "Associated with Industrial Activity", Permit #GP-93-06 (Construction Storm Water General Permit).

Requirements for coverage under the general permit includes the submittal of a Notice of Intent form and the development of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must fulfill permit requirements and should be prepared in accordance with "Chapter Four: The Storm Water Management and Erosion Control Plan" in *Reducing Impacts of Storm Water Runoff from New York Development, NYSDEC, 1992*. The Notice of Intent application form and the text of the Construction Storm Water General Permit are provided in Attachment A2-1.

A complete Storm Water Management and Erosion Control Plan (SWM & ECP) should provide the following information:

- A background discussion of the scope of the construction project;
- A statement of the storm water management objectives;
- An evaluation of post-development runoff conditions;
- A description of proposed storm water control measures; and

- A description of the type and frequency of maintenance activities required to support the control measure.

The Plan should be parcel-specific and address issues such as erosion prevention, sedimentation control, hydraulic loading, pollutant loading, ecological protection, physical site characteristics that impact design, and site management planning. Descriptions of proposed features and structures at the site should include a description of drainage structure placement, supporting engineering data and calculations, construction scheduling, and references to established detailed design criteria.

3.0 POTENTIAL EROSION AND SEDIMENT CONTROL CONCERNS

Following remediation of individual parcels, redevelopment activities will proceed for commercial and light industrial uses of the properties. Parcel-specific design measures regarding erosion and sediment control measures will need to be determined at that time after the development approach for each area of the site has been determined.

Potential areas and items of concern during site re-development activities include the following:

- All portions of the site not covered by buildings, sidewalks, roadways, parking areas, or other structures will be required to be covered with 6"-12" of "clean" soils to limit exposure to remaining subsurface soil/fill materials. The transportation and placement activities associated with this work will require erosion and sediment controls to prevent the surface soil from being washed off the area being developed.

- Some portions of the river bank along the Buffalo River in Area I are protected by sheet piling while others are currently very steep, unstable, and prone to erosion. Any activities in the vicinity of the unprotected areas will require erosion measures to prevent runoff into the river.

- Remediated areas or off-site properties adjacent to unremediated parcels need protection so they do not become impacted by site operations.

- Storm water inlets will require protective measures to limit sediment transfer to storm sewers.
- Runoff from soil stockpiles will require erosion controls.
- Surface slopes need to be minimized as much as practical to control sediment transfer.
- Soil/fill excavated during development will require proper handling and disposal.

4.0 EROSION AND SEDIMENT CONTROL MEASURES

4.1 Background

Standard soil conservation practices need to be incorporated into the construction and development plans to mitigate soil erosion damage, off-site sediment migration, and water pollution from erosion. These practices combine vegetative and structural measures, many of which will be permanent in nature and become part of the completed project (ie. drainage channels and grading). Other measures will be temporary and serve only during the construction stage. Selected erosion and sediment control measures will meet the following criteria:

- Minimize erosion through project design (maximum slopes, phased construction, etc.)
- Incorporate temporary and permanent erosion control measures; and
- Remove sediment from sediment-laden storm water before it leaves the site.

4.2 Temporary Measures

Temporary erosion and sedimentation control measures and facilities will be utilized during construction. They will be installed by the site Developer and will be maintained until they are either no longer needed or until such time as permanent measures are installed and become effective. At a minimum, the following temporary measures will be used:

- Silt fencing
- Straw/hay bales
- Temporary vegetation/mulching
- Temporary sedimentation basins
- Cautious placement, compaction and grading of stockpiles

4.2.1 Silt Fencing

Construction and regrading activities will result in surface water flow to drainage ditches and swales, storm sewers, the Buffalo River, and adjacent properties. Silt fencing will be the primary sediment control measure used in these areas. Prior to extensive soil excavation or grading activities, silt fences will be installed along the perimeter of all construction areas. The orientation of the fencing will be adjusted as necessary as the work proceeds to accommodate changing site conditions.

Intermediate fencing will be utilized upgradient of the perimeter fencing to help lower surface water runoff velocities and reduce the volume of sediment to perimeter fencing. Stockpiles will also be surrounded with silt fencing.

As sediment collects, the silt fences will be cleaned as necessary to maintain their integrity. Removed sediment will be utilized elsewhere on-site as general fill. All perimeter silt fences will remain in place until construction activities in an area are completed and vegetative cover has been established. Silt fences will be installed in accordance with the details presented in Attachment A2-2.

4.2.2 Straw and/or Hay Bales

Straw and/or hay bales will be used to intercept sediment laden storm water runoff in drainage channels during construction. The use of either hay or straw will be based on the availability of materials at the time of construction.

Bales will be placed in swales and ditches where the anticipated flow velocity is not expected to be greater than 5 feet/second (fps). Intermediate bales will be placed upgradient of the final barrier to reduce flow velocities and sediment loadings where higher velocities are anticipated.

As with silt fencing, sediment will be removed as necessary from behind the bales and disposed of on-site. Bales that have become laden with sediment or that have lost their structural integrity or effectiveness due to the weather will be replaced. Bales should be installed in accordance with the details presented in Attachment A2-2.

4.2.3 Temporary Vegetation and Mulching

Due to the extensive nature of the planned site remediation activities and the anticipated project schedule, development of the site is expected to occur in phases as the remediation proceeds. As a result, intermediate areas where development activities will not occur or resume for an extended period of time (greater than 90 days) will be seeded with a quick germinating variety of grass or covered with a layer of mulch to control fugitive dust and erosion. Soil/fill stockpiles that will not be utilized for an extended period of time will also vegetated or covered.

4.2.4 Temporary Sedimentation Basins

Temporary sedimentation basins will be constructed as necessary upgradient of storm water inlets to reduce the volume of sediment laden runoff from the site. The basins can be as simple as a small excavated area along the alignment of a storm water ditch or as elaborate as a full-scale sedimentation basin with outlet structures designed for certain storm events from a given area of the site. The basins will be cleaned as necessary and the removed sediment utilized elsewhere on-site as subgrade fill material.

4.2.5 Cautious Placement of Stockpiles

As development occurs, excavation activities will produce stockpiles of soil and subgrade fill materials. Careful placement and construction of stockpiles will be required to control erosion. Stockpiles will be placed no closer than fifty feet from the Buffalo River, storm water inlets and parcel boundaries. Additionally, stockpiles will be graded and compacted as necessary for positive surface water runoff and dust control.

4.3 Permanent Control Measures During Site Redevelopment

Permanent erosion and sedimentation control measures and structures will be installed as soon as practical during construction for long-term erosion protection. Since the detailed development approach for the site has not been determined, specific design features are yet to be selected. Examples of permanent erosion control measures could include:

- Utilizing maximum slopes in erosion prone areas (ie. along the Buffalo River) to limit erosion.
- Minimizing the potential contact with, and migration of, subsurface soil/fill through the placement of a "clean" soil cover system in all areas not covered with structures, roads, parking areas, sidewalks, etc.
- Construction of permanent storm water detention ponds where appropriate.
- Planting and maintaining vegetation.
- Limiting runoff flow velocities to the extent practical.
- Lining collection channels with riprap, erosion control fabric, vegetation, or similar materials.

5.0 CONSTRUCTION MANAGEMENT PRACTICES

5.1 General

The following general construction practices should be evaluated for erosion and sedimentation control purposes during site development activities:

- Clearing and grading only as much area as is necessary to accommodate the construction needs to minimize disturbance of areas subject to erosion (ie. phasing the work).
- Covering exposed or disturbed areas of the site as quickly as practical.
- All erosion and sediment control measures should be installed prior to disturbing the site subgrade.
- Both on-site and off-site tracking of soil by vehicles should be minimized by utilizing routine entry/exit routes.

5.2 Monitoring, Inspection and Maintenance

All erosion and sedimentation controls described in this Plan will be inspected by a qualified representative of the site developer within 24 hours of a heavy rainfall event and repaired or modified as necessary to effectively control erosion of turbidity problems. Inspections should include areas under construction, stockpile areas, erosion control devices (ie. silt fences, hay bales, etc.) and locations where vehicles enter and leave the site. Routine inspections of the entire site should also be made on a monthly basis during development.

If inspections indicate problems, corrective measures should be implemented within 24 hours. A report summarizing the scope of the inspection, name of the inspector, date, observations made, and a description of the corrective actions taken should be completed. Examples of inspection forms to be completed are included in Attachment A2-3.

ATTACHMENT A2-1

NYSDEC SPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

1. Notice of Intent
2. NYSDEC SPDES General Permit For Storm Water Discharges from Construction

Notice of Intent ("NOI")

See Reverse for Instructions

SPDES FORM

DEC

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-3505

Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity Under the SPDES General Permit

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a SPDES permit issued for storm water discharges associated with industrial activity in the State in Section II of this form. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

I. Facility Operator Information

Name: ______ Phone: ______

Address: ______ Status of Owner/Operator: ☐

City: ______ State: ______ ZIP Code: ______

II. Facility/Site Location Information

Is the Facility Located on Indian Lands? (Y or N) ☐

Name: ______

Address: ______

City: ______ State: ______ ZIP Code: ______

Latitude: ______ Longitude: ______ Quarter: ______ Section: ______ Township: ______ Range: ______

III. Site Activity Information

MS4 Operator Name: ______

Receiving Water Body: ______

If You are Filing as a Co-permittee, Enter Storm Water General Permit Number: ______

Are There Existing Quantitative Data? (Y or N) ☐

Is the Facility Required to Submit Monitoring Data? (1, 2, or 3) ☐

SIC or Designated Activity Code: Primary: ______ 2nd: ______ 3rd: ______ 4th: ______

If This Facility is a Member of a Group Application, Enter Group Application Number: ______

If You Have Other Existing NPDES Permits, Enter Permit Numbers: ______ ______ ______

IV. Additional Information Required for Construction Activities Only

Project Start Date: ______

Completion Date: ______

Estimated Area to be Disturbed (in Acres): ______

Is the Storm Water Pollution Prevention Plan in Compliance with State and/or Local Sediment and Erosion Plans? (Y or N) ☐

V. Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: ______

Date: ______

Signature: ______

91-19-12 (9/92)—10g

Printed on Recycled Paper

Instruction—NYSDEC Form 91-19-12 (9/92)

Notice of Intent (NOI)

For Storm Water Discharges Associated With Industrial Activity to Be Covered Under the SPDES General Permit

Who Must File A Notice Of Intent Form

Federal law at 40 CFR Part 122 prohibits point source discharges of storm water associated with industrial activity to a water body(ies) of the U.S. without a National Pollutant Discharge Elimination System (NPDES) permit. New York State has been delegated the NPDES program and administers its State Pollutant Discharge Elimination System (SPDES) program in lieu of EPA's NPDES program. Wherever the term "NPDES" is used in the NOI form, the reader should substitute "SPDES". The operator of an industrial activity that has a storm water discharge that qualifies for coverage under a SPDES Storm Water General Permit must submit the NOI form to obtain coverage. If you have questions about whether federal regulations require you to obtain a permit for your storm water discharge, contact the EPA Storm Water Hotline at (703) 821-4823. If you have questions concerning the applicability and coverage of the SPDES Storm Water General Permits, contact the New York State of Environmental Conservation at (518) 457-9601. In order to cancel your coverage under the General Permit you must submit a Notice of Termination (NOT) form. Failure to submit a NOT will result in the obligation to pay a yearly Regulatory Fee.

Where To File The NOI Form

New York State intends on using EPA's information management system. Therefore, NOIs must be sent to the following address:

Storm Water Notice of Intent
PO Box 1215
Newington, VA 22122

Completing The Form

You must type or print using upper-case letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, call the EPA Storm Water Hotline at (703) 821-4823.

Section I—Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same as the name of the facility. The responsible party is the legal entity that controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Enter the appropriate letter to indicate the legal status of the operator of the facility:

F—Federal	M—Public (other than federal or state)
S—State	P—Private

Section II—Facility/Site Location Information

Give the facility's or site's official or legal name and complete street address, including city, state, and ZIP code. If the facility or site lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Indicate whether the facility is located on Indian lands.

Section III—Site Activity Information

If the storm water discharges to a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4 (e.g. municipality name, county name) and the receiving water of the discharge from the MS4. (A MS4 is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body which is designed or used for collecting or conveying storm water.)

If the facility discharges storm water directly to receiving water(s), enter the name of the receiving water.

If you are filing as a co-permittee and a storm water general permit number has been issued, enter that number in the space provided.

Indicate whether or not the owner or operator of the facility has existing quantitative data that represent the characteristics and concentration of pollutants in storm water discharges.

Indicate whether the facility is required to submit monthly data by entering one of the following:

1 Not required to submit monitoring date;
2 Required to submit monitoring data;
3 Not required to submit monitoring data; submitting certification for monitoring exclusion.

Those facilities that must submit monitoring data (e.g. choice 2) are Section 313 EPCRA facilities; primary metal industries; land disposal units/incinerators/BIFs; wood treatment facilities; facilities with coal pile runoff, and battery reclaimers.

List, in decreasing order of significance, up to four 4-digit standard industrial classification (SIC) codes that best describe the principal products or services provided at the facility or site identified in Section II of this application.

For industrial activities defined in 40 CFR 122.26(b)(14)(i)-(xi) that do not have SIC codes that accurately describe the principal products produced or services provided, the following 2-character codes are to be used

HZ Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA [40 CFR 122.26(b)(14)(iv)],

LF Landfills, land application sites, and open dumps that receive or have received any industrial wastes, including those that are subject to regulation under subtitle D of RCRA [40 CFR 122.26(b)(14)(v)],

SE Steam electric power generating facilities, including coal handling sites [40 CFR 122.26(b)(14)(vii)];

TW Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage [40 CFR 122.26(b)(14)(ix)];

CO Construction activities [40 CFR 122.26(b)(14)(x)].

If the facility listed in Section II has participated in Part 1 of an approved storm water group application and a group number has been assigned, enter the group application number in the space provided.

If there are other SPDES permits presently issued for the facility or site listed in Section II, list the permit numbers. If an application for the facility has been submitted but no permit number has been assigned, enter the application number.

Section IV—Additional Information Required for Construction Activities Only

Construction activities must complete Section IV in addition to Sections I through III. Only construction activities need to complete Section IV.

Enter the project start date and the estimated completion date for the entire development plan.

Provide an estimate of the total number of acres of the site on which soil will be disturbed (round to the nearest acre).

Indicate whether the storm water pollution prevention plan for the site is in compliance with approved state and/or local sediment and erosion plans, or storm water management plans.

Section V—Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manage of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality, state, federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may decrease or reduce the burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20490, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20603.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT

FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

Permit No. GP-93-06

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: August 1, 1993 Expiration Date: August 1, 1998

George A. Danskin
Chief Permit Administrator
George A Danskin
Authorized Signature

Address:
50 Wolf Road
Albany, N.Y. 12233-1750

Date: July 14, 1993

PREFACE

The Clean Water Act ("CWA")[1] provides that storm water discharges associated with industrial activity from a point source[2] (including discharges through a municipal separate storm sewer system) to waters of the United States[3] are unlawful, unless authorized by a National Pollutant Discharge Elimination System ("NPDES") permit. In New York which is a NPDES-delegated state, this is accomplished through the administration of the state Pollutant Discharge Elimination System ("SPDES") program.

A discharger which is subject to the federal storm water (NPDES) regulations may be eligible to obtain coverage under a general permit by submitting a Notice of Intent ("NOI") to the address given on the NOI form.

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[1] Also referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972 (Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et.seq.)

[2] "Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharges. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

[3] "Waters of the United States" means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters, including interstate "wetlands";

(c) All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea;

(g) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA are not waters of the United States. This exclusion applies only to manmade bodies of water with neither were originally created in waters of the United States (such as disposal areas in wetlands) nor resulted from the impoundment of waters of the United States.

Copies of the General Permit and the Notice of Intent forms for New York are available by calling 1-(800)-952-2490. The United States Environmental Protection Agency (EPA) has established the Stormwater Hotline at (703) 821-4823 to provide information pertaining to the NPDES stormwater regulations.

If you have questions whether federal regulations require you to obtain a permit for your storm water discharge, contact the EPA Storm Water Hotline. If you have questions concerning the applicability and coverage of the SPDES Storm Water General Permits, contact the New York State Department of Environmental Conservation in Albany at (518) 457-9601. In order to cancel your coverage under the General Permit, you must submit a Notice of Termination ("NOT") form. Failure to submit a NOT will result in the continued obligation to pay a yearly Regulatory Fee.

Additionally, copies of the general permit, the NOI form and the NOT form can be obtained by calling the New York State Department of Environmental Conservation ("DEC") Storm Water Information Line at (800) 952-2490 (in New York State), any DEC Regional Office (See Appendix B), or directly from DEC in Albany at the telephone number given above.

Coverage under this general permit is available August 1, 1993 and expires on August 1, 1998.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT
FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES
THAT ARE CLASSIFIED AS "ASSOCIATED WITH INDUSTRIAL ACTIVITY"

TABLE OF CONTENTS

Part I. COVERAGE UNDER THIS PERMIT

A. Permit Area & Applicability. The permit covers all areas of New York State where New York State implements Section 402 of the CWA. Except as in compliance with this general permit or with a duly authorized individual permit from DEC, discharge of stormwater associated with industrial activity from construction activity by any person shall be unlawful.

B. Eligibility.

1. This permit may authorize all discharges of storm water associated with industrial activity from construction activity[4], (those sites or common plans of development or sale that will result in the disturbance of five or more acres total land area[5]), (henceforth referred to as storm water discharges from construction activities) occurring after the effective date of this permit, including discharges occurring after the effective date of this permit where the construction activity was initiated before the effective date of this permit, except for discharges identified under paragraph I.C (see below).

2. This permit may only authorize a storm water discharge from construction activities that is mixed with a storm water discharge associated with industrial activities other than construction, where:

a. the industrial activity other than construction is located on the same site as the construction activity;

b. storm water discharges from construction activities are in compliance with the terms of this permit; and

c. storm water discharges associated with industrial activity other than construction are occurring (including storm water discharges from dedicated asphalt plants and dedicated concrete plants) are covered by a different SPDES general permit or individual permit authorizing such discharges.

C. Limitations on Coverage. The following storm water discharges from construction activities are not authorized by this permit:

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[4] "Storm Water Discharges Associated With Industrial Activity" covered under this general permit includes those defined in 40 CFR Section 122.26(b)(14)(x).

[5] On June 4, 1992, the United States Court of Appeals for the Ninth Circuit remanded the exemption for construction sites of less than five acres to the EPA for further rule making. (Nos. 90-70671 and 91-70200). Any effect of this decision on construction sites of less than five acres will not apply until further EPA or DEC action. Regulations for construction sites of five acres or more remain in effect.

1. Discharges associated with industrial activity after construction activities have been completed and the site has undergone final stabilization[6];

2. Discharges that are mixed with sources of non-storm water other than those expressly authorized under this permit (Part II.A, Page 7 and Part III.D.5, Page 15);

3. Discharges that are subject to an existing SPDES individual or general permit or which are issued an individual or alternative general permit (Page 19); and

4. Discharges that are likely to adversely affect a listed or proposed to be listed endangered or threatened species or its critical habitat.

D. <u>Authorization.</u>

1. An operator[7] must submit a completed Notice of Intent ("NOI") form approved and provided by the State Director[8] (or a photocopy thereof), in order to be authorized to discharge under this general permit[9]. The NOI shall be signed in accordance with Part V.G (see Page 18) of this permit and submitted to the address indicated on the approved NOI form.

2. All contractors and subcontractors of the operator identified under Part III.E.1 (Page 16) must provide certification under Part III.E.2 (Page 16) of this permit in order to be authorized to discharge storm water under this permit.

3. Unless notified by the State Director to the contrary, operators who submit an NOI in accordance with the requirements of this permit are authorized to discharge storm water from construction activities under the terms and conditions of this permit 2 days after the date that the NOI is postmarked. The State Director may deny coverage under this permit and require submittal of an application for an individual SPDES permit at any time based on a review of the NOI or other information (see Part V.J of this permit, Page 19).

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[6] "Final Stabilization" means that all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% the cover for the area has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed.

[7] For the purposes of this permit, the term "operator" means the person, persons, or legal entity which owns or leases the property on which the construction activity is occurring.

[8] "State Director" means the New York State Commissioner of Environmental Conservation, or an authorized representative.

[9] A copy of the approved NOI form is provided in Appendix A of this notice.

4. A copy of the NOI or other indication that storm water discharges from the site are covered under a SPDES permit, and a brief description of the project shall be posted at the construction site in a prominent place for public viewing (such as alongside a building permit).

5. A signed copy of the NOI shall also be submitted concurrently to the local governing body and any other authorized agency[10] having jurisdiction or regulatory control over the construction project.

6. New storm water discharges from construction activities which require any other Uniform Procedures Act permit (Environmental Conservation Law, 6 NYCRR Part 621) must submit the information specified in Appendix G.

   Upon review of this information, DEC may authorize the applicant to submit an NOI to obtain coverage under this general permit.

7. **Renotification.** Upon renewal of this general permit or issuance of a new general permit, the permittee is required to notify the State Director of his intent to be covered by the new general permit.

E. **Deadlines for Notification.**

1. Operators who intend to obtain coverage under this general permit for storm water discharges from construction activities shall submit an NOI in accordance with the requirements of this Part at least 2 days prior to the commencement of construction[11] activities ;

2. For storm water discharges from construction activities where the operator changes, a new NOI in accordance with the requirements of this Part shall be submitted by the new operator at least 2 days prior to the change in operator. Additionally, the operator being replaced must submit a Notice of Termination ("NOT") in accordance with Part VI (Page 21) of this permit <u>and</u> notify the new operator of the requirement to submit a new NOI to obtain coverage under this permit. The new operator must also review and sign the pollution prevention plan in accordance with Part III.B.

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[10] For the purposes of this general permit, "any other authorized agency" shall include any local, regional, or state entity or agency except the Department of Environmental Conservation (DEC) which has authority to review storm water discharge from the project, including authority under any approved watershed protection plan or regulations.

[11] "Commencement of Construction" means the initial disturbance of soils associated with clearing, grading, or excavating activities. or other construction activities

Part II. SPECIAL CONDITIONS AND PROHIBITIONS

A. <u>Prohibition On Non-Stormwater Discharges</u>.

Discharges other than storm water must be in compliance with a SPDES permit (other than this permit). However, the following non-storm water discharges are authorized by this permit: discharges from fire fighting activities; fire hydrant flushings; waters used to wash vehicles or control dust in accordance with Part III.D.2.e.(2) (Page 13); routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; springs; and foundation or footing drains where flows are not contaminated with process materials such as solvents. Except for flows from fire fighting activities, these discharges must be included in the storm water pollution prevention plan (See Part III).

B. <u>Maintaining Water Quality</u> - The discharge authorized by this general permit shall neither cause nor contribute to a violation of water quality standards as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York including, but not limited to:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no suspended, colloidal and settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no: residue from oil and floating substances; visible oil film; globules; or grease.

Part III. STORM WATER POLLUTION PREVENTION PLANS

A storm water pollution prevention plan shall be developed by the operator for construction activities at each site to be covered by this permit. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges. In addition, the plan shall describe and ensure the implementation of practices which will be used to reduce the pollutants in storm water discharges and to assure compliance with the terms and conditions of this permit. Operators are responsible for implementing the provisions of the storm water pollution prevention plan and ensuring that all contractors and subcontractors who perform professional services at the site provide certification of the pollution prevention plan in accordance with Part I.D.2. (Page 5) and Part III.E.2. (Page 14) of this permit. All contractors and subcontractors identified in the storm water pollution prevention plan in accordance with Part III.E.1 (Page 16) of this permit must agree to implement applicable provisions of the pollution prevention plan and satisfy the certification requirement of Part III.E.2 (Page 16). Contractors and subcontractors which are not operators, as defined in this permit (Page 5), do not have to submit a NOI in addition to the NOI submitted by the operator.

A. <u>Deadlines for Plan Preparation and Compliance</u>.

1. For construction activities that have begun on or before February 1, 1994, the plan shall be developed prior to, and provide compliance with the terms and schedule of the plan beginning on, February 1, 1994. However, the plan for sedimentation basins shall provide for compliance no later that April 1, 1994.

2. For construction activities that begin after February 1, 1994, the plan shall be developed prior to the submittal of an NOI and provide for compliance with the terms and schedule of the plan beginning with the initiation of construction activities.

B. <u>Signature and Plan Review</u>

1. The plan shall be signed in accordance with Part V.G (Page 18), and be retained at the site where the construction activity occurs in accordance with Part IV (retention of records, Page 17) of this permit.

2. The permittee shall submit a copy of the pollution prevention plan and any amendments thereto to the local governing body and any other authorized agency having jurisdiction or regulatory control over the construction activity. The operator shall make plans available upon request to the State Director and any local agency having jurisdiction; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system , to the municipal operator of the system.

3. The State Director, or authorized representative, may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this Permit. Such notification shall identify those provisions of the permit which are not being met by the plan, and identify which provisions of the plan requires modifications in order to meet the minimum requirements of this Permit. Within 7 days of such notification, (or

as otherwise provided by the State Director), the permittee shall make the required changes to the plan and shall submit to the State Director a written certification that the requested changes have been made.

C. <u>Keeping Plans Current</u>. The permittee shall amend the plan whenever:

1. There is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the plan; or

2. The storm water pollution prevention plan proves to be ineffective in:

   a. Eliminating or significantly minimizing pollutants from sources identified under Part III.D.2 (See below) of this permit, or in otherwise

   b. Achieving the general objectives of controlling pollutants in storm water discharges from construction activity.

3. Additionally, the plan shall be amended to identify any new contractor and/or subcontractor that will implement a measure of the storm water pollution prevention plan (See Part III.E, Page 16). Amendments to the plan may be reviewed by the State Director in the same manner as provided by Part III.B above.

D. <u>Contents of Plan</u>. The storm water pollution prevention plan shall include the following items and shall be prepared in accordance with Appendix F (THE STORMWATER MANAGEMENT AND EROSION CONTROL PLAN). Any deviation from Appendix F or the requireents listed below shall be explained and justified in the storm water pollution prevention plan.

1. <u>Site Description</u>. Each plan shall provide a description of pollutant sources and other information as indicated:

   a. A description of the nature of the construction activity;

   b. A description of the intended sequence of major activities which disturb soils for major portions of the site (e.g. grubbing, excavation, grading);

   c. Estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities;

d. An estimate of the runoff coefficient[12] of the site after construction activities are completed and existing data describing the soil or the quality of any discharge from the site;

e. A site map indicating drainage patterns and approximate slopes anticipated after major grading activities, areas of soil disturbance, an outline of areas which will not be disturbed, the location of major structural and nonstructural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands), and locations where storm water is discharged to surface or ground water(s); and

f. The name of the receiving water(s) and areal extent of wetland acreage at the site.

2. <u>Controls</u>. Each plan shall include a description of appropriate controls and measures that will be implemented at the construction site. The plan will clearly describe for each major activity identified in Part III.D.1.b above, appropriate control measures and the timing during the construction process that the measures will be implemented. For example, the plan might provide the following: perimeter controls for one portion of the site will be installed after the clearing and grubbing necessary for installation of the measure, but before the clearing and grubbing for the remaining portions of the site; perimeter controls will be actively maintained until final stabilization of those portions of the site upward of the perimeter control; temporary perimeter controls will be removed after final stabilization. The description and implementation of controls shall address the following minimum components:

a. <u>Erosion and Sediment Controls</u>

Except as noted below in Part III.D.2.b, the erosion and sediment control component of a storm water pollution prevention plan shall conform to and be implemented in a manner consistent with the technical standards set forth in Appendix E. Where conformance to Appendix E is not attainable, the operator shall describe what equivalent erosion and sediment control practices will be implemented together with an explanation as to why conformance with Appendix E cannot be achieved. This explanation, together with the alternative erosion and sediment control measures and design specifications, shall be presented in the storm water pollution prevention plan.

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[12] "Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.

A description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. A record of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be included in the plan. Except as provided in Parts III.D.2.(a)(1)and (2) below, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

(1). Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.

(2). Where construction activity will resume on a portion of the site within 21 days from when activities ceased, (e.g. the total time period that construction activity is temporarily ceased is less than 21 days) then stabilization measures do not have to be initiated on that portion of site by the 14th day after construction activity temporarily ceased.

b. **Erosion and Sediment Controls - Structural Practices**.

A description of structural practices to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Such practices may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Structural practices should be placed on upland soils to the degree attainable.

(1) For common drainage locations that serve an area with 10 or more disturbed acres at one time, a

temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. The 3,600 cubic feet of storage area per acre drained does not apply to flows from offsite areas and flows from onsite areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. For drainage locations which serve 10 or more disturbed acres at one time and where a temporary sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent controls is not attainable, smaller sediment basins and/or traps shall be used.

(2) For drainage locations serving less than 10 acres, sediment basins and/or sediment traps should be used. At a minimum, silt fences or equivalent sediment controls are required for all sideslope and downslope boundaries of the construction area unless a sediment basin providing storage for 3,600 cubic feet of storage per acre drained is provided.

c. <u>Storm Water Management</u>.

Storm water management controls shall conform to and be implemented in a manner consistent with the technical standards set forth in Appendix D). Where conformance to Appendix D is not attainable, the operator shall describe what practices will be implemented together with an explanation as to why conformance with Appendix D cannot be achieved. This explanation, together with the alternative storm water management practices and design specifications shall be presented in the storm water pollution prevention plan.

A description of measures that will be installed during the construction process to control storm water discharges that will occur after construction operations have been completed. Structural measures should be placed on upland soils to the degree attainable.

(1) Such practices may include: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices). The pollution prevention plan shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed predevelopment levels.

(2) Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel for the purpose of providing a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., no significant changes in the hydrological regime of the receiving water).

d. Other Controls.

(1) **Waste Disposal**. No solid materials, including building materials, shall be discharged to waters of the United States, except as authorized by a federal or State law.

(2) Off-site vehicle tracking of sediments and the generation of dust shall be minimized.

(3) The plan shall ensure and demonstrate compliance with applicable State and local waste disposal, sanitary sewer or septic system regulations.

e. Approved Local or Regional Control Plans.

(1) Storm water pollution prevention plans must include procedures and requirements specified in applicable sediment and erosion site plans, site permits, storm water management site plans or site permits or duly adopted regulations approved by local officials or any authorized agency. Permittees shall provide a certification in their storm water pollution prevention plan that their storm water pollution prevention plan complies with all requirements applicable to protecting surface and ground water resources in sediment and erosion site plans or site permits, storm water management site plans, site permits, or duly adopted regulations approved by local governing bodies or any authorized agency. Permittees shall comply with any such requirements during the term of the permit.

(2) Storm water pollution prevention plans must be amended to reflect any change applicable to protecting surface and ground water resources in sediment and erosion site plans or site permits, storm water management site plans or site permits, or duly adopted regulations approved by local officials or any authorized agency for which the permittee receives written notice. Where the permittee receives such written notice of a change, the permittee shall provide a recertification in

the storm water pollution prevention plan that the storm water pollution prevention plan has been modified to address such changes.

(3) Operators seeking alternative permit requirements shall submit an individual permit application in accordance with Part V.J (Page 19) of the permit at the address indicated in Part IV.C (Page 17) of this permit for the appropriate DEC Office, along with a description of why requirements in approved local or regional plans, permits or regulations or changes to such plans, permits, or regulations, should not be applicable as a condition of a SPDES permit.

3. Maintenance. A description of procedures to ensure the timely maintenance of vegetation, erosion and sediment control measures and other protective measures identified in the site plan in good and effective operating condition.

In cases where the installed structural controls are designed, in whole or part, to provide for storm water management after construction activity is completed and final stabilization of the site, a description of the post-construction operation and maintenance needs shall be included.

A description of any arrangements that have been made to ensure long term maintenance of storm water facilities after construction operations have been completed and permit coverage is terminated, and a statement describing who will be responsible for maintenance shall be included.

4. Inspections. The operator or qualified personnel of the operator shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater. Where portions of the construction area have been finally stabilized, inspection of such portions shall be conducted at least once every month until the entire site is finally stabilized.

a. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

b. Based on the results of the inspection, the site description identified in the plan in accordance with paragraph III.D.1 (Page 9) of this permit and pollution prevention measures identified in the plan in accordance with paragraph III.D.2 (Page 10) of this permit shall be revised as appropriate, but in no case later than 7 calendar days following the inspection. Such modifications shall provide for timely implementation of any changes to the plan within 7 calendar days following the inspection.

c. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph III.D.4.b (See above) of the permit shall be made and retained as part of the storm water pollution prevention plan for at least three years from the date that the site is finally stabilized. Such reports shall identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with Part V.G (Page 18) of this permit.

5. <u>Non-Storm Water Discharges</u> - Except for flows from fire fighting activities, sources of non-storm water listed in Part II.A (Page 7) of this permit that are combined with storm water discharges from the construction activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

E. <u>Contractors</u>

1. The storm water pollution prevention plan must clearly identify for each measure identified in the plan, the contractor(s) and/or subcontractor(s) that will implement the measure. All contractors and subcontractors identified in the plan must sign a copy of the certification statement in Part III.E.2 (See below) of this permit in accordance with Part V.G (Page 18) of this permit. All certifications must be included in the storm water pollution prevention plan.

2. **<u>Certification Statement</u>**. All contractors and subcontractors identified in a storm water pollution prevention plan in accordance with Part III.E.1 (Page 16) of this permit shall sign a copy of the following certification statement before undertaking any construction activity at the site identified in the storm water pollution prevention plan:

   "I certify under penalty of law that I understand and agree to comply with the terms and conditions of the pollution prevention plan for the construction site identified in such plan as a condition of authorization to discharge storm water. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for storm water discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards."

   The certification must include the name and title of the person providing the signature in accordance with Part V.G (Page 18) of this permit; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made.

Part IV. RETENTION OF RECORDS

A. The operator shall retain copies of storm water pollution prevention plans and all reports required by this permit, and records of all data used to complete the NOI to be covered by this permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by the State Director at any time upon written notification.

B. The operator shall retain a copy of the storm water pollution prevention plan required by this permit at the construction site from the date of initiation of construction activities to the date of final stabilization.

C. <u>Addresses</u>. Except for the submittal of NOIs and NOTs, all written correspondence under this permit directed to the DEC, including the submittal of individual permit applications, shall be sent to the address of the appropriate DEC Office as listed in Appendix B.

Part V. STANDARD PERMIT CONDITIONS

A. <u>Duty to Comply</u>.

The operator must comply with all conditions of this permit. All contractors and subcontractors must comply with the terms of the pollution prevention plan. Any permit noncompliance constitutes a violation of the CWA and the Environmental Conservation Law and is grounds for enforcement action; for permit revocation or modification; or for denial of a permit renewal application.

B. <u>Continuation of the Expired General Permit</u>.

This permit expires on August 1, 1998. However, an expired general permit continues in force and effect until a new general permit is issued. Operators seeking authorization under a new general permit must submit a new NOI in accordance with the terms of such new general permit.

C. <u>Need to halt or reduce activity not a defense</u>. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the construction activity in order to maintain compliance with the conditions of this permit.

D. <u>Duty to Mitigate</u>. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. <u>Duty to Provide Information</u>. The permittee shall furnish to the State Director; or local, or any other agency approving sediment and erosion plans, grading plans, or storm water management plans, or with regulatory control over the project; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with a SPDES permit, to the municipal operator of the system, any information which is requested to determine compliance with this permit or other information.

F. <u>Other Information</u>. When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the NOI or in any other report to the State Director, he or she shall promptly submit such facts or information.

G. Signatory Requirements. All NOIs, NOTs, storm water pollution prevention plans, reports, certifications or information required by this permit or submitted pursuant to this permit, shall be signed as follows:

1. All NOIs and NOTs shall be signed as follows:

a. For a corporation: by (1) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person authorized to and who performs similar policy or decision-making functions for the corporation; or (2) the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second-quarter 1980 dollars) if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The pollution prevention plan and all reports required by the permit and other information requested by the State Director or local agency shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described above and submitted to the State Director.

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

c. Certification. Any person signing documents under paragraph V.G (Page 18) shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

H. Property Rights. The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

I. Severability. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

J. Requiring an individual permit or an alternative general permit.

1. The State Director may require any person authorized by this permit to apply for and/or obtain either an individual SPDES permit or an alternative SPDES general permit. Where the State Director requires a discharger authorized to discharge under this permit to apply for an individual SPDES permit, the State Director shall notify the discharger in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of issuance or denial of the individual SPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications shall be submitted to the appropriate DEC Office indicated in Appendix B of this permit. The State Director may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual SPDES permit application as required by the State Director under this paragraph, then the applicability of this permit to the individual SPDES permittee is automatically terminated at the end of the day specified by the State Director for application submittal.

2. Any discharger authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii) and 6 NYCRR Part 621, with reasons supporting the request, to the State Director at the address for the appropriate DEC Office (see addresses in Appendix B of this permit). The request may be granted by issuance of an individual permit or an alternative general permit at the discretion of the State Director.

3. When an individual SPDES permit is issued to a discharger otherwise subject to this permit, or the discharger is authorized to discharge under an alternative SPDES general permit, the applicability of this permit to the individual SPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual SPDES permit is denied to an operator otherwise subject to this permit, or the operator is denied for coverage under an alternative SPDES general permit, the applicability of this permit to the individual SPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the State Director.

K. **Proper Operation and Maintenance**. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

L. **Inspection and Entry**. The permittee shall allow the State Director or an authorized representative of EPA, the State, or, in the case of a construction site which discharges through a municipal separate storm sewer, an authorized representative of the municipal operator or the separate storm sewer receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

M. Permit Actions. This permit may, at any time, be modified, revoked, and renewed. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Part VI. TERMINATION OF COVERAGE

A. Notice of Termination ("NOT"). Where a site has been finally stabilized and all storm water discharges from construction activities that are authorized by this permit are eliminated[13], the operator must submit an NOT form approved and provided by the State Director (or photocopy thereof). The NOT shall be signed in accordance with Part V.G (Page 18) of this permit and submitted to the address indicated on the approved NOT form.

[13] For the purposes of this certification, elimination of storm water discharges from construction activity means that all disturbed soils at the identified facility have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activities from the identified site that are authorized by a SPDES general permit have otherwise been eliminated.

See Reverse for Instructions

SPDES FORM

DEC

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-3505

Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity Under the SPDES General Permit

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a SPDES permit issued for storm water discharges associated with industrial activity in the State in Section II of this form. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM

I. Facility Operator Information

Name: ____ Phone: ____

Address: ____ Status of Owner/Operator: ☐

City: ____ State: ____ ZIP Code: ____

II. Facility/Site Location Information

Is the Facility Located on Indian Lands? (Y or N) ☐

Name: ____

Address: ____

City: ____ State: ____ ZIP Code: ____

Latitude: ____ Longitude: ____ Quarter: ____ Section: ____ Township: ____ Range: ____

III. Site Activity Information

MS4 Operator Name: ____

Receiving Water Body: ____

If You are Filing as a Co-permittee, Enter Storm Water General Permit Number: ____ Are There Existing Quantitative Data? (Y or N) ☐ Is the Facility Required to Submit Monitoring Data? (1, 2, or 3) ☐

SIC or Designated Activity Code: Primary: ____ 2nd: ____ 3rd: ____ 4th: ____

If This Facility is a Member of a Group Application, Enter Group Application Number: ____

If You Have Other Existing NPDES Permits, Enter Permit Numbers: ____ ____ ____

IV. Additional Information Required for Construction Activities Only

Project Start Date: ____ Completion Date: ____ Estimated Area to be Disturbed (in Acres): ____ Is the Storm Water Pollution Prevention Plan in Compliance with State and/or Local Sediment and Erosion Plans? (Y or N) ☐

V. Certification

V. Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: ____ Date: ____

Signature: ____

91-19-12 (9/92)—10g

Printed on Recycled Paper

Instruction—NYSDEC Form 91-19-12 (9/92)

Notice of Intent (NOI)

For Storm Water Discharges Associated With Industrial Activity to Be Covered Under the SPDES General Permit

Who Must File A Notice Of Intent Form

Federal law at 40 CFR Part 122 prohibits point source discharges of storm water associated with industrial activity to a water body(ies) of the U.S. without a National Pollutant Discharge Elimination System (NPDES) permit. New York State has been delegated the NPDES program and administers its State Pollutant Discharge Elimination System (SPDES) program in lieu of EPA's NPDES program. Wherever the term "NPDES" is used in the NOI form, the reader should substitute "SPDES". The operator of an industrial activity that has a storm water discharge that qualifies for coverage under a SPDES Storm Water General Permit must submit the NOI form to obtain coverage. If you have questions about whether federal regulations require you to obtain a permit for your storm water discharge, contact the EPA Storm Water Hotline at (703) 821-4823. If you have questions concerning the applicability and coverage of the SPDES Storm Water General Permits, contact the New York State of Environmental Conservation at (518) 457-9601. In order to cancel your coverage under the General Permit you must submit a Notice of Termination (NOT) form. Failure to submit a NOT will result in the obligation to pay a yearly Regulatory Fee.

Where To File The NOI Form

New York State intends on using EPA's information management system. Therefore, NOIs must be sent to the following address:

Storm Water Notice of Intent
PO Box 1215
Newington, VA 22122

Completing The Form

You must type or print using upper-case letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, call the EPA Storm Water Hotline at (703) 821-4823.

Section I—Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same as the name of the facility. The responsible party is the legal entity that controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Enter the appropriate letter to indicate the legal status of the operator of the facility:

F—Federal   M—Public (other than federal or state)
S—State   P—Private

Section II—Facility/Site Location Information

Give the facility's or site's official or legal name and complete street address, including city, state, and ZIP code. If the facility or site lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Indicate whether the facility is located on Indian lands.

Section III—Site Activity Information

If the storm water discharges to a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4 (e.g. municipality name, county name) and the receiving water of the discharge from the MS4. (A MS4 is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body which is designed or used for collecting or conveying storm water.)

If the facility discharges storm water directly to receiving water(s), enter the name of the receiving water.

If you are filing as a co-permittee and a storm water general permit number has been issued, enter that number in the space provided.

Indicate whether or not the owner or operator of the facility has existing quantitative data that represent the characteristics and concentration of pollutants in storm water discharges.

Indicate whether the facility is required to submit monthly data by entering one of the following:

1 Not required to submit monitoring date;
2 Required to submit monitoring data;
3 Not required to submit monitoring data; submitting certification for monitoring exclusion.

Those facilities that must submit monitoring data (e.g. choice 2) are: Section 313 EPCRA facilities; primary metal industries; land disposal units/incinerators/BIFs; wood treatment facilities; facilities with coal pile runoff; and battery reclaimers.

List, in decreasing order of significance, up to four 4-digit standard industrial classification (SIC) codes that best describe the principal products or services provided at the facility or site identified in Section II of this application.

For industrial activities defined in 40 CFR 122.26(b)(14)(i)-(xi) that do not have SIC codes that accurately describe the principal products produced or services provided, the following 2-character codes are to be used:

HZ Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA [40 CFR 122.26(b)(14)(iv)].

LF Landfills, land application sites, and open dumps that receive or have received any industrial wastes, including those that are subject to regulation under subtitle D of RCRA [40 CFR 122.26(b)(14)(v)].

SE Steam electric power generating facilities, including coal handling sites [40 CFR 122.26(b)(14)(vii)];

TW Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage [40 CFR 122.26(b)(14)(ix)];

CO Construction activities [40 CFR 122.26(b)(14)(x)].

If the facility listed in Section II has participated in Part 1 of an approved storm water group application and a group number has been assigned, enter the group application number in the space provided.

If there are other SPDES permits presently issued for the facility or site listed in Section II, list the permit numbers. If an application for the facility has been submitted but no permit number has been assigned, enter the application number.

Section IV—Additional Information Required for Construction Activities Only

Construction activities must complete Section IV in addition to Sections I through III. Only construction activities need to complete Section IV.

Enter the project start date and the estimated completion date for the entire development plan.

Provide an estimate of the total number of acres of the site on which soil will be disturbed (round to the nearest acre).

Indicate whether the storm water pollution prevention plan for the site is in compliance with approved state and/or local sediment and erosion plans, or storm water management plans.

Section V—Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manage of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality, state, federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may decrease or reduce the burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20490, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20603.

APPENDIX B - Filing Locations

- Notices of Intent should be sent to: Storm Water Notice of Intent, P. O. Box 1215, Newington, VA 22122;
- Notices of Termination should be sent to: Storm Water Notice of Termination, P. O. Box 1185, Newington, VA 22212
- Discharge Monitoring Reports ("DMRs") should be sent to DEC, Division of Water, 50 Wolf Road, Albany, NY 12233-3506,
- Written reports submitted in accordance with 6 NYCRR Part 595 (Chemical Bulk Storage) should be sent to DEC, Division of Spill Prevention, Response and Remediation, 50 Wolf Road, Albany, NY 12233-3520.

All other reports and submittals required by this permit, including individual SPDES applications, should be submitted in accordance with the table below.

The filing location depends on the county in which the discharge is located. To determine the mailing address for the proper Filing Location, find the county in which the discharge is located in the table below. Use the letter in the "KEY" column to the right of the county name to find the proper mailing address in the list at the right.

Discharge Location - County	NYSDEC Region	KEY	Discharge Location - County	NYSDEC Region	KEY
Albany	4	F	Ontario	8	N
Allegany	9	O	Orange	3	E
Broome	7	L	Orleans	8	N
Cattaraugus	9	O	Oswego	7	L
Cayuga	7	L	Otsego	4	G
Chautauqua	9	O	Putnam	3	E
Chemung	8	N	Rensselaer	4	F
Chenango	7	L	Rockland	3	E
Clinton	5	H	St. Lawrence	6	J
Columbia	4	F	Saratoga	5	I
Cortland	7	L	Schenectady	4	F
Delaware	4	G	Schoharie	4	G
Dutchess	3	E	Schuyler	8	N
Erie	9	O	Seneca	8	N
Essex	5	H	Steuben	8	N
Franklin	5	H	Suffolk	1	A
Fulton	5	I	Sullivan	3	E
Genesee	8	N	Tioga	7	L
Greene	4	F	Tompkins	7	L
Hamilton	5	H	Ulster	3	E
Herkimer	6	K	Warren	5	I
Jefferson	6	J	Washington	5	I
Lewis	6	J	Wayne	8	N
Livingston	8	N	Westchester	3	E
Madison	7	L	Wyoming	9	O
Monroe	8	N	Yates	8	N
Montgomery	4	F	Bronx	2	D
Nassau	1	A	Kings	2	D
Niagara	9	O	New York	2	D
Oneida	6	K	Queens	2	D
Onondaga	7	L	Richmond	2	D

KEY	
A	NYSDEC REGION 1, Bldg. 40 SUNY Stony Brook, NY 11794; Phone: (516) 751-7900
D	NYSDEC REGION 2, One Hunters Point Plaza, 47-40 21st St, Long Island City, NY 11101; Phone: (718) 482-4851
E	NYSDEC REGION 3, 21 South Putt Corners Rd., New Paltz, NY 12561; Phone: (914) 255-5453
F	NYSDEC REGION 4, 2176 Guilderland Ave., Schenectady, NY 12306; Phone: (518) 382-0680
G	NYSDEC REGION 4 SUB-OFFICE, Route 10, Jefferson Road, Stamford, NY 12167; Phone: (607) 652-7364
H	NYSDEC REGION 5, Route 86, Ray Brook, NY 12977; Phone: (518) 891-1370
I	NYSDEC REGION 5 SUB-OFFICE, Hudson St., Warrensburg, NY 12885; Phone: (518) 623-3671
J	NYSDEC REGION 6, State Office Bldg.,317 Washington St., Watertown, NY 13601; Phone: (315) 785-2245
K	NYSDEC REGION 6 SUB-OFFICE, State Office Building., 207 Genesee St., Utica NY 13501-2885; Phone: (315) 793-2554
L	NYSDEC REGION 7, 615 Erie Boulevard West, Syracuse, NY 13204; Phone: (315) 426-7400
N	NYSDEC REGION 8, 6274 East Avon-Lima Rd., Avon, NY 14414; Phone: (716) 226-2466
O	NYSDEC REGION 9, 270 Michigan Ave., Buffalo, NY 14203; Phone: (716) 851-7000

Mail individual SPDES permit applications to "Division of Regulatory Affairs"

Please See Instructions Before Completing This Form

SPDES FORM

DEC

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-3505

Notice of Termination (NOT) for Coverage Under the SPDES General Permit for Storm Water Discharges Associated with Industrial Activity

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with industrial activity under the SPDES program. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

I. Permit Information

NPDES Storm Water General Permit Number: ______ Check Here if You are No Longer the Operator of the Facility: ☐ Check Here if the Storm Water Discharge is Being Terminated: ☐

II. Facility Operator Information

Name: ______ Phone: ______

Address: ______

City: ______ State: ______ ZIP Code: ______

III. Facility/Site Location Information

Name: ______

Address: ______

City: ______ State: ______ ZIP Code: ______

Latitude: ______ Longitude: ______ Quarter: ______ Section: ______ Township: ______ Range: ______

IV. Certification: I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by a NPDES general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

Print Name: ______ Date: ______

Signature: ______

Instructions For Completing Notice of Termination (NOT) Form

Who Should File A Notice of Termination (NOT) Form

Permittees who are presently covered under the New York State issued State Pollutant Discharge Elimination System (SPDES) General Permit for Storm Water Associated with Industrial Activity should submit a Notice of Termination (NOT) form when their facilities no longer have any storm water discharges associated with industrial activity as defined in the storm water regulations at 40 CFR 122.26(b)(14), or when they are no longer the operator of the facilities. Failure to file a Notice of Termination will result in the continued obligation to pay a yearly Regulatory Fee.

For construction activities, elimination of all storm water discharges associated with industrial activity occurs when disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activity from the construction site that are authorized by a SPDES general permit have otherwise been eliminated. Final stabilization means that all soil-disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

Where to File NOT Form

New York State is using EPA's information management system. Therefore, NOTs must be sent to the following address:

Storm Water Notice of Termination
Box 1185
Newington, VA 22122

Completing the Form

Type or print, using upper-case letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only spaces for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, call the EPA Storm Water Hotline at (703) 821-4823.

SEE REVERSE SIDE OF THIS FORM FOR FURTHER INSTRUCTIONS

91-19-13 (9/92)—10g Printed on Recycled Paper

Instructions—NYSDEC Form 91-19-13(9/92)
Notice of Termination (NOT) of Coverage Under The SPDES General Permit for Storm Water Discharges Associated With Industrial Activity

Section I Permit Information

Enter the existing SPDES Storm Water General Permit number assigned to the facility or site identified in Section III. If you do not know the permit number, contact the EPA Storm Water Hotline at (703) 821-4823.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box.

If there has been a change of operator and you are no longer the operator of the facility or site identified in Section III, check the corresponding box.

If all storm water discharges at the facility or site identified in Section III have been terminated, check the corresponding box.

Section II Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity which controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Section III Facility/Site Location Information

Enter the facility's or site's official or legal name and complete address, including city, state and ZIP code. If the facility lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Section IV Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (I) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (II) the manage of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality, state, federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may decrease or reduce the burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20490, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20603.

APPENDIX D
STORMWATER MANAGEMENT GUIDELINES FOR NEW DEVELOPMENT

I. BACKGROUND

Stormwater runoff from developing areas can lead to off-site problems including flooding and erosion and water quality degradation. By changing land cover on developed sites, there can be reduced infiltration into the soil, decreased interception of precipitation by vegetation, and changes in the timing of runoff. Large runoff volumes and high rates of discharge from these sites can cause flooding and erosion if not properly controlled and conveyed from the sites. Additionally, pollutants, such as sediment, oil, grease, metals and nutrients, can be washed off impervious areas during storm events and be transported to lakes and streams and may contribute to water quality degradation. This is reflected in the Nonpoint Source Assessment Report published by NYS DEC in February 1989.

To minimize the effects of development, ideally the quantity and quality of stormwater runoff that reaches surface waters during and after development should not be altered from pre-development conditions. A variety of structural and non-structural measures -- for example, detention ponds, recharge basins, infiltration pits and trenches, diversion ditches, storage terraces and vegetative swales and other vegetative measures including artificial wetlands -- may be used to control and alleviate the adverse impacts of stormwater runoff.

The following guidelines, which include guidance for siting, sizing, and design of stormwater management measures, may be considered in the preparation and review of stormwater management plans to ensure that runoff during and after development is not substantially altered from pre-development conditions. Of course, such preparation and review should proceed on a case-by-case basis, attendant to the facts and circumstances surrounding the particular project involved.

Generally, appropriate stormwater management plans will achieve the following water and natural resource management objectives:

- reduce the rate of runoff from new land development to prevent increases in flooding and flood damage;
- reduce the erosion potential from a development or construction project; assure the adequacy of existing and proposed culverts and bridges; increase water recharge into the ground; decrease nonpoint source pollution and water quality degradation;
- maintain stream channels for their biological functions as well as for drainage through reduced streambank erosion;
- increase opportunities for preserving open space through stream corridor and flood plain protection; and
- increase recreational opportunities through the multiple use of stormwater management facilities.

II. GUIDANCE

The attached guidelines were developed as an aid to persons preparing and reviewing stormwater management plans. They provide guidance on sound management practices, but are not fixed and inflexible rules to be applied in reviewing stormwater management plans without considering the particular facts and circumstances of a particular project. Local conditions, for example the protection of a sensitive lake or trout stream from the influence of urbanization, may indicate the need for additional control measures.

It should be noted that some communities may have duly adopted stormwater management requirements, and that they should be consulted and complied with. For example, special regulations for controlling stormwater runoff in the Lake George Park are being promulgated under Article 43-0112 of the Environmental Conservation Law and watershed rules and regulations for certain water supply watersheds have been adopted.

STORMWATER MANAGEMENT GUIDELINES FOR NEW DEVELOPMENT

1. DEFINITIONS

Baseflow – The portion of stream flow that is not due to storm runoff, is supported by groundwater discharge into a channel.

Conditional negative declaration – A negative declaration may be issued by a lead agency for an unlisted action (under SEQR), in which the action as initially proposed may result in one or more significant adverse environmental effects; however mitigation measures will modify the proposed action so that no significant adverse environmental impacts will result (6 NYCRR 617.6(h)).

Drywell – Similar to infiltration trench but smaller with inflow from pipe; commonly covered with soil and used for drainage areas of less than 1 acre such as roadside inlets and rooftop runoff.

EIS – An Environmental Impact Statement.

Extended detention – A practice designed to store stormwater run–off by collection as a temporary pool of water, usually having at least a 24 hour residence time. A practice which is used to control peak discharge rates, and which provides gravity settling of pollutants.

First flush – The delivery of a disproportionately large load of pollutants during the early part of storms due to the rapid runoff of accumulated pollutants. The first flush in these guidelines is defined as one–half inch of runoff per acre of land which has been made more impervious from pre–development (natural) conditions through land clearing, land grading and construction/development activities.

Flood plain – For a given flood event, that area of land adjoining a continuous watercourse which has been covered temporarily by water.

Forebay – An extra storage area or treatment area, such as a sediment pond or created wetland, near an inlet of a stormwater management facility to trap incoming sediments or take up nutrients before they reach a retention or extended detention pond.

HEC–2 – U.S. Army Corp of Engineers Computer Program 723–X6–L202A intended for calculating water surface profiles for steady or gradually varied flow in natural or man–made channels.

Impervious area – Impermeable surfaces, such as pavement or rooftops, which prevent the infiltration of water into the soil.

Infiltration – A practice designed to promote the recharge of groundwater by containment and concentration of stormwater in porous soils.

Infiltration basin – An impoundment made by excavation or embankment construction; commonly serves a drainage area of 5 to 50 acres; usually closer to 50.

Outfall – The terminus of a storm drain where the contents are released.

Peak flow – The maximum instantaneous flow of water during a storm, usually in reference to a specific design storm event.

Peak flow attenuation – The reduction of the peak discharge of storm runoff by storage and gradual release of that storage.

Retention – A practice designed to store stormwater run–off by collection as a permanent pool of water without release except by means of evaporation, infiltration, or attenuated release when runoff volume exceeds the permanent storage capacity of the permanent pool.

Riparian area – A relatively narrow strip of land that borders a stream or river.

Riprap – A combination of large stone, cobbles and boulders used to line channels, stabilize stream banks, reduce runoff velocities, or filter out sediment.

Riser – A vertical pipe extending from the bottom of a pond that is used to control the discharge rate from the pond for a specified design storm.

Sand attenuating filter – A chamber open to the surface containing a surface layer of sand over a high void aggregate base; these are innovative but apparently effective practices for atypical situations such as where a site is unsuitable for stormwater infiltration or retention.

SEQR – An acronym for the State Environmental Quality Review Act; Article 8 of the Environmental Conservation Law.

Sheetflow – Runoff which flows over the ground surface as a thin, even layer, not concentrated in a channel.

Special flood hazard area – an area in a community that has been identified as susceptible to a 1% or greater chance of flooding in any given year. A 1% probability flood also is known as the 100–year flood.

SPDES – An acronym for the State Pollutant Discharge Elimination System; A regulatory/permit program administered under Article 17 of the Environmental Conservation Law, by the NYS Department of Environmental Conservation to control point source discharges of water pollution.

Storm frequency – The average frequency of occurrence of events having a given volume and duration. For example: a 2–year; 10–year; or 100–year storm.

Storm drain – Any open or closed conduit designed to convey stormwater.

Storm duration – The length of time over which a precipitation event occurs (e.g., 24–hours).

Storm volume – The total amount of precipitation occurring over the storm duration.

Swale – A natural depression or wide shallow ditch used to temporarily route, or filter runoff.

TR–20 – A rainfall runoff model developed by the USDA Soil Conservation Service for hydrologic analyses of a watershed under present conditions of land cover/use and structural or channel modifications using single event storm rainfall–frequency data. Output consists of peaks and/or flood hydrographs, their time of occurrence and water surface elevations at any desired cross section or structure.

2. FLOOD CONTROL GUIDELINES

The following guidelines should be used to ensure that stormwater runoff is safely conveyed through a development site during and after construction. Also through peak flow attenuation, the guidelines can be used to facilitate the control of stormwater runoff so as to minimize or alleviate flooding and stream bank erosion associated with land development and urbanization. The guidelines are as follows:

A. **Peak Flow Attenuation**

(1) The release of stormwater runoff from development should not exceed pre–development (natural) conditions. To accomplish this, stormwater runoff should be controlled so that during and after development, the site will generate no greater peak than prior to development for a 2–year, 10–year, and 100–year 24–hour storm considered individually.

- Attenuation of the 2–year storm is intended to achieve the stream channel erosion control objective.
- Attenuation of the 10–year storm is intended to assure the adequacy of existing and proposed culverts and storm drain systems.
- Attenuation of the 100–year storm is intended to reduce the rate of runoff from development to prevent expansion of the 100–year flood plain so as to alleviate flooding of improved properties and roadways.

(2) It is not necessary that peak flow attenuation requirements be satisfied only by means of detention basins. For example, infiltration trenches, dry wells, or stone reservoirs underneath paving, may be used for the purpose of attenuating peak flows for smaller storms with appropriate consideration for length of life of the stormwater facility, and feasibility of maintenance.

(3) Where dams are to be constructed for attenuating peak flows, approval may have to be obtained from DEC pursuant to Article 15–0503 of the Environmental Conservation Law.

B. **100–Year Flood Plains**

(1) At a minimum, encroachment into the special flood hazard area should be allowed only in compliance with local restrictions adopted for community participation in the National Flood Insurance Program (NFIP). A permit is required for encroachment into flood plains in Part 500 communities [1].

(2) A 50' buffer (building restriction line) should be established from the flood hazard area as a safety factor to allow for inaccuracy in the determination. Pursuant to Article 24 (ECL), a 100-foot buffer is required around a protected wetland.

(3) The stormwater management plan for all developments of 5 or more acres or containing 5 or more dwelling units located wholly or partially within a 100–year flood plain where flood elevation data are not available through the NFIP, must include a study to determine 100–year flood plain elevations in accordance with TR–20, HEC–2 or other standard engineering methods. Such elevation data shall be used to regulate flood plain encroachments in accordance with the NFIP. The 100–year flood plain elevation and the building restriction line should be shown on the plan.

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1 Part 500 community – A community for which flood insurance regulations are administered by the State of New York under 6 NYCRR 500 pursuant to Article 36 of the Environmental Conservation Law.

C. Runoff Conveyance Systems

(1) Priority should be given to maintaining natural drainage systems, including perennial and intermittent streams, swales and drainage ditches in an open condition.

(2) Where closed storm drain systems (i.e., those involving a culvert or similar conduit) are deemed essential, justification should be made as to why it is necessary to have a closed system. When justified, the closed system should be designed to:

(a) convey the 10-year storm flow within the closed storm drain system; and

(b) provide for safe overland conveyance of flow of the 100-year storm through the development (generally over the top of the closed storm drain system). All overland flow conveyance structures should be at least 1' above the 100-year flood plain elevation and the outfalls of such convenances should be stabilized with rip-rap or other suitable material to reduce erosion.

(3) Any alteration to a protected stream, a stream bed or the banks thereof, including the installation of stormwater conveyance systems will require an Article 15, Protection of Water Permit and may require an Article 24, Freshwater Wetlands Permit. When stream protection measures are mandated on a protected stream, a fisheries habitat technician should be involved with the planning and design of such measures.

(4) Any culvert or stormwater structure placed in a stream should not impede fish migration.

D. Stream Corridor Management

(1) Consistent with the State's Stream Corridor Management Program, land clearing and land grading within a stream corridor should be avoided or minimized, except at stream crossing so that stream and drainage courses remain in a natural state. [2]

(2) Care should be exercised to ensure that riparian vegetation, including grasses, shrubs and trees in the stream corridor or along the watercourse, remain undisturbed during land clearing, land grading and land development.

3. WATER QUALITY MANAGEMENT GUIDELINES

The following guidelines should be used in conjunction with the flood control guidelines to protect water quality from runoff associated with land clearing, land grading and construction activities. The guidelines should be followed by a project applicant/sponsor in preparing and implementing a stormwater management plan (SMP). The guidelines should apply to all land areas where soil permeability has been changed as a result of land clearing, land grading and land development.

A. Control of "First Flush"

Control of the "first flush" is important in stormwater management because most runoff-related water quality contaminants are transported from land, particularly impervious surfaces, during the initial stages of a storm event. For example, from 70% to 95% of the contaminants in stormwater can be removed by capturing the first flush of runoff

[2] New York State Department of Environmental Conservation, "Stream Corridor Management: A Basic Reference Manual". Albany, 1986.

through infiltration practices [3]. Regardless of whether infiltration, retention or extended detention practices are used to capture the first flush, the guideline is as follows:

> Provide for control of the first 1/2-inch of runoff from all land areas for which the perviousness has been changed over pre–development (natural) conditions due to land clearing, land grading and construction [4].

B. Control of Thermal Discharges

Control of thermal energy in stormwater runoff in watersheds having streams which support cold water fisheries is essential. Impervious surfaces, for example, asphalt parking areas and roofs, store large quantities of heat during hot weather in summer. The heat from such surfaces is released to stormwater through conduction during storm events. Stormwater runoff having elevated temperatures can, in turn, increase stream temperatures during storm events and adversely impact cold water fisheries. Accordingly:

> Stormwater discharges should be consistent with the thermal criteria found in Part 704 of the Water Quality Regulations, Title 6, Chapter X, New York State Codes, Rules and Regulations.

C. Hierarchy of Methods for Managing Stormwater Quality

The following stormwater management systems, summarized in descending order of preference, should be used to control the first flush when designing stormwater facilities. The practices are: (1) infiltration, (2) retention, and (3) extended detention. When a stream supporting a cold water fishery is the object of protection, extended detention should be placed ahead of retention in the hierarchy. A combination of these practices, including stormwater management adjuncts (number 4 in the hierarchy), may be used to achieve first flush control objectives. The project sponsor/applicant should provide justification for the rejection of practices listed as priority 1, 2, or 3.

(1) **Infiltration** - Infiltration of runoff on–site by use of vegetated depressions and buffer areas, pervious surfaces, drywells, infiltration basins and trenches permits immediate recharge of groundwater and aids quality treatment through soil filtration. This practice eliminates or minimizes direct stormwater discharges to a waterbody and provides thermal benefits to cold water fisheries.

(2) **Retention** - Retention by use of wet ponds and wetlands constructed in upland areas provides for the storage of collected runoff in a holding area prior to release in a waterway allowing quality treatment by sedimentation, flocculation, and biological removal. Retention is used when post-development runoff volume is expected to exceed the capabilities of infiltration. However, summer temperatures of water in a retention facility may exceed temperatures required to sustain a cold water fishery. Therefore, retention is not appropriate where stored (warm) water in a retention facility is displaced by storm runoff and discharged to a trout stream in contravention of Part 704 standards.

(3) **Extended Detention** - Extended detention provides for the temporary storage of collected runoff in a holding area prior to release into a waterway. Settling is the primary pollutant removal mechanism associated with extended detention. As such, the degree of removal is dependent on whether a given pollutant is in particulate or soluble form. Removal is likely

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[3] Maryland Department of Natural Resources, "Minimum Water Quality Objectives and Planning Guidelines for Infiltration Practices," Water Resources Administration, Sediment and Stormwater Division, Annapolis, MD, April,1986.

[4] Note that, in addition to paved surface areas and land areas connected to buildings, the contributory area for which the first 1/2-inch of runoff should be controlled includes lawn and similarly landscaped surfaces.

to be quite high if a pollutant is a particulate, whereas very limited removal can be expected for soluble pollutants.

Extended detention can provide thermal benefits to a trout stream. By using a perforated, low flow drain pipe encased in a gravel jacket having an adequate mass, extended detention may be used to dissipate heat and cool stormwater runoff prior to its discharge to a trout stream.

(4) **Stormwater Management Adjuncts** - Flow and pollutant attenuation by use of open vegetated swales, vegetated buffer zones, or filter strips, provides water quality treatment by filtration, attenuation, buffering, sedimentation, biological and removal and particle retention. These practices should be used to compliment infiltration, retention or extended detention.

4. DESIGN GUIDELINES FOR CONTROLLING THE FIRST ONE-HALF INCH OF RUNOFF

Following are design guidelines for controlling the first 1/2-inch of runoff from the contributory drainage.

A. Infiltration

(1) Infiltration systems should be designed to capture the first one-half inch of stormwater runoff from impervious surfaces, lawns and similarly landscaped areas in the development site. Stormwater volumes in excess of this amount should be managed for quantity control by supplemental practices.

(2) Infiltration systems should incorporate measures which:

a. Recognize that the recommended design time to drain stored runoff from an infiltration system depends on the specific method or practice. Accordingly, the following ponding or storage times represent the maximum design time period for the referenced facility:

TYPE	TIME (24-hour days)
Infiltration Basin	5
Infiltration Trench	15
Dry Wells	15
Porous Pavement	2
Vegetated Depression	1

b. Ensure that infiltration measures are placed at least 100' from septic systems and water supply wells.

c. Recognize that soils with infiltration rates less than .5 inches per hour are unsuitable for infiltration measures.

d. Provide for a vertical separation distance of at least 4 feet between the bottom of the infiltration system and the seasonably high groundwater table or bedrock. (The excavation of an inspection trench/pit or soil borings at the proposed site of the infiltration facilities to determine the elevation of bedrock and groundwater, and the documentation of such tests must be conducted under the direction of a professional engineer, architect, or landscape architect licensed to practice in New York State.)

e. Trap excess loads of sediment, grease, oils, and settleable solids and other objectionable materials including floatable organics, materials from roadways, parking surfaces, and similar paved areas before they enter the infiltration system.

f. Route design runoff flows through an infiltration basin without scouring or eroding the basin floor and clogging the surface soil pores.

g. Route base flow (if any exists) rapidly through the basin to prevent ponding or standing water.

h. Distribute storm runoff volume evenly over the floor of the basin to maximize exfiltration rates.

i. Provide for safe emergency overflow with measures to provide a non–erosive velocity or flow along its length and at the outfall.

In addition to the above;

j. Infiltration systems should not receive runoff until the entire contributory drainage area to the infiltration system is permanently stabilized.

k. Placement of infiltration facilities in areas which have been filled is unacceptable. Compacted fill material loses permeability and the in situ/fill material interface may cause slope failure due to slippage.

l. If on–site septic systems are to be used, soils must be able to accommodate loading from both on–site infiltration facilities and on–site septic systems.

B. Retention

(1) Retention (Wet) Ponds

a. Retention is the preferred method of stormwater management when the water table or bedrock is too high for infiltration and soils are poorly drained. Retention improves stormwater quality by gravity settling, naturally occurring chemical flocculation, and biological uptake.

b. Wet ponds (another term for retention pond) should not be constructed by impounding existing wetlands unless authorized by the DEC under Article 24 Freshwater Wetlands Act. If existing wetlands are to be located in an anticipated permanent pool area, the maximum normal pool elevation should not increase mean water depth in the wetland area.

c. Retention ponds should be enhanced with areas of shallow water habitat for additional water quality benefits. Retention ponds also can be part of a created shallow water wetland design, (see use of wetlands for stormwater management).

d. Retention ponds (other than shallow marshes addressed later) should be designed as follows:

i. pond geometry should provide for complete mixing of inflow before discharging.

ii. in larger ponds, diversion barriers such as small islands should be used to increase effective length of flow and permit maximum mixing.

iii. the depth of the pond will vary depending on its intended use. The pond contour should include:

- an average pond depth of 3–6 feet;
- a shallow area 0.5' to 2' deep at the inlet;
- a littoral area or bench 10 feet in width along the perimeter to promote marsh habitat for filtering and nutrient removal; and
- an area 8' to 14' in depth to promote gravity settling and fish habitat.

iv. the minimum drainage area to be served by a wet (retention) pond should be approximately 10 acres. Soils should have infiltration rates less than 0.5 inches/hour.

v. if soils are so porous that an unreasonably large drainage area is required to sustain a relatively small pond, then infiltration practices should be used.

vi. the residence time of pond water should be 24 to 40 hours to remove a minimum of two–thirds of the suspended solids and other pollutants from the incoming stormwater. For removal of phosphorus compounds in lake watersheds where eutrophication is a threat or problem, larger volume ponds should be designed to provide a 14–day residence time.

vii. retention ponds should accommodate up to 10–year storm volumes. The minimum volume retained should be that associated with the first one–half inch of runoff. Excess volumes, for example, the 100–year storm, may be detained.

viii. velocity dissipation devices should be placed at the outfall of all retention structures and along the length of any outfall channel as necessary to provide a non–erosive velocity of flow from the structure to water course. Velocity dissipation devices may be required in stream channels at outfall locations to prevent erosion and fisheries habitat degradation. Pursuant to Article 15 (ECL), a Protection of Waters Permit may have to be obtained in order to install in–stream velocity dissipation devices in protected streams.

ix. the construction of wet (retention) ponds in and around class AA, A, B, C(T) and (TS) streams (water suitable for trout) may not be appropriate to protect these waters and should not be permitted except where, pursuant to 6 NYCRR Part 704 of the Water Quality Regulations, Title 6, Chapter X, retention will not be injurious to cold water fisheries or their habitat. This practice may elevate water temperatures as well as reduce dissolved oxygen levels.

x. pursuant to Article 15–0503 of the Environmental Conservation Law, approval for construction of a dam for a stormwater retention facility may have to be obtained from DEC.

(2) Use of Wetlands in Stormwater Management

The use of wetlands for stormwater management is receiving increased attention. Wetlands are known to provide water quality benefits by filtering and trapping suspended solids including sediment, chemical adsorption, biological assimilation, microbial decomposition and chemical decomposition.

a. **Use of Existing Wetlands** - It is generally not acceptable to discharge untreated stormwater directly into naturally existing wetlands. Direct, untreated discharges may overload the natural system, and make it impractical to manage (e.g., by periodic sediment removal) resulting in contamination of the wetland and accelerated succession. Direct discharges also may alter the hydrology and hydroperiod of the wetland, which may significantly alter the vegetative community therein.

However, incorporating an existing wetland in its natural state into a well–designed stormwater management plan may be an acceptable method of stormwater management when adverse impacts to the wetland can be avoided. Natural wetlands should be used only for final polishing after pre–treatment by preliminary practices, such as infiltration, retention or extended detention. In these situations, ultimate discharge to the natural wetland may maintain base flow into the system, thereby helping to maintain the health of the wetland.

Except as provided for in section B. (1) b.,natural wetlands should not be impounded for the creation of either wet or dry ponds.

b. **Use of Artificially Created Wetlands** - Wetlands may be created as part of a stormwater management plan to provide water quality improvement. They may enhance treatment provided by wet ponds and create extended detention areas by enlarging the wetland portions of existing basins.

A created wetland also can provide first–flush treatment when one or more smaller ponds are included. Such a design would be essential if no other pre–treatment practices are used. In the winter when vegetative uptake mechanisms are absent, a pond in the wetland retains higher levels of nitrogen compounds which would otherwise escape downstream.

c. **Factors for Consideration in Designing Created Wetlands** -

i. Location – the preferred locations are: upland areas adjacent to, but separated from, existing streams and wetlands by vegetated filter

strips wide enough to provide a buffer; in an upland extended detention basin; or as a forebay to a wet pond or detention basin.

ii. Hydraulic design -- specific stormwater management plan criteria must be determined for each site to ensure the created wetland is sufficient to meet the demands being place on it and to determine hydrologic impacts to receiving wetlands, if any.

iii. Expected inflows -- inflows may be composed of stormwater surface water or groundwater. Stormwater should be introduced to wetlands as sheet flow whenever possible. If inflow is conveyed through the outfall, a forebay is necessary. Incoming velocities should not exceed 4 fps during two–year storm events.

iv. Shape and depth -- shallow ponds do not have as long a residence time as deeper ponds. Therefore, caution should be used in substituting deep ponds with shallow marshes. However, the water quality values provided by the substrate, biota and vegetation in wetlands may provide services not provided by deeper ponds. It is important to determine what water quality improvement is needed and whether ponds or wetlands better serve that need.

When creating wetlands, 75% of the wetland should be 18 inches or shallower. Twenty-five percent of the total surface area should be reserved for open water areas that are deeper than 18 inches. However, if the water exits the wetland through an outlet structure, the outlet should be located in water approximately 3 feet deep. Similarly, if a forebay is used, it should be at least 3 feet deep and comprise 10% of the total wetland and pond volume.

v. Vegetative composition -- the plant species selected should be compatible with the physical nature of the wetland (e.g., depth), the climate conditions of the area, and their tolerance to the presence of pollutants. A planting scheme and schedule should be incorporated into the stormwater management plan.

C. Extended Detention

(1) Extended detention ponds may be used to enhance water quality in stormwater runoff. Extending the detention time of dry or wet ponds is an effective, low cost means of removing particulate pollutants and controlling increases in downstream bank erosion. Extended detention is preferred over retention where there is a need to maintain stream temperatures in support of a trout fishery pursuant to the thermal criteria found in Part 704 of the Water Quality Regulations, Title 6, Chapter X.

(2) When extended detention ponds are used, they may be acceptable with the following conditions:

a. The "first-flush" runoff volume (i.e., the first one-half inch of runoff from the contributory drainage) should be extended over a 24-hour detention period.

b. Stormwater runoff volume generated from a one-inch storm should be released over a 24-hour detention period. The control device should be adjusted so that smaller runoff events (0.1 to 0.2 inches), which normally pass through the pond quickly, are detained for at least a minimum of six hours. In larger watersheds, up to 40 hours of extended detention may be needed for streambank erosion control.

c. Pond outfall velocities should not exceed 4 fps during 2-year storm events.

d. Velocity dissipation devices should be placed at the outfall of all extended detention structures and along the length of any outfall length channel as necessary to provide a non-erosive velocity of flow from the structure to a water course. Velocity dissipation devices may be required in stream channels at outfall locations to prevent erosion and fisheries habitat degradation. Pursuant to Article 15 (ECL), a Protection of Waters Permit may have to be obtained in order to install in-stream velocity dissipation devices in protected streams.

e. Pursuant to Article 15–0503 of the Environmental Conservation Law, approval for construction of a dam for a stormwater detention facility may have to be obtained from DEC.

D. Stormwater Management Adjuncts

Generally, relatively small volumes of stormwater (i.e., drainage from less than 1 acre or relatively small storms) can be managed entirely by flow and pollution attenuation practices including vegetative swales, filter strips, and water quality inlets. These practices usually are used to supplement other practices such as those described above; therefore, they are referred to herein as stormwater management adjuncts. Where vegetative swales and filter strips will be used, stormwater should to the extent possible be managed as sheetflow and have velocities less than 4 fps during 2–year storm events. The following design criteria should be considered when swales, filter strips and water quality inlets are used to control stormwater runoff.

(1) **Vegetative swales** [5] - Vegetative swales typically are applied in single family residential developments and highway medians as an alternative to curb and gutter drainage systems. When individual lots are greater than 0.5 acre, open section roadways with vegetated swales and check dams are preferred over curb and gutter management systems for stormwater conveyance. In designing and constructing swales:

a. small slopes in the flow of swales should be graded as close to zero as drainage will permit. Side–slopes of swales should be no greater than 3:1.

b. a dense cover of water tolerant, erosion resistant grass must be established. Reed canary grass is recommended for this purpose. Swale grasses should not be mowed close to the ground, as this impedes the filtering and hydraulic functions of the swale. Also, if a swale is adjacent to a roadway, sensitive species with a low salt tolerance (e.g., bluegrass) should be avoided.

c. underlying soils should have a percolation rate of at least 0.5 inches per hour.

d. the swale should be tilled before the grass cover is established to restore infiltration capacity lost as a result of prior construction activities.

e. Check dams can be installed in swales to promote additional infiltration. A preferred method is to sink a railroad tie halfway into the swale, and place stones on the downstream side to prevent a scour hole from forming. If a check dam is used, the designer should make sure that the maximum ponding time of runoff backed up behind the check dam does not exceed 24 hours.

(2) **Filter Strips** [6] - Filter strips do not provide enough storage or infiltration to effectively reduce peak discharges to pre-development levels for design storms. Filter strips are however, viewed as one component of an integrated stormwater management system.

a. The top edge of the filter strip should follow across the same elevational contour. If a section on the top edge of the strips dips below the contour, it is likely that runoff will eventually form a channel toward the low spot.

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5 Adopted from: Schueler, T.R. "Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs", Department of Environmental Programs, Metropolitan Washington Council of Governments, Washington, D.C. July, 1987.

6 Ibid.

b. A shallow stone trench which follows the contour can be used as level spreader at the top of the strip to distribute flow evenly. This also can serve to protect the strip from anthropogenic damage.

c. The top edge of the filter strip should directly abut the contributing impervious area. Otherwise, runoff may travel along the top of the filter strip rather than through it. Berms can be placed at 50–100 foot intervals perpendicular to the top edge of the filter strip to prevent runoff from by–passing the strip.

d. As an absolute minimum, a grass strip should be at least 20 feet wide. Improved performance can be achieved if the strip is 50–75 feet wide, plus an additional four feet wide per each one percent of slope at the site (particularly if it is a forested strip).

e. Wooded filter strips are preferred to grassed strips. If an existing wooded belt cannot be preserved at the project site, the grassed strip should be managed to gradually become wooded by intentional plantings.

f. If a filter strip has been used as a sediment control measure during the construction phase, it is advisable to regrade and reseed the top edge of the strip. Otherwise, the sediment trapped in the filter strip may affect the flow patterns across the strip, thereby reducing its effectiveness.

(3) **Water Quality Inlets (oil/grit separators)** - The primary function of a water quality inlet (also known as an oil/grit separator) is to remove sediment and hydrocarbon loadings from impervious surfaces such as parking lots less than one acre in size before runoff reaches an infiltration basin or other stormwater management facility. If contaminants such as sediment and oil or other petroleum–based products found on parking lots and street surfaces are not removed, they will clog soil pores and prevent infiltration of runoff in the soil in infiltration basins or trenches.

A water quality inlet usually is designed as an underground, reinforced concrete vault consisting of three chambers: a sediment/grit removal chamber, an oil separation chamber and an outlet chamber. Owing to their limited capacity, water quality inlets store only a small fraction of the 2–year design storm volume. Therefore, they play no role in attenuating the post–development peak discharge rate. Furthermore, since runoff rapidly flows through an inlet, only moderate removal of coarse sediment, oil/grease, and debris can be expected, while removal of fine–grained particulate pollutants such as silt and clay will be more limited. Water quality inlets have little effect on removing soluble pollutants such as phosphorus. <u>It is to be noted that a State Pollutant Discharge Elimination System (SPDES) Permit may be needed for parking lots or impervious storage areas associated with industrial and commercial activities.</u>

a. oil/grit separators generally should be designed for areas less than one acre in size.

b. the depth of the permanent pool in each chamber should be at least 4 feet, and there should be at least 400 cubic feet of wet storage in the chambers for each impervious acre in the contributory drainage.

c. the first chamber should be designed for grit and sediment removal. The first and second chamber should be separated by a trash rack to prevent clogging orifices between the two chambers.

d. the second chamber should be designed for separation of oil and other hydrocarbons from runoff. Separation can be achieved by installing an inverted pipe with a 90° elbow in the baffle or wall that separates the second from third chamber.

e. the grit/oil separator should be equipped with manholes to facilitate cleanout and maintenance.

5. REFERENCES

The basic design criteria, methodologies and construction specifications for stormwater management should be those of the Soil Conservation Service, the Soil and Water Conservation Society, the Department of Environmental Conservation, and the Metropolitan Council of Governments which may be found in the most current edition of the following publications and their subsequent revisions:

A. Empire State Chapter, Soil and Water Conservation Society, New York Guidelines for Urban Erosion and Sediment Control, Syracuse, 1988.

B. Soil Conservation Service. "Urban Hydrology for Small Watersheds", Technical Release No., 55. June 1986.

C. Soil Conservation Service. "Engineering Field Manual", latest edition, as applicable.

E. "Soil Conservation Service Standards and Specifications for Ponds." Specifications No, 378. July 1981. (This document allows for use of metal pipe risers. Steel structures may corrode in 20 years or less. Therefore, use materials other than steel, especially in aggressive environments.)

F. U.S. Department of Agriculture, Soil Conservation Service, Ponds-Planning Design, Construction. Agriculture Handbook No. 590. 1982.

G. New York State Department of Environmental Conservation, "Guidelines for Design of Dams", Revised January 1988.

H. New York State Department of Environmental Conservation, "An Owners Guidance Manual for the Inspection and Maintenance of Dams in New York State". June 1987.

I. New York State Department of Environmental Conservation. "Stream Corridor Management: A Basic Reference Manual." Albany, 1986

J. Metropolitan Washington Council of Governments, Controlling Urban Runoff-A Practical Manual for Planning and Designing Urban BMPs. July 1987.

NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
STORMWATER MANAGEMENT
SELF–ASSESSMENT CHECKLIST

File No.: ______________________ Date Initiated: ____________

Project Name: ______________________________________

Location: ______________________________________
(Address)

____
(County Region

Applicant: ______________________________________
(Last Name) (First Name) (MI)

FLOOD CONTROL

A. Peak Flow Attenuation

- The pre–development peak discharge rates from the project site are:

  2–year storm ________ cfs
  10–year storm ________ cfs
  100–year storm ________ cfs

- The post–development peak discharge rates from the project site are:

  2–year storm ________ cfs
  10–year storm ________ cfs
  100–year storm ________ cfs

- A dam(s) ______________________ (will/will not) be constructed for attenuating peak flows. If a dam is to be constructed, a permit for Dam Construction will/will not), pursuant to Article 15–0503 of the Conservation Law, be required.

- The proposed development project ______________________ (is/is not) in compliance with local restrictions adopted pursuant to the National Flood Insurance Program.

- All closed stormwater drainage systems on the project site are, at a minimum, designed to convey the ________________-year storm while providing for the ________________- year storm through the development.

- The proposed project ______________________(is/is not) in compliance with all provisions of Article 15 (Protection of Waters Act), Article 24 (Freshwater Wetlands Act), and Article 25 (Tidal Wetlands Act) of the Environmental Conservation Law.

WATER QUALITY MANAGEMENT

The Stormwater Management Facilities ______________________ (have, don't have) water quality improvement features.

If they do, what management facilities are included

Infiltration ______________________

Retention ______________________

Extended Detention ______________________

Is the first 1/2 inch of runoff from the altered land area being treated?

_______ (Yes) _______ (No)

If not, how much runoff will be captured and treated?

____

If the proposed stormwater facilities do not provide for water quality management, or if less than the first 1/2 inch is managed, explain why:

____
____
____
____
____
____

The classification of the waters which receive the stormwater is

____

The thermal criteria contained in 6 NYCRR Part 704 ______________________ (will/will not) be met.

____
(Signature)

____
(License No.)

APPENDIX E
EROSION AND SEDIMENT CONTROL GUIDELINES

I. BACKGROUND

Sediment in runoff from construction sites can have a significant effect on the quality of downstream waters. Construction sites have also been identified as a significant source category in the State Nonpoint Source Assessment Report.

The potential effects of increased sediment are varied:

> Sediment may destroy fish habitat through blanketing of fish spawning and feeding areas and elimination of certain food organisms, directly impact fish through gill abrasion and fin rot, and reduce sunlight penetration, thereby impairing photosynthesis of aquatic plants. Suspended sediment decreases recreational values, reduces fishery habitat, adds to the mechanical wear of water supply pumps and distribution systems, and adds to treatment costs for water supplies. Nutrients and toxic substances attached to sediment particles are transported to waterbodies and may enter aquatic food chains, cause fish toxicity problems, contribute to algal blooms, impair recreational uses, and degrade the water as a drinking water source. [1]

The following guidelines are designed for consideration by both government officials and project sponsors in the preparation and review of erosion and sediment control plans for a land development project. If implemented properly, the guidelines herein will assist in achieving the following water and natural resource management objectives.

- reduce the erosion potential from a development or construction project;
- decrease nonpoint source pollution and water quality degradation;
- maintain stream channels for their biological functions, as well as for drainage, through reduced sediment deposition.

II. GUIDANCE

The attached guidelines were developed to aid persons in preparing and reviewing erosion and sediment control plans. They provide guidance on sound management practices, but are not fixed and inflexible rules to be applied in reviewing erosion control plans without considering the particular facts and circumstances of a particular project.

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[1] Nonpoint Source Management Program. January, 1990.

EROSION AND SEDIMENT CONTROL GUIDELINES FOR NEW DEVELOPMENT

A. Existing vegetation on a project site should be retained and protected as much as possible to minimize soil loss on a project site and to minimize erosion control costs.

B. Sediment control practices/measures, where necessary, should be designed to protect the natural character of rivers, streams, lakes, coastal waters or other waterbodies on–site and minimize erosion and sedimentation off-site from the start of land disturbance activities to establishment of permanent stabilization.

1. The off-site impacts of erosion and sedimentation related to land clearing, grading and construction activities should not be any greater during and following land disturbance activities than under pre–development conditions.

2. Pursuant to Part 700 et seq. of Title 6, Chapter X of NYCRR:

a. toxic and other deleterious substances shall not be discharged in amounts that will adversely affect the taste, color or odor thereof, or impair the waters of the state for their best (classified) usages,

b. suspended, colloidal and settleable solids shall not be discharged in amounts that causes substantial visible contrast to natural conditions, or causes deposition or impairs the waters for their best (classified) usages.

This means that stream reaches on-site and downstream of construction areas should not have substantial visible contrast relative to color, taste, odor, turbidity and sediment deposition from the reaches upstream of the construction area. Impacts such as these which result from construction or developmental activities are a violation of Part 700 water quality standards and may be subject to enforcement actions.

C. Erosion and sediment control measures should be constructed in accordance with an erosion and sediment control plan. The plan should:

1. describe the temporary and permanent structural and vegetative measures that will be used to control erosion and sedimentation for each stage of the project from land clearing to the finished stage.

2. provide a map showing the location of erosion and sediment control measures.

3. provide dimensional details of proposed erosion and sediment control facilities as well as calculations used in the siting and sizing sediment basins. (Guidance for performing calculations can be obtained in the reference cited in Section E.8.)

4. identify temporary erosion and sediment control facilities which will be converted to permanent stormwater management facilities.

5. provide an implementation schedule for staging temporary and permanent erosion and sediment control facilities.

6. provide a maintenance schedule for soil erosion and sediment control facilities and describe maintenance activities to be performed.

D. Erosion and sediment control measures should be constructed prior to beginning any other land disturbances. The devices should not be removed until the disturbed land areas are stabilized.

E. Specify guidance.

1. Exposure Restrictions: No more than 5 acres of unprotected soil should be exposed at any one time. Previous earthwork should be stabilized in accord with approved design standards and specifications referenced in Section E.8 before additional area is exposed. (Site factors including topography, soil erosion potential, proximity to wetlands and water courses may require limiting the amount of raw earth that can be exposed at any one time to less than 5 acres.)

2. Grading: Perimeter grading should blend with adjoining properties.

3. Vegetative Protection: Where protection of trees and/or other vegetation is required, the location of the site to be protected should be shown on the erosion control plan. The method of protecting vegetation during construction should conform to the design criteria referenced in Section E.8.

4. Drainage control.

   a. Surface runoff that is relatively clean and sediment free should be diverted or otherwise prevented from flowing through areas of construction activity on the project site. This will greatly reduce sediment loading in surface runoff.

   b. A fill associated with an approved temporary sediment control structure or permanent stormwater management structure, should not be created which causes water to pond off–site on adjacent property, without first having obtained ownership or permanent easement for such use from the owner of the off–site or adjacent property.

   c. Natural drainage channels should not be altered or relocated without the proper approvals. Pursuant to Article 15 of the Environmental Conservation Law, a protected stream and the bed and banks thereof should not be altered or relocated without the approval of the Department of Environmental Conservation. [2]

   d. Runoff from any land disturbing activity should not be discharged or have the potential to be discharged off-site or into storm drains or into watercourses unless such discharge is directed through a properly designed, installed and maintained structure, such as a sediment trap, to retain sediment on-site. Accumulated sediment should be removed when 60% of the storage capacity of the sediment retention structure is filled with sediment.

   e. For finished grading, adequate gradients should be provided so as to prevent water from standing on the surface of lawns for more than 24 hours after the end of a rainfall, except in a swale flow area which may drain as long as 48 hours after the end of rainfall.

   f. Permanent swales or other points of concentrated water flow should be stabilized with sod, rip–rap, paving, or covered with a approved erosion control matting as provided for in the design criteria referenced in Section E.8.

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[2] A natural drainage channel refers to a swale, water course in a gully, or a protected or unprotected stream. Natural drainage channels should not be altered or relocated on adjacent properties without first having obtained ownership or a permanent easement for the altered or relocated drainage channel from the owner of the off-site or adjacent property.

g. Surface flows over cut and fill slopes should be controlled as provided for in the design criteria for vegetating waterways referenced in Section E.8.

5. Timing.

a. Except as noted below, all sites should be seeded and stabilized with erosion control materials, such as straw mulch, jute mesh, or excelsior within 15 days of final grading. If construction has been suspended, or sections completed, areas should be seeded immediately and stabilized with erosion control materials. Maintenance should be performed as necessary to ensure continued stabilization.

i. For active construction areas such as borrow or stockpile areas, roadway improvements, and areas within 50 ft. of a building under construction, a perimeter sediment control system consisting, for example, of silt fencing or hay bales, should be installed and maintained to contain soil.

ii. On cut side of roads, ditches should be stabilized immediately with rock rip–rap or other non-erodible liners, or where appropriate, vegetative measures such as sod. When seeding is approved, an anchor mulch should be used and soil should be limed and fertilized in accord with recommendations referenced in Section E.8.

iii. Permanent seeding should optimally be undertaken in the spring from March 21 through May 20, and in late summer and early fall from August 25 to October 15. During the peak summer months and in the fall after October 15 when seeding is found to be impracticable, an appropriate mulch should be applied. Permanent seeding may be undertaken during summer if plans provide for adequate watering of the seedbed.

iv. All slopes steeper than 3:1 (h:v), as well as basin or trap embankments, and perimeter dikes should, upon completion, be immediately stabilized with sod, seed and anchored straw mulch, or other approved stabilization measures. Areas outside of the perimeter sediment control system should not be disturbed. Maintenance should be performed as necessary to ensure continued stabilization.

b. Temporary sediment trapping devices should be removed within thirty (30) calendar days following establishment of permanent stabilization in all contributory drainage areas. Stormwater management structures used temporarily for sediment control should be converted to the permanent configuration within this time period as well.

6. Stream protection.

a. The bed and banks of all on-site and off-site streams that may be impacted by land clearing, grading, and construction activities should be protected to prevent stream, river, lake or coastal sedimentation, streambank erosion, stream enlargement and degradation or loss of fisheries habitat. Measures for protecting the bed and/or banks of a stream may include; for example, gabion baskets, rip-rap, log cribbing, and vegetative measures. [3]

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[3] Whenever possible, vegetative streambank stabilization practices are recommended over structural practices such as rip-rap and gabion linings which may unnecessarily alter the existing stream ecosystem.

b. Where temporary work roads or haul roads cross stream channels, adequate waterway openings must be constructed using spans, culverts, washed rock backfill or other acceptable, clean methods that will ensure that road construction and use do not result in turbidity and sediment downstream. All stream crossing activities and appurtenances shall be in compliance with a permit issued pursuant to Article 15 of the Environmental Conservation Law, where applicable, and should be carried out in conformance with guidelines in DEC's Stream Corridor Management manual. [4]

7. Maintenance.

a. An erosion control plan for a project site should identify maintenance requirements for erosion and sediment control practices utilized, and it should provide a maintenance schedule. All erosion and sediment control measures should be inspected periodically and maintained in conformance with the schedule so as to ensure they remain in effective, operating condition until such times as they are removed.

b. All points of construction ingress and egress should be protected to prevent the deposition of materials onto traversed public thoroughfare, either by installing and maintaining a stabilized construction entrance, or by washing all vehicle wheels in a safe disposal area. All materials deposited onto public thoroughfares should be removed immediately. Proper precautions should be taken to ensure that materials deposited onto public thoroughfares are removed so that they do not enter catch basins, storm sewers, or combined sewers.

c. Accumulated sediment should be removed when 60% of the storage capacity of the retention structure is filled with sediment.

8. Design specifications.

Designs, standards and specifications for controlling erosion and sedimentation are found in the following publication and should be identified and shown in the erosion control plan:

> Empire State Chapter, Soil & Water Conservation Society, New York Guidelines for Urban Erosion and Sediment Control, Syracuse. March 1988.

[4] New York State Department of Environmental Conservation, "Stream Corridor Management: A Basic Reference Manual," Albany, 1986.

Appendix F

THE STORMWATER MANAGEMENT AND EROSION CONTROL PLAN*
(Structure and Content)

INTRODUCTION

Water quality impacts and flooding associated with land development can be mitigated by installing structural and vegetative stormwater control measures. In order to properly choose, size and site a stormwater management measure or a combination of measures for a specific project or development site, certain information must be gathered and analyzed beforehand. Such information gathering and analyses can best be accomplished within the framework of a stormwater management and erosion control plan. Such a plan should be required for all development proposals that meet applicability criteria set forth by the locality. Suggested criteria are presented in Chapter III. The purpose of this chapter is to provide local planning agencies, developers and consultants with a framework for (1) structuring a stormwater management and erosion control plan, (2) identifying the kinds of information that should be gathered, and (3) describing the kinds of analyses that should be made.

STORMWATER MANAGEMENT PLAN: STRUCTURE AND CONTENT

At a minimum, a stormwater management and erosion control plan should:

- provide background information about the scope of the project.
- provide a statement of stormwater management objectives.
- compare post-development stormwater runoff conditions with pre-development conditions.
- describe proposed structural and vegetative stormwater measures to ensure that the quantity, temporal distribution and quality of stormwater runoff during and after development is not substantially altered from pre-development conditions.
- identify the type and frequency of maintenance required by the stormwater management and erosion control facilities utilized.

Within the above context, the following outline details the structure and content of a stormwater management and erosion control plan.

I. BACKGROUND INFORMATION

A. PROJECT DESCRIPTION

1. Describe what is being proposed (i.e., residential lot subdivision, planned unit development, commercial/retail development, or industrial development).

2. Describe project size (i.e., number of acres, number of dwelling units, other buildings, and density).

3. Describe other improvements which will be made on project site, including streets and roads, utilities (water, sewer, etc.), and give particular attention to acreage of land that will become paved and covered with buildings. Lawn acreage also should be specified.

*Appendix F is a reprint of Chapter 4 of the NYS DEC April, 1992 publication entitled, Reducing the Impacts of Stormwater Runoff from New Development

4. Provide a location map.* Include watersheds in the community that may be impacted by project. Also, show highways, roads, and proximity of project to nearest city, village or hamlet, and to the nearest waterbody, and other prominent features.

5. Provide a base map containing boundary lines of the project site, sub-catchments, and contributory watersheds at a scale agreed upon by the municipality and developer. **

6. Provide an analysis of site limitations and development constraints by including such factors as slope, soil erodibility, depth to bedrock, depth to seasonal high water, soil percolation, etc., to facilitate evaluation of site suitability for proposed stormwater and erosion control facilities in relation to the overall development proposal.

7. Provide a statement describing how this project will meet stormwater management objectives established by the municipality.

8. Provide a general description of the approaches which will be taken to control erosion and sedimentation and stormwater runoff.

9. Provide a statement indicating when project is to begin and the expected date of completion.

10. Provide a map and descripiton of all critical environmental areas, conservation areas, wildlife habitats, easements, etc., to be protected. (These areas should be marked in the field.)

11. Provide an analysis of potential impacts from the proposed development to natural resource features on-site and off-site such as streams, lakes, wetlands, water supplies, coastal estuaries, etc. A determination as to whether the proposed development will affect any designated primary or principal aquifer should also be included.

B. EXISTING (PRE-DEVELOPMENT) CONDITIONS

1. Provide map showing topography (contours) under existing conditions. On this same map, show drainage patterns, including ditches, culverts, permanent streams, intermittent/ephemeral streams or drainages, wetlands, or other waterbodies, and existing roads. Indicate sizes of existing culverts. Delineate watershed and sub-watershed boundaries on the map.

2. Provide a map showing existing land use, open space, public facilities, utility lines, water supply wells on site, and predominant vegetation cover types (forested, brushland, grassland, cropland, pasture, etc.).

3. Obtain soils survey information and, by sub-catchment, provide tabular information detailing the area in acres that are in each of the Soil Conservation Service (SCS) Hydrologic Soil Groups A, B, C or D in Table 10 in Chapter III. Soils information should be obtained by conducting a site-specific soil survey.

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* Include a north arrow on all maps.

** For subdivision review purposes, maps typically have a scale ranging from 1" = 50' to 1" = 200'. Map scales in the range of 1" = = 1' to 1" = 40' are not uncommon depending on project size and amount of detail required. Maps for stormwater management planning can adopt any of the above scales. The contour interval for the maps should be two feet or an appropriate interval selected on the basis of site conditions and agreed upon by the municipality and developer.

4. Where applicable, provide a map showing designated 100-year flood plain boundaries in affected drainage basins in the community including any available 100-year flood elevations and floodways. Show culverts downstream of project and culvert size. Show existing easements for storm drains, sewers, and other utilities. Show the extent of the drainage area served by a man-made stormwater drainage network if that network system is collecting runoff from outside of the natural drainage basin and is discharging into the basin of concern.

5. Provide hydrologic data describing rainfall characteristics. This should include:

   a. Precipitation data for several return periods (i.e., the 1-year, 2-year, 10-year, and 100-year storms for a 24-hour duration).

   b. Provide stream channel survey data by sub-catchment showing channel conditions including roughness and vegetation.

C. PROPOSED FUTURE (DEVELOPMENT) CONDITIONS

1. Provide a map showing by sub-catchment, the completed project, including lot layout, approximate location of buildings, streets, and other paved surfaces, final contours, utility lines, water supply wells, individual sewage disposal systems, and location and types of easements.

2. Provide tabular information, by sub-catchment, showing the acres of impervious area created in the proposed development as well as the extent of lawn and areas where the land has been made more impervious than pre-development conditions.

3. By sub-catchment, show on a map changes to land surface, including areas of cuts and fills, changes in vegetative cover types, and final contours. Indicate by sub-catchment, land-clearing and earth moving start-up and completion dates.

4. Indicate construction schedule including estimated completion date(s) and proposed winter shutdowns.

II. COMPARISON OF PRE-DEVELOPMENT WITH POST-DEVELOPMENT RUNOFF

A. METHODOLOGIES

1. Describe or identify the methodology used to compare and evaluate pre- with post-development runoff conditions in terms of volumes, peak rates of runoff, routing, and hydrographs. (Chapter III. describes several commonly used hydrologic models for computing runoff.)

   - Peak discharge rates and total runoff volumes from the project area for existing site conditions and post-development conditions for the 2-year and 10-year, 24 hour storm events should be calculated. The relevant variables used in this determination, such as curve number and time of concentration should be included.

   - Downstream analysis of the 100-year, 24 hour event, including peak discharge rates, total runoff volumes and evaluation of impacts to receiving waters and/or wetlands should be evaluated.

- Storage volume and surface area requirements necessary to provide flood control for runoff generated during 2-year, 10-year and 100-year, 24 hour storm events should be calculated.

- Discharge provisions for the proposed control measures, including peak discharge rates, outlet design, discharge capacity for each stage, outlet channel design, and a description of the point of discharge should be provided.

- Sufficient detail should be provided to show that the stormwater facility(ies) is/are capable of withstanding the discharge from the 100-year storm event.

2. Describe or identify the methodology used to compare and evaluate pre- with post-development pollutant loading. Contaminants to be compared include total suspended solids, total phosphorus, total nitrogen, and biological oxygen demand. Pollutant loading coefficients may be used. (Chapter III. describes several commonly used models for calculating pollutant loading.)

   - Water quality treatment facilities should be designed to control the first 1/2 inch of runoff or runoff from the 1-year, 24 hour storm event, or whichever is greater.

   - The necessary storage volumes should be calculated and the proposed stormwater measure(s) should be described in detail. The plans should provide sufficient detail of the water quality control measures to ensure that the relevant design criteria will be met.

   - Specific information may include surface area dimensions, depths, inlet designs, planting specifications for use of aquatic vegetation, percent solids removal expected, discharge rates and outlet design.

B. CALCULATIONS

1. State any assumptions used in making the calculations.

2. Provide assumptions and coefficient values used in the hydrologic calculations for making above comparisons. Evaluate the post-development effect of stormwater runoff on identified flood plains or designated flood hazard areas in the community.

3. Compare pollutant loading between before and after conditions. Provide computations.

III. STORMWATER MANAGEMENT

A. STORMWATER MANAGEMENT FACILITIES

1. Describe in a narrative and show on a map, by sub-catchment, proposed stormwater management facilities. A soil profile to at least one foot below the stormwater management facility should be provided.

2. Provide designs of proposed structural stormwater management facilities. Pursuant to the provisions in Chapter V. for peak flow attenuation and water quality management, indicate which facilities will be used to attenuate peak flows, which will be used to enhance stormwater runoff quality, and which facilities will serve a dual role. Identify the materials to be used in constructing these facilities.

3. Calculations for sizing stormwater facilities should be provided.

4. Provide designs and calculations for siting and sizing such specialized measures and devices as filter strips, water quality inlets (oil/grit separator) forebays, etc., which will be used to remove sediment, oil-based products, and other contaminants found in urban runoff.

5. Provide an evaluation of the amount of treatment or level of pollutant reduction that can be expected from the proposed stormwater management facility(ies). Contaminants to be considered in this evaluation include total suspended solids (TSS), total phosphorus (P), total nitrogen (N), biological oxygen demand (BOD) and thermal pollution. Evaluation of the effectiveness of stormwater management practices can be based on reports on the effectiveness of comparable stormwater facilities on similar sites. Pollutant loading coefficients for total P, total N and BOD, and models for making this evaluation are identified and briefly discussed in Chapter III.

   Guidance for evaluating the level of reduction of TSS (and other pollutants attached thereto) that can be expected from selected stormwater management facilities can be found in the publication entitled "Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality".[1] Also, the BMPSOFT model and P8 Urban Catchment Model referred to in Table 14 in Chapter VI may be used to calculate the level of reduction of TSS (and other pollutants) that can be expected from selected stormwater management facilities.

6. Provide information on the design provisions that address safety considerations (e.g., gentle slopes and benches in ponds) and accommodate maintenance needs (including access to conduct maintenance operations).

B. STORMWATER CONVEYANCE SYSTEM

1. Describe in a narrative and map by sub-catchment the stormwater conveyance (drainage) system. Indicate which segments of the drainage system are open channels and which segments are piped (culverts). Provide rationale and justification for installing piped segments.

2. Provide plan view and cross-sectional designs of stormwater conveyance systems. Hydrologic calculations for siting and sizing the stormwater conveyance system should be provided. Identify materials to be used.

3. Provide plans, designs and identify materials to be used for preventing erosion in channel sections of stormwater conveyance systems. Show how erosion at culvert inlets and outfalls will be prevented.

C. RECREATIONAL AND/OR LANDSCAPE FEATURES (Optional)

1. Describe and illustrate any recreational or landscape features which are to be factored into the stormwater management system to enhance the aesthetics of the facility(ies) and provide multiple use options.

2. On the map prepared under Section I.C.1., show the location of recreational facilities.

3. Provide landscaping sketches and designs for the stormwater management facilities.

IV. EROSION AND SEDIMENT CONTROL

A. TEMPORARY EROSION AND SEDIMENT CONTROL FACILITIES
(to be used during land clearing, land grading and the construction phases)

1. Describe temporary structural facilities and vegetative measures which will be used to control erosion and sedimentation.

2. Provide a map showing, by sub-catchment, the location of temporary vegetative and structural erosion and sediment control facilities.

3. Provide dimensional details of proposed erosion and sediment control facilities and identify the materials that will be used in developing these facilities. Calculations used in siting and sizing sediment basins should be provided (see New York Guidelines for Urban Erosion and Sediment Control).

4. Identify temporary erosion and sediment control facilities which will be converted to permanent stormwater management facilities.

5. Provide an implementation schedule for the staging of temporary erosion and sediment control facilities.

6. Provide a maintenance schedule for soil erosion and sediment control facilities.

B. PERMANENT EROSION AND SEDIMENT CONTROL FACILITIES

1. Describe permanent structural and vegetative practices which will be used to provide long-term control of erosion and sedimentation when construction activities are completed and the project site is restored.

2. Provide a map showing, by catchment, the location of permanent erosion control facilities, including both structural and vegetative.

3. By sub-catchment, provide an implementation schedule for restoring the project site with permanent erosion and sediment control facilities.

V. IMPLEMENTATION SCHEDULE AND MAINTENANCE

A. Provide an implementation schedule for staging of all stormwater management facilities. Describe how this schedule will be coordinated with the staging of erosion and sediment control facilities and construction activities.

B. Provide a description of the arrangements which will be made for ensuring long-term maintenance of stormwater management and erosion control facilities. Back-up contingency plans should be provided and described. Those responsible for performing maintenance should be identified.

ACCOUNTABILITY DURING PLAN IMPLEMENTATION

Significant progress has been made in preparing improved development plans that address stormwater and erosion control concerns. Quite often, however, there is a breakdown between what is called for in the plan and what is actually delivered during the plan implementation phase. Frequently erosion and sediment controls during construction tend to fail because they are either not properly installed or properly maintained. Deposition of sediment in a stream, lake, or other receiving waterbody is the end result.

There are two things that a municipality can do to ensure that stormwater management and erosion and sediment control practices are being properly installed and maintained during the construction phase of the project:

1. If the municipality has an inadequate inspection and enforcement staff, it can extract a fee from the developer(s) to retain staff to do the inspections and provide enforcement.

2. The municipality also can require the developer(s) to establish a dedicated fund, such as a surety bond or irrevocable letter of credit. In the event the developer fails to properly install and maintain required stormwater management and erosion control practices, the municipality can draw upon the fund to do the necessary work itself or to have it done by another firm. In such case, the municipality should require an easement for the purpose of entering onto the property to install, maintain or repair stormwater and erosion control practices.

ATTACHMENT A2-2
EROSION CONTROL DETAILS

1. Silt Fence
2. Straw Bale Dike
3. Perimeter Dike/Swale
4. Temporary Swale
5. Sediment Trap for Drop Inlet

STANDARD AND SPECIFICATIONS FOR STRAW BALE DIKE

Definition

A temporary barrier of straw or similar material used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a bale dike is to reduce runoff velocity and effect deposition of the transported sediment load. Straw bale dikes are to be used for no more than three (3) months.

Conditions Where Practice Applies

The straw bale dike is used where:

1. No other practice is feasible.
2. There is no concentration of water in a channel or other drainage way above the barrier.
3. Erosion would occur in the form of sheet erosion.
4. Length of slope above the straw bale dike does not exceed these limits:

Constructed Slope	Percent Slope	Slope Length (feet)
2:1	50	25
2-1/2:1	40	50
3:1	33	75
3-1/2:1	30	100
4:1	25	125

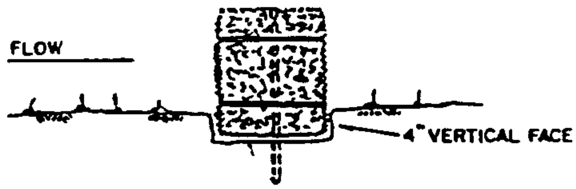
Where slope gradient changes through the drainage area, steepness refers to the steepest slope section contributing to the straw bale dike.

The practice may also be used for a single family lot if the slope is less than 15 percent. The contributing drainage area in this instance shall be less than one acre and the length of slope above the dike shall be less than 200 feet.

Design Criteria

A design is not required. All bales shall be placed on the contour with cut edge of bale adhering to the ground. See Figure 4.3 on page 4.10 or details.

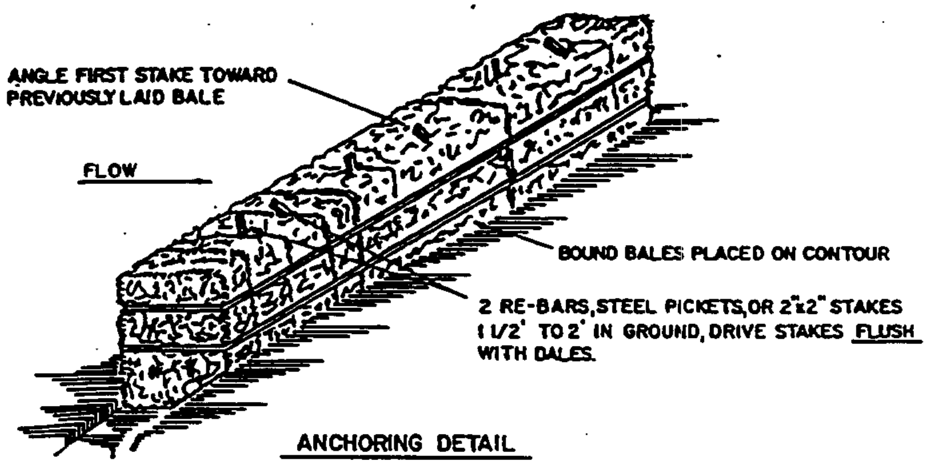
Figure 4.3
Straw Bale Dike Details



BEDDING DETAIL

STANDARD SYMBOL

SBD — DRAINAGE AREA NO MORE THAN 1/4 ac. PER 100 FEET OF STRAW BALE DIKE FOR SLOPES LESS THAN 25%



ANCHORING DETAIL

CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	STRAW BALE DIKE	STANDARD DRAWING SBD-1

STANDARD AND SPECIFICATIONS FOR SILT FENCE

Definition

A temporary barrier of geotextile fabric (filter cloth) used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used.

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence are:

Slope Steepness	Maximum Slope Length (Ft)
2:1	50
3:1	75
4:1	125
5:1	175
Flatter than 5:1	200

2. Maximum drainage area for overland flow to a silt fence shall not exceed 1/2 acre per 100 feet of fence; and
3. Erosion would occur in the form of sheet erosion; and
4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required. All silt fences shall be placed as close to the area as possible, and the area below the fence must be undisturbed or stabilized.

A detail of the silt fence shall be shown on the plan, and contain the following minimum requirements:

1. The type, size, and spacing of fence posts.
2. The size of woven wire support fences. (OPTIONAL)
3. The type of filter cloth used.
4. The method of anchoring the filter cloth.
5. The method of fastening the filter cloth to the fencing support.

Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. See Figure 4.4 on page 4.12 for details.

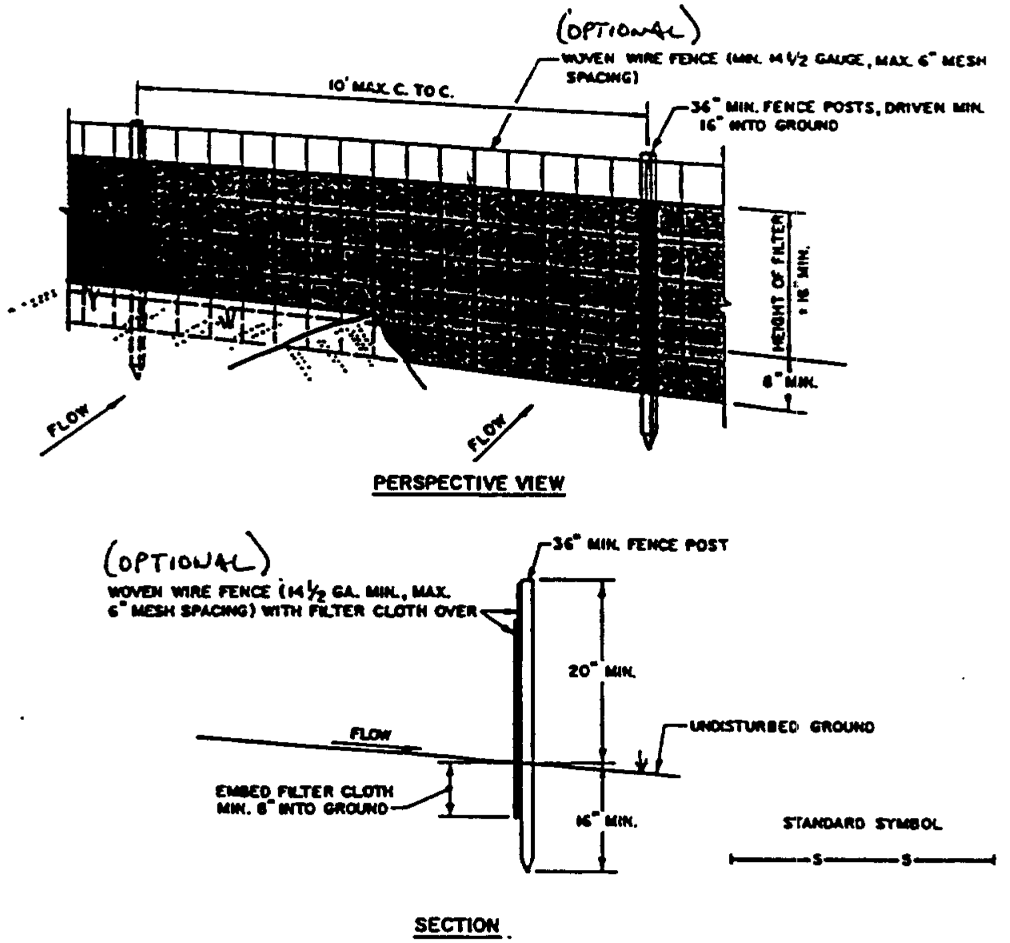
Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance. Statewide acceptability shall depend on in field and/or laboratory observations and evaluations.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	
Equivalent Opening Sizw	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability (%)	90	ASTM G-26

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.
3. Wire Fence (for fabricated units): Wire fencing shall be a minimum 14-1/2 gage with a maximum 6 in. mesh opening, or as approved. (OPTIONAL)
4. Prefabricated Units: Envirofence or approved equal may be used in lieu of the above method providing the unit is installed per manufacturer's instructions.

Figure 4.4
Silt Fence Details



CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

1. (OPTIONAL) WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

POSTS: STEEL EITHER T OR U TYPE OR 2" HARDWOOD

FENCE: WOVEN WIRE, 14½ GA. 6" MAX. MESH OPENING (OPTIONAL)

FILTER CLOTH: FILTER X, MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL

PREFABRICATED UNIT: GEOFAB, ENVIROFENCE, OR APPROVED EQUAL.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	SILT FENCE	STANDARD DRAWING SF-1

STANDARD AND SPECIFICATION FOR TEMPORARY SWALE

Definition

A temporary excavated drainage way.

Purpose

The purpose of a temporary swale is to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet or to intercept sediment laden water and divert it to a sediment trapping device.

Conditions Where Practice Applies

Temporary Swales are constructed:

1. To divert flows from a disturbed area.
2. Intermittently across disturbed areas to shorten overland flow distances.
3. To direct sediment laden water along the base of slopes to a trapping device.
4. To transport offsite flows across disturbed areas such as rights-of-way.

Swales collecting runoff from disturbed areas shall remain in place until the disturbed areas are permanently stabilized.

Design Criteria

See Figure 4.5 on page 4.14 for details.

	Swale A	Swale B
Drainage Area	<5 Ac	5-10 Ac
Bottom Width of Flow Channel	4 ft	6 ft
Depth of Flow Channel	1 ft	1 ft
Side Slopes	2:1 or Flatter	2:1 or Flatter
Grade	0.5% Min. 20% Max.	0.5% Min. 20% Max.

For drainage areas larger than 10 acres, refer to the Standard and Specifications for Waterways on page 4.91.

Stabilization

Stabilization of the swale shall be completed within 10 days of installation in accordance with the appropriate standard and specifications for vegetative stabilization or stabilization with mulch as determined by the time of year. The flow channel shall be stabilized as per the following criteria:

Type of Treatment	Channel Grade	FLOW CHANNEL A ≤5 Ac	FLOW CHANNEL B 5-10 Ac
1	0.5-3.0%	Seed & Straw Mulch	Seed & Straw Mulch
2	3.1-5.0%	Seed & Straw Mulch	Seed and cover with Jute or Excelsior; Sod, or lined with 2 in. stone
3	5.1-8.0%	Seed and cover with Jute or Excelsior, Sod line with 2 in. stone	Line with 4-8 in. stone or Recycled Concrete Equivalent
4	8.1-20%	Line with 4-8 in. stone or Recycled Concrete Equivalent[1]	Engineering Design

In highly erodible soils, as defined by local approving agency, refer to the next higher slope grade for type of stabilization.

[1] Recycled Concrete Equivalent shall be concrete broken into the required size, and shall contain no steel reinforcement.

Outlet

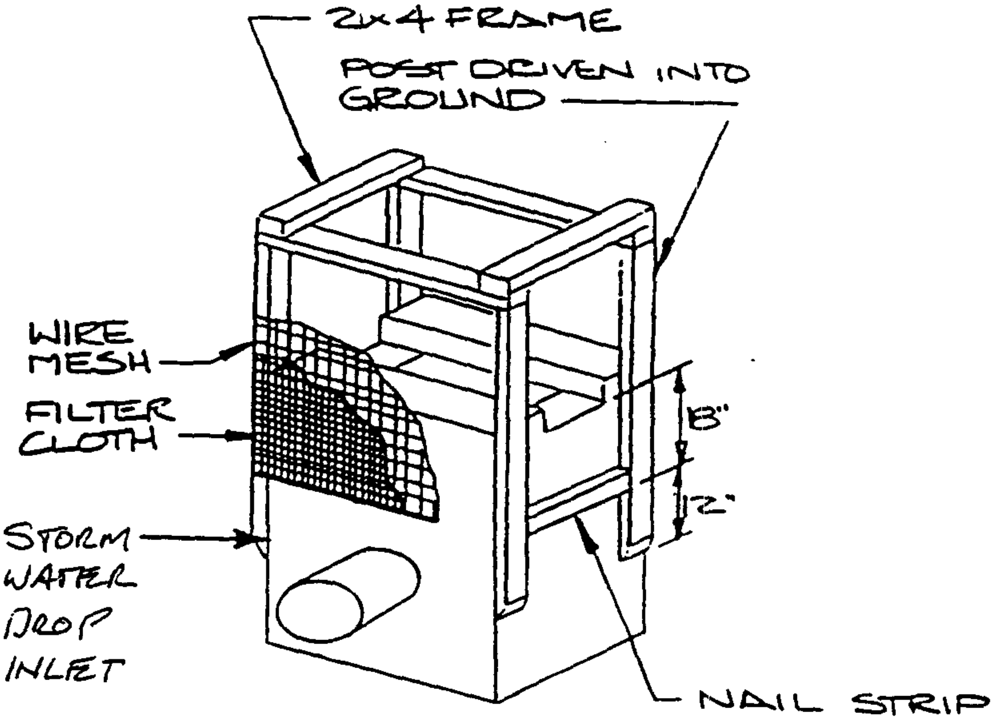
Swale shall have an outlet that functions with a minimum of erosion, and dissipates runoff velocity prior to discharge off the site.

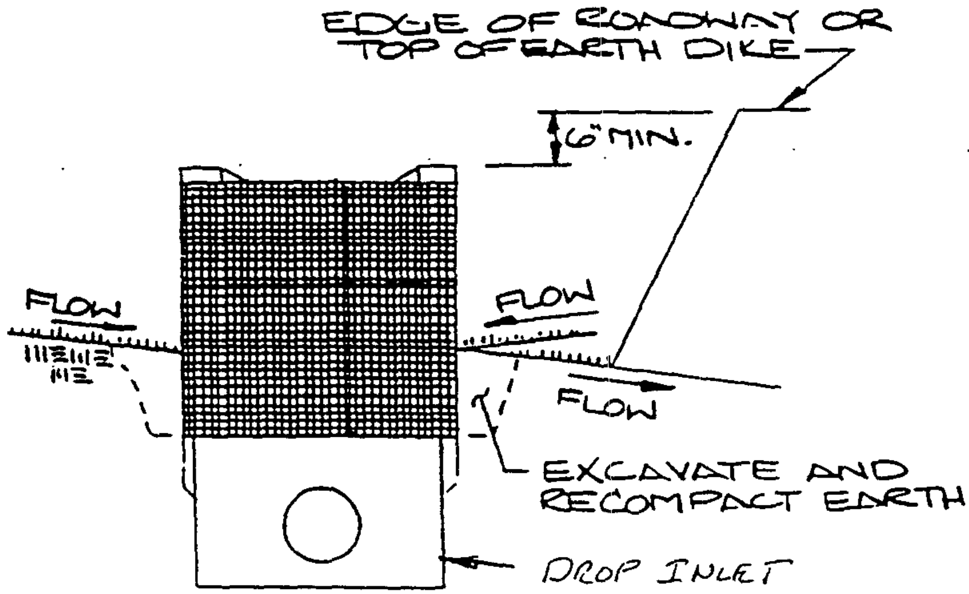
Runoff shall be conveyed to a sediment trapping device such as a sediment trap or sediment basin until the drainage area above the swale is adequately stabilized.

The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet condition.

If swale is used to divert flows from entering a disturbed area, a sediment trapping device may not be needed.

SEDIMENT TRAP FOR DROP INLETS





STANDARD AND SPECIFICATIONS FOR PERIMETER DIKE/SWALE

Definition

A temporary ridge of soil excavated from an adjoining swale located along the perimeter of the site or disturbed area.

Purpose

The purpose of a perimeter dike/swale is to prevent off site storm runoff from entering a disturbed area and to prevent sediment laden storm runoff from leaving the construction site or disturbed area.

Conditions Where Practice Applies

Perimeter dike/swale is constructed to divert flows from entering a disturbed area, or along tops of slopes to prevent flows from eroding the slope, or along base of slopes to direct sediment laden flows to a trapping device.

The perimeter dike/swale shall remain in place until the disturbed areas are permanently stabilized.

Design Criteria

See Figure 4.16 on page 4.34 for details.

The perimeter dike/swale shall not be constructed outside the property lines without obtaining legal easements from effected adjacent property owners. A design is not required for perimeter dike/swale. The following criteria shall be used:

Drainage area - Less than 2 acres (for drainage areas larger than 2 acres but less than 10 acres see earth dike; for drainage areas larger than 10 acres, see standard and specifications for diversion).

Height - 18 inches minimum from bottom of swale to top of dike evenly divided between dike height and swale depth.

Bottom width of dike - 2 feet minimum.

Width of swale - 2 feet minimum.

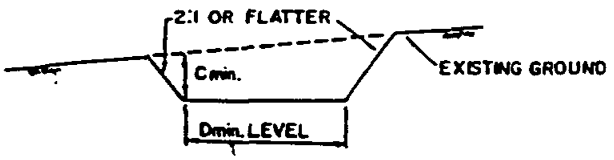
Grade - Dependent upon topography, but shall have positive drainage (sufficient grade to drain) to an adequate outlet. Maximum allowable grade not to exceed 20 percent.

Stabilization - The disturbed area of the dike and swale shall be stabilized within 10 days of installation, in accordance with the standard and specifications for seed and straw mulch or straw mulch only if not in the seeding season.

Outlet

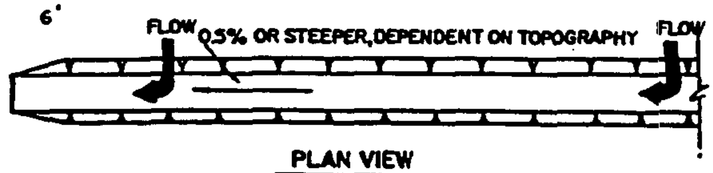
1. Perimeter dike/swale shall have an outlet that functions with a minimum of erosion.
2. Diverted runoff from a protected or stabilized upland area shall outlet directly onto an undisturbed stabilized area.
3. Diverted runoff from a disturbed or exposed upland area shall be conveyed to a sediment trapping device such as a sediment trap, sediment basin, or to an area protected by any of these practices.
4. The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet.

Figure 4.5
Temporary Swale Detail



CROSS SECTION

	SWALE A	SWALE B
C	1'	1'
D	4'	6'



OUTLET AS REQUIRED
SEE ITEM 8 BELOW

PLAN VIEW

STANDARD SYMBOL
A-2 B-3

CONSTRUCTION SPECIFICATIONS

1. ALL TEMPORARY SWALES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
5. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILLS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED ON CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE SWALE.
8. STABILIZATION SHALL BE AS PER THE CHART BELOW:

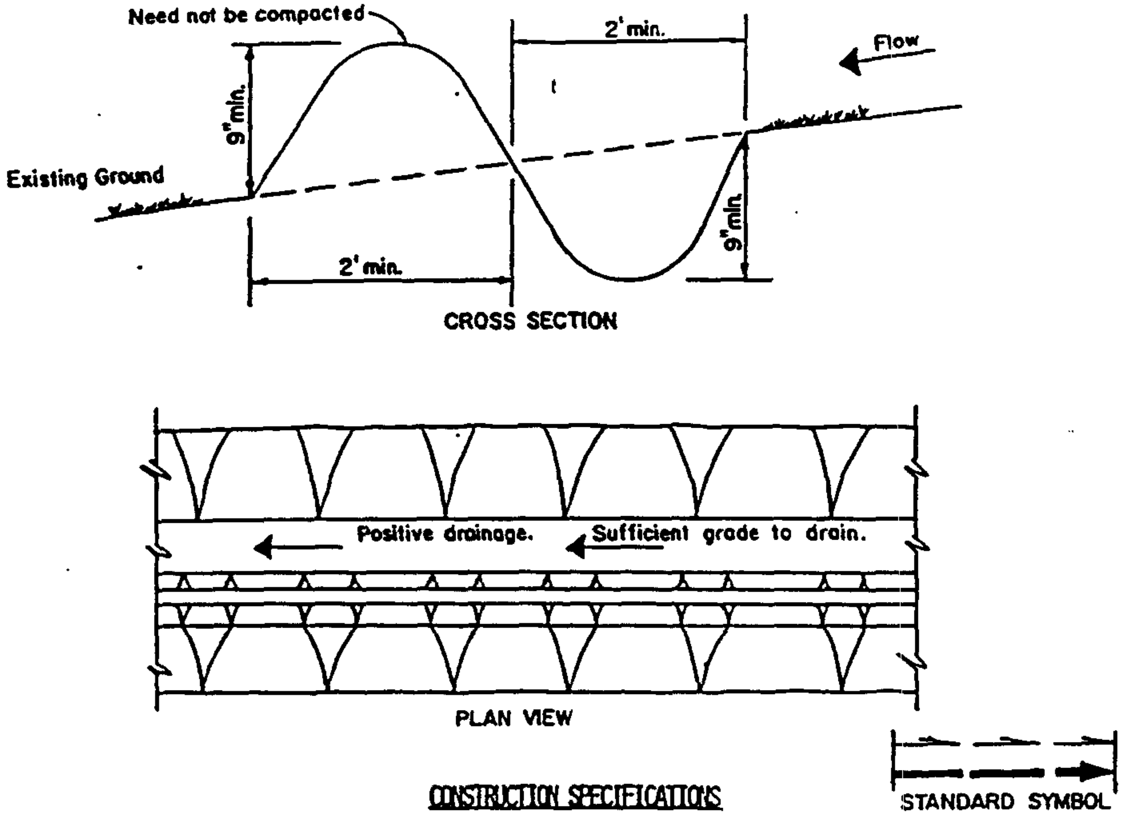
FLOW CHANNEL STABILIZATION

TYPE OF TREATMENT	CHANNEL GRADE	A (5 AC OR LESS)	B (5 AC - 10 AC)
1	0.5-3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1-5.0%	SEED AND STRAW MULCH	SEED USING JUTE OR EXCELSIOR
3	5.1-8.0%	SEED WITH JUTE OR EXCELSIOR; SOD	LINED RIP-RAP 4-8" RECYCLED CONCRETE EQUIVALENT
4	8.1-20%	LINED 4-8" RIP-RAP	ENGINEERED DESIGN

9. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	TEMPORARY SWALE	STANDARD DRAWING TS-1

Figure 4.16
Perimeter Swale Dike Detail



CONSTRUCTION SPECIFICATIONS

1. ALL PERIMETER DIKE/SWALE SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTRUBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSION VELOCITY.
4. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED IN THE STANDARD.
5. STABILIZATION OF THE AREA DISTURBED BY THE DIKE AND SWALE SHALL BE DONE IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SEED AND STRAW MULCH, AND SHALL BE DONE WITHIN 10 DAYS.
6. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

Max. Drainage Area Limit: 2 Acres

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PERIMETER DIKE/SWALE	Standard Drawing PDS-1

ATTACHMENT A2-3

MONITORING, INSPECTION AND MAINTENANCE PLAN

MONITORING, INSPECTION, AND MAINTENANCE PLAN

IMPLEMENTATION

A. The Contractor at this site shall at all times, properly construct, operate and maintain all erosion controls and features, as part of the closure construction activities, in accordance with regulatory requirements, and with good engineering and construction practices. Erosion control measures and activities will be in accordance with currently accepted Best Management Practices (BMPs).

B. This erosion control monitoring, inspection, and maintenance plan has been developed to achieve compliance with the requirements of this construction site storm water and erosion control plan. The key elements of the monitoring effort include the following:

- Site Inspections and Maintenance;
- BMPs Monitoring;
- Recordkeeping;
- Review and Modifications; and
- Certification of Compliance.

SITE INSPECTIONS AND MAINTENANCE PRACTICES

A. The temporary erosion control features installed by the Contractor will be maintained by the contractor until no longer needed or permanent erosion control methods are installed.

Site inspections are required every seven days or within 24 hours of a rainfall of 0.5 inches or greater. All disturbed areas, areas for material storage, locations where vehicles enter or exit the site, and all of the erosion and sediment controls that are identified as part of this site's construction storm water and erosion control plan must be inspected. Controls must be in good operating condition until the affected area they protect has been completely stabilized and the construction activity is complete. If a repair is necessary, it must be completed within seven (7) days of receipt of a report or notice, if practical. Inspection for specific erosion and sediment controls will include the following:

- Silt fence will be inspected to determine the following:

    1) depth;

    2) condition of fabric;

    3) that the fabric is attached to the posts; and

    4) that the fence posts are firmly in the ground.

- The silt fences will be inspected weekly and within 24 hours of a 0.5 inch or greater storm event.

- Diversion berms, if used, will be inspected and any breaches promptly repaired.

- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and other potential erosion control problems.

- The Contractor shall designate individual(s) that will be responsible for erosion control, maintenance, and repair activities. The designated individual will also be responsible for inspecting the site and filling out the inspection and maintenance report.

- Personnel selected for inspection and maintenance responsibilities will receive training as directed by the Engineer. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used onsite in good working order.

B. The individual inspecting the site must record any damages or deficiencies on an inspection form (attached). These forms can be used to request maintenance and repair and to document inspection and maintenance activities. Damages or deficiencies must be corrected as soon as possible after the inspection. Any changes that may be required to correct deficiencies in the Erosion Control Plan should also be made as soon as possible, but in no case later than seven days after the inspection.

C. An Inspection and Maintenance Report Form is attached to record the inspection and assessment.

D. The Contractor's erosion control inspection records must be presented to the Engineer at the site.

RECORDKEEPING

A. Records Retention

A copy of the Storm Water Management and Erosion Control Plan and inspection and maintenance records must be kept at the construction site from the time construction begins until the site is stabilized.

The Plan and related records will be made available upon request to any regulatory agency representatives or members of the public.

MODIFICATIONS TO THE STORM WATER MANAGEMENT AND EROSION CONTROL PLAN

A. During the course of construction, unanticipated changes may occur which affect this plan such as schedule changes, phasing changes, staging area modifications, offsite drainage impacts and repeated failures of designed controls. Any changes to the activities and controls identified in this plan must be documented and the Plan revised accordingly.

B. Certification of revisions to this plan shall be included at the end of the document.

CONSTRUCTION SITE STORM WATER CONTROL PLAN INSPECTION AND MAINTENANCE REPORT FORM

To be completed every 7 days and within 24 hours of a rainfall event of 0.5 inches or more

Regular Inspector:______________ Rainfall Event Inspector:____________ Rainfall (inches):_____

Contractor Activities	OK	NO	N/A	Notes
Are construction onsite traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?				
Are locations of temporary soil stock piles of construction materials in approved areas?				
Is there any evidence of spills and resulting cleanup procedures?				
General Erosion & Sediment Controls				
Are sediment and erosion BMPs installed in the proper location and according to the specifications set out in the SWM & ECP? Are all operational storm drain inlets protected from sediment inflow? Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching? Is there any evidence that sediment is leaving the site? Is there any evidence of erosion or cut fill slopes?				
Perimeter Road Use				
Does much sediment get tracked on to the perimeter road? Is the gravel clean or is it filled with sediment? Does all traffic use the perimeter road to leave the site? Is maintenance or repair required for the perimeter road?				

____
Inspected by (Signature)

____
Date

CONSTRUCTION SITE STORM WATER CONTROL PLAN INSPECTION AND MAINTENANCE REPORT FORM

To be completed every 7 days and within 24 hours of a rainfall event of 0.5 inches or more

Inspector: ______________________________

STABILIZATION MEASURES					
Area	Date Since Last Disturbed	Date of Next Disturbance	Stabilized? Yes/No	Stabilized with	Condition

Stabilization Required: ____

____

____

____

____

____

To be performed by: ____________________ On or before: ____________________

ATTACHMENT A3

New York State Department of Environmental Conservation Certification Form

<u>Annual Certification of Institutional/Engineering Controls</u>
LTV Voluntary Clean-up Program Site

Property Name:
Property Address:

County: Erie
City/Town: Buffalo
Property ID: (Tax Assessment Map)
Section:________ Block:_________ Lot(s):___________

I (name), residing at (address), as owner of the property(ies) listed above which are located wholly or partially within the boundaries of the Voluntary Cleanup Site named above; do certify that the engineering and/or institutional controls, as specified in the Declaration of Covenants and Restrictions for the Voluntary Cleanup Site are in-place and functioning as designed within the property(ies) listed above.

Signature:________________________

(This area for notary public)

ATTACHMENT A4

New York State Department of Environmental Conservation
TAGM 4031

TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM #4031

FUGITIVE DUST SUPPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

TO: Regional Hazardous Waste Remediation Engrs., Bur. Directors & Section Chiefs

FROM: Michael J. O'Toole, Jr., Director, Division of Hazardous Waste Remediation

SUBJECT: DIVISION TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM -- FUGITIVE DUST SUPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

DATE: Oct 27, 1989

Michael J. O'Toole, Jr. (signed)

1. Introduction

Fugitive dust suppression, particulate monitoring, and subsequent action levels for such must be used and applied consistently during remedial activities at hazardous waste sites. This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2. Background

Fugitive dust is particulate matter--a generic term for a broad class of chemically and physically diverse substances that exist as discrete particles, liquid droplets or solids, over a wide range of sizes--which becomes airborne and contributes to air quality as a nuisance and threat to human health and the environment.

On July 1, 1987, the United States Environmental Protection Agency (USEPA) revised the ambient air quality standard for particulates so as to reflect direct impact on human health by setting the standard for particulate matter less than ten microns in diameter (PM_{10}); this involves fugitive dust whether contaminated or not. Based upon an examination of air quality composition, respiratory tract deposition, and health effects, PM_{10} is considered conservative for the primary standard--that requisite to protect public health with an adequate margin of safety. The primary standards are 150 ug/m^3 over a 24-hour averaging time and 50 ug/m^3 over an annual averaging time. Both of these standards are to be averaged arithmetically.

There exists real-time monitoring equipment available to measure PM_{10} and capable of integrating over a period of six seconds to ten hours. Combined with an adequate fugitive dust suppression program, such equipment will aid in preventing the off-site migration of contaminated soil. It will also protect both on-site personnel from exposure to high levels of dust and the public around the site from any exposure to any dust. While specifically intended for the protection of on-site personnel as well as the public, this program is not meant to replace long-term monitoring which may be required given the contaminants inherent to the site and its air quality.

3. <u>Guidance</u>

A program for suppressing fugitive dust and monitoring particulate matter at hazardous waste sites can be developed without placing an undue burden on remedial activities while still being protective of health and environment. Since the responsibility for implementing this program ultimately will fall on the party performing the work, these procedures must be incorporated into appropriate work plans. The following fugitive dust suppression and particulate monitoring program will be employed at hazardous waste sites during construction and other activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Such activities shall also include the excavation, grading, or placement of clean fill, and control measures therefore should be considered.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM_{10}) with the following minimum performance standards:

   Object to be measured: Dust, Mists, Aerosols
   Size range: <0.1 to 10 microns
   Sensitivity: 0.001 mg/m^3
   Range: 0.001 to 10 mg/m^3
   Overall Accuracy: ±10% as compared to gravimetric analysis of stearic acid or reference dust

   Operating Conditions:
      Temperature: 0 to 40°C
      Humidity: 10 to 99% Relative Humidity

   Power: Battery operated with a minimum capacity of eight hours continuous operation

   Automatic alarms are suggested.

   Particulate levels will be monitored immediately downwind <u>at</u> the working site and integrated over a period not to exceed 15 minutes. Consequently, instrumentation shall require necessary averaging hardware to accomplish this task; the P-5 Digital Dust Indicator as manufactured by MDA Scientific, Inc. or similar is appropriate.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the entity operating the equipment to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m^3 over the integrated period not to exceed 15 minutes. While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m^3, the upwind background level must be measured immediately using the same portable monitor. If the working site particulate measurement is greater than 100 ug/m^3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see Paragraph 7). Should the action level of 150 ug/m^3 be exceeded, the Division of Air Resources must be notified in writing within five working days; the notification shall include a description of the control measures implemented to prevent further exceedences.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM_{10} at or above the action level. Since this situation has the potential to migrate contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

    1. Applying water on haul roads.
    2. Wetting equipment and excavation faces.
    3. Spraying water on buckets during excavation and dumping.
    4. Hauling materials in properly tarped or watertight containers.
    5. Restricting vehicle speeds to 10 mph.
    6. Covering excavated areas and material after excavation activity ceases.
    7. Reducing the excavation size and/or number of excavations.

    Experience has shown that utilizing the above-mentioned dust suppression techniques, within reason as not to create excess water which would result in unacceptable wet conditions, the chance of exceeding the 150 ug/m^3 action level at hazardous waste site remediations is remote. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. If the dust suppression techniques being utilized at the site do not lower particulates to an acceptable level (that is, below 150 ug/m^3 and no visible dust), work must be suspended until appropriate corrective measures are approved to remedy the situation. Also, the evaluation of weather conditions will be necessary for proper fugitive dust control--when extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended.

There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require appropriate toxics monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Voluntary Cleanup Program

SITE MANAGEMENT PLAN

for

AREA I

(Former Republic (LTV) Steel Parcel)

STEELFIELDS SITE
BUFFALO, NY
(NYSDEC SITE #V00619-9)

April 2007 0062-010-100

Prepared for:

STEELFIELDS LTD

Prepared by:

TURNKEY ENVIRONMENTAL RESTORATION, LLC

In Association with:

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

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PART I

OPERATION, MONITORING, & MAINTENANCE PLAN

OPERATION, MONITORING, & MAINTENANCE PLAN
for
STEELFIELDS SITE - AREA I

FORMER STEEL MANUFACTURING SITE
BUFFALO, NY

APRIL 2007 | 0062-001-100

Prepared for:

Steelfields, LTD.
Buffalo, NY

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LIST OF ATTACHMENTS

1.0 INTRODUCTION

1.1 Background

In October, 2002 Steelfields Ltd. purchased several vacant industrial properties in South Buffalo, New York (See Figure 1-1 and Figure 1-2) out of bankruptcy from the LTV Steel Company and Hanna Furnace Corporation (a wholly owned subsidiary of the National Steel Corporation). At the same time, Steelfields entered into a Voluntary Cleanup Agreement (VCA) with the New York State Department of Environmental Conservation (NYSDEC). A Work Plan for Voluntary Cleanup Program Remedial Design /Remedial Action for the Former Steel and Coke Manufacturing Site (by TurnKey Environmental Restoration, LLC, September 2002) was approved by the NYSDEC on December 27, 2002. This OM&M Plan pertains to the subdivided parcel known as Area I (former Republic Steel Plant Parcel).

1.2 Purpose and Scope

This Operation, Monitoring, & Maintenance Plan (OM&M Plan) has been prepared for inclusion in the Site Management Plan. The sole purpose of this plan and that of the Soil/Fill Management Plan is to ensure protection of both the environment and human health during redevelopment and use of the Site, subsequent to completion of Voluntary Cleanup activities.

The RD/RA Work Plan addresses remediation activities to be performed as part of the Voluntary cleanup of the site. Following completion of the Voluntary Cleanup activities, post remediation requirements will need to be implemented by subsequent owners or developers of the site to comply with the Voluntary Cleanup Agreement terms and conditions. This Plan summarizes the tasks and obligations required by those parties.

1.3 Operation, Monitoring, and Maintenance Program Responsibility

The developer, Steelfields, LLC and/or property owner(s) will be responsible for all monitoring, implementation, and reporting as required by the OM&M Plan. The NYSDEC will be informed of any change in ownership, redevelopment, site configuration, or subdivision of the property and the "Responsible Party" information below will be revised and resubmitted. The implementation of this plan will continue until such time as the NYSDEC determines the long-term obligations and implementation of this OM&M Plan, including that described in detail in Appendix B of this Document entitled the "Long-Term Groundwater Monitoring Plan" have been fulfilled.

Upon initiation of the OM&M Plan, the developer and/or property owner will be required to submit the following documents to the NYSDEC for review and approval:

- An appropriate Health and Safety Plan
- A Schedule for Required Inspections & Reporting
- Contact information for party responsible for implementation of the OM&M Program

Currently on file, the responsible party for the Area I Property is:

Steelfields, LTD.
P.O. Box 981,
Webster, NY 14580

2.0 OM&M PLAN COMPONENTS

The Operation, Maintenance, & Monitoring (OM&M) Plan for Area I consists of three major components:

- A1-MW-6 Operation, Maintenance, & Monitoring Program
- Long-Term Groundwater Monitoring (LTGWM) Plan
- Annual Inspection & Certification Program

Each of these components is described within this section in detail.

2.1 A1-MW-6 Operation, Maintenance & Monitoring Program

The presence of an immiscible layer detected within monitoring well A1-MW-6 has resulted in the development of an Area-specific OM&M Plan to address that issue. Although the history of the immiscible layer within monitoring well A1-MW-6 has already been submitted in the LTGWM 2004 Annual Report for Area I (revised January 2005), it has been repeated within this document for completeness. The subsequent long-term OM&M of the immiscible layer in monitoring well A1-MW-6 and the LTGWM Plan for Area I are discussed below.

2.1.1 Immiscible Layer Background

During well development and initial sampling activities of the September 2004 Area I LTGWM Event, field personnel performed visual immiscible layer surveillance of each well and observed no non-aqueous phase liquid (NAPL) in any of the on-site monitoring wells, except monitoring well A1-MW-6. Monitoring well A1-MW-6 is located approximately 45-feet from the Buffalo River adjacent to Subarea A (approximately 60 feet) as shown on Figure 1-3. A discussion pertaining to the immiscible layer detected in monitoring well A1-MW-6 follows. During well development and sampling, an immiscible layer, measuring approximately 0.3 feet thick, was observed floating within monitoring well A1-MW-6 (approximately 16.5 fbgs). The LNAPL was described as black and oily with a "weathered" petroleum odor.

2.1.2 Immiscible Layer OM&M

The OM&M of the PetroTrap™ free product passive skimmer will continue to be monitored on a monthly basis in accordance with the following procedure on relatively calm, non-windy days.

- Sampling personnel will obtain the following supplies prior to mobilization to well A1-MW-6:
  - Polyethylene tarp (minimum 5 feet by 20 feet)
  - Nitrile gloves
  - Poly-coated Tyvek
  - 5-gallon container with lid
  - Calibrated 1-gallon temporary container with lid
  - Well keys
  - Project Field Book
  - Oil absorbent pads
  - Paper towels
  - Oil/water interface probe
  - Shovel
- Mobilize to well A1-MW-6
- Cut small hole in center of polyethylene tarp and place over well. Lay out tarp and secure in place (typically using surrounding rocks/concrete at grade) making sure tarp is relatively tight against the well casing.
- Unlock well and place lock and J-plug at a secure location away from well
- Slowly remove the skimmer using the safety rope while coiling the vent tubing, taking care to prevent the tube from contacting un-tarped ground. Care should also be taken to prevent the coiled hose between the filter assembly and top centralizer from kinking.
- Once the skimmer is clear of the well, carefully hover the skimmer over the calibrated 1-gallon container and open the bottom ball valve, emptying the contents. Secure the lid, set the container aside, and allow sufficient time for captured groundwater, if any, and LNAPL to separate. Upon separation, record both quantities in the Project Field Book.
- Once the skimmer is emptied, close the bottom ball valve and carefully lay the skimmer, safety rope, and vent tubing on the polyethylene tarp.
- Take the oil/water interface probe and measure the depth of the immiscible layer and groundwater to the nearest 0.01-foot from the top of well riser and record the measurements in the Project Field Book.
- Slowly retract the interface probe from the well while wiping the tape with paper towels keeping residual product within well casing. Wipe down probe and set meter aside, clear of the well.

- If groundwater was recovered from the skimmer, the depth of the skimmer should be raised slightly in the well by untying the safety rope and re-tying the rope to the well at the new depth before lowering back into the well.
- Carefully pick up the skimmer assembly and slowly lower into the well using the safety rope making sure the coiled hose between the filter assembly and top centralizer has not kinked.
- Replace the J-plug, close the well, and replace the lock.
- Carefully wrap up the polyethylene tarp making sure not to spill any residual product on the ground. If residual product does contact the ground, immediately hand excavate the impact soils and place in garbage bag for disposal.
- Place all disposables (i.e., gloves, Tyvek, tarp etc.) in a standard garbage bag and seal.
- Take 1-gallon temporary container to the Groundwater Pre-Treatment Building and transfer the contents to the 5-gallon container. Place the 1-gallon container in the garbage bag after use.

Following sufficient operational experience and subject to NYSDEC approval, the frequency of monitoring and product removal may be reduced. The removed LNAPL will be stored in a properly labeled and sealed 5-gallon container with secondary containment inside the Groundwater Pre-Treatment Building located at the Steelfields Site. Once the container is full, arrangements will be made with local oil recycling firm for disposal as non-hazardous.

2.2 Long-Term Groundwater Monitoring (LTGWM) Plan

Appendix 4 of this document includes the LTGWM Plan that is required at the Site to monitor the effectiveness of the source area removals, treatment, and controls implemented in accordance with the Voluntary Cleanup Agreement. Groundwater quality trends shall continue to be monitored along the perimeters of the Site in accordance with the schedule presented in Appendix IV Table 1.

2.3 Annual Inspection & Certification Program

The Area I property including wells and other physical components of the site shall be inspected annually by a qualified person representing the Owner or Property Manager/Representative. This qualified person shall at a minimum hold a four-year college degree in environmental sciences or engineering, and be supervised by a New York State Licensed Professional Engineer.

Annual Certification shall be stamped and signed by a New York State Licensed Professional Engineer and must certify and attest that:

- The institutional controls and/or engineering controls employed at such site are unchanged from the previous certification and are:
- In place and effective;
- Performing as designed; and
- Nothing has occurred that would impair the ability of the controls to protect the public health and environment
- Nothing has occurred that would constitute a violation or failure to comply with any operation and maintenance plan for such controls; and
- Access is available to the site to evaluate continued maintenance of such controls.

The Property Owner/ Owner's Representative shall also certify on a yearly basis that no new information has come to the site owner's attention, including groundwater monitoring data from wells located at the site boundary, to indicate that the assumptions made in the qualitative exposure assessment of offsite contamination are no longer valid.

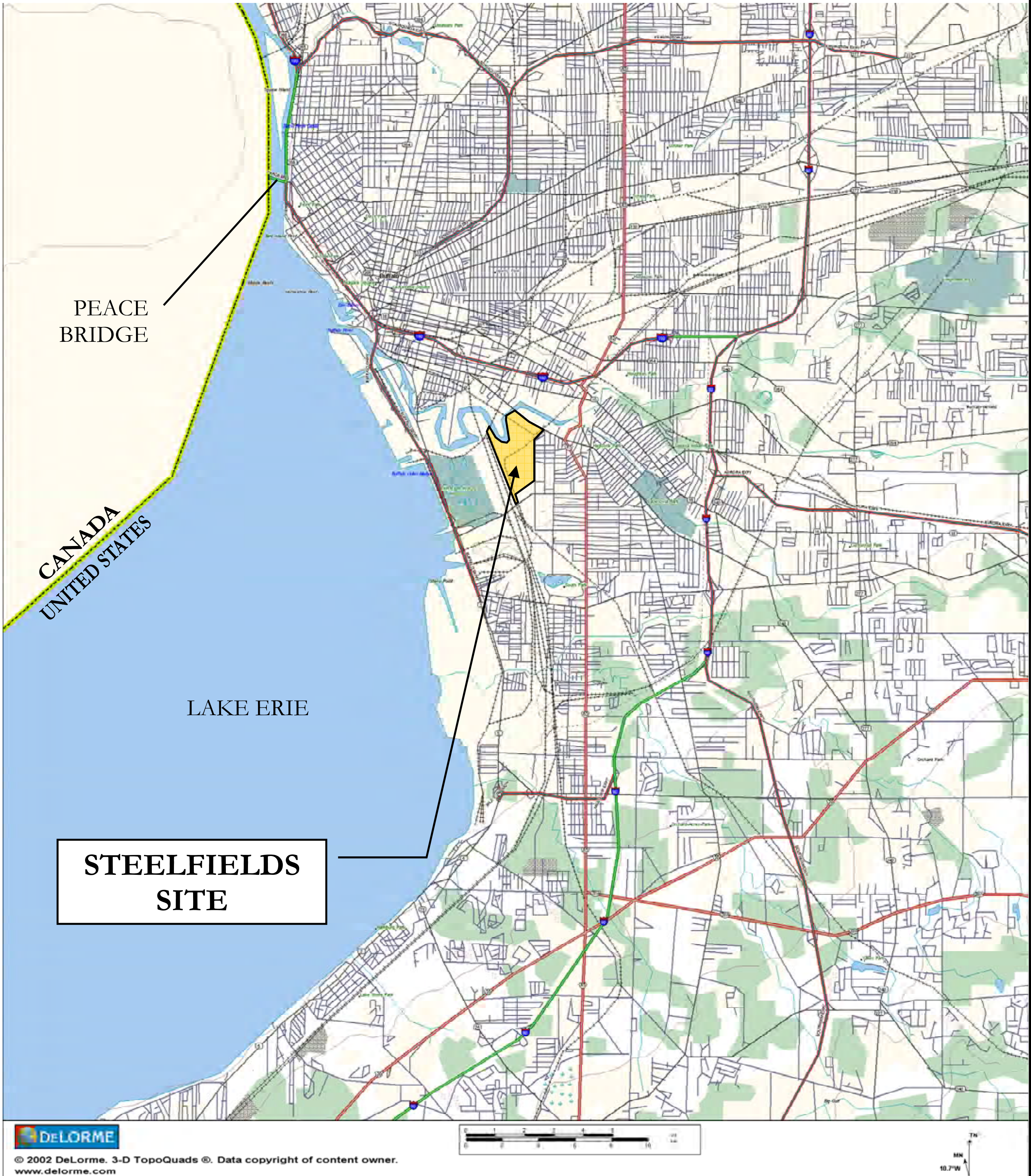
This information can be included in either the Annual Certification documentation, or the Long Term Groundwater Monitoring Annual Report.

In addition to the above certification requirements, the annual inspection will require the completion of the Environmental Inspection Form (attachment A1). The Corrective Actions Certification (Attachment A2) may be required if something is noted for attention during the initial inspection. If maintenance is required, the owner shall notify the NYSDEC and schedule repairs. The NYSDEC shall be informed by the Property Owner/Manager when repairs have been completed. The Inspection forms shall be submitted to the NYSDEC within 60 days of completion, with a letter signed by a New York State Licensed Professional Engineer verifying that all institutional and engineering controls are in place and operating correctly and/or pending repair and maintenance.

Every five years, the Property Owner/ Owner's Representative shall document and certify that the assumptions made in the qualitative exposure assessment remain valid.

FIGURES

FIGURE 1-1



TURNKEY ENVIRONMENTAL RESTORATION, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-008-400

DATE: SEPTEMBER 2004

DRAFTED BY: BCH

SITE REGIONAL MAP

O.M. & M PLAN

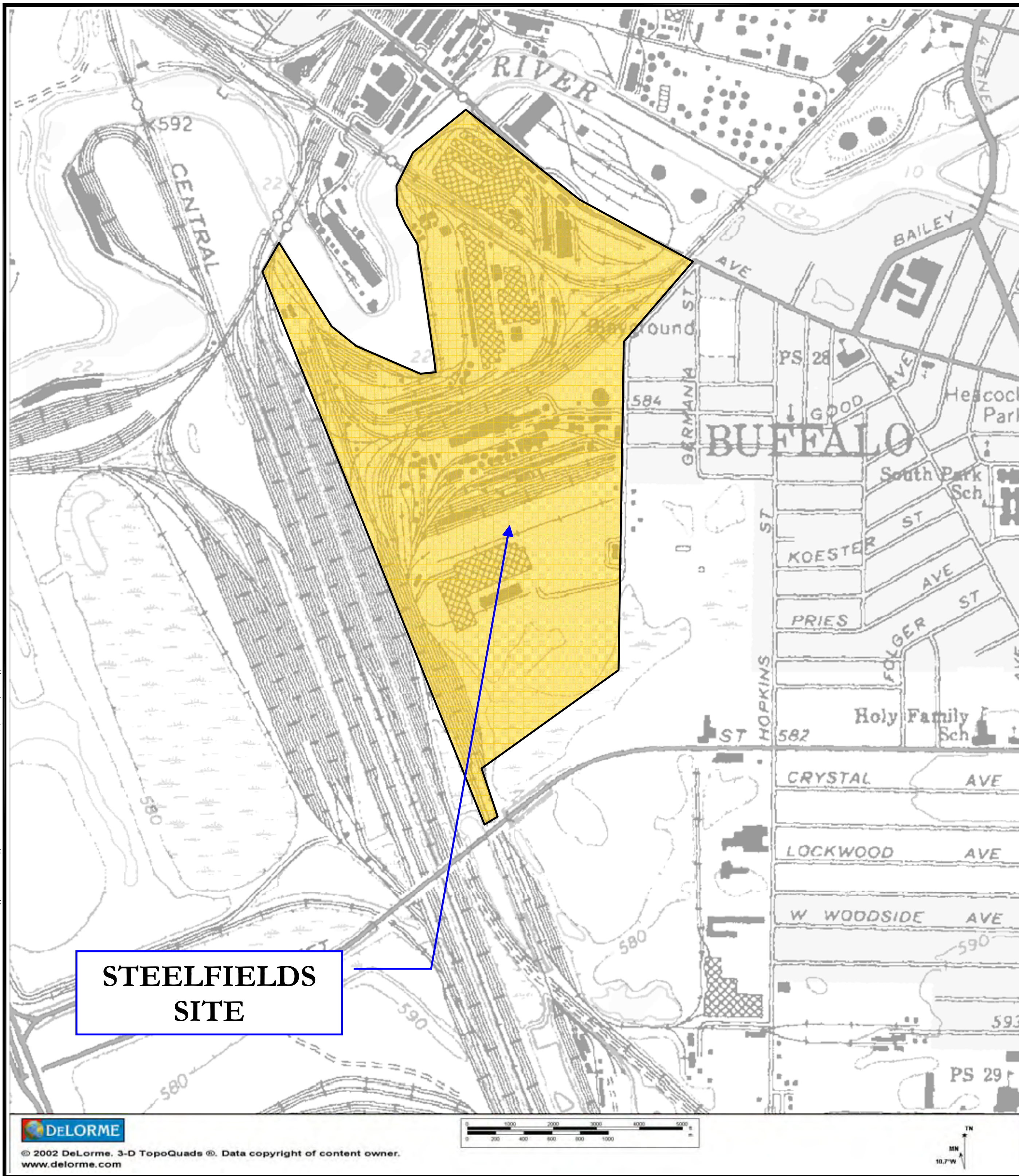
AREA I - FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR

STEELFIELDS, LTD.

FILEPATH:g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 1-1; site regional map.dwg

FIGURE 1-2



TurnKey Environmental Restoration, LLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-008-400

DATE: SEPTEMBER 2004

DRAFTED BY: BCH

SITE VICINITY MAP

O. M. & M PLAN

AREA I - FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR

STEELFIELDS, LTD.

FILEPATH:g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 1-2; site vicinity map.dwg

APPENDIX I

ENVIRONMENTAL INSPECTION FORM

Environmental Inspection Form
Operation, Monitoring, & Maintenance Work Plan

Property Name:	Project No.:	
Client:		
Property Address:	City, State:	Zip Code:
Property ID: (Tax Assessment Map) Section:	Block:	Lot(s):
Preparer's Name:	Date/Time:	

CERTIFICATION

The results of this inspection were discussed with the owner and/or owner's representative. Any corrective actions required have been identified and noted in this report, and a supplemental Corrective Actions Form has been completed. Proper implementation of these corrective actions have been discussed with the owner, agreed upon, and scheduled.

Preparer / Inspector: **Date:**

Signature: ____________________

Next Scheduled Inspection (date): [ ]

Final Surface Cover / Vegatation

In accordance with the Soil/Fill Management Plan, vegetative or other (eg. Asphalt, buildings, concrete) surface coverage over the entire redeveloped parcel is required by the developer or owner as a pre-condition of occupancy. The following documents the condition of the above.

1. Final Cover is in Place and in good condition? ☐ yes ☐ no ☐ N/A
   Cover consists of (mainly): ____________________
2. Evidence of erosion? ☐ yes ☐ no ☐ N/A
3. Cracks visible in pavement? ☐ yes ☐ no ☐ N/A
4. Evidence of distressed vegetation/turf? ☐ yes ☐ no ☐ N/A
5. Evidence of unintended traffic and/or rutting? ☐ yes ☐ no ☐ N/A
6. Evidence of uneven settlement and/or ponding? ☐ yes ☐ no ☐ N/A
7. Damage to any surface coverage? ☐ yes ☐ no ☐ N/A

If yes to any question above, please provide more information below.

Environmental Inspection Form
Operation, Monitoring, & Maintenance Work Plan

Property Security & Access

In accordance with the Soil/Fill Management Plan, fencing is required to restrict access in all undeveloped areas and as necessary in redeveloped areas. In addition, all fencing around undeveloped areas will be posted with "No Trespassing" signs.

1. Is access controlled by perimeter fencing? ☐ yes ☐ no ☐ N/A
   If not, please note: ______________________
2. Is fencing in need of repair? ☐ yes ☐ no ☐ N/A
3. Area access gates in working order? ☐ yes ☐ no ☐ N/A
4. Suffecient signage posted (No Trespassing)? ☐ yes ☐ no ☐ N/A
5. Has there been any noted or reported trespassing? ☐ yes ☐ no ☐ N/A

Please note any irregularities/ changes in site access and security: ______________________

Property Use Changes / Site Development

Has the property usage changed, or site been redeveloped since the last inspection?
☐ yes ☐ no ☐ N/A

If so, please list with date: ______________________

This space for Notes and Comments

Please include the following Attachments:

1. Site Sketch
2. Photographs

APPENDIX II

CORRECTIVE ACTION CERTIFICATION

Corrective Action Certification
Operation, Monitoring, & Maintenance Work Plan

Property Name:	Project No.:	
Client:		
Property Address:	City, State:	Zip Code:
Property ID: (Tax Assessment Map) Section:	Block:	Lot(s):
Preparer's Name:	Date/Time:	

Issue Addressed

The environmental Inspection of the above property determined the need for corrective action. This form has been completed to document the required corrective action and it's implementation.

Description of site Issue identified during Environmental Inspection (include sketch & photographs):

Corrective Action Taken

Date Completed:

Describe Action Taken (include sketch & photographs):

Certification of Implementation

The signatory hereby certifies that the corrective action as described in this form has been completed in accordance with all relevant requirements of the Soil/Fill Management Plan and other applicable documents.

Preparer / Inspector: **Date:**

Signature:

Please verify inclusion of the following Attachments:

1. Site Sketch
2. Photographs

APPENDIX III

NYSDEC INSTITUTIONAL AND ENGINEERING CONTROLS CERTIFICATION FORM

Enclosure 1
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Insitutional and Engineering Controls Certification Form

Site Details **Box 1**

Site No. **V00619-9**

Site Name **Steelfields Site (AREA I)**

Site Address: Zip Code: 14210

City/Town: Buffalo

County: Erie, County

Current Use: Storage / Vacant

Intended Use: Commercial / Industrial Redevelopment

Box 2

Verification of Site Details

		YES	NO
1.	Are the Site Details above, correct?	☐	☐
	If NO, are changes handwritten above or included on a separate sheet?	☐	
2.	Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment since the initial/last certification?	☐	☐
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	☐	☐
3.	Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property since the initial/last certification?	☐	☐
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	☐	☐
4.	Has a change-of-use occurred since the initial/last certification?	☐	
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	☐	
5.	For non-significant-threat Brownfield Cleanup Program Sites subject to ECL 27-1415.7(c), has any new information revealed that assumptions made in the Qualitative Exposure Assessment for offsite contamination are no longer valid?	☐	☐
	If YES, is the new information or evidence that new information has been previously submitted included with this Certification?	☐	
6.	For non-significant-threat Brownfield Cleanup Program Sites subject to ECL 27-1415.7(c), are the assumptions in the Qualitative Exposure Assessment still valid (must be certified every five years) ?	☐	☐

SITE NO. V00619-9 **Box 3**

Description of Institutional/Engineering Control

	YES	NO
Environmental Easements & Restrictions	☐	☐
Site Management Plan Adherence	☐	☐

Control Certification Statement

For each Institutional or Engineering control listed above, I certify by checking "Yes" that all of the following statements are true:

(a) the Institutional Control and/or Engineering Control employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

(b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

(c) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

(d) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control.

(e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

IC/EC CERTIFICATIONS
SITE NO.

Box 5

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 2 & 3 are true. I understand that a false statement made herein is punishable as a Class “A” misdemeanor, pursuant to Section 210.45 of the Penal Law.

I ________________________________ at ____,
print name print business address

am certifying as ____(Owner or Remedial Party)

for the Site named in the SIte Details Section of this form.

____ __________________
Signature of Owner or Remedial Party Rendering Certification Date

Box 6

QUALIFIED ENVIRONMENTAL PROFESSIONAL (QEP) SIGNATURE

I certify that all information and statements in Box 4 are true. I understand that a false statement made herein is punishable as a Class “A” misdemeanor, pursuant to Section 210.45 of the Penal Law.

I ________________________________ at ____,
print name print business address

am certifying as a Qualified Environmental Professional for the _______________________________

(Owner or Remedial Party) for the Site named in the SIte Details Section of this form.

____ ________________ _________
Signature of Qualified Environmental Professional, for the Owner or Remedial Party, Rendering Certification Stamp (if Required) Date

Enclosure 2

Certification of Institutional Controls/ Engineering Controls (ICs/ECs)
Step-by-Step Instructions, Certification Requirements and Definitions

The Owner, or Remedial Party, and when necessary, a Professional Engineer (P.E.), or the Qualified Environmental Professional (QEP), must review and complete the IC/EC Certification Form, sign the IC/EC Certifications Signature Page, and return it, along with the Periodic Review Report (PRR), within 45 days of the date of this notice.

Please use the following instructions to complete the IC/EC Certification.

I. Verification of Site Details (Box 1 and Box 2):

Answer the six questions in the Verification of Site Details Section. Questions 5 and 6 refer to only sites in the Brownfield Cleanup Program. ECL Section 27-1415-7(c) is included in **IV. IC/EC Certification Requirements**. The Owner and/or your P.E. or QEP may include handwritten changes and/or other supporting documentation, as necessary.

II. Verification of Institutional / Engineering Controls (Box 3 and Box 4)

Review the listed Institutional / Engineering Controls, confirming that all existing controls are listed, and that all existing controls are still applicable. If there is a control that is no longer applicable the Owner / Remedial Party is to petition the Department requesting approval to remove the control.

2. Select "YES" or "NO" for **Control Certification** for each IC/EC, based on Sections (a)-(e) of the **Control Certification Statement**.

   If the Department concurs with the explanation, the corrective measures, and the proposed schedule, a letter authorizing the implementation of those corrective measures will be issued by the Project Manager. If the Department has any questions or concerns regarding the completion of the certification, the Project Manager will contact you.

3. If you cannot certify "Yes" for each Control, please continue to complete the remainder of this **Control Certification** form. Attach supporting documentation that explains why the **Control Certification** cannot be rendered, as well as a statement of proposed corrective measures, and an associated schedule for completing the corrective measures. Note that this **Control Certification** form must be submitted even if an IC or EC cannot be certified; however, the certification process will not be considered complete until corrective action is conducted.

   If the Department concurs with the explanation, the corrective measures, and the proposed schedule, a letter authorizing the implementation of those corrective measures will be issued by the Project Manager. Once the corrective measures are complete a new Periodic Review Report (with IC/EC Certification) is to be submitted within 45 days to the Department. If the Department has any questions or concerns regarding the PRR and/or completion of the IC/EC Certification, the Project Manager will contact you.

III. IC/EC Certification by Signature (Box 5 and Box 6):

1. If you certified "Yes" for each Control, please complete and sign the IC/EC Certifications page. To determine WHO signs the **IC/EC Certification,** please use Table 1. Signature Requirements for the IC/EC Certification, which follows.

Table 1. Signature Requirements for Control Certification Page

Type of Control	Example of IC/EC	Required Signatures
IC only	Environmental Easement Deed Restriction.	A site or property owner or remedial party.
IC with an EC which does not include a treatment system or engineered caps.	Fence, Clean Soil Cover, Individual House Water Treatment System, Vapor Mitigation System	A site or property owner or remedial party, and a QEP. (P.E. license not required)
IC with an EC that includes treatment system or an engineered cap.	Pump & Treat System providing hydraulic control of a plume, Part 360 Cap.	A site or property owner or remedial party, and a QEP with a P.E. license.

IV. IC/EC Certification Requirements:

Division of Environmental Remediation Program Policy requires periodic certification of IC(s) and EC(s) as follows:

For Environmental Restoration Projects: N.Y. Envtl Conserv.Law Section 56-0503 (Environmental restoration projects; state assistance)

For State Superfund Projects: Envtl Conserv.Law Section 27-1318. (Institutional and engineering controls)

For Brownfields Cleanup Program Projects: Envtl Conserv.Law Section 27-1415. (Remedial program requirements)

Envtl Conserv.Law Section 27-1415-7(c) states:

(c) At non-significant threat sites where contaminants in groundwater at the site boundary contravene drinking water standards, such certification shall also certify that no new information has come to the owner's attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of offsite contamination are no longer valid. Every five years the owner at such sites shall certify that the assumptions made in the qualitative exposure assessment remain valid. The requirement to provide such certifications may be terminated by a written determination by the Commissioner in consultation with the Commissioner of Health, after notice to the parties on the brownfield site contact list and a public comment period of thirty days.

Voluntary Cleanup Program: Applicable program guidance.

Petroleum Remediation Program: Applicable program guidance.

Federal Brownfields: Applicable program guidance.

Manufactured Gas Plant Projects: Applicable program guidance (including non-registry listed MGPs).

WHERE to mail the signed Certification Form by Thursday, May 24, 2007 (45 days of the date of the notice):

New York State Department of Environmental Conservation
Division of Environmental Remediation

Attn: , Project Manager

Please note that extra postage may be required.

V. Definitions

“Engineering Control” (EC), means any physical barrier or method employed to actively or passively contain, stabilize, or monitor contamination, restrict the movement of contamination to ensure the long-term effectiveness of a remedial program, or eliminate potential exposure pathways to contamination. Engineering controls include, but are not limited to, pavement, caps, covers, subsurface barriers, vapor barriers, slurry walls, building ventilation systems, fences, access controls, provision of alternative water supplies via connection to an existing public water supply, adding treatment technologies to such water supplies, and installing filtration devices on private water supplies.

“Institutional Control” (IC), means any non-physical means of enforcing a restriction on the use of real property that limits human and environmental exposure, restricts the use of groundwater, provides notice to potential owners, operators, or members of the public, or prevents actions that would interfere with the effectiveness of a remedial program or with the effectiveness and/or integrity of operation, maintenance, or monitoring activities at or pertaining to a remedial site.

“Professional Engineer” (P.E.) means an individual or firm licensed or otherwise authorized under article 145 of the Education Law of the State of New York to practice engineering.

“Property Owner” means, for purposes of an IC/EC certification, the actual owner of a property. If the site has multiple properties with different owners, the Department requires that the owners be represented by a single representative to sign the certification.

“Oversight Document” means any document the Department issues pursuant to each Remedial Program (see below) to define the role of a person participating in the investigation and/or remediation of a site or area(s) of concern. Examples for the various programs are as follows:

BCP (after approval of the BCP application by DEC) - Brownfield Site Cleanup Agreement.
ERP (after approval of the ERP application by DEC) - State Assistance Contract.
Federal Superfund Sites - Federal Consent Decrees, Administrative Orders on Consent or Unilateral Orders issued pursuant to CERCLA.
Oil Spill Program - Order on Consent, or Stipulation pursuant to Article 12 of the Navigation Law (and the New York Environmental Conservation Law).
State Superfund Program - Administrative Consent Order, Record of Decision.
VCP (after approval of the VCP application by DEC) - Voluntary Cleanup Agreement.
RCRA Corrective Action Sites- Federal Consent Decrees, Administrative Orders on Consent or permit conditions issued pursuant to RCRA.

"Qualified Environmental Professional" (QEP), means a person who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding the presence of releases or threatened releases to the surface or subsurface of a property or off-site areas, sufficient to meet the objectives and performance factors for the areas of practice identified by this Part. Such a person must:

(1) hold a current professional engineer's or a professional geologist's license or registration issued by the State or another state, and have the equivalent of three years of full-time relevant experience in site investigation and remediation of the type detailed in this Part; or

(2) be a site remediation professional licensed or certified by the federal government, a state or a recognized accrediting agency, to perform investigation or remediation tasks consistent with Department guidance, and have the equivalent of three years of full-time relevant experience.

"Qualitative Exposure Assessment" means a qualitative assessment to determine the route, intensity, frequency, and duration of actual or potential exposures of humans and/or fish and wildlife to contaminants.

"Remedial Party" means a person implementing a remedial program at a remedial site pursuant to an order, agreement or State assistance contract with the Department.

"Site Management" (SM) means the activities undertaken as the last phase of the remedial program at a site, which continue after a Certificate of Completion is issued. Site management is conducted in accordance with a site management plan, which identifies and implements the institutional and engineering controls required for a site, as well as any necessary monitoring and/or operation and maintenance of the remedy.

"Site Management Plan" (SMP) means a document which details the steps necessary to assure that the institutional and engineering controls required for a site are in-place, and any physical components of the remedy are operated, maintained and monitored to assure their continued effectiveness, developed pursuant to Section 6 (DER10 Technical Guide).

"Site Owner" means the actual owner of a site. If the site has multiple owners of multiple properties with ICs and/or ECs, the Department requires that the owners designate a single representative for IC/EC Certification activities.

APPENDIX IV

LONG-TERM GROUNDWATER MONITORING WORK PLAN

WORK PLAN
for
LONG-TERM GROUNDWATER MONITORING

FORMER STEEL MANUFACTURING SITE
BUFFALO, NY

March 2000
Revised June 2005
Revised April 2007

0062-011-100

Prepared for:

STEELFIELDS LTD

Prepared by:

TurnKey Environmental Restoration, LLC

LIST OF TABLES

LIST OF FIGURES

ATTACHMENTS

1.0 INTRODUCTION

This groundwater monitoring program has been designed to monitor the effectiveness of the source area removal, treatment, and controls to be implemented at the Former Steel Manufacturing Site in accordance with the Voluntary Cleanup Agreement. Groundwater quality trends will be monitored along the perimeter of the Site and along the Buffalo River. Groundwater elevation and/or quality trends will be monitored inside and adjacent to the Area II containment cell to assess its effectiveness in collecting, containing and controlling groundwater flows.

2.0 GROUNDWATER MONITORING PROGRAM

2.1 Monitoring Network

The long-term groundwater monitoring network and monitoring frequency for this program is presented in Table C1. Figure C1 presents the monitoring well locations.

If any existing wells identified to be in the Groundwater Monitoring Program become damaged or unusable during remedial construction, those wells will be replaced within 30 days of completion of remedial construction. The potential need to install additional wells or adjust the location of new wells will be determined during the remedial activities as additional field information is gathered. New well installations will be surveyed to accurately determine their location and elevation.

2.2 Groundwater Flow and Hydrodynamics

For the first year of monitoring (began 2004) following construction of the Area II groundwater collection and containment system, a complete round of water table elevation data will be collected quarterly from the new wells and all other functional wells that remain on the Site and groundwater isopotential maps prepared. Thereafter, groundwater elevation data will be collected and an isopotential map prepared annually. Slug testing will be performed for any new monitoring wells installed adjacent to the Buffalo River (i.e. A1-MW-6) and used for calculating average annual groundwater constituent loadings to the River.

2.3 Groundwater Sampling

2.3.1 Sampling Frequency

Each newly installed well in the Groundwater Monitoring Program will be sampled semi-annually for two years after completion of remedial work in a subarea and then annually thereafter. In addition, existing monitoring wells will be sampled semi-annually for one year after completion of remedial work in a subarea and then annually thereafter. Following semi-annual sampling events, all Monitoring Program wells will continue to be sampled annually thereafter or at the frequency identified on Table C1. Any wells installed after remediation is complete (as listed in Section 2.1) will be sampled to establish a historical baseline for each monitoring well.

2.3.2 Sampling Method

The monitoring wells in the program will be sampled using USEPA Region II Low Stress (i.e. low-flow) Purging and Sampling technique. The low flow method produces samples with lower turbidity and smaller volumes of purge water than using conventional bailer techniques. Low-flow sampling also produces less agitation of the groundwater. As a result, the low-flow method provides a more representative sample, in relation to actual groundwater conditions, by not drastically altering the chemistry of the groundwater while withdrawing the sample. TurnKey's Field Operating Procedure (FOP) for the low-flow technique is provided as Attachment C1.

2.3.3 Analyses

For the first year, groundwater samples will be analyzed for the parameters and analytical methods presented in Table C2. After the first year, the parameter list will be reviewed for each monitoring well to determine whether the parameter list can be reduced based on the analytical results as well as the proposed activities for the site.

2.4 Statistical Evaluations

2.4.1 Parameters of Interest

Based upon the groundwater test results to date, the following parameters of interest will be statistically evaluated for all water quality monitoring wells in Area I:

- Benzene, lead, cyanide and TPH (for those wells that TPH and cyanide are analyzed), and
- Any parameters exceeding the groundwater quality standard for two (2) consecutive events.

For each "parameter of interest", statistical tables in spreadsheet form will be generated that include parameter concentration for each sampling event number, laboratory detection limit, moving average, standard deviation, and mean. The moving average will involve averaging four sequential concentrations in succession for analytical data.

2.4.2 Data Evaluation

For each monitoring location, a graph will then be generated which has the individual sample results and moving average concentration versus sampling event (i.e. time). A trend line will be plotted of the moving average, and evaluated to assess an increasing, decreasing, or neutral trend (neutral is having no significant increasing or decreasing trend).

The results will be interpreted in the following manner:

- If an increasing trend occurs for two consecutive monitoring events and the concentrations of each of the monitoring events are above New York State Groundwater Quality Standards/Guidance Values (GWQS/GV), an evaluation will be made to determine the potential cause. The type of evaluation will depend on which parameter(s) has the increasing trend.

- If there is a neutral or decreasing trend in a monitoring well for four consecutive monitoring events (after source removal or implementation of remedial measure), the parameter list and/or frequency of sampling may be reduced subject to NYSDEC approval.

- If there is a neutral or decreasing long-term trend in a monitoring well for all parameters for eight consecutive monitoring events, that location will be considered for elimination from further monitoring subject to NYSDEC approval.

- If an increasing trend occurs along the Buffalo River, the loadings calculation will be performed for the segment belonging to that well. The methodology described in Attachment C2 will be used to calculate loadings, if needed.

2.5 Immiscible Layer Surveillance

During well development and 2004 Long-Term Groundwater Monitoring sampling activities in Area I, field personnel performed visual immiscible layer surveillance of each well and observed no immiscible layer in any of the on-site monitoring wells, except monitoring well A1-MW-6. Monitoring well A1-MW-6 is located approximately 45-feet from the Buffalo River adjacent to Subarea A as shown on Figure C1. In response to NYSDEC's December 27, 2004 letter, a discussion pertaining to the immiscible layer detected in monitoring well A1-MW-6 was presented in the Long-Term Groundwater Monitoring 2004 Annual Report (revised January 2005).

2.5.1 Product Skimmer Installation and Performance

On February 1, 2005, TurnKey personnel installed the PetroTrap™ free product passive skimmer to mitigate the localized immiscible layer in and adjacent to monitoring well A1-MW-6 in accordance with the Long-Term Groundwater Monitoring (LTGWM) 2004 Annual Report for Area I (revised January 2005). The PetroTrap™ free product passive skimmer separates and recovers petroleum and light hydrocarbons from the groundwater. Incorporating hydrophobic filter technology with a storage canister, the device will automatically collect floating product down to a sheen. The PetroTrap™ has a vertical travel of 24 inches to compensate for water table fluctuation.

At the time of installation of the device, the immiscible layer thickness measured 3.35 feet. Based upon this measurement, the monitoring and product removal was conducted twice per week. Subsequent immiscible layer monitoring events at well A1-MW-6 indicated substantial removal of immiscible material with a corresponding decrease in layer thickness within the well. The attached Table C3 summarizes the recovered immiscible material quantities and layer thickness measurements for each monitoring event since the February 2005 installation. As indicated on Figure C3, substantial immiscible layer removal progress has been made since installation of the device.

2.5.2 Monitoring Procedure

Upon arrival at monitoring well A1-MW-6, field personnel will adhere to the following procedure:

- Don appropriate personal protective equipment, such as poly-coated Tyvek and nitrile gloves.
- Place a large polyethylene tarp covering the ground surface around the well using surrounding stones/concrete pieces to secure the tarp in place.
- Unlock well and remove J-plug.
- Carefully remove the PetroTrap™ device by pulling on the safety rope while rolling up the vent tubing; do not pull the device by the vent tubing.
- While holding the device in a vertical position over the tarp, open the bottom valve to drain the collected product into a sealable storage device, such as a plastic bucket with a lid. The bucket should have calibrated markings on the side so that the quantity of product recovered can be determined and recorded.

- Upon product removal, lay the device on the plastic tarp taking care to avoid contact between the device and un-tarped ground surface.
- Slowly lower the interface probe down to the product surface and record the measurement depth.
- Continue lowering the probe through the immiscible layer to the water table and record the measurement depth.
- Remove probe taking care to wipe excess product from the tape of the probe.
- Gather up the PetroTrap™ device and tubing making sure the coiled hose from the hydrophobic filter assembly and storage canister is not kinked and moves freely.
- Slowly lower the device into the well using the safety rope and unrolling the vent tubing.
- If excess water is recovered from the device, raise the device approximately one-foot. If subsequent visits indicate persistent water infiltration, the hydrophobic filter assembly may require replacement.
- Replace the J-plug and lock the well.
- Gather up all disposables (i.e., tarp, gloves, Tyvek, paper towels etc.) and place in standard garbage bag for disposal.
- Transfer recovered product to a properly labeled and sealed 5-gallon bucket with secondary containment inside the Groundwater Pretreatment Building at the Site. Once the bucket is full, a representative sample will be collected and characterized for appropriate off-site disposal.

2.5.3 Monitoring Schedule

Now that the immiscible layer thickness has been substantially decreased, the monitoring frequency will be conducted monthly. Based upon continued monthly monitoring progress of the device, the frequency of monitoring and product removal may be modified, subject to NYSDEC approval.

2.5.4 Petroleum Product Storage and Disposal

The removed petroleum product will be stored in a properly labeled and sealed 5-gallon bucket with secondary containment inside the Groundwater Pretreatment Building at the Site. As discussed in Section 2.5.2, the immiscible layer has been characterized as petroleum product and will be handled as such. Once the bucket is nearly full, a licensed used oil service contractor will be contacted to pick up the recovered product for proper recycling or disposal.

3.0 REPORTING

During the first two years of semi-annual monitoring described in Section 2.3.1, two reports per year will be provided to the NYSDEC. A semi-annual report summarizing the first semi-annual event that includes graphs with trend lines, sampling data, discussion of results, isopotential map, and analytical data presented as tables and maps and an annual report presenting a summary of all semi-annual analytical data collected during the calendar year as well as an engineering and geologic evaluation of all of the data. After the first two years of semi-annual monitoring described above, one annual report will be provided to the NYSDEC, Region 9 Office, by March 1 of each calendar year that includes the information listed above.

Any and all changes to the Monitoring Program will be approved by the NYSDEC prior to implementation.

TABLES

TABLE 1

GROUNDWATER MONITORING NETWORK AND SAMPLE FREQUENCY

Steelfields, LTD.
Former Steel Manufacturing Site
Buffalo, New York

Well Designation	Type of Well		Former Well Designation [1]	Monitoring Event				
				Year 1		Year 2		Year 3
	New	Existing		1 SA	2SA	1 SA	2SA	Annually
AREA I								
A1-MW-1		x	--	x	x	x		x
A1-MW-2		x	--	x	x	x		x
A1-MW-3		x	--	x	x	x		x
A1-MW-4	x		--	x	x	x	x	x
A1-MW-5	x		--	x	x	x	x	x
A1-MW-6	x		A1-MW-9A	x	x	x	x	x
A1-MW-7	x		--	*water level only*				
A1-MW-8	x		A1-MW-F2	x	x	x	x	x
A1-MW-9	x		A1-P-1	x	x	x	x	x
A1-MW-M2		x	--	x	x	x		x
A1-P-4		x	--	x	x	x		x
AREA II								
A2-MW-3		x	--	x	x	x		x
A2-MW-4		x	--	x	x	x		x
A2-MW-5		x	--	x	x	x		x
A2-MW-6		x	--	*water level only*				
A2-MW-7		x	--	*water level only*				
A2-MW-10		x	--	x	x	x		x
A2-MW-12		x	--	*water level only*				
A2-MW-13		x	--	x	x	x		x
A2-MW-14	x		--	x	x	x	x	x
A2-MW-15 [2]	x		--	x				x
A2-MW-16	x		--	x	x	x	x	x
A2-MW-17	x		--	x	x	x	x	x
A2-MW-18	x		--	*water level only*				
A2-MW-19 [3]	x		--	*water level only*				
Various Piezometers [4]	x		--	*water level only*				
AREA III								
A3-MW-7		x	--	x	x	x		x
A3-MW-9 [3]	x		--	*water level only*				
AREA IV								
A4-MW-4		x	--	x	x	x		x
A4-MW-6		x	--	*water level only*				
A4-MW-7		x	--	x	x	x		x
A4-MW-8		x	--	x	x	x		x
A4-MW-9 [3]	x		--	x	x	x	x	x

Notes:
1. The existing monitoring well was either destroyed during construction activities and not present or required decommissioning due to an obstruction; a replacement well was installed during 2004 drilling activities with a new well designation.
2. Monitoring well will be sampled every two years.
3. Monitoring well will be installed within 30 days of remedial work completion.
4. Various piezometers will be installed in the Area II collection trench to assist in hydraulic monitoring.
5. Monitoring well requires the installation of a protective casing.

TABLE 2

ANALYTICAL PARAMETERS PER AREA

Steelfields, LTD.
Former Steel Manufacturing Site
Buffalo, New York

Areas I & II	Areas III & IV
STARS List VOCs (Method 8021)	STARS List VOCs (Method 8021)
Arsenic (Method 6010)	Arsenic (Method 6010)
Chromium (Method 6010)	Chromium (Method 6010)
Lead (Method 6010)	Lead (Method 6010)
TPH (Method 1664) for wells: A1-MW-1 A1-MW-3 A1-MW-6 A1-MW-9	Cyanide (Method 335)

Notes:
1. For the first semi-annual event, wells will be analyzed for "Full List" (i.e., TCL and STARS List VOCs).

TABLE 3

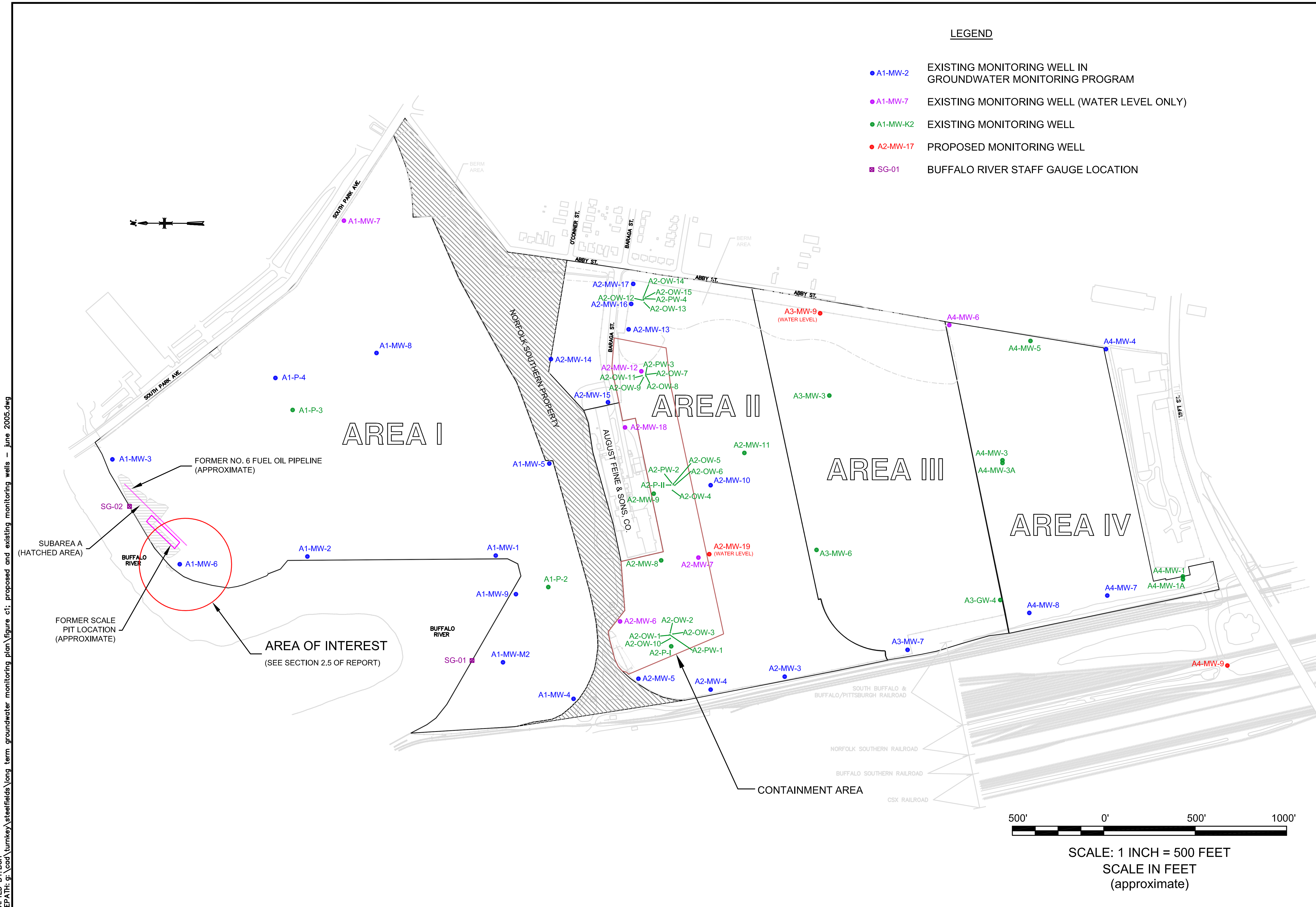
SUMMARY OF LNAPL THICKNESS / REMOVAL IN A1-MW-6

Steelfields, LTD.
Former Steel Manufacturing Site
Buffalo, New York

Date	Days Since Last Visit	LNAPL Measurement			Quantity Removed (oz.)	Progress Report #	Comments
		Top (fbTOR)	Bottom (fbTOR)	Thickness (feet)			
09/21/04	--	18.10	18.40	0.30	NA	1	well development
09/23/04	2	18.10	18.40	0.30	NA		Fall 2004 groundwater monitoring event
02/01/05	131	17.50	20.85	3.35	NA		installed Petro Trap passive skimmer @ 16.00 fbTOR
02/08/05	7	17.94	19.89	1.95	16		first LNAPL removal from Petro Trap
02/11/05	3	17.89	19.75	1.86	20		ok
02/15/05	4	18.10	18.52	0.42	20		ok
02/18/05	3	17.59	17.91	0.32	12		ok
02/25/05	7	18.02	18.51	0.49	2		Petro Trap tubing was tangled
03/04/05	7	18.13	18.63	0.50	6	2	Petro Trap tubing was tangled
03/18/05	14	18.00	18.74	0.74	3.5		checked Petro Trap for leaks, none located
04/08/05	21	17.37	18.20	0.83	24		ok; raised Petro Trap approximately 1-foot
04/14/05	27	17.65	17.81	0.16	22		ok
04/28/05	41	16.23	16.25	0.02	26	3 (to be submitted)	ok
05/17/05	39	17.62	17.80	0.18	14		~14 oz. of water in Petro Trap; raised approx. 1-foot

Total Quantity Removed To Date: 165.5 oz.

FIGURES



726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

TURNKEY ENVIRONMENTAL RESTORATION, LLC

JOB NO.: 0062-001-100

PROPOSED NEW & EXISTING MONITORING WELLS

LONG TERM GROUNDWATER MONITORING PLAN

FORMER STEEL MANUFACTURING SITE
BUFFALO, NEW YORK

PREPARED FOR
STEELFIELDS, LTD.

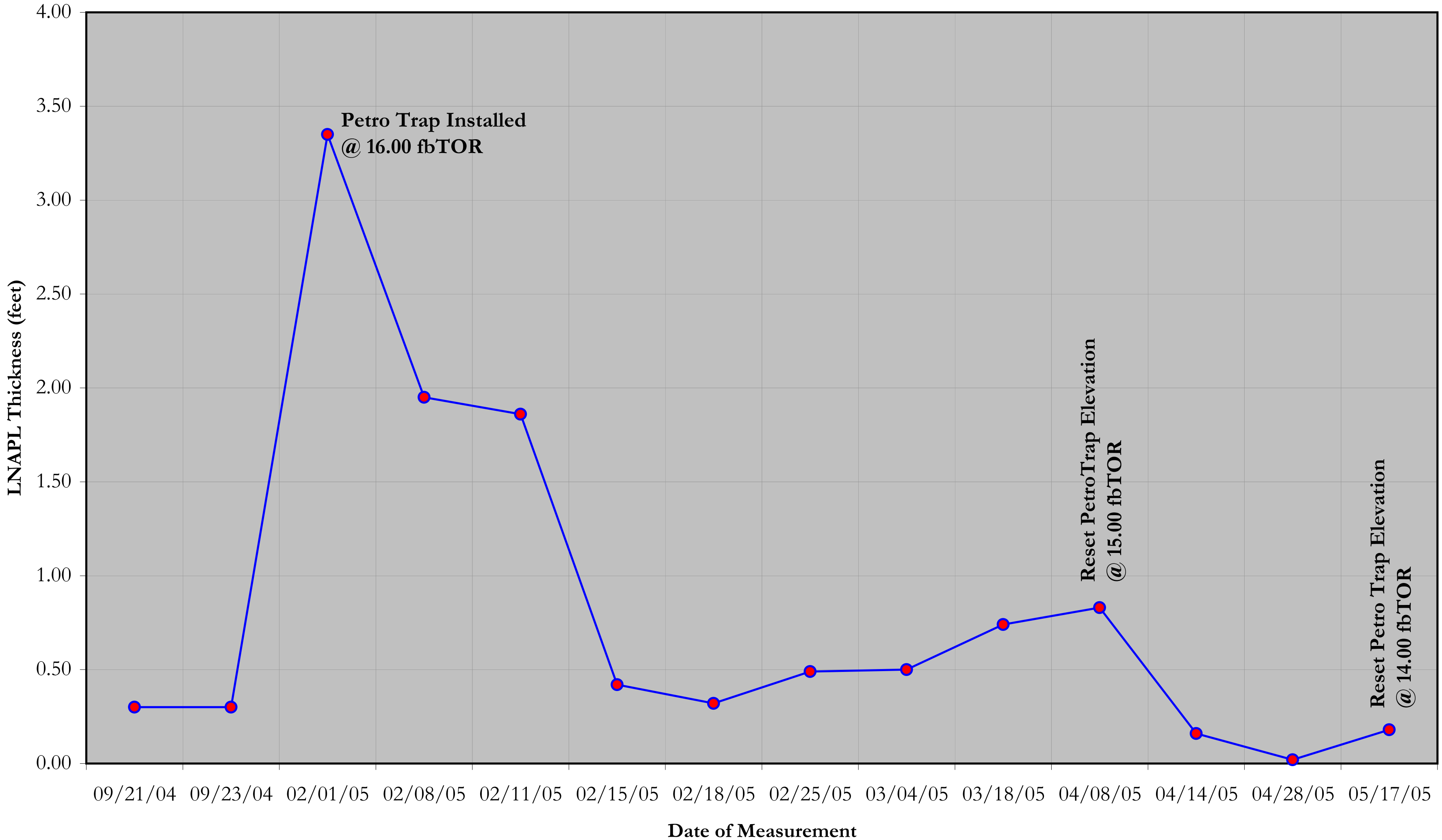
FIGURE C1

DATE: JUNE 2005
DRAFTED BY: BCH
FILEPATH: g:\cad\turnkey\steelfields\long term groundwater monitoring plan\figure c1; proposed and existing monitoring wells -- june 2005.dwg

FIGURE 2

LNAPL THICKNESS WITHIN A1-MW-6 VERSUS TIME

Steelfields, LTD.
Former Steel Manaufacturing Site
Buffalo, New York



ATTACHMENT C1

LOW-FLOW PURGING/SAMPLING STANDARD OPERATING PROCEDURE

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

FIELD OPERATING PROCEDURES

Low-Flow (Minimal Drawdown) Groundwater Purging & Sampling Procedure

FOP 031.0

LOW FLOW (MINIMAL DRAWDOWN) GROUNDWATER PURGING & SAMPLING PROCEDURES

PURPOSE

This procedure describes the methods used for performing low flow (minimal drawdown) purging, also referred to as micro-purging, at a well prior to groundwater sampling to obtain a representative sample from the water-bearing zone. This method of purging is used to minimize the turbidity of the produced water. This may increase the representativeness of the groundwater samples by avoiding the necessity of filtering suspended solids in the field prior to preservation of the sample.

Well purging is typically performed immediately preceding groundwater sampling. The sample should be collected as soon as the parameters measured in the field (i.e., pH, specific conductance, dissolved oxygen, Eh, temperature, and turbidity) have stabilized.

PROCEDURE

1. Water samples should not be taken immediately following well development. Sufficient time should be allowed to stabilize the groundwater flow regime in the vicinity of the monitoring well. This lag time will depend on site conditions and methods of installation but may exceed one week.

2. Prepare the electronic water level indicator (e-line) in accordance with the procedures referenced in the Benchmark's Groundwater Level Measurement FOP and decontaminate the e-line probe and a lower portion of cable following the procedures referenced in the Benchmark's Non-disposable and Non-dedicated Sampling Equipment Decontamination FOP. Store the e-line in a protected area until use. This may include wrapping the e-line in clean plastic until the time of use.

3. Calibrate all sampling devices and monitoring equipment in accordance with manufacturer's recommendations, the site Quality Assurance Project Plan (QAPP) and/or Field Sampling Plan (FSP). Calibration of field

instrumentation should be followed as specified in Benchmark's Calibration and Maintenance FOP for each individual meter.

4. Inspect the well/piezometer for signs of vandalism or damage and record condition on the Groundwater Well Purge & Sample Collection Log form (sample attached). Specifically, inspect the integrity of the following: concrete surface seal, lock, protective casing and well cover, well casing and J-plug/cap. Report any irregular findings to the Project Manager.

5. Unlock and remove the well protective cap or cover and place on clean plastic to avoid introducing foreign material into the well.

6. Monitor the well for organic vapors using a PID, as per the Work Plan. If a reading of greater than 5 ppm is recorded, the well should be allowed to vent until levels drop below 5 ppm before proceeding with purging.

7. Lower the e-line probe slowly into the monitoring well and record the initial water level in accordance with the procedures referenced in Benchmark's Groundwater Level Measurement FOP. Refer to the construction diagram for the well to identify the screened depth.

8. Decontaminate all non-dedicated pump and tubing equipment following the procedures referenced in the Benchmark's Non-disposable and Non-dedicated Sampling Equipment Decontamination FOP.

9. Lower the purge pump or tubing (i.e., low-flow electrical submersible, peristaltic, etc.) <u>slowly</u> into the well until the pump/tubing intake is approximately in the middle of the screened interval. Rapid insertion of the pump will increase the turbidity of well water, and can increase the required purge time. This step can be eliminated if dedicated tubing is already within the well.

   Placement of the pump close to the bottom of the well will cause increased entrainment of solids, which may have settled in the well over time. Low-flow purging has the advantage of minimizing mixing between the overlying stagnant casing water and water within the screened interval. The objective of low-flow purging is to maintain a purging rate, which minimizes stress (drawdown) of the water level in the well. Low-flow refers to the velocity with which water enters the pump intake and that is imparted to the formation pore water in the immediate vicinity of the well screen.

10. Lower the e-line back down the well as water levels will be frequently monitored during purge and sample activities.

11. Begin pumping to purge the well. The pumping rate should be between 100 and 500 milliliters (ml) per minute (0.03 to 0.13 gallons per minute) depending on site hydrogeology. Periodically check the well water level with the e-line adjusting the flow rate as necessary to stabilize drawdown within the well. If possible, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 feet or less). If the water level exceeds 2 feet below static and declining, slow the purge rate until the water level generally stabilizes. Record each pumping rate and water level during the event.

    The low flow rate determined during purging will be maintained during the collection of analytical samples. At some sites where geologic heterogeneities are sufficiently different within the screened interval, high conductivity zones may be preferentially sampled.

12. Measure and record field parameters (pH, specific conductance, Eh, dissolved oxygen (DO), temperature, and turbidity) during purging activities. In lieu of measuring all of the parameters, a minimum subset could be limited to pH, specific conductance, and turbidity or DO.

    Water quality indicator parameters should be used to determine purging needs prior to sample collection in each well. Stabilization of indicator parameters should be used to determine when formation water is first encountered during purging. In general, the order of stabilization is pH, temperature, and specific conductance, followed by Eh, DO and turbidity. Performance criteria for determination of stabilization should be based on water-level drawdown, pumping rate and equipment specifications for measuring indicator parameters. An in-line flow through cell to continuously measure the above parameters may be used. The in-line device should be disconnected or bypassed during sample collection.

13. Purging will continue until parameters of water quality have stabilized. Record measurements for field indicator parameters (including water levels) at regular intervals during purging. The stability of these parameters with time can be used to guide the decision to discontinue purging. Proper adjustments must be made to stabilize the flow rate as soon as possible.

14. Record well purging and sampling data in the Project Field Book or on the attached Groundwater Well Purge & Sample Collection Log (sample attached). Measurements should be taken approximately every three to five minutes, or as merited given the rapidity of change.

15. Purging is complete when field indicator parameters stabilize. Stabilization is achieved after all field parameters have stabilized for three successive readings. Three successive readings should be within ± 0.1 units for pH, ± 3% for specific conductance, ± 10 mV for Eh, and ± 10% for turbidity and dissolved oxygen. These stabilization guidelines are provided for rough estimates only, actual site-specific knowledge may be used to adjust these requirements higher or lower.

    An in-line water quality measurement device (e.g., flow-through cell) should be used to establish the stabilization time for several field parameters on a well-specific basis. Data on pumping rate, drawdown and volume required for parameter stabilization can be used as a guide for conducting subsequent sampling activities.

16. Collect all project-required samples from the discharge tubing at the flow rate established during purging in accordance with Benchmark's Groundwater Sample Collection Procedures FOP. **If a peristaltic pump and dedicated tubing is used, collect all project-required samples from the discharge tubing as stated before, however volatile organic compounds should be collected in accordance with the procedure presented in the next**

section. Continue to maintain a constant flow rate such that the water level is not drawn down as described above. Fill sample containers with minimal turbulence by allowing the ground water to flow from the tubing along the inside walls of the container.

17. If field filtration is recommended as a result of increased turbidity, an in-line filter equipped with a 0.45-micron filter should be utilized.

18. Replace the dedicated tubing down the well taking care to avoid contact with the ground surface.

19. Restore the well to its capped/covered and locked condition.

20. Upon purge and sample collection completion, slowly lower the e-line to the bottom of the well/piezometer. Record the total depth to the nearest 0.01-foot and compare to the previous total depth measurement. If a significant discrepancy exists, re-measure the total depth. Record observations of purge water to determine whether the well/piezometer had become silted due to inactivity or damaged (i.e., well sand within purge water). Upon confirmation of the new total depth and determination of the cause (i.e., siltation or damage), notify the Project Manager following project field activities.

PERISTALTIC PUMP VOC SAMPLE COLLECTION PROCEDURE

The collection of VOCs from a peristaltic pump and dedicated tubing assembly shall be collected using the following procedure.

1. Once all other required sample containers have been filled, turn off the peristaltic pump. The negative pressure effects of the pump head have not altered groundwater remaining within the dedicated tubing assembly and as such, this groundwater can be collected for VOC analysis.

2. While maintaining the pressure on the flexible tubing within the pump head assembly, carefully remove and coil the polyethylene tubing from the well; taking care to prevent the tubing from coming in contact with the ground

surface and without allowing groundwater to escape or drain from the tubing intake.

3. Once the polyethylene tubing is removed, turn the variable speed control to zero and reverse the pump direction.

4. Slowly increase the pump rate allowing the groundwater within the polyethylene tubing to be "pushed" out of the intake end (i.e., positive displacement) making sure the groundwater within the tubing is not "pulled" through the original discharge end (i.e., negative displacement). Groundwater pulled through the pump head assembly CANNOT be collected for VOC analysis.

5. Slowly fill each VOC vial by holding the vial at a 45-degree angle and allowing the flowing groundwater to cascade down the side until the vial is filled with as minimal disturbance as possible. As the vial fills, slowly rotate the vial to vertical. **DO NOT OVERFILL THE VIAL, AS THE PRESERVATIVE WILL BE LOST.** The vial should be filled only enough so that the water creates a slight meniscus at the vial mouth.

6. Cap the VOC vials leaving no visible headspace (i.e., air-bubbles). Gently tap each vial against your hand checking for air bubbles.

7. If an air bubble is observed, slowly remove the cap and repeat Steps 5 and 6.

ATTACHMENTS

Groundwater Well Purge & Sample Collection Log (sample)

REFERENCES

United States Environmental Protection Agency, 540/S-95/504, 1995. *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*.

<u>Benchmark FOPs:</u>

007 Calibration and Maintenance of Portable Dissolved Oxygen Meter
008 Calibration and Maintenance of Portable Field pH/Eh Meter
009 Calibration and Maintenance of Portable Field Turbidity Meter
011 Calibration and Maintenance of Portable Photoionization Detector
012 Calibration and Maintenance of Portable Specific Conductance Meter
022 Groundwater Level Measurement
024 Groundwater Sample Collection Procedures
040 Non-Disposable and Non-Dedicated Sampling Equipment Decontamination
046 Sample Labeling, Storage and Shipment Procedures

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

LOW FLOW METHOD GROUNDWATER PURGE & SAMPLE COLLECTION LOG

Project Name:	WELL LOCATION:
Project Number:	Sample Matrix: groundwater
Client:	Weather:

WELL DATA:

DATE:	TIME:

Casing Diameter (inches):	Casing Material:
Screened interval (fbTOR):	Screen Material:
Static Water Level (fbTOR):	Bottom Depth (fbTOR):
Elevation Top of Well Riser (fmsl):	Ground Surface Elevation (fmsl):
Elevation Top of Screen (fmsl):	Stick-up (feet):
Standing volume in gallons:	
[(bottom depth - static water level) x vol calculation in table per well diameter]:	

Volume Calculation

Well Diameter	Volume gal/ft
1"	0.041
2"	0.163
3"	0.367
4"	0.653
5"	1.020
6"	1.469

PURGING DATA:

Pump Type:

Is equipment dedicated to location? yes no	Is tubing dedicated to location? yes no
Depth of Sample (i.e. Level of Intake) (fbTOR):	Approximate Purge Rate (gal/min):

Time	Water Level (fbTOR)	Accumulated Volume (gallons)	pH (units)	Temperature (degrees C)	Specific conductance (µS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	Initial								

SAMPLING DATA:

DATE:	START TIME:	END TIME:

Method: low-flow with dedicated tubing	Was well sampled to dryness? yes no
Initial Water Level (fbTOR):	Was well sampled below top of sand pack? yes no
Final Water Level (fbTOR):	Field Personnel:

PHYSICAL & CHEMICAL DATA:

Appearance:	
Color:	
Odor:	
Sediment Present?	

WATER QUALITY MEASUREMENTS

pH (units)	TEMP. (°C)	SC (uS)	TURB. (NTU)	DO (ppm)	ORP (mV)

REMARKS:

PREPARED BY:

EXHIBIT C1

EPA REGION II LOW STRESS (OR LOW FLOW) PURGING AND SAMPLING PROCEDURE

United States Environmental Protection Agency
Office of Research and Development
Office of Solid Waste and Emergency Response
EPA/540/S-95/504
April 1996

Ground Water Issue

LOW-FLOW (MINIMAL DRAWDOWN) GROUND-WATER SAMPLING PROCEDURES

by Robert W. Puls[1] and Michael J. Barcelona[2]

Background

The Regional Superfund Ground Water Forum is a group of ground-water scientists, representing EPA's Regional Superfund Offices, organized to exchange information related to ground-water remediation at Superfund sites. One of the major concerns of the Forum is the sampling of ground water to support site assessment and remedial performance monitoring objectives. This paper is intended to provide background information on the development of low-flow sampling procedures and its application under a variety of hydrogeologic settings. It is hoped that the paper will support the production of standard operating procedures for use by EPA Regional personnel and other environmental professionals engaged in ground-water sampling.

For further information contact: Robert Puls, 405-436-8543, Subsurface Remediation and Protection Division, NRMRL, Ada, Oklahoma.

I. Introduction

The methods and objectives of ground-water sampling to assess water quality have evolved over time. Initially the emphasis was on the assessment of water quality of aquifers as sources of drinking water. Large water-bearing units were identified and sampled in keeping with that objective. These were highly productive aquifers that supplied drinking water via private wells or through public water supply systems. Gradually, with the increasing awareness of subsurface pollution of these water resources, the understanding of complex hydrogeochemical processes which govern the fate and transport of contaminants in the subsurface increased. This increase in understanding was also due to advances in a number of scientific disciplines and improvements in tools used for site characterization and ground-water sampling. Ground-water quality investigations where pollution was detected initially borrowed ideas, methods, and materials for site characterization from the water supply field and water analysis from public health practices. This included the materials and manner in which monitoring wells were installed and the way in which water was brought to the surface, treated, preserved and analyzed. The prevailing conceptual ideas included convenient generalizations of ground-water resources in terms of large and relatively homogeneous hydrologic *units*. With time it became apparent that conventional water supply generalizations of *homogeneity* did not adequately represent field data regarding pollution of these subsurface resources. The important role of *heterogeneity* became increasingly clear not only in geologic terms, but also in terms of complex physical,

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[2]University of Michigan

Communication • Training • Technology Support
Technology Support Project

Superfund Technology Support Center for Ground Water

National Risk Management Research Laboratory
Subsurface Protection and Remediation Division
Robert S. Kerr Environmental Research Center
Ada, Oklahoma

Technology Innovation Office
Office of Solid Waste and Emergency Response, US EPA, Washington, DC

Walter W. Kovalick, Jr., Ph.D.
Director

chemical and biological subsurface processes. With greater appreciation of the role of heterogeneity, it became evident that subsurface pollution was ubiquitous and encompassed the unsaturated zone to the deep subsurface and included unconsolidated sediments, fractured rock, and *aquitards* or low-yielding or impermeable formations. Small-scale processes and heterogeneities were shown to be important in identifying contaminant distributions and in controlling water and contaminant flow paths.

It is beyond the scope of this paper to summarize all the advances in the field of ground-water quality investigations and remediation, but two particular issues have bearing on ground-water sampling today: aquifer heterogeneity and colloidal transport. Aquifer heterogeneities affect contaminant flow paths and include variations in geology, geochemistry, hydrology and microbiology. As methods and the tools available for subsurface investigations have become increasingly sophisticated and understanding of the subsurface environment has advanced, there is an awareness that in most cases a primary concern for site investigations is characterization of contaminant flow paths rather than entire aquifers. In fact, in many cases, plume thickness can be less than well screen lengths (e.g., 3-6 m) typically installed at hazardous waste sites to detect and monitor plume movement over time. Small-scale differences have increasingly been shown to be important and there is a general trend toward smaller diameter wells and shorter screens.

The hydrogeochemical significance of colloidal-size particles in subsurface systems has been realized during the past several years (Gschwend and Reynolds, 1987; McCarthy and Zachara, 1989; Puls, 1990; Ryan and Gschwend, 1990). This realization resulted from both field and laboratory studies that showed faster contaminant migration over greater distances and at higher concentrations than flow and transport model predictions would suggest (Buddemeier and Hunt, 1988; Enfield and Bengtsson, 1988; Penrose et al., 1990). Such models typically account for interaction between the mobile aqueous and immobile solid phases, but do not allow for a mobile, reactive solid phase. It is recognition of this third *phase* as a possible means of contaminant transport that has brought increasing attention to the manner in which samples are collected and processed for analysis (Puls et al., 1990; McCarthy and Degueldre, 1993; Backhus et al., 1993; U. S. EPA, 1995). If such a phase is present in sufficient mass, possesses high sorption reactivity, large surface area, and remains stable in suspension, it can serve as an important mechanism to facilitate contaminant transport in many types of subsurface systems.

Colloids are particles that are sufficiently small so that the surface free energy of the particle dominates the bulk free energy. Typically, in ground water, this includes particles with diameters between 1 and 1000 nm. The most commonly observed mobile particles include: secondary clay minerals; hydrous iron, aluminum, and manganese oxides; dissolved and particulate organic materials, and viruses and bacteria. These reactive particles have been shown to be mobile under a variety of conditions in both field studies and laboratory column experiments, and as such need to be included in monitoring programs where identification of the *total* mobile contaminant loading (dissolved + naturally suspended particles) at a site is an objective. To that end, sampling methodologies must be used which do not artificially bias *naturally* suspended particle concentrations.

Currently the most common ground-water purging and sampling methodology is to purge a well using bailers or high speed pumps to remove 3 to 5 casing volumes followed by sample collection. This method can cause adverse impacts on sample quality through collection of samples with high levels of turbidity. This results in the inclusion of otherwise immobile artifactual particles which produce an overestimation of certain analytes of interest (e.g., metals or hydrophobic organic compounds). Numerous documented problems associated with filtration (Danielsson, 1982; Laxen and Chandler, 1982; Horowitz et al., 1992) make this an undesirable method of rectifying the turbidity problem, and include the removal of potentially mobile (contaminant-associated) particles during filtration, thus artificially biasing contaminant concentrations low. Sampling-induced turbidity problems can often be mitigated by using low-flow purging and sampling techniques.

Current subsurface conceptual models have undergone considerable refinement due to the recent development and increased use of field screening tools. So-called hydraulic *push* technologies (e.g., cone penetrometer, Geoprobe®, QED HydroPunch®) enable relatively fast screening site characterization which can then be used to design and install a monitoring well network. Indeed, alternatives to conventional monitoring wells are now being considered for some hydrogeologic settings. The ultimate design of any monitoring system should however be based upon adequate site characterization and be consistent with established monitoring objectives.

If the sampling program objectives include accurate assessment of the magnitude and extent of subsurface contamination over time and/or accurate assessment of subsequent remedial performance, then some information regarding plume delineation in three-dimensional space is necessary prior to monitoring well network design and installation. This can be accomplished with a variety of different tools and equipment ranging from hand-operated augers to screening tools mentioned above and large drilling rigs. Detailed information on ground-water flow velocity, direction, and horizontal and vertical variability are essential baseline data requirements. Detailed soil and geologic data are required prior to and during the installation of sampling points. This includes historical as well as detailed soil and geologic logs which accumulate during the site investigation. The use of borehole geophysical techniques is also recommended. With this information (together with other site characterization data) and a clear understanding of sampling objectives, then appropriate location, screen length, well diameter, slot size, etc. for the monitoring well network can be decided. This is especially critical for new in situ remedial approaches or natural attenuation assessments at hazardous waste sites.

In general, the overall goal of any ground-water sampling program is to collect water samples with no alteration in water chemistry; analytical data thus obtained may be used for a variety of specific monitoring programs depending on the regulatory requirements. The sampling methodology described in this paper assumes that the monitoring goal is to sample monitoring wells for the presence of contaminants and it is applicable whether mobile colloids are a concern or not and whether the analytes of concern are metals (and metalloids) or organic compounds.

II. Monitoring Objectives and Design Considerations

The following issues are important to consider prior to the design and implementation of any ground-water monitoring program, including those which anticipate using low-flow purging and sampling procedures.

A. Data Quality Objectives (DQOs)

Monitoring objectives include four main types: detection, assessment, corrective-action evaluation and resource evaluation, along with *hybrid* variations such as site-assessments for property transfers and water availability investigations. Monitoring objectives may change as contamination or water quality problems are discovered. However, there are a number of common components of monitoring programs which should be recognized as important regardless of initial objectives. These components include:

1) Development of a conceptual model that incorporates elements of the regional geology to the local geologic framework. The conceptual model development also includes initial site characterization efforts to identify hydrostratigraphic units and likely flow-paths using a minimum number of borings and well completions;

2) Cost-effective and well documented collection of high quality data utilizing simple, accurate, and reproducible techniques; and

3) Refinement of the conceptual model based on supplementary data collection and analysis.

These fundamental components serve many types of monitoring programs and provide a basis for future efforts that evolve in complexity and level of spatial detail as purposes and objectives expand. High quality, reproducible data collection is a common goal regardless of program objectives.

High quality data collection implies data of sufficient accuracy, precision, and completeness (i.e., ratio of valid analytical results to the minimum sample number called for by the program design) to meet the program objectives. Accuracy depends on the correct choice of monitoring tools and procedures to minimize sample and subsurface disturbance from collection to analysis. Precision depends on the repeatability of sampling and analytical protocols. It can be assured or improved by replication of sample analyses including blanks, field/lab standards and reference standards.

B. Sample Representativeness

An important goal of any monitoring program is collection of data that is truly representative of conditions at the site. The term *representativeness* applies to chemical and hydrogeologic data collected via wells, borings, piezometers, geophysical and soil gas measurements, lysimeters, and temporary sampling points. It involves a recognition of the statistical variability of individual subsurface physical properties, and contaminant or major ion concentration levels, while explaining extreme values. Subsurface temporal and spatial variability are facts. Good professional practice seeks to maximize representativeness by using proven accurate and reproducible techniques to define limits on the distribution of measurements collected at a site. However, measures of representativeness are dynamic and are controlled by evolving site characterization and monitoring objectives. An evolutionary site characterization model, as shown in Figure 1, provides a systematic approach to the goal of consistent data collection.

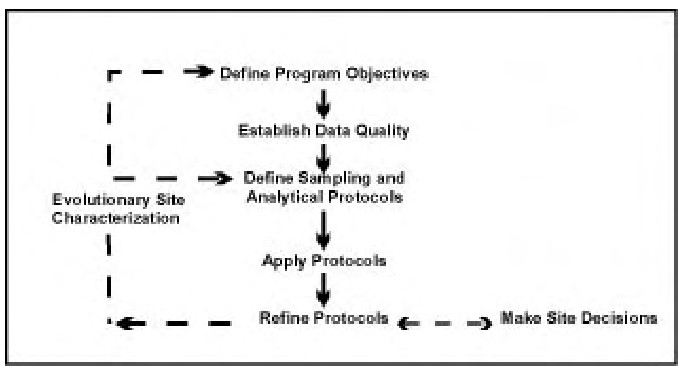

Figure 1. Evolutionary Site Characterization Model

The model emphasizes a recognition of the causes of the variability (e.g., use of inappropriate technology such as using bailers to purge wells; imprecise or operator-dependent methods) and the need to control avoidable errors.

1) Questions of Scale

A sampling plan designed to collect representative samples must take into account the potential scale of changes in site conditions through space and time as well as the chemical associations and behavior of the parameters that are targeted for investigation. In subsurface systems, physical (i.e., aquifer) and chemical properties over time or space are not statistically independent. In fact, samples taken in close proximity (i.e., within distances of a few meters) or within short time periods (i.e., more frequently than monthly) are highly auto-correlated. This means that designs employing high-sampling frequency (e.g., monthly) or dense spatial monitoring designs run the risk of redundant data collection and misleading inferences regarding trends in values that aren't statistically valid. In practice, contaminant detection and assessment monitoring programs rarely suffer these *over-sampling* concerns. In corrective-action evaluation programs, it is also possible that too little data may be collected over space or time. In these cases, false interpretation of the spatial extent of contamination or underestimation of temporal concentration variability may result.

2) Target Parameters

Parameter selection in monitoring program design is most often dictated by the regulatory status of the site. However, background water quality constituents, purging indicator parameters, and contaminants, all represent targets for data collection programs. The tools and procedures used in these programs should be equally rigorous and applicable to all categories of data, since all may be needed to determine or support regulatory action.

C. Sampling Point Design and Construction

Detailed site characterization is central to all decision-making purposes and the basis for this characterization resides in identification of the geologic framework and major hydro-stratigraphic units. Fundamental data for sample point location include: subsurface lithology, head-differences and background geochemical conditions. Each sampling point has a proper use or uses which should be documented at a level which is appropriate for the program's data quality objectives. Individual sampling points may not always be able to fulfill multiple monitoring objectives (e.g., detection, assessment, corrective action).

1) Compatibility with Monitoring Program and Data Quality Objectives

Specifics of sampling point location and design will be dictated by the complexity of subsurface lithology and variability in contaminant and/or geochemical conditions. It should be noted that, regardless of the ground-water sampling approach, few sampling points (e.g., wells, drive-points, screened augers) have zones of influence in excess of a few feet. Therefore, the spatial frequency of sampling points should be carefully selected and designed.

2) Flexibility of Sampling Point Design

In most cases *well-point* diameters in excess of 1 7/8 inches will permit the use of most types of submersible pumping devices for low-flow (minimal drawdown) sampling. It is suggested that *short* (e.g., less than 1.6 m) screens be incorporated into the monitoring design where possible so that comparable results from one device to another might be expected. *Short*, of course, is relative to the degree of vertical water quality variability expected at a site.

3) Equilibration of Sampling Point

Time should be allowed for equilibration of the well or sampling point with the formation after installation. Placement of well or sampling points in the subsurface produces some disturbance of ambient conditions. Drilling techniques (e.g., auger, rotary, etc.) are generally considered to cause more disturbance than *direct-push* technologies. In either case, there may be a period (i.e., days to months) during which water quality near the point may be distinctly different from that in the formation. Proper development of the sampling point and adjacent formation to remove fines created during emplacement will shorten this water quality *recovery* period.

III. Definition of Low-Flow Purging and Sampling

It is generally accepted that water in the well casing is non-representative of the formation water and needs to be purged prior to collection of ground-water samples. However, the water in the screened interval may indeed be representative of the formation, depending upon well construction and site hydrogeology. Wells are purged to some extent for the following reasons: the presence of the air interface at the top of the water column resulting in an oxygen concentration gradient with depth, loss of volatiles up the water column, leaching from or sorption to the casing or filter pack, chemical changes due to clay seals or backfill, and surface infiltration.

Low-flow purging, whether using portable or dedicated systems, should be done using pump-intake located in the middle or slightly above the middle of the screened interval. Placement of the pump too close to the bottom of the well will cause increased entrainment of solids which have collected in the well over time. These particles are present as a result of well development, prior purging and sampling events, and natural colloidal transport and deposition. Therefore, placement of the pump in the middle or toward the top of the screened interval is suggested. Placement of the pump at the top of the water column for sampling is only recommended in unconfined aquifers, screened across the water table, where this is the desired sampling point. Low-flow purging has the advantage of minimizing mixing between the overlying stagnant casing water and water within the screened interval.

A. Low-Flow Purging and Sampling

Low-flow refers to the velocity with which water enters the pump intake and that is imparted to the formation pore water in the immediate vicinity of the well screen. It does not necessarily refer to the flow rate of water discharged at the surface which can be affected by flow regulators or restrictions. Water level drawdown provides the best indication of the stress imparted by a given flow-rate for a given hydrological situation. The objective is to pump in a manner that minimizes stress (drawdown) to the system to the extent practical taking into account established site sampling objectives. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology. Some extremely coarse-textured formations have been successfully sampled in this manner at flow rates to 1 L/min. The effectiveness of using low-flow purging is intimately linked with proper screen location, screen length, and well construction and development techniques. The reestablishment of natural flow paths in both the vertical and horizontal directions is important for correct interpretation of the data. For high resolution sampling needs, screens less than 1 m should be used. Most of the need for purging has been found to be due to passing the sampling device through the overlying casing water which causes mixing of these stagnant waters and the dynamic waters within the screened interval. Additionally, there is disturbance to suspended sediment collected in the bottom of the casing and the displacement of water out into the formation immediately adjacent to the well screen. These disturbances and impacts can be avoided using dedicated sampling equipment, which precludes the need to insert the sampling device prior to purging and sampling.

Isolation of the screened interval water from the overlying stagnant casing water may be accomplished using low-flow minimal drawdown techniques. If the pump intake is located within the screened interval, most of the water pumped will be drawn in directly from the formation with little mixing of casing water or disturbance to the sampling zone. However, if the wells are not constructed and developed properly, zones other than those intended may be sampled. At some sites where geologic heterogeneities are sufficiently different within the screened interval, higher conductivity zones may be preferentially sampled. This is another reason to use shorter screened intervals, especially where high spatial resolution is a sampling objective.

B. Water Quality Indicator Parameters

It is recommended that water quality indicator parameters be used to determine purging needs prior to sample collection in each well. Stabilization of parameters such as pH, specific conductance, dissolved oxygen, oxidation-reduction potential, temperature and turbidity should be used to determine when formation water is accessed during purging. In general, the order of stabilization is pH, temperature, and specific conductance, followed by oxidation-reduction potential, dissolved oxygen and turbidity. Temperature and pH, while commonly used as purging indicators, are actually quite insensitive in distinguishing between formation water and stagnant casing water; nevertheless, these are important parameters for data interpretation purposes and should also be measured. Performance criteria for determination of stabilization should be based on water-level drawdown, pumping rate and equipment specifications for measuring indicator parameters. Instruments are available which utilize in-line flow cells to continuously measure the above parameters.

It is important to establish specific well stabilization criteria and then consistently follow the same methods thereafter, particularly with respect to drawdown, flow rate and sampling device. Generally, the time or purge volume required for parameter stabilization is independent of well depth or well volumes. Dependent variables are well diameter, sampling device, hydrogeochemistry, pump flow rate, and whether the devices are used in a portable or dedicated manner. If the sampling device is already in place (i.e., dedicated sampling systems), then the time and purge volume needed for stabilization is much shorter. Other advantages of dedicated equipment include less purge water for waste disposal, much less decontamination of equipment, less time spent in preparation of sampling as well as time in the field, and more consistency in the sampling approach which probably will translate into less variability in sampling results. The use of dedicated equipment is strongly recommended at wells which will undergo routine sampling over time.

If parameter stabilization criteria are too stringent, then minor oscillations in indicator parameters may cause purging operations to become unnecessarily protracted. It should also be noted that turbidity is a very conservative parameter in terms of stabilization. Turbidity is always the last parameter to stabilize. Excessive purge times are invariably related to the establishment of too stringent turbidity stabilization criteria. It should be noted that natural turbidity levels in ground water may exceed 10 nephelometric turbidity units (NTU).

C. Advantages and Disadvantages of Low-Flow (Minimum Drawdown) Purging

In general, the advantages of low-flow purging include:

- samples which are representative of the *mobile* load of contaminants present (dissolved and colloid-associated);
- minimal disturbance of the sampling point thereby minimizing sampling artifacts;
- less operator variability, greater operator control;

- reduced stress on the formation (minimal drawdown);
- less mixing of stagnant casing water with formation water;
- reduced need for filtration and, therefore, less time required for sampling;
- smaller purging volume which decreases waste disposal costs and sampling time;
- better sample consistency; reduced artificial sample variability.

Some disadvantages of low-flow purging are:

- higher initial capital costs,
- greater set-up time in the field,
- need to transport additional equipment to and from the site,
- increased training needs,
- resistance to change on the part of sampling practitioners,
- concern that new data will indicate a *change in conditions* and trigger an *action*.

IV. Low-Flow (Minimal Drawdown) Sampling Protocols

The following ground-water sampling procedure has evolved over many years of experience in ground-water sampling for organic and inorganic compound determinations and as such summarizes the authors' (and others) experiences to date (Barcelona et al., 1984, 1994; Barcelona and Helfrich, 1986; Puls and Barcelona, 1989; Puls et. al. 1990, 1992; Puls and Powell, 1992; Puls and Paul, 1995). High-quality chemical data collection is essential in ground-water monitoring and site characterization. The primary limitations to the collection of *representative* ground-water samples include: mixing of the stagnant casing and *fresh* screen waters during insertion of the sampling device or ground-water level measurement device; disturbance and resuspension of settled solids at the bottom of the well when using high pumping rates or raising and lowering a pump or bailer; introduction of atmospheric gases or degassing from the water during sample handling and transfer, or inappropriate use of vacuum sampling device, etc.

A. Sampling Recommendations

Water samples should not be taken immediately following well development. Sufficient time should be allowed for the ground-water flow regime in the vicinity of the monitoring well to stabilize and to approach chemical equilibrium with the well construction materials. This lag time will depend on site conditions and methods of installation but often exceeds one week.

Well purging is nearly always necessary to obtain samples of water flowing through the geologic formations in the screened interval. Rather than using a general but arbitrary guideline of purging three casing volumes prior to sampling, it is recommended that an in-line water quality measurement device (e.g., flow-through cell) be used to establish the stabilization time for several parameters (e.g. , pH, specific conductance, redox, dissolved oxygen, turbidity) on a well-specific basis. Data on pumping rate, drawdown, and volume required for parameter stabilization can be used as a guide for conducting subsequent sampling activities.

The following are recommendations to be considered before, during and after sampling:

- use low-flow rates (<0.5 L/min), during both purging and sampling to maintain minimal drawdown in the well;
- maximize tubing wall thickness, minimize tubing length;
- place the sampling device intake at the desired sampling point;
- minimize disturbances of the stagnant water column above the screened interval during water level measurement and sampling device insertion;
- make proper adjustments to stabilize the flow rate as soon as possible;
- monitor water quality indicators during purging;
- collect unfiltered samples to estimate contaminant loading and transport potential in the subsurface system.

B. Equipment Calibration

Prior to sampling, all sampling device and monitoring equipment should be calibrated according to manufacturer's recommendations and the site Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP). Calibration of pH should be performed with at least two buffers which bracket the expected range. Dissolved oxygen calibration must be corrected for local barometric pressure readings and elevation.

C. Water Level Measurement and Monitoring

It is recommended that a device be used which will least disturb the water surface in the casing. Well depth should be obtained from the well logs. Measuring to the bottom of the well casing will only cause resuspension of settled solids from the formation and require longer purging times for turbidity equilibration. Measure well depth after sampling is completed. The water level measurement should be taken from a permanent reference point which is surveyed relative to ground elevation.

D. Pump Type

The use of low-flow (e.g., 0.1-0.5 L/min) pumps is suggested for purging and sampling all types of analytes. All pumps have some limitation and these should be investigated with respect to application at a particular site. Bailers are inappropriate devices for low-flow sampling.

1) General Considerations

There are no unusual requirements for ground-water sampling devices when using low-flow, minimal drawdown techniques. The major concern is that the device give consistent results and minimal disturbance of the sample across a range of *low* flow rates (i.e., < 0.5 L/min). Clearly, pumping rates that cause minimal to no drawdown in one well could easily cause *significant* drawdown in another well finished in a less transmissive formation. In this sense, the pump should not cause undue pressure or temperature changes or physical disturbance on the water sample over a reasonable sampling range. Consistency in operation is critical to meet accuracy and precision goals.

2) Advantages and Disadvantages of Sampling Devices

A variety of sampling devices are available for low-flow (minimal drawdown) purging and sampling and include peristaltic pumps, bladder pumps, electrical submersible pumps, and gas-driven pumps. Devices which lend themselves to both dedication and consistent operation at definable low-flow rates are preferred. It is desirable that the pump be easily adjustable and operate reliably at these lower flow rates. The peristaltic pump is limited to shallow applications and can cause degassing resulting in alteration of pH, alkalinity, and some volatiles loss. Gas-driven pumps should be of a type that does not allow the gas to be in direct contact with the sampled fluid.

Clearly, bailers and other *grab* type samplers are ill-suited for low-flow sampling since they will cause repeated disturbance and mixing of *stagnant* water in the casing and the *dynamic* water in the screened interval. Similarly, the use of inertial lift foot-valve type samplers may cause too much disturbance at the point of sampling. Use of these devices also tends to introduce uncontrolled and unacceptable operator variability.

Summaries of advantages and disadvantages of various sampling devices are listed in Herzog et al. (1991), U. S. EPA (1992), Parker (1994) and Thurnblad (1994).

E. Pump Installation

Dedicated sampling devices (left in the well) capable of pumping and sampling are preferred over <u>any</u> other type of device. Any portable sampling device should be slowly and carefully lowered to the middle of the screened interval or slightly above the middle (e.g., 1-1.5 m below the top of a 3 m screen). This is to minimize excessive mixing of the stagnant water in the casing above the screen with the screened interval zone water, and to minimize resuspension of solids which will have collected at the bottom of the well. These two disturbance effects have been shown to directly affect the time required for purging. There also appears to be a direct correlation between size of portable sampling devices relative to the well bore and resulting purge volumes and times. The key is to minimize disturbance of water and solids in the well casing.

F. Filtration

Decisions to filter samples should be dictated by sampling objectives rather than as a *fix* for poor sampling practices, and field-filtering of certain constituents should not be the default. Consideration should be given as to what the application of field-filtration is trying to accomplish. For assessment of truly dissolved (as opposed to operationally *dissolved* [i.e., samples filtered with 0.45 µm filters]) concentrations of major ions and trace metals, 0.1 µm filters are recommended although 0.45 µm filters are normally used for most regulatory programs. Alkalinity samples must also be filtered if significant particulate calcium carbonate is suspected, since this material is likely to impact alkalinity titration results (although filtration itself may alter the CO_2 composition of the sample and, therefore, affect the results).

Although filtration may be appropriate, filtration of a sample may cause a number of unintended changes to occur (e.g. oxidation, aeration) possibly leading to filtration-induced artifacts during sample analysis and uncertainty in the results. Some of these unintended changes may be unavoidable but the factors leading to them must be recognized. Deleterious effects can be minimized by consistent application of certain filtration guidelines. Guidelines should address selection of filter type, media, pore size, etc. in order to identify and minimize potential sources of uncertainty when filtering samples.

In-line filtration is recommended because it provides better consistency through less sample handling, and minimizes sample exposure to the atmosphere. In-line filters are available in both disposable (barrel filters) and non-disposable (in-line filter holder, flat membrane filters) formats and various filter pore sizes (0.1-5.0 µm). Disposable filter cartridges have the advantage of greater sediment handling capacity when compared to traditional membrane filters. Filters must be pre-rinsed following manufacturer's recommendations. If there are no recommendations for rinsing, pass through a minimum of 1 L of ground water following purging and prior to sampling. Once filtration has begun, a filter cake may develop as particles larger than the pore size accumulate on the filter membrane. The result is that the effective pore diameter of the membrane is reduced and particles smaller than the stated pore size are excluded from the filtrate. Possible corrective measures include prefiltering (with larger pore size filters), minimizing particle loads to begin with, and reducing sample volume.

G. Monitoring of Water Level and Water Quality Indicator Parameters

Check water level periodically to monitor drawdown in the well as a guide to flow rate adjustment. The goal is minimal drawdown (<0.1 m) during purging. This goal may be difficult to achieve under some circumstances due to geologic heterogeneities within the screened interval, and may require adjustment based on site-specific conditions and personal experience. In-line water quality indicator parameters should be continuously monitored during purging. The water quality indicator parameters monitored can include pH, redox potential, conductivity, dissolved oxygen (DO) and turbidity. The last three parameters are often most sensitive. Pumping rate, drawdown, and the time or volume required to obtain stabilization of parameter readings can be used as a future guide to purge the well. Measurements should be taken every three to five minutes if the above suggested rates are used. Stabilization is achieved after all parameters have stabilized for three successive readings. In lieu of measuring all five parameters, a minimum subset would include pH, conductivity, and turbidity or DO. Three successive readings should be within ± 0.1 for pH, ± 3% for conductivity, ± 10 mv for redox potential, and ± 10% for turbidity and DO. Stabilized purge indicator parameter trends are generally obvious and follow either an exponential or asymptotic change to stable values during purging. Dissolved oxygen and turbidity usually require the longest time for stabilization. The above stabilization guidelines are provided for rough estimates based on experience.

H. Sampling, Sample Containers, Preservation and Decontamination

Upon parameter stabilization, sampling can be initiated. If an in-line device is used to monitor water quality parameters, it should be disconnected or bypassed during sample collection. Sampling flow rate may remain at established purge rate or may be adjusted slightly to minimize aeration, bubble formation, turbulent filling of sample bottles, or loss of volatiles due to extended residence time in tubing. Typically, flow rates less than 0.5 L/min are appropriate. The same device should be used for sampling as was used for purging. Sampling should occur in a progression from least to most contaminated well, if this is known. Generally, volatile (e.g., solvents and fuel constituents) and gas sensitive (e.g., Fe^{2+}, CH_4, H_2S/HS^-, alkalinity) parameters should be sampled first. The sequence in which samples for most inorganic parameters are collected is immaterial unless filtered (dissolved) samples are desired. Filtering should be done last and in-line filters should be used as discussed above. During both well purging and sampling, proper protective clothing and equipment must be used based upon the type and level of contaminants present.

The appropriate sample container will be prepared in advance of actual sample collection for the analytes of interest and include sample preservative where necessary. Water samples should be collected directly into this container from the pump tubing.

Immediately after a sample bottle has been filled, it must be preserved as specified in the site (QAPP). Sample preservation requirements are based on the analyses being performed (use site QAPP, FSP, RCRA guidance document [U. S. EPA, 1992] or EPA SW-846 [U. S. EPA, 1982]). It may be advisable to add preservatives to sample bottles in a controlled setting prior to entering the field in order to reduce the chances of improperly preserving sample bottles or introducing field contaminants into a sample bottle while adding the preservatives.

The preservatives should be transferred from the chemical bottle to the sample container using a disposable polyethylene pipet and the disposable pipet should be used only once and then discarded.

After a sample container has been filled with ground water, a Teflon™ (or tin)-lined cap is screwed on tightly to prevent the container from leaking. A sample label is filled out as specified in the FSP. The samples should be stored inverted at 4°C.

Specific decontamination protocols for sampling devices are dependent to some extent on the type of device used and the type of contaminants encountered. Refer to the site QAPP and FSP for specific requirements.

I. Blanks

The following blanks should be collected:

(1) field blank: one field blank should be collected from each source water (distilled/deionized water) used for sampling equipment decontamination or for assisting well development procedures.

(2) equipment blank: one equipment blank should be taken prior to the commencement of field work, from each set of sampling equipment to be used for that day. Refer to site QAPP or FSP for specific requirements.

(3) trip blank: a trip blank is required to accompany each volatile sample shipment. These blanks are prepared in the laboratory by filling a 40-mL volatile organic analysis (VOA) bottle with distilled/deionized water.

V. Low-Permeability Formations and Fractured Rock

The overall sampling program goals or sampling objectives will drive how the sampling points are located, installed, and choice of sampling device. Likewise, site-specific hydrogeologic factors will affect these decisions. Sites with very low permeability formations or fractures causing discrete flow channels may require a unique monitoring approach. Unlike water supply wells, wells installed for ground-water quality assessment and restoration programs are often installed in low water-yielding settings (e.g., clays, silts). Alternative types of sampling points and sampling methods are often needed in these types of environments, because low-permeability settings may require extremely low-flow purging (<0.1 L/min) and may be technology-limited. Where devices are not readily available to pump at such low flow rates, the primary consideration is to avoid dewatering of the well screen. This may require repeated recovery of the water during purging while leaving the pump in place within the well screen.

Use of low-flow techniques may be impractical in these settings, depending upon the water recharge rates. The sampler and the end-user of data collected from such wells need to understand the limitations of the data collected; i.e., a strong potential for underestimation of actual contaminant concentrations for volatile organics, potential false negatives for filtered metals and potential false positives for unfiltered metals. It is suggested that comparisons be made between samples recovered using low-flow purging techniques and samples recovered using passive sampling techniques (i.e., two sets of samples). Passive sample collection would essentially entail acquisition of the sample with no or very little purging using a dedicated sampling system installed within the screened interval or a passive sample collection device.

A. Low-Permeability Formations (<0.1 L/min recharge)

1. Low-Flow Purging and Sampling with Pumps

a. "portable or non-dedicated mode" - Lower the pump (one capable of pumping at <0.1 L/min) to mid-screen or slightly above and set in place for minimum of 48 hours (to lessen purge volume requirements). After 48 hours, use procedures listed in Part IV above regarding monitoring water quality parameters for stabilization, etc., but do not dewater the screen. If excessive drawdown and slow recovery is a problem, then alternate approaches such as those listed below may be better.

b. "dedicated mode" - Set the pump as above at least a week prior to sampling; that is, operate in a dedicated pump mode. With this approach significant reductions in purge volume should be realized. Water quality parameters should stabilize quite rapidly due to less disturbance of the sampling zone.

2. Passive Sample Collection

Passive sampling collection requires insertion of the device into the screened interval for a sufficient time period to allow flow and sample equilibration before extraction for analysis. Conceptually, the extraction of water from low yielding formations seems more akin to the collection of water from the unsaturated zone and passive sampling techniques may be more appropriate in terms of obtaining "representative" samples. Satisfying usual sample volume requirements is typically a problem with this approach and some latitude will be needed on the part of regulatory entities to achieve sampling objectives.

B. Fractured Rock

In fractured rock formations, a low-flow to zero purging approach using pumps in conjunction with packers to isolate the sampling zone in the borehole is suggested. Passive multi-layer sampling devices may also provide the most "representative" samples. It is imperative in these settings to identify flow paths or water-producing fractures prior to sampling using tools such as borehole flowmeters and/or other geophysical tools.

After identification of water-bearing fractures, install packer(s) and pump assembly for sample collection using low-flow sampling in "dedicated mode" or use a passive sampling device which can isolate the identified water-bearing fractures.

VI. Documentation

The usual practices for documenting the sampling event should be used for low-flow purging and sampling techniques. This should include, at a minimum: information on the conduct of purging operations (flow-rate, drawdown, water-quality parameter values, volumes extracted and times for measurements), field instrument calibration data, water sampling forms and chain of custody forms. See Figures 2 and 3 and "Ground Water Sampling Workshop -- A Workshop Summary" (U. S. EPA, 1995) for example forms and other documentation suggestions and information. This information coupled with laboratory analytical data and validation data are needed to judge the "useability" of the sampling data.

VII. Notice

The U.S. Environmental Protection Agency through its Office of Research and Development funded and managed the research described herein as part of its in-house research program and under Contract No. 68-C4-0031 to Dynamac Corporation. It has been subjected to the Agency's peer and administrative review and has been approved for publication as an EPA document. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

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Figure 2. **Ground Water Sampling Log**

Project ________________ **Site** ________________ **Well No.** ______________ **Date** ___________________________

Well Depth _____________ **Screen Length** ___________ **Well Diameter** __________ **Casing Type** _____________

Sampling Device ________________ **Tubing type** _______________________ **Water Level** ___________________

Measuring Point _____________________ **Other Infor** ____

____

Sampling Personnel ____

Time	pH	Temp	Cond.	Dis.O_2	Turb.	[ ]Conc			Notes

Type of Samples Collected

____

Information: 2 in = 617 ml/ft, 4 in = 2470 ml/ft: $Vol_{cyl} = \pi r^2 h$, $Vol_{sphere} = 4/3\pi\, r^3$

Figure 3. **Ground Water Sampling Log** (with automatic data logging for most water quality parameters)

Project ______________ **Site** ______________ **Well No.** ____________ **Date** ______________________

Well Depth ___________ **Screen Length** _________ **Well Diameter** ________ **Casing Type** __________

Sampling Device ______________ **Tubing type** ___________________ **Water Level** ________________

Measuring Point _________________ **Other Infor** ____

____

Sampling Personnel ____

Time	Pump Rate	Turbidity	Alkalinity	[ ] Conc	Notes

Type of Samples Collected

____

Information: 2 in = 617 ml/ft, 4 in = 2470 ml/ft: $Vol_{cyl} = \pi r^2 h$, $Vol_{sphere} = 4/3\pi\ r^3$

ATTACHMENT C2

CALCULATION PROCEDURE-CONTAMINANT LOADING CALCULATION

(TO BE REVISED)

CALCULATION PROCEDURE
CONTAMINANT LOADING CALCULATION

1.0 GENERAL

This procedure presents a method to calculate contaminant loading from the former Steel Manufacturing Site to the Buffalo River, if necessary. This calculation would only be required along the affected segment if an increasing trend in contaminant concentration occurs along the Buffalo River during long-term groundwater monitoring of the site.

2.0 SITE-SPECIFIC CONTAMINANT LOADINGS TO BUFFALO RIVER

Data collected during the long term groundwater monitoring will be used to estimate the groundwater contaminant loading offsite (toward South Park or to the Buffalo River). The calculation of groundwater contaminant mass loading from the Site will be based upon the following assumptions:

- The shoreline of the Buffalo River and the segment along South Park Avenue to the north-northeast will be approximated as four straight lines. Each line will be further segmented as shown on Figure C2-1 and described below:

  Line 1: Segment 1-1 from monitoring well A1-MW-7 to A1-P-4 (approximately 940 feet long). Segment 1-2 from monitoring well A1-P-4 to A1-MW-3 (approximately 1000 feet long).

  Line 2: Segment 2-1 from monitoring well A1-MW-3 to monitoring well A1-MW-6 (approximately 682 feet long). Segment 2-2 from monitoring well A1-MW-6 to monitoring well A1-MW-2 (approximately 700 feet long).

  Line 3: Segment 3-1 from monitoring well A1-MW-2 to monitoring well A1-MW-1 (approximately 1030 feet). Segment 3-2 from monitoring well A1-MW-1 to approximately 230 feet south.

  Line 4: Segment 4-1 from 230 feet south of monitoring well A1-MW-1 to A1-MW-9 (approximately 245 feet). Segment 4-2 from A1-MW-9 to monitoring well A1-MW-M2 (approximately 360 feet). Segment 4-3 from monitoring well A1-MW-M2 approximately 506 feet northwest.

- Only groundwater in the uppermost-saturated zone (viz. fill material) is contributing contaminants to the Buffalo River. Table C2-1 provides saturated fill thickness of existing monitoring wells measured on September 23, 2004.

- The hydraulic conductivity, hydraulic gradient, and groundwater constituent concentration for each segment will be calculated by taking the arithmetic average of the specific variable for each of the wells that define the segment (the values that currently exist are presented in Tables C2-2 and C2-3).

- The west end point of Segment 4-3 will be assumed to have the same chemical properties as monitoring well A1-MW-M2.

- Segment 4-3 hydraulic conductivity will be the average hydraulic conductivity of A1-MW-M2, A1-MW-9, and A1-P-2.

- The hydraulic and chemical properties of south end of Segment 3-2 and the east end of Segment 4-1 will be estimated by interpolating data between A1-MW-1 and A1-MW-9.

- For compounds where the practical quantitation limit exceeds the groundwater quality standard and was detected in Area I groundwater, a value of one-half the method detection limit will be factored into the loading calculations for that compound.

- Any segments with the water table surface existing in the alluvium will be represented with a zero because there would be no flow contribution from saturated fill offsite (Table C-3).

Using the data described above, the groundwater flow rate from the northern boundary of Area I to the Buffalo River will be estimated for each segment using Darcy's Law:

2.1.1.1 **Q=kiA**

where:

Q = Groundwater flow rate

k = average hydraulic conductivity of the segment

i = average hydraulic gradient of the segment

A = saturated cross-sectional area

The estimated groundwater flows from each segment will then be combined to give the total estimated groundwater flow rate from the Site to the River (of 82,446) in cubic feet per day. Groundwater flow rate calculations will be summarized in tabular form (Table 4-7).

Using the groundwater flow rate and the estimated groundwater concentrations for each segment, the off-site contaminant loading will be calculated using the following equation:

$$(\text{Mass Loading})_{i,j} = (6.243 \times 10^{-8})\ Q_i\ C_{i,j}$$

where:

$(\text{Mass Loading})_{i,j}$ = mass loading of constituent j in segment i (lb/day)

Q_i = groundwater flow rate through segment i (ft^3/day)

$C_{i,j}$ = concentration of constituent j in segment i (ug/l)

6.243×10^{-8} = conversion factor to lb/day

Calculations of groundwater contaminant mass loadings for each segment will be summarized in tabular form (Table 4-8) and total off-site contaminant mass loadings from the Site to the Buffalo River summarized in tabular form (Table 4-9). Total off-site VOC and SVOC loadings to the Buffalo River will be estimated in lb/day and shown in tabular (4-9) form.

2.2 3.0 Assessment of Groundwater Impacts on Buffalo River Quality

Using the groundwater contaminant loadings procedure presented above, the estimated increase in downstream constituent concentrations in the Buffalo River at average summer flow rates of 49 million gallons per day (Source: Buffalo River Remedial Action Plan, NYSDEC, November 1989), will be calculated and then compared with New York State Class "D" Water Quality Standards or Guidance Values.

TABLE 2-1

SATURATED FILL THICKNESS FOR MONITORING WELLS

RD/RA Work Plan Appendix C - Long Term Groundwater Monitoring Plan
Steelfields, LTD.
Buffalo, New York

Well Designation	Measurement Date	Ground Elevation (fmsl)	Groundwater Elevation (09/23/04) (fmsl)	Depth to Native Soil (fbgs)	Bottom of Fill Elevation (fmsl)	Saturated Soil/Fill Thickness (feet)
A1-MW-1	09/23/04	583.94	574.94	5.5	578.4	*note 1*
A1-MW-2	09/23/04	584.30	577.78	12.7	571.6	6.2
A1-MW-3	09/23/04	589.68	573.48	17.0	572.7	0.8
A1-MW-6	09/23/04	589.74	573.20	10.0	579.7	*note 1*
A1-MW-7	09/23/04	584.32	574.39	2.0	582.3	*note 1*
A1-MW-9 [2]	09/23/04	585.73	574.75	11.5	574.2	0.5
A1-P-4	09/23/04	586.97	576.21	4.0	583.0	*note 1*
A1-MW-M2	09/23/04	586.08	580.66	6.5	579.6	1.1

Notes:
1. Well screened within native soil. No saturated fill at this location.
2. Monitoring well A1-MW-9 was installed adjacent to and within 6-feet of decommissioned piezometer A1-P-1 on May 10, 2004.

Table 2-2

Calculated Average Groundwater Constituent Concentrations By Segment

Site Assessment Report (Area I)
LTV Steel Company

Constituent	Segment 1-1	Segment 1-2	Segment 1-3	Segment 1-4	Segment 2-1	Segment 2-2	Segment 2-3	Segment 3-1	Segment 3-2	Segment 3-3
Volatile Organic Compounds (ug/L):										
Acetone	27	0	0	0	0	0	0	0	11.5	23
Benzene [1]	0.435	0.435	0.435	0.435	0.435	0.435	0.435	0.435	0.435	0.435
Ethylbenzene	0	0	0.0	0.2	1.2	1	0	0	0	0
Toluene	0	0	3.5	6.3	2.8	0	0	0	0	0
Xylene (total) [2]	1.75	1.75	7.9	12.7	6.2	1.375	1.75	1.75	1.75	1.75
Semivolatile Organic Compounds (ug/L):										
Acenaphthene	0	0	2	5.1	10.6	7.5	0.21	0.61	0.4	0
Anthracene	0	0	0	0	0	0	0.26	0.76	0.5	0
Fluorene	0	0	3	7.8	16.8	12	0	0	0	0
2-Methylnaphthalene	0	0	10.5	30.8	80.3	60	0	0	0	0
Naphthalene	0	0	4.5	14.6	43.1	33.5	0.74	0.24	0	0
Phenanthrene	0	0	4	11.2	27.2	20	0.26	0.76	0.5	0
Phenol [3]	0.465	0.465	1.233	1.848	1.081	0.465	0.465	0.465	0.465	0.465

Notes:

1. Benzene was not detected in the site perimeter groundwater samples. Since the practical quantitation limit was above the groundwater quality standard, a concentration of 1/2 the method detection limit (0.87 ug/L) was used.
2. Xylene was not detected in the site perimeter groundwater samples that define Segments 1-1, 1-2, 2-3, 3-1, 3-2, and 3-3. Since the practical quantitation limit was above the groundwater quality standard, a concentration of 1/2 the method detection limit (3.5 ug/L) was used.
3. Phenol was not detected in the site perimeter groundwater samples that define Segments 1-1, 1-2, 2-2, 2-3, 3-1, 3-2, and 3-3. Since the practical quantitation limit was above the groundwater quality standard, a concentration of 1/2 the method detection limit (0.93 ug/L) was used.

TurnKey Environmental Restoration, LLC

TABLE 2-3

CALCULATION OF GROUNDWATER FLOW CONTRIBUTION TO BUFFALO RIVER FROM AREA I

SITE MANAGEMENT PLAN - PART I -APPENDIX IV
Steelfields, LTD.
Buffalo, New York

Line No.	Segment	Location	I (ft/ft)	K (ft/day)	A (ft^2)	Groundwater Flow (ft^3/day)
1	1-1	A1-MW-7	0.0025		0	0.0
		A1-P-4	0.0037	0.68		
	1-2	A1-P-4	0.0037	0.68	292.228	9.2
		A1-MW-3	0.0066	11.6		
2	2-1	A1-MW-3	0.0066	11.6	412.336	15.7
		A1-MW-6	0.0066			
	2-2	A1-MW-6	0.0066		1485.8883	3899.6
		A1-MW-2	0.0181	425.2		
3	3-1	A1-MW-2	0.0181	425.2	1010.739	5831.2
		A1-MW-1	0.0232	133.2		
	3-2	A1-MW-1	0.0232	133.2	97.2675	506.0
		south end	0.0221	325.8		
4	4-1	south end	0.0221	325.8	122.7009	1628.7
		A1-MW-9	0.0355	595.3		
	4-2	A1-MW-9	0.0355	595.3	286.232	2526.4
		A1-MW-M2	0.0238	0.12		
	4-3	A1-MW-M2	0.0238	0.12	774.2628	1.7
		NW end	0.0119	0.12		

Notes:
1. Interpolated groundwater elevations were taken from the September 2004 isopotential map, upgradient of the well location.

= slug testing to be performed

PART II

SOIL / FILL MANAGEMENT PLAN

SOIL/FILL MANAGEMENT PLAN
for
FORMER STEEL MANUFACTURING SITE

FORMER STEEL MANUFACTURING SITE
BUFFALO, NY

March 2000
Revised September 2006
Revised April 2007

0062-001-100

Prepared for:

Steelfields, LTD.
Buffalo, NY

SOIL/FILL MANAGEMENT PLAN FOR FORMER STEEL MANUFACTURING SITE

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SOIL/FILL MANAGEMENT PLAN FOR FORMER STEEL MANUFACTURING SITE

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1.0 INTRODUCTION

1.1 Background

LTV Steel Company owns, or co-owns with The Hanna Furnace Corporation, a vacant industrial property located along the Buffalo River in Buffalo, New York (See Figure 1-1 and Figure 1-2). The property, hereinafter referred to as the Former Steel Manufacturing Site or Site, is subdivided into four parcels (refer to Figure 1-3) totaling 219 acres, more or less, based on the operational and ownership history of each. The parcels are designated:

- Area I –Republic Steel Plant Parcel
- Area II –Donner-Hanna Coke Plant Parcel
- Area III –Republic Warehouse Parcel
- Area IV –Donner-Hanna Coke Yard Parcel

Two Voluntary Cleanup Site Assessment Reports (April, 1999) were prepared; one characterizing environmental conditions in Area I and the other characterizing the environmental conditions in Area II, III and IV. Two addendum reports to the Area I report (October 1999 and January 2000) and one to the Area II, III, and IV report (January 2000) were prepared to present supplemental site investigation data.

A voluntary cleanup of the Site will be performed in accordance with a Remedial Design/Remedial Action (RD/RA) Work Plan approved by the New York State Department of Environmental Conservation (NYSDEC). The voluntary cleanup program will render the Site suitable for planned redevelopment and use for commercial and industrial purposes.

1.2 Purpose and Scope

The purpose of this Soil/Fill Management Plan (S/FMP) is to protect both the

environment and human health during redevelopment of the Site, subsequent to completion of Voluntary Cleanup activities.

While an assessment of surface and subsurface soil/fill and groundwater at the Site has already been performed and additional off-site field investigations are planned in accordance with the RD/RA Work Plan, subsurface information is never 100 percent complete or accurate, especially on such a large site with a long and diverse manufacturing history. As such, it is not unreasonable to anticipate the possibility that some quantity of subsurface soil/fill contamination may be encountered after completion of the Voluntary Cleanup. In particular, soil/fill contamination may be encountered during development activities such as infrastructure construction (i.e. roads, waterline, sewers, electric cable etc.) or foundation excavation and site grading.

Compliance with this S/FMP is required to properly manage subsurface soil contamination. This S/FMP was developed and incorporated into the Voluntary Cleanup Agreement for the Site with the express purpose of addressing unknown subsurface contamination if and when encountered, thus maintaining the release and covenant not to sue by the NYSDEC. The S/FMP also facilitates the transfer of responsibilities with property ownership.

This S/FMP provides protocols for the proper handling of site soil/fill during development activities, including:

- excavation, grading, sampling and handling of site soils.
- acceptability of soils/fill from off-site sources for backfill or subgrade fill.
- erosion and dust control measures.
- fencing and other access controls.
- health and safety procedures for subsurface construction work and the protection of the surrounding community.
- acceptability and placement of final soil and vegetative cover.
- deed restrictions.

- rezoning of the property.
- program responsibilities.
- notification and reporting requirements.

1.3 Soil/Fill Management Program Responsibility

The developer, Steelfields, LLC and the property owner(s) will be responsible for all monitoring, implementation and reporting requirements of the S/FMP. The developer and owner will not perform, nor contract, nor permit their employees, agents, or assigns to perform any excavations or disturbance of site soils, except as delineated in this S/FMP. Any excavation, regrading or disturbance of on-site soils inconsistent with the provisions of the Plan may be grounds for NYSDEC to void its release from claims, actions, suits, proceeding by the Department against the site owner(s), successor(s) or assigns for environmental conditions on the Site. Such nonconformance with this S/FMP may also void or limit environmental insurance protection of the owner(s) and their successors and assigns in accordance with policy terms and conditions. The property owner(s) or their agents will be responsible for proper notification and reporting to regulatory agencies (i.e., NYSDEC Region 9, Division of Environmental Remediation and NYS Department of Health) prior to and following site development as described in Section 2.8.

The NYSDEC will provide periodic construction oversight and monitoring during site redevelopment activities to verify that the requirements of this S/FMP are adhered to.

2.0 SOIL/FILL MANAGEMENT

2.1 Excavation and Handling of On-Site Soil/Fill

TurnKey Environmental Restoration, LLC or a Professional Engineer with experience in environmental site investigations and the New York State Voluntary Cleanup Program will inspect soil/fill excavations or disturbances on behalf of the subject property owner. The soil/fill will be inspected for staining or discoloration, and will be field screened for the presence of volatile organic compounds (VOCs) with a photoionization detector (PID). The PID detector will be calibrated as per the manufacturer's requirements. Excavated soil/fill that is visibly petroleum or tar-stained, discolored or produces elevated PID readings (i.e. sustained readings of 5 ppm above background or greater) will be stockpiled in an area away from the primary work activities and then sampled for reuse, treatment or disposal. The length of time that potentially impacted soil can be temporarily stockpiled while awaiting analytical results shall be limited to 21 days. Sampling and analysis will be in accordance with the protocols delineated in Section 2.3. Analyzed soil/fill that is determined to contain one or more constituents in excess of the site-specific action levels (SSALs) and additional criteria shown in Table 2-1 shall be covered or treated on-site according to a NYSDEC-approved treatment plan or transported off-site to a permitted waste management facility for disposal. Soil/fill that exhibits no petroleum or tar staining, discoloration or elevated PID readings, or soil/fill, which has been analyzed and found to meet SSALs, may be reused on-site as subgrade backfill. No excavated soil/fill may be removed from the site except for off-site disposal at a permitted waste management facility.

2.2 Subgrade Material

Subgrade material used to backfill excavations or to increase site grades or elevations shall meet the following criteria:

- Excavated on-site soil/fill meeting the requirements of Section 2.1.

- On-site soil/fill treated in accordance with a NYSDEC-approved treatment plan and tested to meet the requirements of Table 2-1.

- Off-site soil/fill originating from known sources having no evidence of disposal or releases of hazardous substances, hazardous, toxic or radioactive wastes, or petroleum and tested to meet all SSALs.

- All off-site sources of material to be used as backfill must be tested in accordance with the Sampling and Analytical Protocol (Section 2.3), and found to contain concentrations less than criteria listed in Table 2-1 plus organic pesticides/herbicides and PCBs as defined in Appendix A of Technical and Administrative Guidance Memorandum (TAGM) Number 4046.

- No off-site materials meeting the definition of a solid waste as defined in 6 NYCRR, Part 360-1.2 (a) shall be used as backfill.

TABLE 2-1

PARAMETER	MAXIMUM CONCENTRATION IN SOIL/FILL (mg/kg) (1,2)
Individual VOC	1
Total VOCs (3)	10
Total SVOCs (4)	500
Total cPAHs (5)	10
Arsenic	75
Barium	1,000
Cadmium	15
Chromium	1,000
Lead	1,000
Mercury	10
Selenium	61
Silver	10
Cyanide (Total Amenable)	1,600

NOTES:

(1) Off-site backfill material shall also meet recommended soil cleanup objectives for organic pesticides/herbicides and PCBs as defined in TAGM 4046.
(2) All analyses shall be performed per USEPA SW-846 methodology or other methods acceptable to NYSDEC.
(3) NYSDEC STARS List VOCs per USEPA Method 8021
(4) Target Compound List (TCL) SVOCs per USEPA Method 8270

(5) Carcinogenic polynuclear aromatic hydrocarbons (i.e., benzo(a)anthracene, benzo(a)pyrene, dibenzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene per USEPA Method 8270.

2.3 Soil/Fill Sampling and Analysis Protocol

2.3.1 Excavated On-Site Soil/Fill

Excavated soil/fill that is visibly stained, discolored or produces elevated PID readings will be sampled and classified for reuse, treatment or off-site disposal. A tiered approach based upon the volume of soil/fill being excavated will be used to determine the frequency of sampling. A minimum of one composite sample will be collected for each 250 cubic yards up to1000 cubic yards of material excavated. If more than 1,000 cubic yards of soils are excavated from the same general vicinity and all samples of the first 1,000 cubic yards meet the SSALs in Table 2-1, the sample collection frequency may be reduced to one composite for each additional 1,000 cubic yards of soil from the same general vicinity, up to 5,000 cubic yards. For excavations that generate greater than 5,000 cubic yards, sampling frequency may be reduced to one sample per 5,000 cubic yards, providing all earlier samples met SSALs. A minimum of four grab samples will be collected for each composite sample. Approximately equal aliquots of the grab samples will be composited in the field using a stainless steel trowel and bowl. The trowel and bowl shall be decontaminated with detergent and tap water between sampling locations. The composite sample will be analyzed by a NYSDOH ELAP certified laboratory for the parameters listed on Table 2-1. VOCs may be excluded from the analysis provided that the soil/fill does not exhibit elevated PID readings.

Any excavated soil that produces elevated PID readings will be separately stockpiled in 1000 cubic yard or smaller piles. A single grab sample will be collected from the stockpile from the zone displaying the most elevated field PID reading. The grab sample will be analyzed by a NYSDOH ELAP certified laboratory for volatile organic compounds (EPA Method 8021). A composite sample shall also be prepared from each stockpile for analysis of the other parameters listed in Table 2-1.

If the analysis of the soil/fill samples reveals levels of parameters greater than one or more SSAL, then a duplicate sample will be analyzed by the Toxicity Characteristic Leaching Procedure (TCLP) method for the particular metal or compounds in question to determine the appropriate off-site disposal method. If TCLP hazardous waste characteristic values are exceeded, the soil/fill will be disposed of in a permitted hazardous waste disposal facility. If TCLP analytical results are below hazardous waste characteristic values, the soil/fill will be either disposed of off-site in a permitted sanitary landfill or possibly on-site within the Area II containment cell.

The containment cell may be used as an on-site disposal area only if:

- The groundwater collection, containment and treatment systems are fully functional,
- The final cover system construction has not been completed,
- There is sufficient space available based on the containment cell design, and
- Prior written approval is received from both the NYSDEC and owner/operator of the containment cell.

All soil/fill disposed of within the containment cell will be compacted in maximum twelve-inch lifts to specified density and uniformly graded to promote positive surface water runoff. Proper erosion and dust control methods as described in Section 2.5 will be implemented during soil placement activities.

2.4 Final Surface Coverage

Vegetative or other (e.g., asphalt, buildings, concrete) surface coverage over the entire redeveloped parcel will be required by the developer or owner as a pre-condition of occupancy.

Topsoil used for the final soil cover shall meet the following general specifications:

1. Fertile, friable, natural loam surface soil, capable of sustaining plant growth, free of, clods of hard earth, plants or roots, sticks or other extraneous material harmful to plant growth. Supply a well-graded topsoil with the following approximate analysis:

(a)

Sieve Size	Percent Passing by Weight
3-inch	100
No. 4	>75
No. 200	>30
0.002 mm	<20

(b) pH 5.5 to pH 7.6.

(c) Minimum organic content of 2.5 percent as determined by ignition loss.

(d) Soluble salt content not greater than 500 ppm.

2. Before delivery, collect soil samples for every 5,000 cubic yards of topsoil provided by Developer.

In addition to the above specifications, all topsoil must be tested and found to contain constituent concentrations less than those specified in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046.
TAGM 4046 establishes soil cleanup objectives for inorganics based on site background. The following background levels for heavy metals will be utilized for topsoil:

Parameter	Concentration (mg/kg)
Arsenic	25
Barium	1000
Cadmium	15
Chromium	350
Lead	400
Mercury	1.0
Selenium	5.0
Silver	5.0

(Note: The methodology used to develop background levels for the above described metals (except lead) is based on background concentrations throughout the Buffalo, N.Y. area as described in Appendix A of the April 1999 Site

Assessment Reports. The proposed limit for lead was derived from the February 1998 NYSDEC document entitled Guidelines for Petroleum Spill Inactivation.)

Grass seed used for the final soil cover shall meet the following general specifications:

1. Grass seed mixture: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.

2. The entire ground surface disturbed by construction operations shall be seeded with 100 lbs/acre of seed conforming to the following:

Name of Grass	Application Rate (lbs/acre)	Purity (%)	Germination (%)
Perennial Ryegrass	10	95	85
Kentucky Bluegrass	20	85	75
Strong Creeping Red Fescue	20	95	80
Chewings Fescue	20	95	80
Hard Fescue	20	95	80
White Clover	10	98	75

   (a) Germination and purity percentages should equal or exceed the minimum seed standards listed. If it is necessary to use seed with a germination percentage less than the minimum recommended above, increase the seeding rate accordingly to compensate for the lower germinations.

   (b) Weed seed content not over 0.25 percent and free of noxious weeds.

   (c) All seed shall be rejected if the label lists any of the following grasses:
      1) Sheep Fescue
      2) Meadow Fescue
      3) Canada Blue
      4) Alta Fescue
      5) Kentucky 31 Fescue
      6) Bent Grass

3. In addition to the seed mixtures listed above, one bushel per acre of oats or rye seed shall be sowed over the entire area, including drainage ditches, to provide a quick shade cover and to prevent erosion during turf establishment.

2.5 Erosion Controls

An important element of soil and fill management on this site is the mitigation and control of surface erosion from stormwater runoff. For this reason a Master Erosion Control Plan to be used by all developers has been developed and incorporated as Attachment A2.

2.6 Dust Controls

Particulate monitoring will be performed along the downwind occupied perimeter of subareas or parcels during subgrade excavation, grading and handling activities in accordance with the Community Monitoring Plan further detailed in Section 3.0 as well as in accordance with NYSDEC TAGM 4031 (Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites) presented in Appendix A4.

Dust suppression techniques will be employed as necessary to mitigate fugitive dust from unvegetated or disturbed soil/fill to the extent practicable during post-remediation construction and redevelopment. Such techniques shall be employed even if the community air monitoring results indicate particulate levels are below action levels. Techniques to be utilized may include one or more of the following:

- Applying water on haul roads.
- Wetting equipment and excavation faces.
- Spraying water on buckets during excavation and dumping.
- Hauling materials in properly tarped containers or vehicles.
- Restricting vehicle speeds on-site.
- Covering excavated areas and materials after excavation activity ceases.
- Reducing the excavation size and/or number of excavations.

All reasonable attempts will be made to keep visible and/or fugitive dust to a minimum.

2.7 Fencing and Access Control

A 6-foot tall chain link fence currently surrounds Area I. Additional interior fencing shall be erected and maintained as necessary by the property owner as

remediation/redevelopment proceeds to control access to subdivided or undeveloped parcels and separate them from parcels in active use. Fencing will be relocated by the property owner(s) as necessary as development proceeds. The Area II containment cell and groundwater pretreatment system will be isolated from the remainder of the Site by a 6-foot chain link fence. All fencing around undeveloped areas will be posted with "No Trespassing" signs.

2.8 Property Use Limitations

Requirements for surface coverage over the site and limitations placed on the type of buildings to be constructed will be enforced through the issuance of building permits by the City of Buffalo. Obtaining a building permit from the City will be contingent upon agreeing to implement and comply with this S/FMP. Site limitations will be enforced through the same deed restrictions described in the Voluntary Cleanup Agreement. Deed restrictions shall be applicable to successors and assigns of the property. Specifically, the deed restrictions will be recorded with the Erie County Clerk and:

1. shall prohibit any parcel or subparcel of the Site from being used for purposes other than for the industrial, commercial, and recreational use (and designed) to preclude contact with contamination by humans without the express written waiver of such prohibition by the NYSDEC (Department), or if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department;

2. shall prohibit the use of the groundwater underlying any parcel or subparcel of the Site for drinking water, industrial, or other purposes;

3. shall require owner(s) or the site and subparcels thereof and their successors and assigns to continue in full force and effect any institutional controls, operation and maintenance, and/or soils management required by the Voluntary Cleanup Agreement (VCA), the RD/RA Work Plan (including the Soil/Fill Management Plan), and/or the O&M Plan;

4. shall provide that Volunteers, on behalf of themselves and their successors and assigns, consent to the enforcement by the Department, or if at such time the Department shall no longer exist, any New York State department, bureau, or

other entity replacing the Department, of the prohibitions and restrictions that the VCA requires to be recorded, and thereby covenant not to contest such enforcement.

5. the prohibitions described in the VCA shall be for the duration provided in that document and shall be enforceable only by the Department, or, if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department, but shall not be enforceable by any other party,

6. if there is performed on the Site an additional response action acceptable to the Department, or, if at such time the Department shall no longer exist, any New York State department, bureau, or other entity replacing the Department, such as to allow it to be used for residential or other purposes, the Department or its successor shall execute a document in recordable form terminating that portion of the instrument relating to the matter identified in the VCA for the area in the Site which the Department has determined may be used for residential purposes; and

7. in the event of a conflict between the above-described Deed Restrictions and those contained in or attached to the VCA, those contained in or attached to the VCA shall apply.

The industrial/commercial use of the site will also be controlled by the City through zoning restrictions. The responsibility for the operation and maintenance of the collection/cover system and groundwater monitoring shall remain with LTV Steel Company and the Hanna Furnace Corporation and/or their successors or assigns. Said responsibilities will be clearly described in any purchase or sale agreements between LTV Steel/The Hanna Furnace Corporation and possible future property owner(s).

Certain stormwater system design criteria will also be required to be implemented during site development. In areas with known groundwater impacts, subsurface injection of storm water from building and parking area stormwater systems could mobilize additional contaminants. In these areas, stormwater injection (drywells) will be prohibited on the Site and stormwater conveyance pipes will be required to have gasketed joints for water tightness to prevent the infiltration of impacted groundwater into the collection systems.

2.9 Notification and Reporting Requirements

The following minimum notification and reporting requirements shall be followed by the property owner prior to and following site development, as appropriate:

- The NYSDEC and NYSDOH will be notified that subgrade activities are being initiated a minimum of 5 working days in advance of construction.

- A construction certification report stamped by a NYS-licensed Professional Engineer, will be prepared and submitted to the NYSDEC and NYSDOH within 90 days after development of each parcel. At a minimum, the report will include:

    - An area map showing the parcel that was developed;

    - A topographic map of the developed property showing actual building locations and dimensions, roads, parking areas, utility locations, berms, fences, property lines, sidewalks, green areas, contours and other pertinent improvements and features;

    - Plans showing areas and depth of fill removal;

    - Copies of daily inspection reports;

    - Description of erosion control measures;

    - A text narrative describing the excavation activities performed, health and safety monitoring performed (both site specific and Community Air Monitoring), quantities and locations of soil/fill excavated, disposal locations for the soil/fill, soil sampling locations and results, a description of any problems encountered, location and acceptability test results for backfill sources, and other pertinent information necessary to document that the site activities were carried out properly;

    - Plans showing before and after survey elevations on a 100-foot grid system to document the thickness of the clean soil cover system; and

    - A certification that all work was performed in conformance with the S/FMP.

- The owners of developed parcels shall complete and submit to the New York State

Department of Environmental Conservation, an Annual Report by January 15th of the following year. This report shall contain certification that the institutional controls put in place, pursuit to the Soil/Fill Management Plan, are still in place, have not been altered and are still effective. The recommended NYSDEC Certification Form is included as Appendix A3, of this Soil/Fill Management Plan.

3.0 HEALTH AND SAFETY PROCEDURES

During redevelopment activities, the developer shall be responsible for implementing suitable procedures to prevent both site construction workers and the community from adverse exposure to residual parameters of concern and other potential hazards posed by the redevelopment work. This will be accomplished through adherence to a written, parcel-specific worker Health and Safety Plan, prepared in accordance with the regulations contained in OSHA 29CFR 1910.120 and the attached Community Air Monitoring Plan.

Although voluntary cleanup remedial measures are anticipated to reduce the potential for encountering parameters of concern above site-specific action levels, the redevelopment activities governed by this Soils Management Plan are a required element of the Voluntary Cleanup Agreement for the site. Thus, 29CFR 1910.120(a)(1)(iii) indicates that these activities are subject to OSHA's hazardous waste operations and emergency response (Hazwopper) standard. This includes the requirement for preparation and implementation of a site-specific worker Health and Safety Plan addressing the following items:

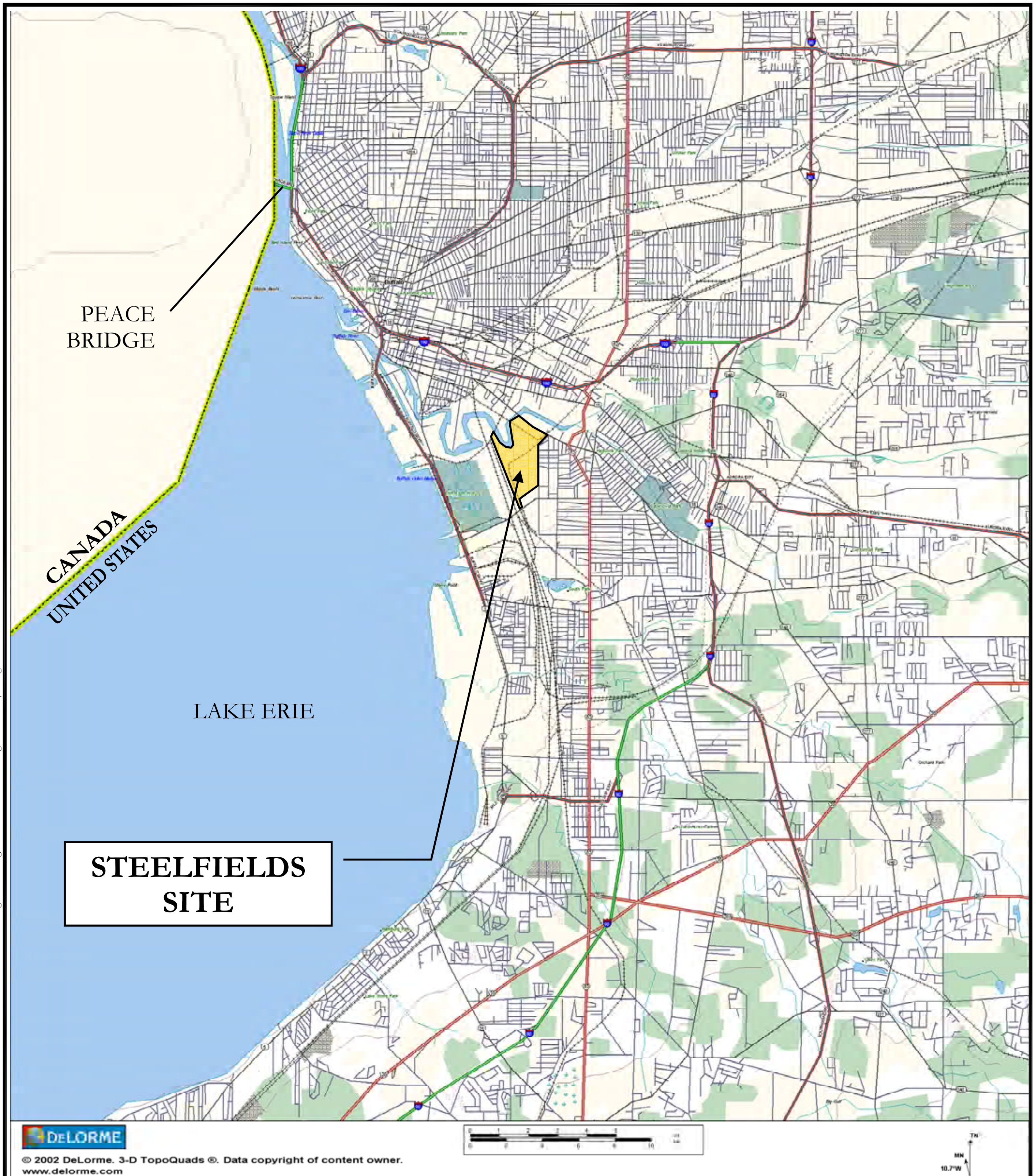
- A safety and health or hazard analysis for each site task and operation.
- Employee training requirements.
- Personal protective equipment (PPE) to be used by employees for the site tasks.
- Medical surveillance requirements.
- Frequency and type of air monitoring, personnel monitoring , and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of equipment.
- Site control measures.
- Decontamination procedures.
- An emergency response plan.
- Confined space entry procedures.

- A spill containment program.

As an integral component of the worker HASP, the developer or site/parcel owner will be responsible for implementing a Community Air Monitoring Plan designed to prevent the surrounding community from adverse exposures due to potential release/migration of airborne particulates or vapors. The community as referenced herein includes potential receptors located off-site (e.g., neighboring residents or businesses) as well as on-site receptors not directly involved in redevelopment activities (e.g. businesses or contractors occupying the site prior to final redevelopment). The Community Air Monitoring Plan presented as Attachment A will be implemented during redevelopment work involving disturbance or handling of Site fill soils. The Plan includes appropriate monitoring, mitigation and response measures consistent with NYSDOH and NYSDEC guidelines. The results of the Community Air Monitoring Plan must be documented to the NYSDEC as described in Section 2.8.

FIGURES

FIGURE 1-1



726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

TurnKey Environmental Restoration, LLC

PROJECT NO.: 0062-008-400

DATE: SEPTEMBER 2004

DRAFTED BY: BCH

SITE REGIONAL MAP

SOIL/FILL MANAGEMENT PLAN

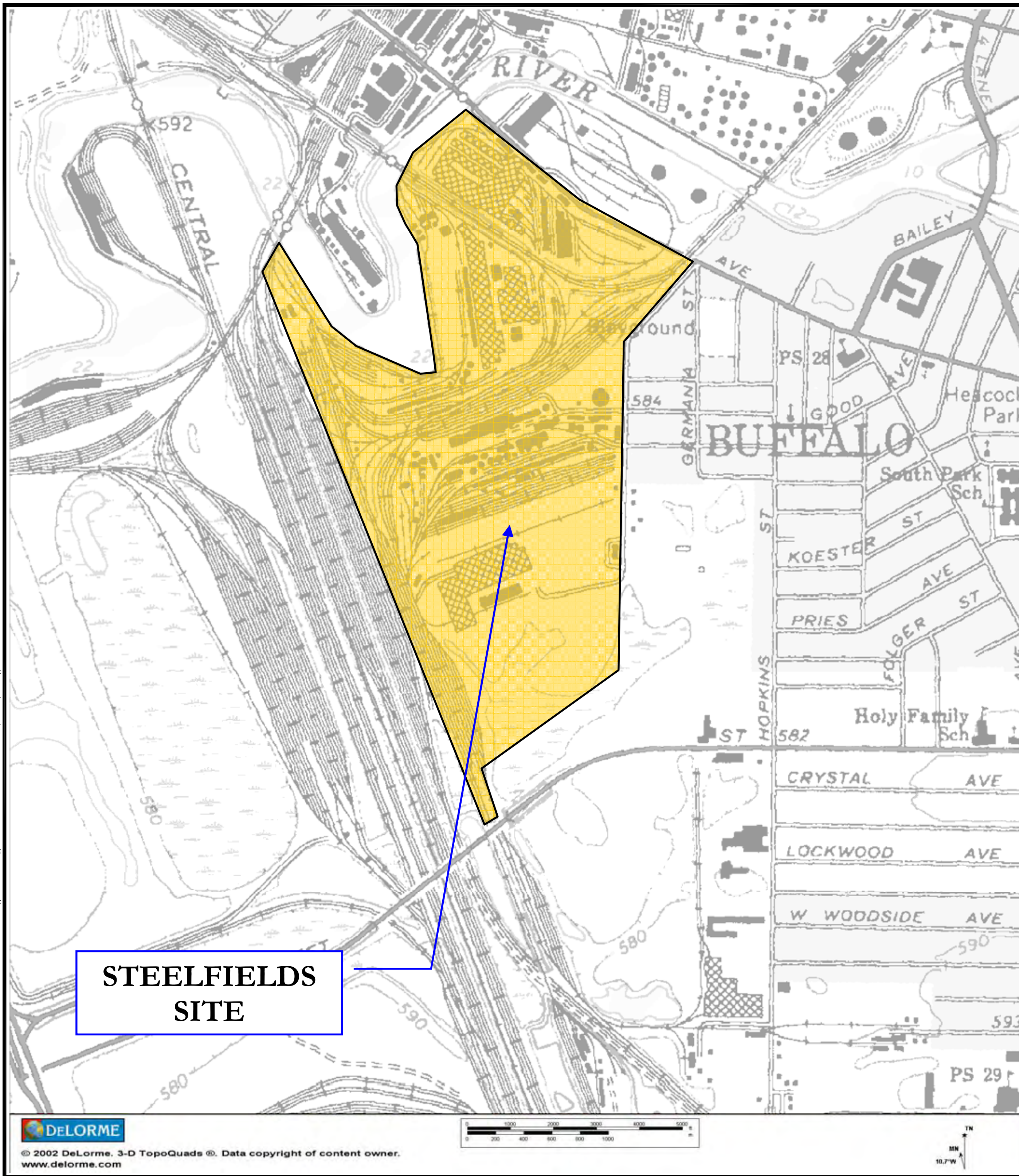
AREA I - FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR

STEELFIELDS, LTD.

FILEPATH:g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 1-1; site regional map.dwg

FIGURE 1-2



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SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0635

PROJECT NO.: 0062-008-400

DATE: SEPTEMBER 2004

DRAFTED BY: BCH

SITE VICINITY MAP

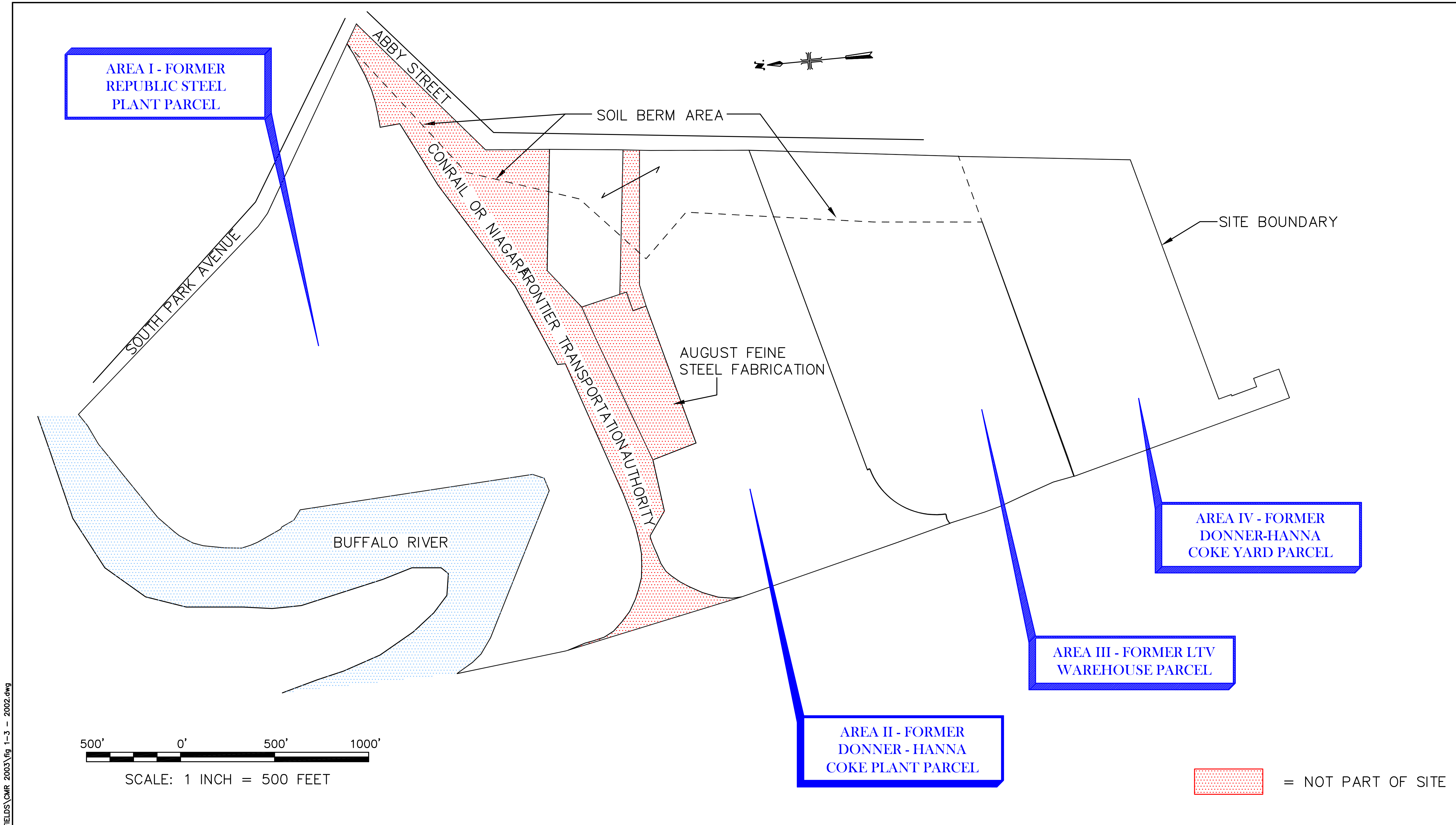
SOIL/FILL MANAGEMENT PLAN

AREA I - FORMER REPUBLIC (LTV) STEEL PARCEL
BUFFALO, NEW YORK

PREPARED FOR

STEELFIELDS, LTD.

FILEPATH:g:\cad\turnkey\steelfields\2003 cmr\area 1 construction closeout\figures\figure 1-2; site vicinity map.dwg



TurnKey Environmental Restoration, LLC

FORMER STEEL MANUFACTURING SITE
SITE MAP
AREA I CLOSE-OUT REPORT
STEELFIELDS LTD

FIGURE 1-3

PROJECT NO.: 0062-008-400
PROJECT LOCATION: BUFFALO, NEW YORK

DATE: JANUARY 2004
DRAFTED BY: BCH/WJM
FILEPATH: f:\turnkey\cad\STEELFIELDS\CMR 2003\fig 1-3 - 2002.dwg

ATTACHMENT A1

Community Air Monitoring Documentation Forms

COMMUNITY AIR MONITORING PLAN:
PARTICULATE MONITORING RECORD

PROJECT: ______________________________ **DATE/ TIME:** ______________

AIR MONITORING PERSONNEL: ______________________ **WEATHER:** ______________

______________________________ **Temp:** ______________

AIR MONITORING EQUIPMENT: ______________________ **Wind:** ______________

____

DAILY INSTRUMENT CALIBRATION:

Calibration Time: ______________________________

Type/Concentration of Calibration Standard(s): ______________________________

Post-Calibration Meter Response: ______________________________

Calibration Notes: ______________________________

____

UPWIND PARTICULATE MONITORING RESULTS: (See Side 2 for Downwind Particulate Monitoring)

Location:	Time:	Result (ug/m^3):	Location:	Time:	Result (ug/m^3):

SKETCH OF WORK ZONE(S):

Monitoring Personnel Signature(s): ______________________________

____

____

COMMUNITY AIR MONITORING PLAN:
PARTICULATE MONITORING RECORD (CONT.)

DOWNWIND PARTICULATE MONITORING RESULTS:

Location:	Time:	Result (ug/m^3):	Location:	Time:	Result (ug/m^3)

DESCRIPTION OF DUST SUPPRESSION TECHNIQUES EMPLOYED:

NOTES:

ATTACHMENT A2

Master Erosion Control Plan

MASTER EROSION CONTROL PLAN for FORMER STEEL MANUFACTURING SITE

FORMER STEEL MANUFACTURING SITE BUFFALO, NY

April 2002
Revised July 2002

0062-001-100

Prepared for:

Steelfields LLC
Buffalo, NY

MASTER EROSION CONTROL PLAN
FORMER STEEL MANUFACTURING SITE

Table of Contents

1.0 INTRODUCTION

1.1 Background

LTV Steel Company owns, or co-owns with The Hanna Furnace Corporation, an industrial property located along the Buffalo River in Buffalo, New York (See Figure 1-1 and 1-2). The property, referred to as the Former Steel Manufacturing Site or Site, is subdivided into four parcels totaling 219 acres, more or less, based on the operational and ownership history of each. The parcels are designated:

- Area I – Republic Steel Plant Parcel
- Area II – Donner-Hanna Coke Plant Parcel
- Area III – Republic Warehouse Parcel
- Area IV – Donner-Hanna Coke Yard Parcel

A voluntary cleanup of the Site will be performed in accordance the Remedial Design/Remedial Action (RD/RA) Work Plan approved by the New York State Department of Environmental Conservation (NYSDEC). The voluntary cleanup program will render the Site suitable for planned redevelopment and use for commercial and industrial purposes.

1.2 Purpose and Scope

A Soil/Fill Management Plan (S/FMP) was prepared as part of the RD/RA Work Plan that describes protocols for the proper handling of site soil/fill during development activities. The property owner at the time of development will be responsible for all monitoring, implementation and reporting requirements of the S/FMP.

Since erosion control will be a critical component of preventing the potential migration of contaminants onto developed property or off-site during development of the site, this Master Erosion Control Plan (MECP) was prepared to provide guidance to developers during build-out activities on the properties. This MECP is a critical component of the S/FMP. This document is generic in nature and provides minimum erosion control practices to be utilized by site owners and/or developers. More specific plans for each parcel may be developed by the property owner(s) after the long-term development approach for each property has been determined.

2.0 GENERAL PERMIT REQUIREMENTS

Redevelopment of the Site will be in accordance with the S/FMP and Voluntary Cleanup Agreement. Since development activities will disturb more than five acres of land, the Federal Water Pollution Control Act (as amended, 33 U.S.C. 1251 et.seq.), and the New York State Environmental Conservation Law (Article 17, Titles 7 and 8, and Article 70) require that the project developer obtain coverage under the NYS Department of Environmental Conservation SPDES General Permit for Storm Water Discharges from Construction Activities that are classified as "Associated with Industrial Activity", Permit #GP-93-06 (Construction Storm Water General Permit).

Requirements for coverage under the general permit includes the submittal of a Notice of Intent form and the development of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must fulfill permit requirements and should be prepared in accordance with "Chapter Four: The Storm Water Management and Erosion Control Plan" in *Reducing Impacts of Storm Water Runoff from New York Development, NYSDEC, 1992*. The Notice of Intent application form and the text of the Construction Storm Water General Permit are provided in Attachment A2-1.

A complete Storm Water Management and Erosion Control Plan (SWM & ECP) should provide the following information:

- A background discussion of the scope of the construction project;
- A statement of the storm water management objectives;
- An evaluation of post-development runoff conditions;
- A description of proposed storm water control measures; and

- A description of the type and frequency of maintenance activities required to support the control measure.

The Plan should be parcel-specific and address issues such as erosion prevention, sedimentation control, hydraulic loading, pollutant loading, ecological protection, physical site characteristics that impact design, and site management planning. Descriptions of proposed features and structures at the site should include a description of drainage structure placement, supporting engineering data and calculations, construction scheduling, and references to established detailed design criteria.

3.0 POTENTIAL EROSION AND SEDIMENT CONTROL CONCERNS

Following remediation of individual parcels, redevelopment activities will proceed for commercial and light industrial uses of the properties. Parcel-specific design measures regarding erosion and sediment control measures will need to be determined at that time after the development approach for each area of the site has been determined.

Potential areas and items of concern during site re-development activities include the following:

- All portions of the site not covered by buildings, sidewalks, roadways, parking areas, or other structures will be required to be covered with 6"-12" of "clean" soils to limit exposure to remaining subsurface soil/fill materials. The transportation and placement activities associated with this work will require erosion and sediment controls to prevent the surface soil from being washed off the area being developed.

- Some portions of the river bank along the Buffalo River in Area I are protected by sheet piling while others are currently very steep, unstable, and prone to erosion. Any activities in the vicinity of the unprotected areas will require erosion measures to prevent runoff into the river.

- Remediated areas or off-site properties adjacent to unremediated parcels need protection so they do not become impacted by site operations.

- Storm water inlets will require protective measures to limit sediment transfer to storm sewers.
- Runoff from soil stockpiles will require erosion controls.
- Surface slopes need to be minimized as much as practical to control sediment transfer.
- Soil/fill excavated during development will require proper handling and disposal.

4.0 EROSION AND SEDIMENT CONTROL MEASURES

4.1 Background

Standard soil conservation practices need to be incorporated into the construction and development plans to mitigate soil erosion damage, off-site sediment migration, and water pollution from erosion. These practices combine vegetative and structural measures, many of which will be permanent in nature and become part of the completed project (ie. drainage channels and grading). Other measures will be temporary and serve only during the construction stage. Selected erosion and sediment control measures will meet the following criteria:

- Minimize erosion through project design (maximum slopes, phased construction, etc.)
- Incorporate temporary and permanent erosion control measures; and
- Remove sediment from sediment-laden storm water before it leaves the site.

4.2 Temporary Measures

Temporary erosion and sedimentation control measures and facilities will be utilized during construction. They will be installed by the site Developer and will be maintained until they are either no longer needed or until such time as permanent measures are installed and become effective. At a minimum, the following temporary measures will be used:

- Silt fencing
- Straw/hay bales
- Temporary vegetation/mulching
- Temporary sedimentation basins
- Cautious placement, compaction and grading of stockpiles

4.2.1 Silt Fencing

Construction and regrading activities will result in surface water flow to drainage ditches and swales, storm sewers, the Buffalo River, and adjacent properties. Silt fencing will be the primary sediment control measure used in these areas. Prior to extensive soil excavation or grading activities, silt fences will be installed along the perimeter of all construction areas. The orientation of the fencing will be adjusted as necessary as the work proceeds to accommodate changing site conditions.

Intermediate fencing will be utilized upgradient of the perimeter fencing to help lower surface water runoff velocities and reduce the volume of sediment to perimeter fencing. Stockpiles will also be surrounded with silt fencing.

As sediment collects, the silt fences will be cleaned as necessary to maintain their integrity. Removed sediment will be utilized elsewhere on-site as general fill. All perimeter silt fences will remain in place until construction activities in an area are completed and vegetative cover has been established. Silt fences will be installed in accordance with the details presented in Attachment A2-2.

4.2.2 Straw and/or Hay Bales

Straw and/or hay bales will be used to intercept sediment laden storm water runoff in drainage channels during construction. The use of either hay or straw will be based on the availability of materials at the time of construction.

Bales will be placed in swales and ditches where the anticipated flow velocity is not expected to be greater than 5 feet/second (fps). Intermediate bales will be placed upgradient of the final barrier to reduce flow velocities and sediment loadings where higher velocities are anticipated.

As with silt fencing, sediment will be removed as necessary from behind the bales and disposed of on-site. Bales that have become laden with sediment or that have lost their structural integrity or effectiveness due to the weather will be replaced. Bales should be installed in accordance with the details presented in Attachment A2-2.

4.2.3 Temporary Vegetation and Mulching

Due to the extensive nature of the planned site remediation activities and the anticipated project schedule, development of the site is expected to occur in phases as the remediation proceeds. As a result, intermediate areas where development activities will not occur or resume for an extended period of time (greater than 90 days) will be seeded with a quick germinating variety of grass or covered with a layer of mulch to control fugitive dust and erosion. Soil/fill stockpiles that will not be utilized for an extended period of time will also vegetated or covered.

4.2.4 Temporary Sedimentation Basins

Temporary sedimentation basins will be constructed as necessary upgradient of storm water inlets to reduce the volume of sediment laden runoff from the site. The basins can be as simple as a small excavated area along the alignment of a storm water ditch or as elaborate as a full-scale sedimentation basin with outlet structures designed for certain storm events from a given area of the site. The basins will be cleaned as necessary and the removed sediment utilized elsewhere on-site as subgrade fill material.

4.2.5 Cautious Placement of Stockpiles

As development occurs, excavation activities will produce stockpiles of soil and subgrade fill materials. Careful placement and construction of stockpiles will be required to control erosion. Stockpiles will be placed no closer than fifty feet from the Buffalo River, storm water inlets and parcel boundaries. Additionally, stockpiles will be graded and compacted as necessary for positive surface water runoff and dust control.

4.3 Permanent Control Measures During Site Redevelopment

Permanent erosion and sedimentation control measures and structures will be installed as soon as practical during construction for long-term erosion protection. Since the detailed development approach for the site has not been determined, specific design features are yet to be selected. Examples of permanent erosion control measures could include:

- Utilizing maximum slopes in erosion prone areas (ie. along the Buffalo River) to limit erosion.
- Minimizing the potential contact with, and migration of, subsurface soil/fill through the placement of a "clean" soil cover system in all areas not covered with structures, roads, parking areas, sidewalks, etc.
- Construction of permanent storm water detention ponds where appropriate.
- Planting and maintaining vegetation.
- Limiting runoff flow velocities to the extent practical.
- Lining collection channels with riprap, erosion control fabric, vegetation, or similar materials.

5.0 CONSTRUCTION MANAGEMENT PRACTICES

5.1 General

The following general construction practices should be evaluated for erosion and sedimentation control purposes during site development activities:

- Clearing and grading only as much area as is necessary to accommodate the construction needs to minimize disturbance of areas subject to erosion (ie. phasing the work).
- Covering exposed or disturbed areas of the site as quickly as practical.
- All erosion and sediment control measures should be installed prior to disturbing the site subgrade.
- Both on-site and off-site tracking of soil by vehicles should be minimized by utilizing routine entry/exit routes.

5.2 Monitoring, Inspection and Maintenance

All erosion and sedimentation controls described in this Plan will be inspected by a qualified representative of the site developer within 24 hours of a heavy rainfall event and repaired or modified as necessary to effectively control erosion of turbidity problems. Inspections should include areas under construction, stockpile areas, erosion control devices (ie. silt fences, hay bales, etc.) and locations where vehicles enter and leave the site. Routine inspections of the entire site should also be made on a monthly basis during development.

If inspections indicate problems, corrective measures should be implemented within 24 hours. A report summarizing the scope of the inspection, name of the inspector, date, observations made, and a description of the corrective actions taken should be completed. Examples of inspection forms to be completed are included in Attachment A2-3.

ATTACHMENT A2-1
NYSDEC SPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

1. Notice of Intent
2. NYSDEC SPDES General Permit For Storm Water Discharges from Construction

See Reverse for Instructions

SPDES FORM

DEC

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-3505

Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity Under the SPDES General Permit

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a SPDES permit issued for storm water discharges associated with industrial activity in the State in Section II of this form. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

I. Facility Operator Information

Name: Phone:

Address: Status of Owner/Operator:

City: State: ZIP Code:

II. Facility/Site Location Information

Name: Is the Facility Located on Indian Lands? (Y or N)

Address:

City: State: ZIP Code:

Latitude: Longitude: Quarter: Section: Township: Range:

III. Site Activity Information

MS4 Operator Name:

Receiving Water Body:

If You are Filing as a Co-permittee, Enter Storm Water General Permit Number:

Are There Existing Quantitative Data? (Y or N)

Is the Facility Required to Submit Monitoring Data? (1, 2, or 3)

SIC or Designated Activity Code: Primary: 2nd: 3rd: 4th:

If This Facility is a Member of a Group Application, Enter Group Application Number:

If You Have Other Existing NPDES Permits, Enter Permit Numbers:

IV. Additional Information Required for Construction Activities Only

Project Start Date:

Completion Date:

Estimated Area to be Disturbed (in Acres):

Is the Storm Water Pollution Prevention Plan in Compliance with State and/or Local Sediment and Erosion Plans? (Y or N)

V. Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: Date:

Signature:

Instruction—NYSDEC Form 91-19-12 (9/92)

Notice of Intent (NOI)

For Storm Water Discharges Associated With Industrial Activity to Be Covered Under the SPDES General Permit

Who Must File A Notice Of Intent Form

Federal law at 40 CFR Part 122 prohibits point source discharges of storm water associated with industrial activity to a water body(ies) of the U.S. without a National Pollutant Discharge Elimination System (NPDES) permit. New York State has been delegated the NPDES program and administers its State Pollutant Discharge Elimination System (SPDES) program in lieu of EPA's NPDES program. Wherever the term "NPDES" is used in the NOI form, the reader should substitute "SPDES". The operator of an industrial activity that has a storm water discharge that qualifies for coverage under a SPDES Storm Water General Permit must submit the NOI form to obtain coverage. If you have questions about whether federal regulations require you to obtain a permit for your storm water discharge, contact the EPA Storm Water Hotline at (703) 821-4823. If you have questions concerning the applicability and coverage of the SPDES Storm Water General Permits, contact the New York State of Environmental Conservation at (518) 457-9601. In order to cancel your coverage under the General Permit you must submit a Notice of Termination (NOT) form. Failure to submit a NOT will result in the obligation to pay a yearly Regulatory Fee.

Where To File The NOI Form

New York State intends on using EPA's information management system. Therefore, NOIs must be sent to the following address:

Storm Water Notice of Intent
PO Box 1215
Newington, VA 22122

Completing The Form

You must type or print using upper-case letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, call the EPA Storm Water Hotline at (703) 821-4823.

Section I—Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same as the name of the facility. The responsible party is the legal entity that controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Enter the appropriate letter to indicate the legal status of the operator of the facility:

F—Federal	M—Public (other than federal or state)
S—State	P—Private

Section II—Facility/Site Location Information

Give the facility's or site's official or legal name and complete street address, including city, state, and ZIP code. If the facility or site lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Indicate whether the facility is located on Indian lands.

Section III—Site Activity Information

If the storm water discharges to a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4 (e.g. municipality name, county name) and the receiving water of the discharge from the MS4. (A MS4 is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body which is designed or used for collecting or conveying storm water.)

If the facility discharges storm water directly to receiving water(s), enter the name of the receiving water.

If you are filing as a co-permittee and a storm water general permit number has been issued, enter that number in the space provided.

Indicate whether or not the owner or operator of the facility has existing quantitative data that represent the characteristics and concentration of pollutants in storm water discharges.

Indicate whether the facility is required to submit monthly data by entering one of the following:

1 Not required to submit monitoring date;
2 Required to submit monitoring data;
3 Not required to submit monitoring data; submitting certification for monitoring exclusion.

Those facilities that must submit monitoring data (e.g. choice 2) are Section 313 EPCRA facilities; primary metal industries; land disposal units/incinerators/BIFs; wood treatment facilities; facilities with coal pile runoff, and battery reclaimers.

List, in decreasing order of significance, up to four 4-digit standard industrial classification (SIC) codes that best describe the principal products or services provided at the facility or site identified in Section II of this application.

For industrial activities defined in 40 CFR 122.26(b)(14)(i)-(xi) that do not have SIC codes that accurately describe the principal products produced or services provided, the following 2-character codes are to be used

- HZ Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA [40 CFR 122.26(b)(14)(iv)];
- LF Landfills, land application sites, and open dumps that receive or have received any industrial wastes, including those that are subject to regulation under subtitle D of RCRA [40 CFR 122.26(b)(14)(v)];
- SE Steam electric power generating facilities, including coal handling sites [40 CFR 122.26(b)(14)(vii)];
- TW Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage [40 CFR 122.26(b)(14)(ix)];
- CO Construction activities [40 CFR 122.26(b)(14)(x)].

If the facility listed in Section II has participated in Part 1 of an approved storm water group application and a group number has been assigned, enter the group application number in the space provided.

If there are other SPDES permits presently issued for the facility or site listed in Section II, list the permit numbers. If an application for the facility has been submitted but no permit number has been assigned, enter the application number.

Section IV—Additional Information Required for Construction Activities Only

Construction activities must complete Section IV in addition to Sections I through III. Only construction activities need to complete Section IV.

Enter the project start date and the estimated completion date for the entire development plan.

Provide an estimate of the total number of acres of the site on which soil will be disturbed (round to the nearest acre).

Indicate whether the storm water pollution prevention plan for the site is in compliance with approved state and/or local sediment and erosion plans, or storm water management plans.

Section V—Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manage of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality, state, federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may decrease or reduce the burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20490, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20603.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT

FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

Permit No. GP-93-06

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: August 1, 1993 Expiration Date: August 1, 1998

George A. Danskin
Chief Permit Administrator
George A Danskin
Authorized Signature

Address:
50 Wolf Road
Albany, N.Y. 12233-1750

Date: July 14, 1993

PREFACE

The Clean Water Act ("CWA")[1] provides that storm water discharges associated with industrial activity from a point source[2] (including discharges through a municipal separate storm sewer system) to waters of the United States[3] are unlawful, unless authorized by a National Pollutant Discharge Elimination System ("NPDES") permit. In New York which is a NPDES-delegated state, this is accomplished through the administration of the state Pollutant Discharge Elimination System ("SPDES") program.

A discharger which is subject to the federal storm water (NPDES) regulations may be eligible to obtain coverage under a general permit by submitting a Notice of Intent ("NOI") to the address given on the NOI form.

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[1] Also referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972 (Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et.seq.)

[2] "Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharges. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

[3] "Waters of the United States" means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters, including interstate "wetlands";

(c) All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea;

(g) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA are not waters of the United States. This exclusion applies only to manmade bodies of water with neither were originally created in waters of the United States (such as disposal areas in wetlands) nor resulted from the impoundment of waters of the United States.

Copies of the General Permit and the Notice of Intent forms for New York are available by calling 1-(800)-952-2490. The United States Environmental Protection Agency (EPA) has established the Stormwater Hotline at (703) 821-4823 to provide information pertaining to the NPDES stormwater regulations.

If you have questions whether federal regulations require you to obtain a permit for your storm water discharge, contact the EPA Storm Water Hotline. If you have questions concerning the applicability and coverage of the SPDES Storm Water General Permits, contact the New York State Department of Environmental Conservation in Albany at (518) 457-9601. In order to cancel your coverage under the General Permit, you must submit a Notice of Termination ("NOT") form. Failure to submit a NOT will result in the continued obligation to pay a yearly Regulatory Fee.

Additionally, copies of the general permit, the NOI form and the NOT form can be obtained by calling the New York State Department of Environmental Conservation ("DEC") Storm Water Information Line at (800) 952-2490 (in New York State), any DEC Regional Office (See Appendix B), or directly from DEC in Albany at the telephone number given above.

Coverage under this general permit is available August 1, 1993 and expires on August 1, 1998.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT
FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES
THAT ARE CLASSIFIED AS "ASSOCIATED WITH INDUSTRIAL ACTIVITY"

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Part I. COVERAGE UNDER THIS PERMIT

A. Permit Area & Applicability. The permit covers all areas of New York State where New York State implements Section 402 of the CWA. Except as in compliance with this general permit or with a duly authorized individual permit from DEC, discharge of stormwater associated with industrial activity from construction activity by any person shall be unlawful.

B. Eligibility.

1. This permit may authorize all discharges of storm water associated with industrial activity from construction activity[4], (those sites or common plans of development or sale that will result in the disturbance of five or more acres total land area[5]), (henceforth referred to as storm water discharges from construction activities) occurring after the effective date of this permit, including discharges occurring after the effective date of this permit where the construction activity was initiated before the effective date of this permit, except for discharges identified under paragraph I.C (see below).

2. This permit may only authorize a storm water discharge from construction activities that is mixed with a storm water discharge associated with industrial activities other than construction, where:

   a. the industrial activity other than construction is located on the same site as the construction activity;

   b. storm water discharges from construction activities are in compliance with the terms of this permit; and

   c. storm water discharges associated with industrial activity other than construction are occurring (including storm water discharges from dedicated asphalt plants and dedicated concrete plants) are covered by a different SPDES general permit or individual permit authorizing such discharges.

C. Limitations on Coverage. The following storm water discharges from construction activities are not authorized by this permit:

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[4] "Storm Water Discharges Associated With Industrial Activity" covered under this general permit includes those defined in 40 CFR Section 122.26(b)(14)(x).

[5] On June 4, 1992, the United States Court of Appeals for the Ninth Circuit remanded the exemption for construction sites of less than five acres to the EPA for further rule making. (Nos. 90-70671 and 91-70200). Any effect of this decision on construction sites of less than five acres will not apply until further EPA or DEC action. Regulations for construction sites of five acres or more remain in effect.

1. Discharges associated with industrial activity after construction activities have been completed and the site has undergone final stabilization[6];

2. Discharges that are mixed with sources of non-storm water other than those expressly authorized under this permit (Part II.A, Page 7 and Part III.D.5, Page 15);

3. Discharges that are subject to an existing SPDES individual or general permit or which are issued an individual or alternative general permit (Page 19); and

4. Discharges that are likely to adversely affect a listed or proposed to be listed endangered or threatened species or its critical habitat.

D. <u>Authorization.</u>

1. An operator[7] must submit a completed Notice of Intent ("NOI") form approved and provided by the State Director[8] (or a photocopy thereof), in order to be authorized to discharge under this general permit[9]. The NOI shall be signed in accordance with Part V.G (see Page 18) of this permit and submitted to the address indicated on the approved NOI form.

2. All contractors and subcontractors of the operator identified under Part III.E.1 (Page 16) must provide certification under Part III.E.2 (Page 16) of this permit in order to be authorized to discharge storm water under this permit.

3. Unless notified by the State Director to the contrary, operators who submit an NOI in accordance with the requirements of this permit are authorized to discharge storm water from construction activities under the terms and conditions of this permit 2 days after the date that the NOI is postmarked. The State Director may deny coverage under this permit and require submittal of an application for an individual SPDES permit at any time based on a review of the NOI or other information (see Part V.J of this permit, Page 19).

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[6] "Final Stabilization" means that all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% the cover for the area has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed.

[7] For the purposes of this permit, the term "operator" means the person, persons, or legal entity which owns or leases the property on which the construction activity is occurring.

[8] "State Director" means the New York State Commissioner of Environmental Conservation, or an authorized representative.

[9] A copy of the approved NOI form is provided in Appendix A of this notice.

4. A copy of the NOI or other indication that storm water discharges from the site are covered under a SPDES permit, and a brief description of the project shall be posted at the construction site in a prominent place for public viewing (such as alongside a building permit).

5. A signed copy of the NOI shall also be submitted concurrently to the local governing body and any other authorized agency[10] having jurisdiction or regulatory control over the construction project.

6. New storm water discharges from construction activities which require any other Uniform Procedures Act permit (Environmental Conservation Law, 6 NYCRR Part 621) must submit the information specified in Appendix G.

   Upon review of this information, DEC may authorize the applicant to submit an NOI to obtain coverage under this general permit.

7. __Renotification__. Upon renewal of this general permit or issuance of a new general permit, the permittee is required to notify the State Director of his intent to be covered by the new general permit.

E. __Deadlines for Notification__.

1. Operators who intend to obtain coverage under this general permit for storm water discharges from construction activities shall submit an NOI in accordance with the requirements of this Part at least 2 days prior to the commencement of construction[11] activities ;

2. For storm water discharges from construction activities where the operator changes, a new NOI in accordance with the requirements of this Part shall be submitted by the new operator at least 2 days prior to the change in operator. Additionally, the operator being replaced must submit a Notice of Termination ("NOT") in accordance with Part VI (Page 21) of this permit __and__ notify the new operator of the requirement to submit a new NOI to obtain coverage under this permit. The new operator must also review and sign the pollution prevention plan in accordance with Part III.B.

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[10] For the purposes of this general permit, "any other authorized agency" shall include any local, regional, or state entity or agency except the Department of Environmental Conservation (DEC) which has authority to review storm water discharge from the project, including authority under any approved watershed protection plan or regulations.

[11] "Commencement of Construction" means the initial disturbance of soils associated with clearing, grading, or excavating activities. or other construction activities

Part II. SPECIAL CONDITIONS AND PROHIBITIONS

A. Prohibition On Non-Stormwater Discharges.

Discharges other than storm water must be in compliance with a SPDES permit (other than this permit). However, the following non-storm water discharges are authorized by this permit: discharges from fire fighting activities; fire hydrant flushings; waters used to wash vehicles or control dust in accordance with Part III.D.2.e.(2) (Page 13); routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; springs; and foundation or footing drains where flows are not contaminated with process materials such as solvents. Except for flows from fire fighting activities, these discharges must be included in the storm water pollution prevention plan (See Part III).

B. Maintaining Water Quality - The discharge authorized by this general permit shall neither cause nor contribute to a violation of water quality standards as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York including, but not limited to:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no suspended, colloidal and settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no: residue from oil and floating substances; visible oil film; globules; or grease.

Part III. STORM WATER POLLUTION PREVENTION PLANS

A storm water pollution prevention plan shall be developed by the operator for construction activities at each site to be covered by this permit. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges. In addition, the plan shall describe and ensure the implementation of practices which will be used to reduce the pollutants in storm water discharges and to assure compliance with the terms and conditions of this permit. Operators are responsible for implementing the provisions of the storm water pollution prevention plan and ensuring that all contractors and subcontractors who perform professional services at the site provide certification of the pollution prevention plan in accordance with Part I.D.2. (Page 5) and Part III.E.2. (Page 14) of this permit. All contractors and subcontractors identified in the storm water pollution prevention plan in accordance with Part III.E.1 (Page 16) of this permit must agree to implement applicable provisions of the pollution prevention plan and satisfy the certification requirement of Part III.E.2 (Page 16). Contractors and subcontractors which are not operators, as defined in this permit (Page 5), do not have to submit a NOI in addition to the NOI submitted by the operator.

A. **Deadlines for Plan Preparation and Compliance.**

1. For construction activities that have begun on or before February 1, 1994, the plan shall be developed prior to, and provide compliance with the terms and schedule of the plan beginning on, February 1, 1994. However, the plan for sedimentation basins shall provide for compliance no later that April 1, 1994.

2. For construction activities that begin after February 1, 1994, the plan shall be developed prior to the submittal of an NOI and provide for compliance with the terms and schedule of the plan beginning with the initiation of construction activities.

B. **Signature and Plan Review**

1. The plan shall be signed in accordance with Part V.G (Page 18), and be retained at the site where the construction activity occurs in accordance with Part IV (retention of records, Page 17) of this permit.

2. The permittee shall submit a copy of the pollution prevention plan and any amendments thereto to the local governing body and any other authorized agency having jurisdiction or regulatory control over the construction activity. The operator shall make plans available upon request to the State Director and any local agency having jurisdiction; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system , to the municipal operator of the system.

3. The State Director, or authorized representative, may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this Permit. Such notification shall identify those provisions of the permit which are not being met by the plan, and identify which provisions of the plan requires modifications in order to meet the minimum requirements of this Permit. Within 7 days of such notification, (or

as otherwise provided by the State Director), the permittee shall make the required changes to the plan and shall submit to the State Director a written certification that the requested changes have been made.

C. __Keeping Plans Current__. The permittee shall amend the plan whenever:

1. There is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the plan; or

2. The storm water pollution prevention plan proves to be ineffective in:

   a. Eliminating or significantly minimizing pollutants from sources identified under Part III.D.2 (See below) of this permit, or in otherwise

   b. Achieving the general objectives of controlling pollutants in storm water discharges from construction activity.

3. Additionally, the plan shall be amended to identify any new contractor and/or subcontractor that will implement a measure of the storm water pollution prevention plan (See Part III.E, Page 16). Amendments to the plan may be reviewed by the State Director in the same manner as provided by Part III.B above.

D. __Contents of Plan__. The storm water pollution prevention plan shall include the following items and shall be prepared in accordance with Appendix F (THE STORMWATER MANAGEMENT AND EROSION CONTROL PLAN). Any deviation from Appendix F or the requireents listed below shall be explained and justified in the storm water pollution prevention plan.

1. __Site Description__. Each plan shall provide a description of pollutant sources and other information as indicated:

   a. A description of the nature of the construction activity;

   b. A description of the intended sequence of major activities which disturb soils for major portions of the site (e.g. grubbing, excavation, grading);

   c. Estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities;

d. An estimate of the runoff coefficient[12] of the site after construction activities are completed and existing data describing the soil or the quality of any discharge from the site;

e. A site map indicating drainage patterns and approximate slopes anticipated after major grading activities, areas of soil disturbance, an outline of areas which will not be disturbed, the location of major structural and nonstructural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands), and locations where storm water is discharged to surface or ground water(s); and

f. The name of the receiving water(s) and areal extent of wetland acreage at the site.

2. <u>Controls</u>. Each plan shall include a description of appropriate controls and measures that will be implemented at the construction site. The plan will clearly describe for each major activity identified in Part III.D.1.b above, appropriate control measures and the timing during the construction process that the measures will be implemented. For example, the plan might provide the following: perimeter controls for one portion of the site will be installed after the clearing and grubbing necessary for installation of the measure, but before the clearing and grubbing for the remaining portions of the site; perimeter controls will be actively maintained until final stabilization of those portions of the site upward of the perimeter control; temporary perimeter controls will be removed after final stabilization. The description and implementation of controls shall address the following minimum components:

a. <u>Erosion and Sediment Controls</u>

Except as noted below in Part III.D.2.b, the erosion and sediment control component of a storm water pollution prevention plan shall conform to and be implemented in a manner consistent with the technical standards set forth in Appendix E. Where conformance to Appendix E is not attainable, the operator shall describe what equivalent erosion and sediment control practices will be implemented together with an explanation as to why conformance with Appendix E cannot be achieved. This explanation, together with the alternative erosion and sediment control measures and design specifications, shall be presented in the storm water pollution prevention plan.

[12] "Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.

A description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. A record of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be included in the plan. Except as provided in Parts III.D.2.(a)(1)and (2) below, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

(1). Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.

(2). Where construction activity will resume on a portion of the site within 21 days from when activities ceased, (e.g. the total time period that construction activity is temporarily ceased is less than 21 days) then stabilization measures do not have to be initiated on that portion of site by the 14th day after construction activity temporarily ceased.

b. **Erosion and Sediment Controls - Structural Practices**.

A description of structural practices to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Such practices may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Structural practices should be placed on upland soils to the degree attainable.

(1) For common drainage locations that serve an area with 10 or more disturbed acres at one time, a

temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. The 3,600 cubic feet of storage area per acre drained does not apply to flows from offsite areas and flows from onsite areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. For drainage locations which serve 10 or more disturbed acres at one time and where a temporary sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent controls is not attainable, smaller sediment basins and/or traps shall be used.

(2) For drainage locations serving less than 10 acres, sediment basins and/or sediment traps should be used. At a minimum, silt fences or equivalent sediment controls are required for all sideslope and downslope boundaries of the construction area unless a sediment basin providing storage for 3,600 cubic feet of storage per acre drained is provided.

c. <u>Storm Water Management</u>.

Storm water management controls shall conform to and be implemented in a manner consistent with the technical standards set forth in Appendix D). Where conformance to Appendix D is not attainable, the operator shall describe what practices will be implemented together with an explanation as to why conformance with Appendix D cannot be achieved. This explanation, together with the alternative storm water management practices and design specifications shall be presented in the storm water pollution prevention plan.

A description of measures that will be installed during the construction process to control storm water discharges that will occur after construction operations have been completed. Structural measures should be placed on upland soils to the degree attainable.

(1) Such practices may include: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices). The pollution prevention plan shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed predevelopment levels.

(2) Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel for the purpose of providing a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., no significant changes in the hydrological regime of the receiving water).

d. Other Controls.

(1) Waste Disposal. No solid materials, including building materials, shall be discharged to waters of the United States, except as authorized by a federal or State law.

(2) Off-site vehicle tracking of sediments and the generation of dust shall be minimized.

(3) The plan shall ensure and demonstrate compliance with applicable State and local waste disposal, sanitary sewer or septic system regulations.

e. Approved Local or Regional Control Plans.

(1) Storm water pollution prevention plans must include procedures and requirements specified in applicable sediment and erosion site plans, site permits, storm water management site plans or site permits or duly adopted regulations approved by local officials or any authorized agency. Permittees shall provide a certification in their storm water pollution prevention plan that their storm water pollution prevention plan complies with all requirements applicable to protecting surface and ground water resources in sediment and erosion site plans or site permits, storm water management site plans, site permits, or duly adopted regulations approved by local governing bodies or any authorized agency. Permittees shall comply with any such requirements during the term of the permit.

(2) Storm water pollution prevention plans must be amended to reflect any change applicable to protecting surface and ground water resources in sediment and erosion site plans or site permits, storm water management site plans or site permits, or duly adopted regulations approved by local officials or any authorized agency for which the permittee receives written notice. Where the permittee receives such written notice of a change, the permittee shall provide a recertification in

the storm water pollution prevention plan that the storm water pollution prevention plan has been modified to address such changes.

(3) Operators seeking alternative permit requirements shall submit an individual permit application in accordance with Part V.J (Page 19) of the permit at the address indicated in Part IV.C (Page 17) of this permit for the appropriate DEC Office, along with a description of why requirements in approved local or regional plans, permits or regulations or changes to such plans, permits, or regulations, should not be applicable as a condition of a SPDES permit.

3. __Maintenance__. A description of procedures to ensure the timely maintenance of vegetation, erosion and sediment control measures and other protective measures identified in the site plan in good and effective operating condition.

In cases where the installed structural controls are designed, in whole or part, to provide for storm water management after construction activity is completed and final stabilization of the site, a description of the post-construction operation and maintenance needs shall be included.

A description of any arrangements that have been made to ensure long term maintenance of storm water facilities after construction operations have been completed and permit coverage is terminated, and a statement describing who will be responsible for maintenance shall be included.

4. __Inspections__. The operator or qualified personnel of the operator shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater. Where portions of the construction area have been finally stabilized, inspection of such portions shall be conducted at least once every month until the entire site is finally stabilized.

a. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

b. Based on the results of the inspection, the site description identified in the plan in accordance with paragraph III.D.1 (Page 9) of this permit and pollution prevention measures identified in the plan in accordance with paragraph III.D.2 (Page 10) of this permit shall be revised as appropriate, but in no case later than 7 calendar days following the inspection. Such modifications shall provide for timely implementation of any changes to the plan within 7 calendar days following the inspection.

c. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph III.D.4.b (See above) of the permit shall be made and retained as part of the storm water pollution prevention plan for at least three years from the date that the site is finally stabilized. Such reports shall identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with Part V.G (Page 18) of this permit.

5. <u>Non-Storm Water Discharges</u> - Except for flows from fire fighting activities, sources of non-storm water listed in Part II.A (Page 7) of this permit that are combined with storm water discharges from the construction activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

E. <u>Contractors</u>

1. The storm water pollution prevention plan must clearly identify for each measure identified in the plan, the contractor(s) and/or subcontractor(s) that will implement the measure. All contractors and subcontractors identified in the plan must sign a copy of the certification statement in Part III.E.2 (See below) of this permit in accordance with Part V.G (Page 18) of this permit. All certifications must be included in the storm water pollution prevention plan.

2. **<u>Certification Statement</u>**. All contractors and subcontractors identified in a storm water pollution prevention plan in accordance with Part III.E.1 (Page 16) of this permit shall sign a copy of the following certification statement before undertaking any construction activity at the site identified in the storm water pollution prevention plan:

   "I certify under penalty of law that I understand and agree to comply with the terms and conditions of the pollution prevention plan for the construction site identified in such plan as a condition of authorization to discharge storm water. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for storm water discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards."

   The certification must include the name and title of the person providing the signature in accordance with Part V.G (Page 18) of this permit; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made.

Part IV. RETENTION OF RECORDS

A. The operator shall retain copies of storm water pollution prevention plans and all reports required by this permit, and records of all data used to complete the NOI to be covered by this permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by the State Director at any time upon written notification.

B. The operator shall retain a copy of the storm water pollution prevention plan required by this permit at the construction site from the date of initiation of construction activities to the date of final stabilization.

C. Addresses. Except for the submittal of NOIs and NOTs, all written correspondence under this permit directed to the DEC, including the submittal of individual permit applications, shall be sent to the address of the appropriate DEC Office as listed in Appendix B.

Part V. STANDARD PERMIT CONDITIONS

A. Duty to Comply.

The operator must comply with all conditions of this permit. All contractors and subcontractors must comply with the terms of the pollution prevention plan. Any permit noncompliance constitutes a violation of the CWA and the Environmental Conservation Law and is grounds for enforcement action; for permit revocation or modification; or for denial of a permit renewal application.

B. Continuation of the Expired General Permit.

This permit expires on August 1, 1998. However, an expired general permit continues in force and effect until a new general permit is issued. Operators seeking authorization under a new general permit must submit a new NOI in accordance with the terms of such new general permit.

C. Need to halt or reduce activity not a defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the construction activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Duty to Provide Information. The permittee shall furnish to the State Director; or local, or any other agency approving sediment and erosion plans, grading plans, or storm water management plans, or with regulatory control over the project; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with a SPDES permit, to the municipal operator of the system, any information which is requested to determine compliance with this permit or other information.

F. Other Information. When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the NOI or in any other report to the State Director, he or she shall promptly submit such facts or information.

G. <u>Signatory Requirements</u>. All NOIs, NOTs, storm water pollution prevention plans, reports, certifications or information required by this permit or submitted pursuant to this permit, shall be signed as follows:

1. All NOIs and NOTs shall be signed as follows:

a. For a corporation: by (1) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person authorized to and who performs similar policy or decision-making functions for the corporation; or (2) the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second-quarter 1980 dollars) if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The pollution prevention plan and all reports required by the permit and other information requested by the State Director or local agency shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described above and submitted to the State Director.

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

c. <u>Certification</u>. Any person signing documents under paragraph V.G (Page 18) shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

H. <u>Property Rights</u>. The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

I. <u>Severability</u>. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

J. <u>Requiring an individual permit or an alternative general permit.</u>

1. The State Director may require any person authorized by this permit to apply for and/or obtain either an individual SPDES permit or an alternative SPDES general permit. Where the State Director requires a discharger authorized to discharge under this permit to apply for an individual SPDES permit, the State Director shall notify the discharger in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of issuance or denial of the individual SPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications shall be submitted to the appropriate DEC Office indicated in Appendix B of this permit. The State Director may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual SPDES permit application as required by the State Director under this paragraph, then the applicability of this permit to the individual SPDES permittee is automatically terminated at the end of the day specified by the State Director for application submittal.

2. Any discharger authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii) and 6 NYCRR Part 621, with reasons supporting the request, to the State Director at the address for the appropriate DEC Office (see addresses in Appendix B of this permit). The request may be granted by issuance of an individual permit or an alternative general permit at the discretion of the State Director.

3. When an individual SPDES permit is issued to a discharger otherwise subject to this permit, or the discharger is authorized to discharge under an alternative SPDES general permit, the applicability of this permit to the individual SPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual SPDES permit is denied to an operator otherwise subject to this permit, or the operator is denied for coverage under an alternative SPDES general permit, the applicability of this permit to the individual SPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the State Director.

K. **Proper Operation and Maintenance**. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

L. **Inspection and Entry**. The permittee shall allow the State Director or an authorized representative of EPA, the State, or, in the case of a construction site which discharges through a municipal separate storm sewer, an authorized representative of the municipal operator or the separate storm sewer receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

M. Permit Actions. This permit may, at any time, be modified, revoked, and renewed. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Part VI. TERMINATION OF COVERAGE

A. Notice of Termination ("NOT"). Where a site has been finally stabilized and all storm water discharges from construction activities that are authorized by this permit are eliminated[13], the operator must submit an NOT form approved and provided by the State Director (or photocopy thereof). The NOT shall be signed in accordance with Part V.G (Page 18) of this permit and submitted to the address indicated on the approved NOT form.

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[13] For the purposes of this certification, elimination of storm water discharges from construction activity means that all disturbed soils at the identified facility have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activities from the identified site that are authorized by a SPDES general permit have otherwise been eliminated.

See Reverse for Instructions

SPDES FORM

DEC

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-3505

Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity Under the SPDES General Permit

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a SPDES permit issued for storm water discharges associated with industrial activity in the State in Section II of this form. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM

I. Facility Operator Information

Name: ____ Phone: ____

Address: ____ Status of Owner/Operator: ☐

City: ____ State: ____ ZIP Code: ____

II. Facility/Site Location Information

Is the Facility Located on Indian Lands? (Y or N) ☐

Name: ____

Address: ____

City: ____ State: ____ ZIP Code: ____

Latitude: ____ Longitude: ____ Quarter: ____ Section: ____ Township: ____ Range: ____

III. Site Activity Information

MS4 Operator Name: ____

Receiving Water Body: ____

If You are Filing as a Co-permittee, Enter Storm Water General Permit Number: ____

Are There Existing Quantitative Data? (Y or N) ☐

Is the Facility Required to Submit Monitoring Data? (1, 2, or 3) ☐

SIC or Designated Activity Code: Primary: ____ 2nd: ____ 3rd: ____ 4th: ____

If This Facility is a Member of a Group Application, Enter Group Application Number: ____

If You Have Other Existing NPDES Permits, Enter Permit Numbers: ____ ____ ____

IV. Additional Information Required for Construction Activities Only

Project Start Date: ____

Completion Date: ____

Estimated Area to be Disturbed (in Acres): ____

Is the Storm Water Pollution Prevention Plan in Compliance with State and/or Local Sediment and Erosion Plans? (Y or N) ☐

V. Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: ____ Date: ____

Signature: ____

91-19-12 (9/92)—10g

Printed on Recycled Paper

APPENDIX A - Notice of Intent ("NOI")

Instruction—NYSDEC Form 91-19-12 (9/92)

Notice of Intent (NOI)

For Storm Water Discharges Associated With Industrial Activity to Be Covered Under the SPDES General Permit

Who Must File A Notice Of Intent Form

Federal law at 40 CFR Part 122 prohibits point source discharges of storm water associated with industrial activity to a water body(ies) of the U.S. without a National Pollutant Discharge Elimination System (NPDES) permit. New York State has been delegated the NPDES program and administers its State Pollutant Discharge Elimination System (SPDES) program in lieu of EPA's NPDES program. Wherever the term "NPDES" is used in the NOI form, the reader should substitute "SPDES". The operator of an industrial activity that has a storm water discharge that qualifies for coverage under a SPDES Storm Water General Permit must submit the NOI form to obtain coverage. If you have questions about whether federal regulations require you to obtain a permit for your storm water discharge, contact the EPA Storm Water Hotline at (703) 821-4823. If you have questions concerning the applicability and coverage of the SPDES Storm Water General Permits, contact the New York State of Environmental Conservation at (518) 457-9601. In order to cancel your coverage under the General Permit you must submit a Notice of Termination (NOT) form. Failure to submit a NOT will result in the obligation to pay a yearly Regulatory Fee.

Where To File The NOI Form

New York State intends on using EPA's information management system. Therefore, NOIs must be sent to the following address:

Storm Water Notice of Intent
PO Box 1215
Newington, VA 22122

Completing The Form

You must type or print using upper-case letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, call the EPA Storm Water Hotline at (703) 821-4823.

Section I—Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same as the name of the facility. The responsible party is the legal entity that controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Enter the appropriate letter to indicate the legal status of the operator of the facility:

F—Federal   M—Public (other than federal or state)
S—State   P—Private

Section II—Facility/Site Location Information

Give the facility's or site's official or legal name and complete street address, including city, state, and ZIP code. If the facility or site lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Indicate whether the facility is located on Indian lands.

Section III—Site Activity Information

If the storm water discharges to a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4 (e.g. municipality name, county name) and the receiving water of the discharge from the MS4. (A MS4 is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body which is designed or used for collecting or conveying storm water.)

If the facility discharges storm water directly to receiving water(s), enter the name of the receiving water.

If you are filing as a co-permittee and a storm water general permit number has been issued, enter that number in the space provided.

Indicate whether or not the owner or operator of the facility has existing quantitative data that represent the characteristics and concentration of pollutants in storm water discharges.

Indicate whether the facility is required to submit monthly data by entering one of the following:

1 Not required to submit monitoring date;
2 Required to submit monitoring data;
3 Not required to submit monitoring data; submitting certification for monitoring exclusion.

Those facilities that must submit monitoring data (e.g. choice 2) are Section 313 EPCRA facilities; primary metal industries, land disposal units/incinerators/BIFs; wood treatment facilities, facilities with coal pile runoff, and battery reclaimers

List, in decreasing order of significance, up to four 4-digit standard industrial classification (SIC) codes that best describe the principal products or services provided at the facility or site identified in Section II of this application.

For industrial activities defined in 40 CFR 122.26(b)(14)(i)-(xi) that do not have SIC codes that accurately describe the principal products produced or services provided, the following 2-character codes are to be used

HZ Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA [40 CFR 122.26(b)(14)(iv)].

LF Landfills, land application sites, and open dumps that receive or have received any industrial wastes, including those that are subject to regulation under subtitle D of RCRA [40 CFR 122.26(b)(14)(v)].

SE Steam electric power generating facilities, including coal handling sites [40 CFR 122.26(b)(14)(vii)];

TW Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage [40 CFR 122.26(b)(14)(ix)];

CO Construction activities [40 CFR 122.26(b)(14)(x)].

If the facility listed in Section II has participated in Part 1 of an approved storm water group application and a group number has been assigned, enter the group application number in the space provided.

If there are other SPDES permits presently issued for the facility or site listed in Section II, list the permit numbers. If an application for the facility has been submitted but no permit number has been assigned, enter the application number.

Section IV—Additional Information Required for Construction Activities Only

Construction activities must complete Section IV in addition to Sections I through III. Only construction activities need to complete Section IV.

Enter the project start date and the estimated completion date for the entire development plan.

Provide an estimate of the total number of acres of the site on which soil will be disturbed (round to the nearest acre).

Indicate whether the storm water pollution prevention plan for the site is in compliance with approved state and/or local sediment and erosion plans, or storm water management plans.

Section V—Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manage of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality, state, federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may decrease or reduce the burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20490, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20603.

APPENDIX B - Filing Locations

- Notices of Intent should be sent to: Storm Water Notice of Intent, P. O. Box 1215, Newington, VA 22122;
- Notices of Termination should be sent to: Storm Water Notice of Termination, P. O. Box 1185, Newington, VA 22212
- Discharge Monitoring Reports ("DMRs") should be sent to DEC, Division of Water, 50 Wolf Road, Albany, NY 12233-3506,
- Written reports submitted in accordance with 6 NYCRR Part 595 (Chemical Bulk Storage) should be sent to DEC, Division of Spill Prevention, Response and Remediation, 50 Wolf Road, Albany, NY 12233-3520.

All other reports and submittals required by this permit, including individual SPDES applications, should be submitted in accordance with the table below.

The filing location depends on the county in which the discharge is located. To determine the mailing address for the proper Filing Location, find the county in which the discharge is located in the table below. Use the letter in the "KEY" column to the right of the county name to find the proper mailing address in the list at the right.

Discharge Location - County	NYSDEC Region	KEY	Discharge Location - County	NYSDEC Region	KEY
Albany	4	F	Ontario	8	N
Allegany	9	O	Orange	3	E
Broome	7	L	Orleans	8	N
Cattaraugus	9	O	Oswego	7	L
Cayuga	7	L	Otsego	4	G
Chautauqua	9	O	Putnam	3	E
Chemung	8	N	Rensselaer	4	F
Chenango	7	L	Rockland	3	E
Clinton	5	H	St. Lawrence	6	J
Columbia	4	F	Saratoga	5	I
Cortland	7	L	Schenectady	4	F
Delaware	4	G	Schoharie	4	G
Dutchess	3	E	Schuyler	8	N
Erie	9	O	Seneca	8	N
Essex	5	H	Steuben	8	N
Franklin	5	H	Suffolk	1	A
Fulton	5	I	Sullivan	3	E
Genesee	8	N	Tioga	7	L
Greene	4	F	Tompkins	7	L
Hamilton	5	H	Ulster	3	E
Herkimer	6	K	Warren	5	I
Jefferson	6	J	Washington	5	I
Lewis	6	J	Wayne	8	N
Livingston	8	N	Westchester	3	E
Madison	7	L	Wyoming	9	O
Monroe	8	N	Yates	8	N
Montgomery	4	F	Bronx	2	D
Nassau	1	A	Kings	2	D
Niagara	9	O	New York	2	D
Oneida	6	K	Queens	2	D
Onondaga	7	L	Richmond	2	D

KEY	
A	NYSDEC REGION 1, Bldg. 40 SUNY Stony Brook, NY 11794; Phone: (516) 751-7900
D	NYSDEC REGION 2, One Hunters Point Plaza, 47-40 21st St, Long Island City, NY 11101; Phone: (718) 482-4851
E	NYSDEC REGION 3, 21 South Putt Corners Rd., New Paltz, NY 12561; Phone: (914) 255-5453
F	NYSDEC REGION 4, 2176 Guilderland Ave., Schenectady, NY 12306; Phone: (518) 382-0680
G	NYSDEC REGION 4 SUB-OFFICE, Route 10, Jefferson Road, Stamford, NY 12167; Phone: (607) 652-7364
H	NYSDEC REGION 5, Route 86, Ray Brook, NY 12977; Phone: (518) 891-1370
I	NYSDEC REGION 5 SUB-OFFICE, Hudson St., Warrensburg, NY 12885; Phone: (518) 623-3671
J	NYSDEC REGION 6, State Office Bldg.,317 Washington St., Watertown, NY 13601; Phone: (315) 785-2245
K	NYSDEC REGION 6 SUB-OFFICE, State Office Building., 207 Genesee St., Utica NY 13501-2885; Phone: (315) 793-2554
L	NYSDEC REGION 7, 615 Erie Boulevard West, Syracuse, NY 13204; Phone: (315) 426-7400
N	NYSDEC REGION 8, 6274 East Avon-Lima Rd., Avon, NY 14414; Phone: (716) 226-2466
O	NYSDEC REGION 9, 270 Michigan Ave., Buffalo, NY 14203; Phone: (716) 851-7000

Mail individual SPDES permit applications to "Division of Regulatory Affairs"

Please See Instructions Before Completing This Form

SPDES FORM

DEC

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-3505

Notice of Termination (NOT) for Coverage Under the SPDES General Permit for Storm Water Discharges Associated with Industrial Activity

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with industrial activity under the SPDES program. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

I. Permit Information

NPDES Storm Water General Permit Number: [ ]

Check Here if You are No Longer the Operator of the Facility: [ ]

Check Here if the Storm Water Discharge is Being Terminated: [ ]

II. Facility Operator Information

Name: [ ] Phone: [ ]

Address: [ ]

City: [ ] State: [ ] ZIP Code: [ ]

III. Facility/Site Location Information

Name: [ ]

Address: [ ]

City: [ ] State: [ ] ZIP Code: [ ]

Latitude: [ ] Longitude: [ ] Quarter: [ ] Section: [ ] Township: [ ] Range: [ ]

IV. Certification:

I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by a NPDES general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

Print Name: [ ] Date: [ ]

Signature: ____________________

Instructions For Completing Notice of Termination (NOT) Form

Who Should File A Notice of Termination (NOT) Form

Permittees who are presently covered under the New York State issued State Pollutant Discharge Elimination System (SPDES) General Permit for Storm Water Associated with Industrial Activity should submit a Notice of Termination (NOT) form when their facilities no longer have any storm water discharges associated with industrial activity as defined in the storm water regulations at 40 CFR 122.26(b)(14), or when they are no longer the operator of the facilities. Failure to file a Notice of Termination will result in the continued obligation to pay a yearly Regulatory Fee.

For construction activities, elimination of all storm water discharges associated with industrial activity occurs when disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activity from the construction site that are authorized by a SPDES general permit have otherwise been eliminated. Final stabilization means that all soil-disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

Where to File NOT Form

New York State is using EPA's information management system. Therefore, NOTs must be sent to the following address:

Storm Water Notice of Termination
Box 1185
Newington, VA 22122

Completing the Form

Type or print, using upper-case letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only spaces for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, call the EPA Storm Water Hotline at (703) 821-4823.

SEE REVERSE SIDE OF THIS FORM FOR FURTHER INSTRUCTIONS

91-19-13 (9/92)—10g

Instructions—NYSDEC Form 91-19-13(9/92)
Notice of Termination (NOT) of Coverage Under The SPDES General Permit for Storm Water Discharges Associated With Industrial Activity

Section I Permit Information

Enter the existing SPDES Storm Water General Permit number assigned to the facility or site identified in Section III. If you do not know the permit number, contact the EPA Storm Water Hotline at (703) 821-4823.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box.

If there has been a change of operator and you are no longer the operator of the facility or site identified in Section III, check the corresponding box.

If all storm water discharges at the facility or site identified in Section III have been terminated, check the corresponding box.

Section II Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity which controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Section III Facility/Site Location Information

Enter the facility's or site's official or legal name and complete address, including city, state and ZIP code. If the facility lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Section IV Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (I) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (II) the manage of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality, state, federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may decrease or reduce the burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20490, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20603.

APPENDIX D
STORMWATER MANAGEMENT GUIDELINES FOR NEW DEVELOPMENT

I. BACKGROUND

Stormwater runoff from developing areas can lead to off-site problems including flooding and erosion and water quality degradation. By changing land cover on developed sites, there can be reduced infiltration into the soil, decreased interception of precipitation by vegetation, and changes in the timing of runoff. Large runoff volumes and high rates of discharge from these sites can cause flooding and erosion if not properly controlled and conveyed from the sites. Additionally, pollutants, such as sediment, oil, grease, metals and nutrients, can be washed off impervious areas during storm events and be transported to lakes and streams and may contribute to water quality degradation. This is reflected in the Nonpoint Source Assessment Report published by NYS DEC in February 1989.

To minimize the effects of development, ideally the quantity and quality of stormwater runoff that reaches surface waters during and after development should not be altered from pre-development conditions. A variety of structural and non-structural measures -- for example, detention ponds, recharge basins, infiltration pits and trenches, diversion ditches, storage terraces and vegetative swales and other vegetative measures including artificial wetlands -- may be used to control and alleviate the adverse impacts of stormwater runoff.

The following guidelines, which include guidance for siting, sizing, and design of stormwater management measures, may be considered in the preparation and review of stormwater management plans to ensure that runoff during and after development is not substantially altered from pre-development conditions. Of course, such preparation and review should proceed on a case-by-case basis, attendant to the facts and circumstances surrounding the particular project involved.

Generally, appropriate stormwater management plans will achieve the following water and natural resource management objectives:

- reduce the rate of runoff from new land development to prevent increases in flooding and flood damage;
- reduce the erosion potential from a development or construction project; assure the adequacy of existing and proposed culverts and bridges; increase water recharge into the ground; decrease nonpoint source pollution and water quality degradation;
- maintain stream channels for their biological functions as well as for drainage through reduced streambank erosion;
- increase opportunities for preserving open space through stream corridor and flood plain protection; and
- increase recreational opportunities through the multiple use of stormwater management facilities.

II. GUIDANCE

The attached guidelines were developed as an aid to persons preparing and reviewing stormwater management plans. They provide guidance on sound management practices, but are not fixed and inflexible rules to be applied in reviewing stormwater management plans without considering the particular facts and circumstances of a particular project. Local conditions, for example the protection of a sensitive lake or trout stream from the influence of urbanization, may indicate the need for additional control measures.

It should be noted that some communities may have duly adopted stormwater management requirements, and that they should be consulted and complied with. For example, special regulations for controlling stormwater runoff in the Lake George Park are being promulgated under Article 43-0112 of the Environmental Conservation Law and watershed rules and regulations for certain water supply watersheds have been adopted.

STORMWATER MANAGEMENT GUIDELINES FOR NEW DEVELOPMENT

1. DEFINITIONS

Baseflow – The portion of stream flow that is not due to storm runoff, is supported by groundwater discharge into a channel.

Conditional negative declaration – A negative declaration may be issued by a lead agency for an unlisted action (under SEQR), in which the action as initially proposed may result in one or more significant adverse environmental effects; however mitigation measures will modify the proposed action so that no significant adverse environmental impacts will result (6 NYCRR 617.6(h)).

Drywell – Similar to infiltration trench but smaller with inflow from pipe; commonly covered with soil and used for drainage areas of less than 1 acre such as roadside inlets and rooftop runoff.

EIS – An Environmental Impact Statement.

Extended detention – A practice designed to store stormwater run–off by collection as a temporary pool of water, usually having at least a 24 hour residence time. A practice which is used to control peak discharge rates, and which provides gravity settling of pollutants.

First flush – The delivery of a disproportionately large load of pollutants during the early part of storms due to the rapid runoff of accumulated pollutants. The first flush in these guidelines is defined as one–half inch of runoff per acre of land which has been made more impervious from pre–development (natural) conditions through land clearing, land grading and construction/development activities.

Flood plain – For a given flood event, that area of land adjoining a continuous watercourse which has been covered temporarily by water.

Forebay – An extra storage area or treatment area, such as a sediment pond or created wetland, near an inlet of a stormwater management facility to trap incoming sediments or take up nutrients before they reach a retention or extended detention pond.

HEC–2 – U.S. Army Corp of Engineers Computer Program 723–X6–L202A intended for calculating water surface profiles for steady or gradually varied flow in natural or man–made channels.

Impervious area – Impermeable surfaces, such as pavement or rooftops, which prevent the infiltration of water into the soil.

Infiltration – A practice designed to promote the recharge of groundwater by containment and concentration of stormwater in porous soils.

Infiltration basin – An impoundment made by excavation or embankment construction; commonly serves a drainage area of 5 to 50 acres; usually closer to 50.

Outfall – The terminus of a storm drain where the contents are released.

Peak flow – The maximum instantaneous flow of water during a storm, usually in reference to a specific design storm event.

Peak flow attenuation – The reduction of the peak discharge of storm runoff by storage and gradual release of that storage.

Retention – A practice designed to store stormwater run–off by collection as a permanent pool of water without release except by means of evaporation, infiltration, or attenuated release when runoff volume exceeds the permanent storage capacity of the permanent pool.

Riparian area – A relatively narrow strip of land that borders a stream or river.

Riprap – A combination of large stone, cobbles and boulders used to line channels, stabilize stream banks, reduce runoff velocities, or filter out sediment.

Riser – A vertical pipe extending from the bottom of a pond that is used to control the discharge rate from the pond for a specified design storm.

Sand attenuating filter – A chamber open to the surface containing a surface layer of sand over a high void aggregate base; these are innovative but apparently effective practices for atypical situations such as where a site is unsuitable for stormwater infiltration or retention.

SEQR – An acronym for the State Environmental Quality Review Act; Article 8 of the Environmental Conservation Law.

Sheetflow – Runoff which flows over the ground surface as a thin, even layer, not concentrated in a channel.

Special flood hazard area – an area in a community that has been identified as susceptible to a 1% or greater chance of flooding in any given year. A 1% probability flood also is known as the 100–year flood.

SPDES – An acronym for the State Pollutant Discharge Elimination System; A regulatory/permit program administered under Article 17 of the Environmental Conservation Law, by the NYS Department of Environmental Conservation to control point source discharges of water pollution.

Storm frequency – The average frequency of occurrence of events having a given volume and duration. For example: a 2–year; 10–year; or 100–year storm.

Storm drain – Any open or closed conduit designed to convey stormwater.

Storm duration – The length of time over which a precipitation event occurs (e.g., 24–hours).

Storm volume – The total amount of precipitation occurring over the storm duration.

Swale – A natural depression or wide shallow ditch used to temporarily route, or filter runoff.

TR–20 – A rainfall runoff model developed by the USDA Soil Conservation Service for hydrologic analyses of a watershed under present conditions of land cover/use and structural or channel modifications using single event storm rainfall–frequency data. Output consists of peaks and/or flood hydrographs, their time of occurrence and water surface elevations at any desired cross section or structure.

2. FLOOD CONTROL GUIDELINES

The following guidelines should be used to ensure that stormwater runoff is safely conveyed through a development site during and after construction. Also through peak flow attenuation, the guidelines can be used to facilitate the control of stormwater runoff so as to minimize or alleviate flooding and stream bank erosion associated with land development and urbanization. The guidelines are as follows:

A. **Peak Flow Attenuation**

(1) The release of stormwater runoff from development should not exceed pre–development (natural) conditions. To accomplish this, stormwater runoff should be controlled so that during and after development, the site will generate no greater peak than prior to development for a 2–year, 10–year, and 100–year 24–hour storm considered individually.

- Attenuation of the 2–year storm is intended to achieve the stream channel erosion control objective.
- Attenuation of the 10–year storm is intended to assure the adequacy of existing and proposed culverts and storm drain systems.
- Attenuation of the 100–year storm is intended to reduce the rate of runoff from development to prevent expansion of the 100–year flood plain so as to alleviate flooding of improved properties and roadways.

(2) It is not necessary that peak flow attenuation requirements be satisfied only by means of detention basins. For example, infiltration trenches, dry wells, or stone reservoirs underneath paving, may be used for the purpose of attenuating peak flows for smaller storms with appropriate consideration for length of life of the stormwater facility, and feasibility of maintenance.

(3) Where dams are to be constructed for attenuating peak flows, approval may have to be obtained from DEC pursuant to Article 15–0503 of the Environmental Conservation Law.

B. **100–Year Flood Plains**

(1) At a minimum, encroachment into the special flood hazard area should be allowed only in compliance with local restrictions adopted for community participation in the National Flood Insurance Program (NFIP). A permit is required for encroachment into flood plains in Part 500 communities [1].

(2) A 50' buffer (building restriction line) should be established from the flood hazard area as a safety factor to allow for inaccuracy in the determination. Pursuant to Article 24 (ECL), a 100-foot buffer is required around a protected wetland.

(3) The stormwater management plan for all developments of 5 or more acres or containing 5 or more dwelling units located wholly or partially within a 100–year flood plain where flood elevation data are not available through the NFIP, must include a study to determine 100–year flood plain elevations in accordance with TR–20, HEC–2 or other standard engineering methods. Such elevation data shall be used to regulate flood plain encroachments in accordance with the NFIP. The 100–year flood plain elevation and the building restriction line should be shown on the plan.

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1 Part 500 community – A community for which flood insurance regulations are administered by the State of New York under 6 NYCRR 500 pursuant to Article 36 of the Environmental Conservation Law.

C. Runoff Conveyance Systems

(1) Priority should be given to maintaining natural drainage systems, including perennial and intermittent streams, swales and drainage ditches in an open condition.

(2) Where closed storm drain systems (i.e., those involving a culvert or similar conduit) are deemed essential, justification should be made as to why it is necessary to have a closed system. When justified, the closed system should be designed to:

(a) convey the 10-year storm flow within the closed storm drain system; and

(b) provide for safe overland conveyance of flow of the 100-year storm through the development (generally over the top of the closed storm drain system). All overland flow conveyance structures should be at least 1' above the 100-year flood plain elevation and the outfalls of such convenances should be stabilized with rip-rap or other suitable material to reduce erosion.

(3) Any alteration to a protected stream, a stream bed or the banks thereof, including the installation of stormwater conveyance systems will require an Article 15, Protection of Water Permit and may require an Article 24, Freshwater Wetlands Permit. When stream protection measures are mandated on a protected stream, a fisheries habitat technician should be involved with the planning and design of such measures.

(4) Any culvert or stormwater structure placed in a stream should not impede fish migration.

D. Stream Corridor Management

(1) Consistent with the State's Stream Corridor Management Program, land clearing and land grading within a stream corridor should be avoided or minimized, except at stream crossing so that stream and drainage courses remain in a natural state. [2]

(2) Care should be exercised to ensure that riparian vegetation, including grasses, shrubs and trees in the stream corridor or along the watercourse, remain undisturbed during land clearing, land grading and land development.

3. WATER QUALITY MANAGEMENT GUIDELINES

The following guidelines should be used in conjunction with the flood control guidelines to protect water quality from runoff associated with land clearing, land grading and construction activities. The guidelines should be followed by a project applicant/sponsor in preparing and implementing a stormwater management plan (SMP). The guidelines should apply to all land areas where soil permeability has been changed as a result of land clearing, land grading and land development.

A. Control of "First Flush"

Control of the "first flush" is important in stormwater management because most runoff-related water quality contaminants are transported from land, particularly impervious surfaces, during the initial stages of a storm event. For example, from 70% to 95% of the contaminants in stormwater can be removed by capturing the first flush of runoff

[2] New York State Department of Environmental Conservation, "Stream Corridor Management: A Basic Reference Manual". Albany, 1986.

through infiltration practices [3]. Regardless of whether infiltration, retention or extended detention practices are used to capture the first flush, the guideline is as follows:

> Provide for control of the first 1/2-inch of runoff from all land areas for which the perviousness has been changed over pre–development (natural) conditions due to land clearing, land grading and construction [4].

B. <u>Control of Thermal Discharges</u>

Control of thermal energy in stormwater runoff in watersheds having streams which support cold water fisheries is essential. Impervious surfaces, for example, asphalt parking areas and roofs, store large quantities of heat during hot weather in summer. The heat from such surfaces is released to stormwater through conduction during storm events. Stormwater runoff having elevated temperatures can, in turn, increase stream temperatures during storm events and adversely impact cold water fisheries. Accordingly:

> Stormwater discharges should be consistent with the thermal criteria found in Part 704 of the Water Quality Regulations, Title 6, Chapter X, New York State Codes, Rules and Regulations.

C. <u>Hierarchy of Methods for Managing Stormwater Quality</u>

The following stormwater management systems, summarized in descending order of preference, should be used to control the first flush when designing stormwater facilities. The practices are: (1) infiltration, (2) retention, and (3) extended detention. When a stream supporting a cold water fishery is the object of protection, extended detention should be placed ahead of retention in the hierarchy. A combination of these practices, including stormwater management adjuncts (number 4 in the hierarchy), may be used to achieve first flush control objectives. The project sponsor/applicant should provide justification for the rejection of practices listed as priority 1, 2, or 3.

(1) **Infiltration** - Infiltration of runoff on–site by use of vegetated depressions and buffer areas, pervious surfaces, drywells, infiltration basins and trenches permits immediate recharge of groundwater and aids quality treatment through soil filtration. This practice eliminates or minimizes direct stormwater discharges to a waterbody and provides thermal benefits to cold water fisheries.

(2) **Retention** - Retention by use of wet ponds and wetlands constructed in upland areas provides for the storage of collected runoff in a holding area prior to release in a waterway allowing quality treatment by sedimentation, flocculation, and biological removal. Retention is used when post-development runoff volume is expected to exceed the capabilities of infiltration. However, summer temperatures of water in a retention facility may exceed temperatures required to sustain a cold water fishery. Therefore, retention is not appropriate where stored (warm) water in a retention facility is displaced by storm runoff and discharged to a trout stream in contravention of Part 704 standards.

(3) **Extended Detention** - Extended detention provides for the temporary storage of collected runoff in a holding area prior to release into a waterway. Settling is the primary pollutant removal mechanism associated with extended detention. As such, the degree of removal is dependent on whether a given pollutant is in particulate or soluble form. Removal is likely

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3 Maryland Department of Natural Resources, "Minimum Water Quality Objectives and Planning Guidelines for Infiltration Practices," Water Resources Administration, Sediment and Stormwater Division, Annapolis, MD, April,1986.

4 Note that, in addition to paved surface areas and land areas connected to buildings, the contributory area for which the first 1/2-inch of runoff should be controlled includes lawn and similarly landscaped surfaces.

to be quite high if a pollutant is a particulate, whereas very limited removal can be expected for soluble pollutants.

Extended detention can provide thermal benefits to a trout stream. By using a perforated, low flow drain pipe encased in a gravel jacket having an adequate mass, extended detention may be used to dissipate heat and cool stormwater runoff prior to its discharge to a trout stream.

(4) **Stormwater Management Adjuncts** - Flow and pollutant attenuation by use of open vegetated swales, vegetated buffer zones, or filter strips, provides water quality treatment by filtration, attenuation, buffering, sedimentation, biological and removal and particle retention. These practices should be used to compliment infiltration, retention or extended detention.

4. <u>DESIGN GUIDELINES FOR CONTROLLING THE FIRST ONE-HALF INCH OF RUNOFF</u>

Following are design guidelines for controlling the first 1/2-inch of runoff from the contributory drainage.

A. <u>Infiltration</u>

(1) Infiltration systems should be designed to capture the first one-half inch of stormwater runoff from impervious surfaces, lawns and similarly landscaped areas in the development site. Stormwater volumes in excess of this amount should be managed for quantity control by supplemental practices.

(2) Infiltration systems should incorporate measures which:

a. Recognize that the recommended design time to drain stored runoff from an infiltration system depends on the specific method or practice. Accordingly, the following ponding or storage times represent the maximum design time period for the referenced facility:

TYPE	TIME (24-hour days)
Infiltration Basin	5
Infiltration Trench	15
Dry Wells	15
Porous Pavement	2
Vegetated Depression	1

b. Ensure that infiltration measures are placed at least 100' from septic systems and water supply wells.

c. Recognize that soils with infiltration rates less than .5 inches per hour are unsuitable for infiltration measures.

d. Provide for a vertical separation distance of at least 4 feet between the bottom of the infiltration system and the seasonably high groundwater table or bedrock. (The excavation of an inspection trench/pit or soil borings at the proposed site of the infiltration facilities to determine the elevation of bedrock and groundwater, and the documentation of such tests must be conducted under the direction of a professional engineer, architect, or landscape architect licensed to practice in New York State.)

e. Trap excess loads of sediment, grease, oils, and settleable solids and other objectionable materials including floatable organics, materials from roadways, parking surfaces, and similar paved areas before they enter the infiltration system.

f. Route design runoff flows through an infiltration basin without scouring or eroding the basin floor and clogging the surface soil pores.

g. Route base flow (if any exists) rapidly through the basin to prevent ponding or standing water.

h. Distribute storm runoff volume evenly over the floor of the basin to maximize exfiltration rates.

   i. Provide for safe emergency overflow with measures to provide a non–erosive velocity or flow along its length and at the outfall.

In addition to the above;

j. Infiltration systems should not receive runoff until the entire contributory drainage area to the infiltration system is permanently stabilized.

k. Placement of infiltration facilities in areas which have been filled is unacceptable. Compacted fill material loses permeability and the in situ/fill material interface may cause slope failure due to slippage.

l. If on–site septic systems are to be used, soils must be able to accommodate loading from both on–site infiltration facilities and on–site septic systems.

B. Retention

(1) **Retention (Wet) Ponds**

a. Retention is the preferred method of stormwater management when the water table or bedrock is too high for infiltration and soils are poorly drained. Retention improves stormwater quality by gravity settling, naturally occurring chemical flocculation, and biological uptake.

b. Wet ponds (another term for retention pond) should not be constructed by impounding existing wetlands unless authorized by the DEC under Article 24 Freshwater Wetlands Act. If existing wetlands are to be located in an anticipated permanent pool area, the maximum normal pool elevation should not increase mean water depth in the wetland area.

c. Retention ponds should be enhanced with areas of shallow water habitat for additional water quality benefits. Retention ponds also can be part of a created shallow water wetland design, (see use of wetlands for stormwater management).

d. Retention ponds (other than shallow marshes addressed later) should be designed as follows:

   i. pond geometry should provide for complete mixing of inflow before discharging.

   ii. in larger ponds, diversion barriers such as small islands should be used to increase effective length of flow and permit maximum mixing.

iii. the depth of the pond will vary depending on its intended use. The pond contour should include:

- an average pond depth of 3–6 feet;
- a shallow area 0.5' to 2' deep at the inlet;
- a littoral area or bench 10 feet in width along the perimeter to promote marsh habitat for filtering and nutrient removal; and
- an area 8' to 14' in depth to promote gravity settling and fish habitat.

iv. the minimum drainage area to be served by a wet (retention) pond should be approximately 10 acres. Soils should have infiltration rates less than 0.5 inches/hour.

v. if soils are so porous that an unreasonably large drainage area is required to sustain a relatively small pond, then infiltration practices should be used.

vi. the residence time of pond water should be 24 to 40 hours to remove a minimum of two–thirds of the suspended solids and other pollutants from the incoming stormwater. For removal of phosphorus compounds in lake watersheds where eutrophication is a threat or problem, larger volume ponds should be designed to provide a 14–day residence time.

vii. retention ponds should accommodate up to 10–year storm volumes. The minimum volume retained should be that associated with the first one–half inch of runoff. Excess volumes, for example, the 100–year storm, may be detained.

viii. velocity dissipation devices should be placed at the outfall of all retention structures and along the length of any outfall channel as necessary to provide a non–erosive velocity of flow from the structure to water course. Velocity dissipation devices may be required in stream channels at outfall locations to prevent erosion and fisheries habitat degradation. Pursuant to Article 15 (ECL), a Protection of Waters Permit may have to be obtained in order to install in–stream velocity dissipation devices in protected streams.

ix. the construction of wet (retention) ponds in and around class AA, A, B, C(T) and (TS) streams (water suitable for trout) may not be appropriate to protect these waters and should not be permitted except where, pursuant to 6 NYCRR Part 704 of the Water Quality Regulations, Title 6, Chapter X, retention will not be injurious to cold water fisheries or their habitat. This practice may elevate water temperatures as well as reduce dissolved oxygen levels.

x. pursuant to Article 15–0503 of the Environmental Conservation Law, approval for construction of a dam for a stormwater retention facility may have to be obtained from DEC.

(2) Use of Wetlands in Stormwater Management

The use of wetlands for stormwater management is receiving increased attention. Wetlands are known to provide water quality benefits by filtering and trapping suspended solids including sediment, chemical adsorption, biological assimilation, microbial decomposition and chemical decomposition.

a. **Use of Existing Wetlands** - It is generally not acceptable to discharge untreated stormwater directly into naturally existing wetlands. Direct, untreated discharges may overload the natural system, and make it impractical to manage (e.g., by periodic sediment removal) resulting in contamination of the wetland and accelerated succession. Direct discharges also may alter the hydrology and hydroperiod of the wetland, which may significantly alter the vegetative community therein.

However, incorporating an existing wetland in its natural state into a well–designed stormwater management plan may be an acceptable method of stormwater management when adverse impacts to the wetland can be avoided. Natural wetlands should be used only for final polishing after pre–treatment by preliminary practices, such as infiltration, retention or extended detention. In these situations, ultimate discharge to the natural wetland may maintain base flow into the system, thereby helping to maintain the health of the wetland.

Except as provided for in section B. (1) b.,natural wetlands should not be impounded for the creation of either wet or dry ponds.

b. **Use of Artificially Created Wetlands** - Wetlands may be created as part of a stormwater management plan to provide water quality improvement. They may enhance treatment provided by wet ponds and create extended detention areas by enlarging the wetland portions of existing basins.

A created wetland also can provide first–flush treatment when one or more smaller ponds are included. Such a design would be essential if no other pre–treatment practices are used. In the winter when vegetative uptake mechanisms are absent, a pond in the wetland retains higher levels of nitrogen compounds which would otherwise escape downstream.

c. **Factors for Consideration in Designing Created Wetlands** -

i. <u>Location</u> -- the preferred locations are: upland areas adjacent to, but separated from, existing streams and wetlands by vegetated filter

strips wide enough to provide a buffer; in an upland extended detention basin; or as a forebay to a wet pond or detention basin.

ii. <u>Hydraulic design</u> -- specific stormwater management plan criteria must be determined for each site to ensure the created wetland is sufficient to meet the demands being place on it and to determine hydrologic impacts to receiving wetlands, if any.

iii. <u>Expected inflows</u> -- inflows may be composed of stormwater surface water or groundwater. Stormwater should be introduced to wetlands as sheet flow whenever possible. If inflow is conveyed through the outfall, a forebay is necessary. Incoming velocities should not exceed 4 fps during two–year storm events.

iv. Shape and depth -- shallow ponds do not have as long a residence time as deeper ponds. Therefore, caution should be used in substituting deep ponds with shallow marshes. However, the water quality values provided by the substrate, biota and vegetation in wetlands may provide services not provided by deeper ponds. It is important to determine what water quality improvement is needed and whether ponds or wetlands better serve that need.

When creating wetlands, 75% of the wetland should be 18 inches or shallower. Twenty-five percent of the total surface area should be reserved for open water areas that are deeper than 18 inches. However, if the water exits the wetland through an outlet structure, the outlet should be located in water approximately 3 feet deep. Similarly, if a forebay is used, it should be at least 3 feet deep and comprise 10% of the total wetland and pond volume.

v. Vegetative composition -- the plant species selected should be compatible with the physical nature of the wetland (e.g., depth), the climate conditions of the area, and their tolerance to the presence of pollutants. A planting scheme and schedule should be incorporated into the stormwater management plan.

C. Extended Detention

(1) Extended detention ponds may be used to enhance water quality in stormwater runoff. Extending the detention time of dry or wet ponds is an effective, low cost means of removing particulate pollutants and controlling increases in downstream bank erosion. Extended detention is preferred over retention where there is a need to maintain stream temperatures in support of a trout fishery pursuant to the thermal criteria found in Part 704 of the Water Quality Regulations, Title 6, Chapter X.

(2) When extended detention ponds are used, they may be acceptable with the following conditions:

a. The "first-flush" runoff volume (i.e., the first one-half inch of runoff from the contributory drainage) should be extended over a 24-hour detention period.

b. Stormwater runoff volume generated from a one-inch storm should be released over a 24-hour detention period. The control device should be adjusted so that smaller runoff events (0.1 to 0.2 inches), which normally pass through the pond quickly, are detained for at least a minimum of six hours. In larger watersheds, up to 40 hours of extended detention may be needed for streambank erosion control.

c. Pond outfall velocities should not exceed 4 fps during 2-year storm events.

d. Velocity dissipation devices should be placed at the outfall of all extended detention structures and along the length of any outfall length channel as necessary to provide a non-erosive velocity of flow from the structure to a water course. Velocity dissipation devices may be required in stream channels at outfall locations to prevent erosion and fisheries habitat degradation. Pursuant to Article 15 (ECL), a Protection of Waters Permit may have to be obtained in order to install in-stream velocity dissipation devices in protected streams.

e. Pursuant to Article 15–0503 of the Environmental Conservation Law, approval for construction of a dam for a stormwater detention facility may have to be obtained from DEC.

D. Stormwater Management Adjuncts

Generally, relatively small volumes of stormwater (i.e., drainage from less than 1 acre or relatively small storms) can be managed entirely by flow and pollution attenuation practices including vegetative swales, filter strips, and water quality inlets. These practices usually are used to supplement other practices such as those described above; therefore, they are referred to herein as stormwater management adjuncts. Where vegetative swales and filter strips will be used, stormwater should to the extent possible be managed as sheetflow and have velocities less than 4 fps during 2–year storm events. The following design criteria should be considered when swales, filter strips and water quality inlets are used to control stormwater runoff.

(1) **Vegetative swales** [5] - Vegetative swales typically are applied in single family residential developments and highway medians as an alternative to curb and gutter drainage systems. When individual lots are greater than 0.5 acre, open section roadways with vegetated swales and check dams are preferred over curb and gutter management systems for stormwater conveyance. In designing and constructing swales:

a. small slopes in the flow of swales should be graded as close to zero as drainage will permit. Side–slopes of swales should be no greater than 3:1.

b. a dense cover of water tolerant, erosion resistant grass must be established. Reed canary grass is recommended for this purpose. Swale grasses should not be mowed close to the ground, as this impedes the filtering and hydraulic functions of the swale. Also, if a swale is adjacent to a roadway, sensitive species with a low salt tolerance (e.g., bluegrass) should be avoided.

c. underlying soils should have a percolation rate of at least 0.5 inches per hour.

d. the swale should be tilled before the grass cover is established to restore infiltration capacity lost as a result of prior construction activities.

e. Check dams can be installed in swales to promote additional infiltration. A preferred method is to sink a railroad tie halfway into the swale, and place stones on the downstream side to prevent a scour hole from forming. If a check dam is used, the designer should make sure that the maximum ponding time of runoff backed up behind the check dam does not exceed 24 hours.

(2) **Filter Strips** [6] - Filter strips do not provide enough storage or infiltration to effectively reduce peak discharges to pre-development levels for design storms. Filter strips are however, viewed as one component of an integrated stormwater management system.

a. The top edge of the filter strip should follow across the same elevational contour. If a section on the top edge of the strips dips below the contour, it is likely that runoff will eventually form a channel toward the low spot.

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5 Adopted from: Schueler, T.R. "Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs", Department of Environmental Programs, Metropolitan Washington Council of Governments, Washington, D.C. July, 1987.

6 Ibid.

b. A shallow stone trench which follows the contour can be used as level spreader at the top of the strip to distribute flow evenly. This also can serve to protect the strip from anthropogenic damage.

c. The top edge of the filter strip should directly abut the contributing impervious area. Otherwise, runoff may travel along the top of the filter strip rather than through it. Berms can be placed at 50–100 foot intervals perpendicular to the top edge of the filter strip to prevent runoff from by–passing the strip.

d. As an absolute minimum, a grass strip should be at least 20 feet wide. Improved performance can be achieved if the strip is 50–75 feet wide, plus an additional four feet wide per each one percent of slope at the site (particularly if it is a forested strip).

e. Wooded filter strips are preferred to grassed strips. If an existing wooded belt cannot be preserved at the project site, the grassed strip should be managed to gradually become wooded by intentional plantings.

f. If a filter strip has been used as a sediment control measure during the construction phase, it is advisable to regrade and reseed the top edge of the strip. Otherwise, the sediment trapped in the filter strip may affect the flow patterns across the strip, thereby reducing its effectiveness.

(3) **Water Quality Inlets (oil/grit separators)** - The primary function of a water quality inlet (also known as an oil/grit separator) is to remove sediment and hydrocarbon loadings from impervious surfaces such as parking lots less than one acre in size before runoff reaches an infiltration basin or other stormwater management facility. If contaminants such as sediment and oil or other petroleum–based products found on parking lots and street surfaces are not removed, they will clog soil pores and prevent infiltration of runoff in the soil in infiltration basins or trenches.

A water quality inlet usually is designed as an underground, reinforced concrete vault consisting of three chambers: a sediment/grit removal chamber, an oil separation chamber and an outlet chamber. Owing to their limited capacity, water quality inlets store only a small fraction of the 2–year design storm volume. Therefore, they play no role in attenuating the post–development peak discharge rate. Furthermore, since runoff rapidly flows through an inlet, only moderate removal of coarse sediment, oil/grease, and debris can be expected, while removal of fine–grained particulate pollutants such as silt and clay will be more limited. Water quality inlets have little effect on removing soluble pollutants such as phosphorus. <u>It is to be noted that a State Pollutant Discharge Elimination System (SPDES) Permit may be needed for parking lots or impervious storage areas associated with industrial and commercial activities.</u>

a. oil/grit separators generally should be designed for areas less than one acre in size.

b. the depth of the permanent pool in each chamber should be at least 4 feet, and there should be at least 400 cubic feet of wet storage in the chambers for each impervious acre in the contributory drainage.

c. the first chamber should be designed for grit and sediment removal. The first and second chamber should be separated by a trash rack to prevent clogging orifices between the two chambers.

d. the second chamber should be designed for separation of oil and other hydrocarbons from runoff. Separation can be achieved by installing an inverted pipe with a 90° elbow in the baffle or wall that separates the second from third chamber.

e. the grit/oil separator should be equipped with manholes to facilitate cleanout and maintenance.

5. REFERENCES

The basic design criteria, methodologies and construction specifications for stormwater management should be those of the Soil Conservation Service, the Soil and Water Conservation Society, the Department of Environmental Conservation, and the Metropolitan Council of Governments which may be found in the most current edition of the following publications and their subsequent revisions:

A. Empire State Chapter, Soil and Water Conservation Society, New York Guidelines for Urban Erosion and Sediment Control, Syracuse, 1988.

B. Soil Conservation Service. "Urban Hydrology for Small Watersheds", Technical Release No., 55. June 1986.

C. Soil Conservation Service. "Engineering Field Manual", latest edition, as applicable.

E. "Soil Conservation Service Standards and Specifications for Ponds." Specifications No, 378. July 1981. (This document allows for use of metal pipe risers. Steel structures may corrode in 20 years or less. Therefore, use materials other than steel, especially in aggressive environments.)

F. U.S. Department of Agriculture, Soil Conservation Service, Ponds-Planning Design, Construction. Agriculture Handbook No. 590. 1982.

G. New York State Department of Environmental Conservation, "Guidelines for Design of Dams", Revised January 1988.

H. New York State Department of Environmental Conservation, "An Owners Guidance Manual for the Inspection and Maintenance of Dams in New York State". June 1987.

I. New York State Department of Environmental Conservation. "Stream Corridor Management: A Basic Reference Manual." Albany, 1986

J. Metropolitan Washington Council of Governments, Controlling Urban Runoff-A Practical Manual for Planning and Designing Urban BMPs. July 1987.

NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
STORMWATER MANAGEMENT
SELF–ASSESSMENT CHECKLIST

File No.: ______________________ Date Initiated: ______________

Project Name: ____

Location: ____
(Address)

____
(County Region

Applicant: ____
(Last Name) (First Name) (MI)

FLOOD CONTROL

A. Peak Flow Attenuation

- The pre–development peak discharge rates from the project site are:

  2–year storm ________ cfs
  10–year storm ________ cfs
  100–year storm ________ cfs

- The post–development peak discharge rates from the project site are:

  2–year storm ________ cfs
  10–year storm ________ cfs
  100–year storm ________ cfs

- A dam(s) ______________________ (will/will not) be constructed for attenuating peak flows. If a dam is to be constructed, a permit for Dam Construction will/will not), pursuant to Article 15–0503 of the Conservation Law, be required.

- The proposed development project ______________________ (is/is not) in compliance with local restrictions adopted pursuant to the National Flood Insurance Program.

- All closed stormwater drainage systems on the project site are, at a minimum, designed to convey the __________________-year storm while providing for the __________________- year storm through the development.

- The proposed project ________________________(is/is not) in compliance with all provisions of Article 15 (Protection of Waters Act), Article 24 (Freshwater Wetlands Act), and Article 25 (Tidal Wetlands Act) of the Environmental Conservation Law.

WATER QUALITY MANAGEMENT

The Stormwater Management Facilities ________________________ (have, don't have) water quality improvement features.

If they do, what management facilities are included

Infiltration ____________________________

Retention ____________________________

Extended Detention ____________________________

Is the first 1/2 inch of runoff from the altered land area being treated?

_______ (Yes) _______ (No)

If not, how much runoff will be captured and treated?

____

If the proposed stormwater facilities do not provide for water quality management, or if less than the first 1/2 inch is managed, explain why:

____
____
____
____
____
____

The classification of the waters which receive the stormwater is

____

The thermal criteria contained in 6 NYCRR Part 704 ________________________ (will/will not) be met.

____
(Signature)

____
(License No.)

APPENDIX E
EROSION AND SEDIMENT CONTROL GUIDELINES

I. BACKGROUND

Sediment in runoff from construction sites can have a significant effect on the quality of downstream waters. Construction sites have also been identified as a significant source category in the State Nonpoint Source Assessment Report.

The potential effects of increased sediment are varied:

> Sediment may destroy fish habitat through blanketing of fish spawning and feeding areas and elimination of certain food organisms, directly impact fish through gill abrasion and fin rot, and reduce sunlight penetration, thereby impairing photosynthesis of aquatic plants. Suspended sediment decreases recreational values, reduces fishery habitat, adds to the mechanical wear of water supply pumps and distribution systems, and adds to treatment costs for water supplies. Nutrients and toxic substances attached to sediment particles are transported to waterbodies and may enter aquatic food chains, cause fish toxicity problems, contribute to algal blooms, impair recreational uses, and degrade the water as a drinking water source. [1]

The following guidelines are designed for consideration by both government officials and project sponsors in the preparation and review of erosion and sediment control plans for a land development project. If implemented properly, the guidelines herein will assist in achieving the following water and natural resource management objectives.

- reduce the erosion potential from a development or construction project;
- decrease nonpoint source pollution and water quality degradation;
- maintain stream channels for their biological functions, as well as for drainage, through reduced sediment deposition.

II. GUIDANCE

The attached guidelines were developed to aid persons in preparing and reviewing erosion and sediment control plans. They provide guidance on sound management practices, but are not fixed and inflexible rules to be applied in reviewing erosion control plans without considering the particular facts and circumstances of a particular project.

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[1] Nonpoint Source Management Program. January, 1990.

EROSION AND SEDIMENT CONTROL GUIDELINES
FOR NEW DEVELOPMENT

A. Existing vegetation on a project site should be retained and protected as much as possible to minimize soil loss on a project site and to minimize erosion control costs.

B. Sediment control practices/measures, where necessary, should be designed to protect the natural character of rivers, streams, lakes, coastal waters or other waterbodies on–site and minimize erosion and sedimentation off-site from the start of land disturbance activities to establishment of permanent stabilization.

1. The off-site impacts of erosion and sedimentation related to land clearing, grading and construction activities should not be any greater during and following land disturbance activities than under pre–development conditions.

2. Pursuant to Part 700 et seq. of Title 6, Chapter X of NYCRR:

a. toxic and other deleterious substances shall not be discharged in amounts that will adversely affect the taste, color or odor thereof, or impair the waters of the state for their best (classified) usages,

b. suspended, colloidal and settleable solids shall not be discharged in amounts that causes substantial visible contrast to natural conditions, or causes deposition or impairs the waters for their best (classified) usages.

This means that stream reaches on-site and downstream of construction areas should not have substantial visible contrast relative to color, taste, odor, turbidity and sediment deposition from the reaches upstream of the construction area. Impacts such as these which result from construction or developmental activities are a violation of Part 700 water quality standards and may be subject to enforcement actions.

C. Erosion and sediment control measures should be constructed in accordance with an erosion and sediment control plan. The plan should:

1. describe the temporary and permanent structural and vegetative measures that will be used to control erosion and sedimentation for each stage of the project from land clearing to the finished stage.

2. provide a map showing the location of erosion and sediment control measures.

3. provide dimensional details of proposed erosion and sediment control facilities as well as calculations used in the siting and sizing sediment basins. (Guidance for performing calculations can be obtained in the reference cited in Section E.8.)

4. identify temporary erosion and sediment control facilities which will be converted to permanent stormwater management facilities.

5. provide an implementation schedule for staging temporary and permanent erosion and sediment control facilities.

6. provide a maintenance schedule for soil erosion and sediment control facilities and describe maintenance activities to be performed.

D. Erosion and sediment control measures should be constructed prior to beginning any other land disturbances. The devices should not be removed until the disturbed land areas are stabilized.

E. Specify guidance.

1. Exposure Restrictions: No more than 5 acres of unprotected soil should be exposed at any one time. Previous earthwork should be stabilized in accord with approved design standards and specifications referenced in Section E.8 before additional area is exposed. (Site factors including topography, soil erosion potential, proximity to wetlands and water courses may require limiting the amount of raw earth that can be exposed at any one time to less than 5 acres.)

2. Grading: Perimeter grading should blend with adjoining properties.

3. Vegetative Protection: Where protection of trees and/or other vegetation is required, the location of the site to be protected should be shown on the erosion control plan. The method of protecting vegetation during construction should conform to the design criteria referenced in Section E.8.

4. Drainage control.

   a. Surface runoff that is relatively clean and sediment free should be diverted or otherwise prevented from flowing through areas of construction activity on the project site. This will greatly reduce sediment loading in surface runoff.

   b. A fill associated with an approved temporary sediment control structure or permanent stormwater management structure, should not be created which causes water to pond off–site on adjacent property, without first having obtained ownership or permanent easement for such use from the owner of the off–site or adjacent property.

   c. Natural drainage channels should not be altered or relocated without the proper approvals. Pursuant to Article 15 of the Environmental Conservation Law, a protected stream and the bed and banks thereof should not be altered or relocated without the approval of the Department of Environmental Conservation. [2]

   d. Runoff from any land disturbing activity should not be discharged or have the potential to be discharged off-site or into storm drains or into watercourses unless such discharge is directed through a properly designed, installed and maintained structure, such as a sediment trap, to retain sediment on-site. Accumulated sediment should be removed when 60% of the storage capacity of the sediment retention structure is filled with sediment.

   e. For finished grading, adequate gradients should be provided so as to prevent water from standing on the surface of lawns for more than 24 hours after the end of a rainfall, except in a swale flow area which may drain as long as 48 hours after the end of rainfall.

   f. Permanent swales or other points of concentrated water flow should be stabilized with sod, rip–rap, paving, or covered with a approved erosion control matting as provided for in the design criteria referenced in Section E.8.

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[2] A natural drainage channel refers to a swale, water course in a gully, or a protected or unprotected stream. Natural drainage channels should not be altered or relocated on adjacent properties without first having obtained ownership or a permanent easement for the altered or relocated drainage channel from the owner of the off-site or adjacent property.

g. Surface flows over cut and fill slopes should be controlled as provided for in the design criteria for vegetating waterways referenced in Section E.8.

5. Timing.

a. Except as noted below, all sites should be seeded and stabilized with erosion control materials, such as straw mulch, jute mesh, or excelsior within 15 days of final grading. If construction has been suspended, or sections completed, areas should be seeded immediately and stabilized with erosion control materials. Maintenance should be performed as necessary to ensure continued stabilization.

i. For active construction areas such as borrow or stockpile areas, roadway improvements, and areas within 50 ft. of a building under construction, a perimeter sediment control system consisting, for example, of silt fencing or hay bales, should be installed and maintained to contain soil.

ii. On cut side of roads, ditches should be stabilized immediately with rock rip–rap or other non-erodible liners, or where appropriate, vegetative measures such as sod. When seeding is approved, an anchor mulch should be used and soil should be limed and fertilized in accord with recommendations referenced in Section E.8.

iii. Permanent seeding should optimally be undertaken in the spring from March 21 through May 20, and in late summer and early fall from August 25 to October 15. During the peak summer months and in the fall after October 15 when seeding is found to be impracticable, an appropriate mulch should be applied. Permanent seeding may be undertaken during summer if plans provide for adequate watering of the seedbed.

iv. All slopes steeper than 3:1 (h:v), as well as basin or trap embankments, and perimeter dikes should, upon completion, be immediately stabilized with sod, seed and anchored straw mulch, or other approved stabilization measures. Areas outside of the perimeter sediment control system should not be disturbed. Maintenance should be performed as necessary to ensure continued stabilization.

b. Temporary sediment trapping devices should be removed within thirty (30) calendar days following establishment of permanent stabilization in all contributory drainage areas. Stormwater management structures used temporarily for sediment control should be converted to the permanent configuration within this time period as well.

6. Stream protection.

a. The bed and banks of all on-site and off-site streams that may be impacted by land clearing, grading, and construction activities should be protected to prevent stream, river, lake or coastal sedimentation, streambank erosion, stream enlargement and degradation or loss of fisheries habitat. Measures for protecting the bed and/or banks of a stream may include; for example, gabion baskets, rip-rap, log cribbing, and vegetative measures. [3]

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[3] Whenever possible, vegetative streambank stabilization practices are recommended over structural practices such as rip-rap and gabion linings which may unnecessarily alter the existing stream ecosystem.

b. Where temporary work roads or haul roads cross stream channels, adequate waterway openings must be constructed using spans, culverts, washed rock backfill or other acceptable, clean methods that will ensure that road construction and use do not result in turbidity and sediment downstream. All stream crossing activities and appurtenances shall be in compliance with a permit issued pursuant to Article 15 of the Environmental Conservation Law, where applicable, and should be carried out in conformance with guidelines in DEC's Stream Corridor Management manual. [4]

7. Maintenance.

a. An erosion control plan for a project site should identify maintenance requirements for erosion and sediment control practices utilized, and it should provide a maintenance schedule. All erosion and sediment control measures should be inspected periodically and maintained in conformance with the schedule so as to ensure they remain in effective, operating condition until such times as they are removed.

b. All points of construction ingress and egress should be protected to prevent the deposition of materials onto traversed public thoroughfare, either by installing and maintaining a stabilized construction entrance, or by washing all vehicle wheels in a safe disposal area. All materials deposited onto public thoroughfares should be removed immediately. Proper precautions should be taken to ensure that materials deposited onto public thoroughfares are removed so that they do not enter catch basins, storm sewers, or combined sewers.

c. Accumulated sediment should be removed when 60% of the storage capacity of the retention structure is filled with sediment.

8. Design specifications.

Designs, standards and specifications for controlling erosion and sedimentation are found in the following publication and should be identified and shown in the erosion control plan:

> Empire State Chapter, Soil & Water Conservation Society, New York Guidelines for Urban Erosion and Sediment Control, Syracuse. March 1988.

[4] New York State Department of Environmental Conservation, "Stream Corridor Management: A Basic Reference Manual," Albany, 1986.

Appendix F

THE STORMWATER MANAGEMENT AND EROSION CONTROL PLAN*
(Structure and Content)

INTRODUCTION

Water quality impacts and flooding associated with land development can be mitigated by installing structural and vegetative stormwater control measures. In order to properly choose, size and site a stormwater management measure or a combination of measures for a specific project or development site, certain information must be gathered and analyzed beforehand. Such information gathering and analyses can best be accomplished within the framework of a stormwater management and erosion control plan. Such a plan should be required for all development proposals that meet applicability criteria set forth by the locality. Suggested criteria are presented in Chapter III. The purpose of this chapter is to provide local planning agencies, developers and consultants with a framework for (1) structuring a stormwater management and erosion control plan, (2) identifying the kinds of information that should be gathered, and (3) describing the kinds of analyses that should be made.

STORMWATER MANAGEMENT PLAN: STRUCTURE AND CONTENT

At a minimum, a stormwater management and erosion control plan should:

- provide background information about the scope of the project.
- provide a statement of stormwater management objectives.
- compare post-development stormwater runoff conditions with pre-development conditions.
- describe proposed structural and vegetative stormwater measures to ensure that the quantity, temporal distribution and quality of stormwater runoff during and after development is not substantially altered from pre-development conditions.
- identify the type and frequency of maintenance required by the stormwater management and erosion control facilities utilized.

Within the above context, the following outline details the structure and content of a stormwater management and erosion control plan.

I. BACKGROUND INFORMATION

A. PROJECT DESCRIPTION

1. Describe what is being proposed (i.e., residential lot subdivision, planned unit development, commercial/retail development, or industrial development).
2. Describe project size (i.e., number of acres, number of dwelling units, other buildings, and density).
3. Describe other improvements which will be made on project site, including streets and roads, utilities (water, sewer, etc.), and give particular attention to acreage of land that will become paved and covered with buildings. Lawn acreage also should be specified.

*Appendix F is a reprint of Chapter 4 of the NYS DEC April, 1992 publication entitled, Reducing the Impacts of Stormwater Runoff from New Development

4. Provide a location map.* Include watersheds in the community that may be impacted by project. Also, show highways, roads, and proximity of project to nearest city, village or hamlet, and to the nearest waterbody, and other prominent features.

5. Provide a base map containing boundary lines of the project site, sub-catchments, and contributory watersheds at a scale agreed upon by the municipality and developer. **

6. Provide an analysis of site limitations and development constraints by including such factors as slope, soil erodibility, depth to bedrock, depth to seasonal high water, soil percolation, etc., to facilitate evaluation of site suitability for proposed stormwater and erosion control facilities in relation to the overall development proposal.

7. Provide a statement describing how this project will meet stormwater management objectives established by the municipality.

8. Provide a general description of the approaches which will be taken to control erosion and sedimentation and stormwater runoff.

9. Provide a statement indicating when project is to begin and the expected date of completion.

10. Provide a map and descripiton of all critical environmental areas, conservation areas, wildlife habitats, easements, etc., to be protected. (These areas should be marked in the field.)

11. Provide an analysis of potential impacts from the proposed development to natural resource features on-site and off-site such as streams, lakes, wetlands, water supplies, coastal estuaries, etc. A determination as to whether the proposed development will affect any designated primary or principal aquifer should also be included.

B. EXISTING (PRE-DEVELOPMENT) CONDITIONS

1. Provide map showing topography (contours) under existing conditions. On this same map, show drainage patterns, including ditches, culverts, permanent streams, intermittent/ephemeral streams or drainages, wetlands, or other waterbodies, and existing roads. Indicate sizes of existing culverts. Delineate watershed and sub-watershed boundaries on the map.

2. Provide a map showing existing land use, open space, public facilities, utility lines, water supply wells on site, and predominant vegetation cover types (forested, brushland, grassland, cropland, pasture, etc.).

3. Obtain soils survey information and, by sub-catchment, provide tabular information detailing the area in acres that are in each of the Soil Conservation Service (SCS) Hydrologic Soil Groups A, B, C or D in Table 10 in Chapter III. Soils information should be obtained by conducting a site-specific soil survey.

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* Include a north arrow on all maps.

** For subdivision review purposes, maps typically have a scale ranging from 1" = 50' to 1" = 200'. Map scales in the range of 1" = = 1' to 1" = 40' are not uncommon depending on project size and amount of detail required. Maps for stormwater management planning can adopt any of the above scales. The contour interval for the maps should be two feet or an appropriate interval selected on the basis of site conditions and agreed upon by the municipality and developer.

4. Where applicable, provide a map showing designated 100-year flood plain boundaries in affected drainage basins in the community including any available 100-year flood elevations and floodways. Show culverts downstream of project and culvert size. Show existing easements for storm drains, sewers, and other utilities. Show the extent of the drainage area served by a man-made stormwater drainage network if that network system is collecting runoff from outside of the natural drainage basin and is discharging into the basin of concern.

5. Provide hydrologic data describing rainfall characteristics. This should include:

   a. Precipitation data for several return periods (i.e., the 1-year, 2-year, 10-year, and 100-year storms for a 24-hour duration).

   b. Provide stream channel survey data by sub-catchment showing channel conditions including roughness and vegetation.

C. PROPOSED FUTURE (DEVELOPMENT) CONDITIONS

1. Provide a map showing by sub-catchment, the completed project, including lot layout, approximate location of buildings, streets, and other paved surfaces, final contours, utility lines, water supply wells, individual sewage disposal systems, and location and types of easements.

2. Provide tabular information, by sub-catchment, showing the acres of impervious area created in the proposed development as well as the extent of lawn and areas where the land has been made more impervious than pre-development conditions.

3. By sub-catchment, show on a map changes to land surface, including areas of cuts and fills, changes in vegetative cover types, and final contours. Indicate by sub-catchment, land-clearing and earth moving start-up and completion dates.

4. Indicate construction schedule including estimated completion date(s) and proposed winter shutdowns.

II. COMPARISON OF PRE-DEVELOPMENT WITH POST-DEVELOPMENT RUNOFF

A. METHODOLOGIES

1. Describe or identify the methodology used to compare and evaluate pre- with post-development runoff conditions in terms of volumes, peak rates of runoff, routing, and hydrographs. (Chapter III. describes several commonly used hydrologic models for computing runoff.)

   - Peak discharge rates and total runoff volumes from the project area for existing site conditions and post-development conditions for the 2-year and 10-year, 24 hour storm events should be calculated. The relevant variables used in this determination, such as curve number and time of concentration should be included.

   - Downstream analysis of the 100-year, 24 hour event, including peak discharge rates, total runoff volumes and evaluation of impacts to receiving waters and/or wetlands should be evaluated.

- Storage volume and surface area requirements necessary to provide flood control for runoff generated during 2-year, 10-year and 100-year, 24 hour storm events should be calculated.

- Discharge provisions for the proposed control measures, including peak discharge rates, outlet design, discharge capacity for each stage, outlet channel design, and a description of the point of discharge should be provided.

- Sufficient detail should be provided to show that the stormwater facility(ies) is/are capable of withstanding the discharge from the 100-year storm event.

2. Describe or identify the methodology used to compare and evaluate pre- with post-development pollutant loading. Contaminants to be compared include total suspended solids, total phosphorus, total nitrogen, and biological oxygen demand. Pollutant loading coefficients may be used. (Chapter III. describes several commonly used models for calculating pollutant loading.)

   - Water quality treatment facilities should be designed to control the first 1/2 inch of runoff or runoff from the 1-year, 24 hour storm event, or whichever is greater.

   - The necessary storage volumes should be calculated and the proposed stormwater measure(s) should be described in detail. The plans should provide sufficient detail of the water quality control measures to ensure that the relevant design criteria will be met.

   - Specific information may include surface area dimensions, depths, inlet designs, planting specifications for use of aquatic vegetation, percent solids removal expected, discharge rates and outlet design.

B. CALCULATIONS

1. State any assumptions used in making the calculations.

2. Provide assumptions and coefficient values used in the hydrologic calculations for making above comparisons. Evaluate the post-development effect of stormwater runoff on identified flood plains or designated flood hazard areas in the community.

3. Compare pollutant loading between before and after conditions. Provide computations.

III. <u>STORMWATER MANAGEMENT</u>

A. STORMWATER MANAGEMENT FACILITIES

1. Describe in a narrative and show on a map, by sub-catchment, proposed stormwater management facilities. A soil profile to at least one foot below the stormwater management facility should be provided.

2. Provide designs of proposed structural stormwater management facilities. Pursuant to the provisions in Chapter V. for peak flow attenuation and water quality management, indicate which facilities will be used to attenuate peak flows, which will be used to enhance stormwater runoff quality, and which facilities will serve a dual role. Identify the materials to be used in constructing these facilities.

3. Calculations for sizing stormwater facilities should be provided.

4. Provide designs and calculations for siting and sizing such specialized measures and devices as filter strips, water quality inlets (oil/grit separator) forebays, etc., which will be used to remove sediment, oil-based products, and other contaminants found in urban runoff.

5. Provide an evaluation of the amount of treatment or level of pollutant reduction that can be expected from the proposed stormwater management facility(ies). Contaminants to be considered in this evaluation include total suspended solids (TSS), total phosphorus (P), total nitrogen (N), biological oxygen demand (BOD) and thermal pollution. Evaluation of the effectiveness of stormwater management practices can be based on reports on the effectiveness of comparable stormwater facilities on similar sites. Pollutant loading coefficients for total P, total N and BOD, and models for making this evaluation are identified and briefly discussed in Chapter III.

   Guidance for evaluating the level of reduction of TSS (and other pollutants attached thereto) that can be expected from selected stormwater management facilities can be found in the publication entitled "Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality".[1] Also, the BMPSOFT model and P8 Urban Catchment Model referred to in Table 14 in Chapter VI may be used to calculate the level of reduction of TSS (and other pollutants) that can be expected from selected stormwater management facilities.

6. Provide information on the design provisions that address safety considerations (e.g., gentle slopes and benches in ponds) and accommodate maintenance needs (including access to conduct maintenance operations).

B. STORMWATER CONVEYANCE SYSTEM

1. Describe in a narrative and map by sub-catchment the stormwater conveyance (drainage) system. Indicate which segments of the drainage system are open channels and which segments are piped (culverts). Provide rationale and justification for installing piped segments.

2. Provide plan view and cross-sectional designs of stormwater conveyance systems. Hydrologic calculations for siting and sizing the stormwater conveyance system should be provided. Identify materials to be used.

3. Provide plans, designs and identify materials to be used for preventing erosion in channel sections of stormwater conveyance systems. Show how erosion at culvert inlets and outfalls will be prevented.

C. RECREATIONAL AND/OR LANDSCAPE FEATURES (Optional)

1. Describe and illustrate any recreational or landscape features which are to be factored into the stormwater management system to enhance the aesthetics of the facility(ies) and provide multiple use options.

2. On the map prepared under Section I.C.1., show the location of recreational facilities.

3. Provide landscaping sketches and designs for the stormwater management facilities.

IV. EROSION AND SEDIMENT CONTROL

A. TEMPORARY EROSION AND SEDIMENT CONTROL FACILITIES
(to be used during land clearing, land grading and the construction phases)

1. Describe temporary structural facilities and vegetative measures which will be used to control erosion and sedimentation.

2. Provide a map showing, by sub-catchment, the location of temporary vegetative and structural erosion and sediment control facilities.

3. Provide dimensional details of proposed erosion and sediment control facilities and identify the materials that will be used in developing these facilities. Calculations used in siting and sizing sediment basins should be provided (see New York Guidelines for Urban Erosion and Sediment Control).

4. Identify temporary erosion and sediment control facilities which will be converted to permanent stormwater management facilities.

5. Provide an implementation schedule for the staging of temporary erosion and sediment control facilities.

6. Provide a maintenance schedule for soil erosion and sediment control facilities.

B. PERMANENT EROSION AND SEDIMENT CONTROL FACILITIES

1. Describe permanent structural and vegetative practices which will be used to provide long-term control of erosion and sedimentation when construction activities are completed and the project site is restored.

2. Provide a map showing, by catchment, the location of permanent erosion control facilities, including both structural and vegetative.

3. By sub-catchment, provide an implementation schedule for restoring the project site with permanent erosion and sediment control facilities.

V. IMPLEMENTATION SCHEDULE AND MAINTENANCE

A. Provide an implementation schedule for staging of all stormwater management facilities. Describe how this schedule will be coordinated with the staging of erosion and sediment control facilities and construction activities.

B. Provide a description of the arrangements which will be made for ensuring long-term maintenance of stormwater management and erosion control facilities. Back-up contingency plans should be provided and described. Those responsible for performing maintenance should be identified.

ACCOUNTABILITY DURING PLAN IMPLEMENTATION

Significant progress has been made in preparing improved development plans that address stormwater and erosion control concerns. Quite often, however, there is a breakdown between what is called for in the plan and what is actually delivered during the plan implementation phase. Frequently erosion and sediment controls during construction tend to fail because they are either not properly installed or properly maintained. Deposition of sediment in a stream, lake, or other receiving waterbody is the end result.

There are two things that a municipality can do to ensure that stormwater management and erosion and sediment control practices are being properly installed and maintained during the construction phase of the project:

1. If the municipality has an inadequate inspection and enforcement staff, it can extract a fee from the developer(s) to retain staff to do the inspections and provide enforcement.

2. The municipality also can require the developer(s) to establish a dedicated fund, such as a surety bond or irrevocable letter of credit. In the event the developer fails to properly install and maintain required stormwater management and erosion control practices, the municipality can draw upon the fund to do the necessary work itself or to have it done by another firm. In such case, the municipality should require an easement for the purpose of entering onto the property to install, maintain or repair stormwater and erosion control practices.

ATTACHMENT A2-2
EROSION CONTROL DETAILS

1. Silt Fence
2. Straw Bale Dike
3. Perimeter Dike/Swale
4. Temporary Swale
5. Sediment Trap for Drop Inlet

STANDARD AND SPECIFICATIONS FOR STRAW BALE DIKE

Definition

A temporary barrier of straw or similar material used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a bale dike is to reduce runoff velocity and effect deposition of the transported sediment load. Straw bale dikes are to be used for no more than three (3) months.

Conditions Where Practice Applies

The straw bale dike is used where:

1. No other practice is feasible.
2. There is no concentration of water in a channel or other drainage way above the barrier.
3. Erosion would occur in the form of sheet erosion.
4. Length of slope above the straw bale dike does not exceed these limits:

Constructed Slope	Percent Slope	Slope Length (feet)
2:1	50	25
2-1/2:1	40	50
3:1	33	75
3-1/2:1	30	100
4:1	25	125

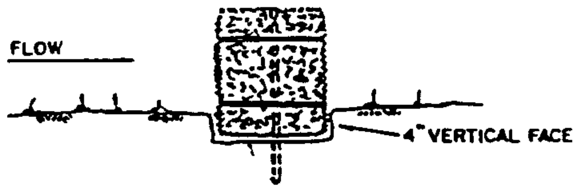
Where slope gradient changes through the drainage area, steepness refers to the steepest slope section contributing to the straw bale dike.

The practice may also be used for a single family lot if the slope is less than 15 percent. The contributing drainage area in this instance shall be less than one acre and the length of slope above the dike shall be less than 200 feet.

Design Criteria

A design is not required. All bales shall be placed on the contour with cut edge of bale adhering to the ground. See Figure 4.3 on page 4.10 or details.

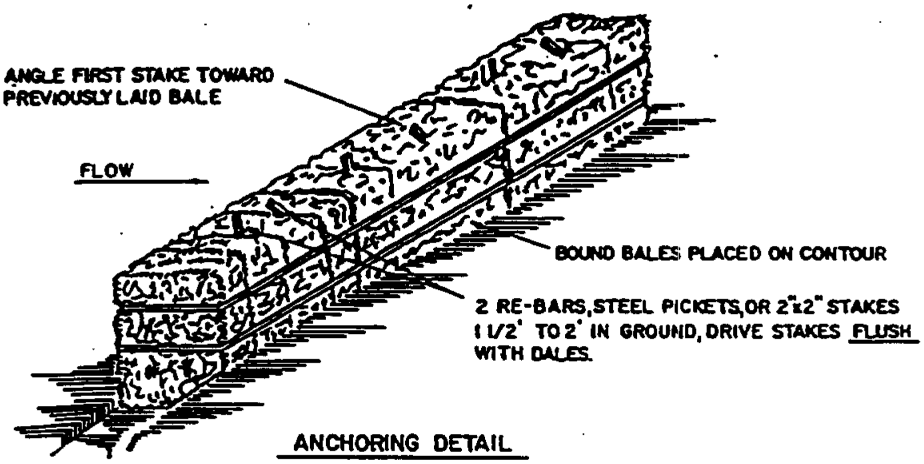
Figure 4.3
Straw Bale Dike Details



BEDDING DETAIL

STANDARD SYMBOL

SBD — DRAINAGE AREA NO MORE THAN 1/4 ac. PER 100 FEET OF STRAW BALE DIKE FOR SLOPES LESS THAN 25%



ANCHORING DETAIL

CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	STRAW BALE DIKE	STANDARD DRAWING SBD-1

STANDARD AND SPECIFICATIONS FOR SILT FENCE

Definition

A temporary barrier of geotextile fabric (filter cloth) used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used.

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence are:

Slope Steepness	Maximum Slope Length (Ft)
2:1	50
3:1	75
4:1	125
5:1	175
Flatter than 5:1	200

2. Maximum drainage area for overland flow to a silt fence shall not exceed 1/2 acre per 100 feet of fence; and
3. Erosion would occur in the form of sheet erosion; and
4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required. All silt fences shall be placed as close to the area as possible, and the area below the fence must be undisturbed or stabilized.

A detail of the silt fence shall be shown on the plan, and contain the following minimum requirements:

1. The type, size, and spacing of fence posts.
2. The size of woven wire support fences. (OPTIONAL)
3. The type of filter cloth used.
4. The method of anchoring the filter cloth.
5. The method of fastening the filter cloth to the fencing support.

Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. See Figure 4.4 on page 4.12 for details.

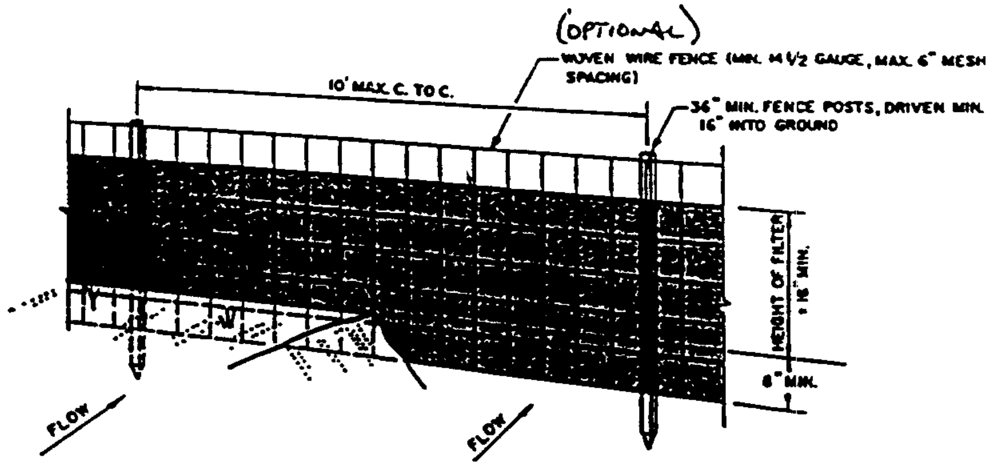
Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance. Statewide acceptability shall depend on in field and/or laboratory observations and evaluations.

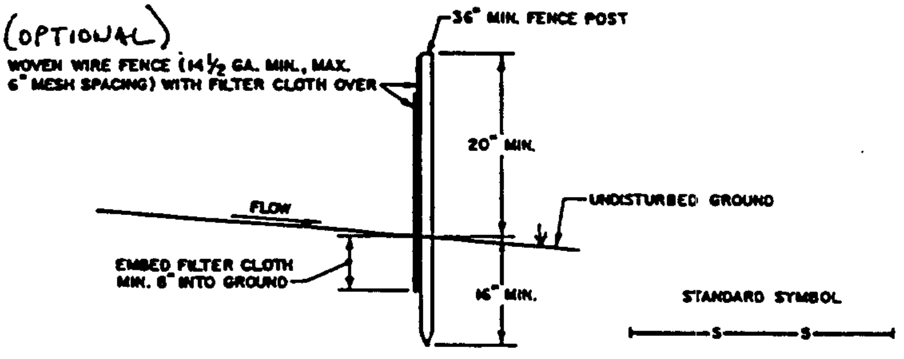
Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	
Equivalent Opening Sizw	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability (%)	90	ASTM G-26

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.
3. Wire Fence (for fabricated units): Wire fencing shall be a minimum 14-1/2 gage with a maximum 6 in. mesh opening, or as approved. (OPTIONAL)
4. Prefabricated Units: Envirofence or approved equal may be used in lieu of the above method providing the unit is installed per manufacturer's instructions.

Figure 4.4
Silt Fence Details



PERSPECTIVE VIEW



SECTION

CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

1. (OPTIONAL) WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

POSTS: STEEL EITHER T OR U TYPE OR 2" HARDWOOD

FENCE: WOVEN WIRE, 14 1/2 GA. 6" MAX. MESH OPENING (OPTIONAL)

FILTER CLOTH: FILTER X, MIRAFI 100X, STABI-LINKA T140N OR APPROVED EQUAL

PREFABRICATED UNIT: GEOFAB, ENVIROFENCE, OR APPROVED EQUAL.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	SILT FENCE	STANDARD DRAWING SF-1

STANDARD AND SPECIFICATION FOR TEMPORARY SWALE

Definition

A temporary excavated drainage way.

Purpose

The purpose of a temporary swale is to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet or to intercept sediment laden water and divert it to a sediment trapping device.

Conditions Where Practice Applies

Temporary Swales are constructed:

1. To divert flows from a disturbed area.
2. Intermittently across disturbed areas to shorten overland flow distances.
3. To direct sediment laden water along the base of slopes to a trapping device.
4. To transport offsite flows across disturbed areas such as rights-of-way.

Swales collecting runoff from disturbed areas shall remain in place until the disturbed areas are permanently stabilized.

Design Criteria

See Figure 4.5 on page 4.14 for details.

	Swale A	Swale B
Drainage Area	<5 Ac	5-10 Ac
Bottom Width of Flow Channel	4 ft	6 ft
Depth of Flow Channel	1 ft	1 ft
Side Slopes	2:1 or Flatter	2:1 or Flatter
Grade	0.5% Min. 20% Max.	0.5% Min. 20% Max.

For drainage areas larger than 10 acres, refer to the Standard and Specifications for Waterways on page 4.91.

Stabilization

Stabilization of the swale shall be completed within 10 days of installation in accordance with the appropriate standard and specifications for vegetative stabilization or stabilization with mulch as determined by the time of year. The flow channel shall be stabilized as per the following criteria:

Type of Treatment	Channel Grade	FLOW CHANNEL A ≤5 Ac	FLOW CHANNEL B 5-10 Ac
1	0.5-3.0%	Seed & Straw Mulch	Seed & Straw Mulch
2	3.1-5.0%	Seed & Straw Mulch	Seed and cover with Jute or Excelsior; Sod, or lined with 2 in. stone
3	5.1-8.0%	Seed and cover with Jute or Excelsior, Sod line with 2 in. stone	Line with 4-8 in. stone or Recycled Concrete Equivalent
4	8.1-20%	Line with 4-8 in. stone or Recycled Concrete Equivalent[1]	Engineering Design

In highly erodible soils, as defined by local approving agency, refer to the next higher slope grade for type of stabilization.

[1] Recycled Concrete Equivalent shall be concrete broken into the required size, and shall contain no steel reinforcement.

Outlet

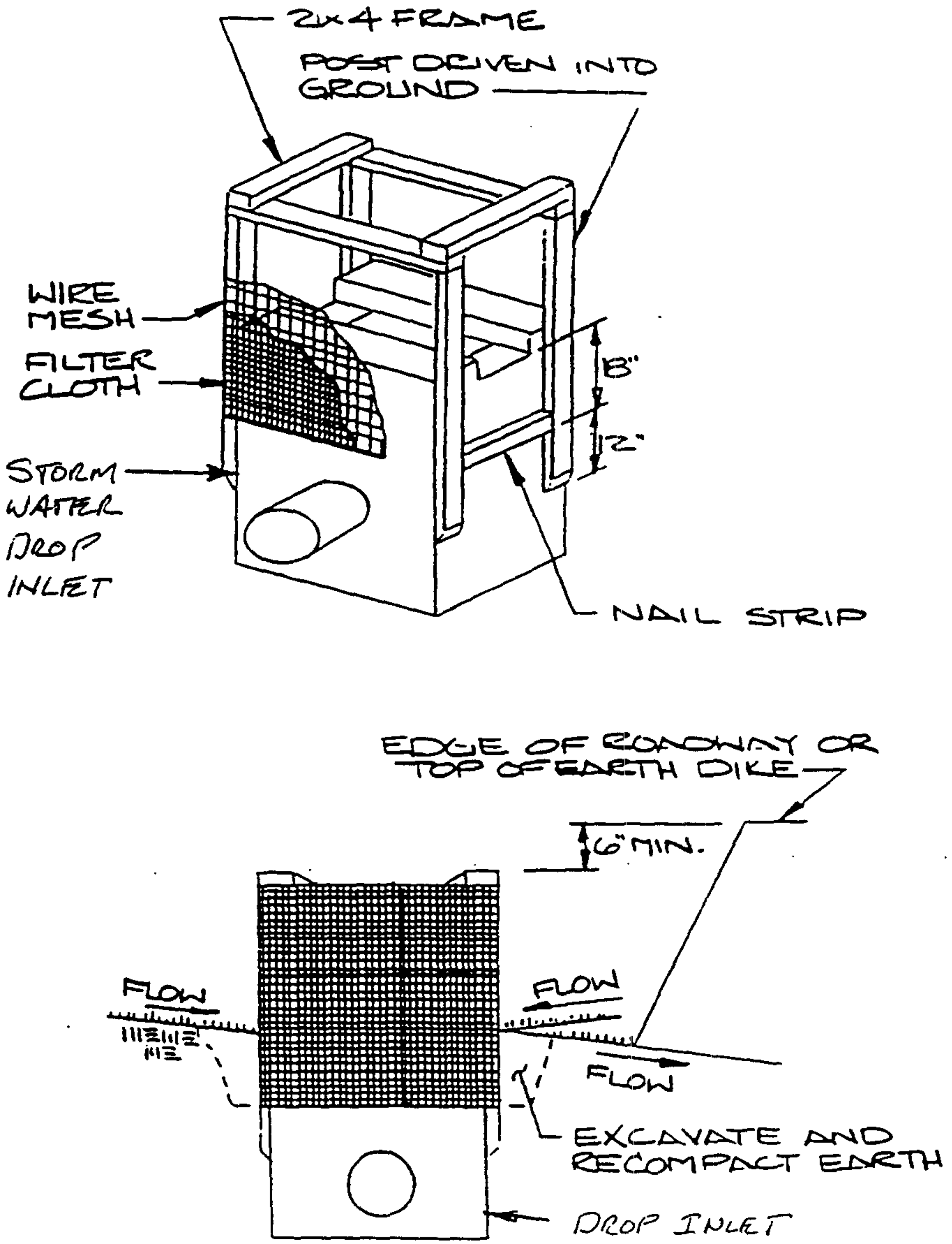
Swale shall have an outlet that functions with a minimum of erosion, and dissipates runoff velocity prior to discharge off the site.

Runoff shall be conveyed to a sediment trapping device such as a sediment trap or sediment basin until the drainage area above the swale is adequately stabilized.

The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet condition.

If swale is used to divert flows from entering a disturbed area, a sediment trapping device may not be needed.

Sediment Trap for Drop Inlets



STANDARD AND SPECIFICATIONS FOR PERIMETER DIKE/SWALE

Definition

A temporary ridge of soil excavated from an adjoining swale located along the perimeter of the site or disturbed area.

Purpose

The purpose of a perimeter dike/swale is to prevent off site storm runoff from entering a disturbed area and to prevent sediment laden storm runoff from leaving the construction site or disturbed area.

Conditions Where Practice Applies

Perimeter dike/swale is constructed to divert flows from entering a disturbed area, or along tops of slopes to prevent flows from eroding the slope, or along base of slopes to direct sediment laden flows to a trapping device.

The perimeter dike/swale shall remain in place until the disturbed areas are permanently stabilized.

Design Criteria

See Figure 4.16 on page 4.34 for details.

The perimeter dike/swale shall not be constructed outside the property lines without obtaining legal easements from effected adjacent property owners. A design is not required for perimeter dike/swale. The following criteria shall be used:

Drainage area - Less than 2 acres (for drainage areas larger than 2 acres but less than 10 acres see earth dike; for drainage areas larger than 10 acres, see standard and specifications for diversion).

Height - 18 inches minimum from bottom of swale to top of dike evenly divided between dike height and swale depth.

Bottom width of dike - 2 feet minimum.

Width of swale - 2 feet minimum.

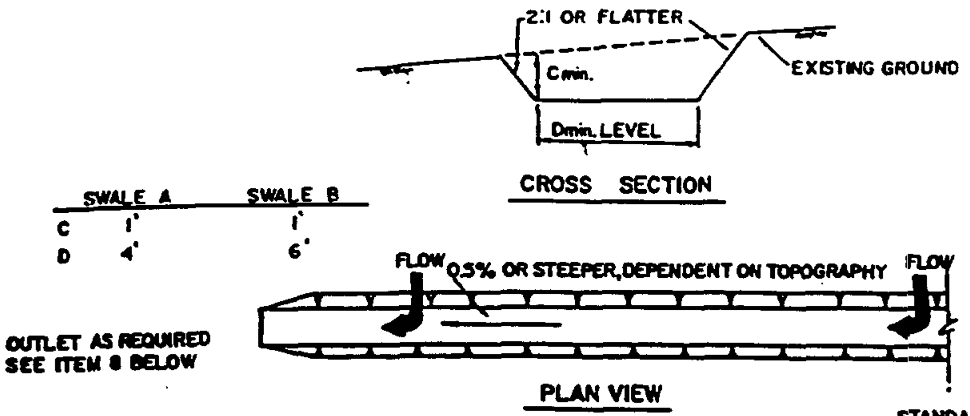
Grade - Dependent upon topography, but shall have positive drainage (sufficient grade to drain) to an adequate outlet. Maximum allowable grade not to exceed 20 percent.

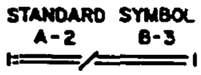
Stabilization - The disturbed area of the dike and swale shall be stabilized within 10 days of installation, in accordance with the standard and specifications for seed and straw mulch or straw mulch only if not in the seeding season.

Outlet

1. Perimeter dike/swale shall have an outlet that functions with a minimum of erosion.
2. Diverted runoff from a protected or stabilized upland area shall outlet directly onto an undisturbed stabilized area.
3. Diverted runoff from a disturbed or exposed upland area shall be conveyed to a sediment trapping device such as a sediment trap, sediment basin, or to an area protected by any of these practices.
4. The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet.

Figure 4.5
Temporary Swale Detail





CONSTRUCTION SPECIFICATIONS

1. ALL TEMPORARY SWALES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
5. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILLS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED ON CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE SWALE.
8. STABILIZATION SHALL BE AS PER THE CHART BELOW:

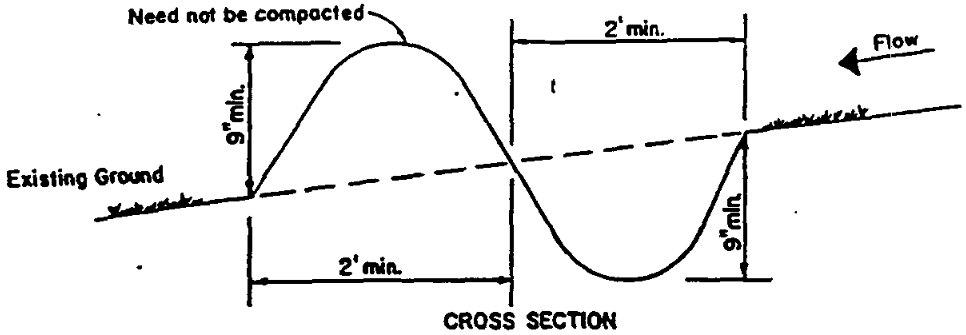
FLOW CHANNEL STABILIZATION

TYPE OF TREATMENT	CHANNEL GRADE	A (5 AC OR LESS)	B (5 AC - 10 AC)
1	0.5-3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1-5.0%	SEED AND STRAW MULCH	SEED USING JUTE OR EXCELSIOR
3	5.1-8.0%	SEED WITH JUTE OR EXCELSIOR; SOD	LINED RIP-RAP 4-8" RECYCLED CONCRETE EQUIVALENT
4	8.1-20%	LINED 4-8" RIP-RAP	ENGINEERED DESIGN

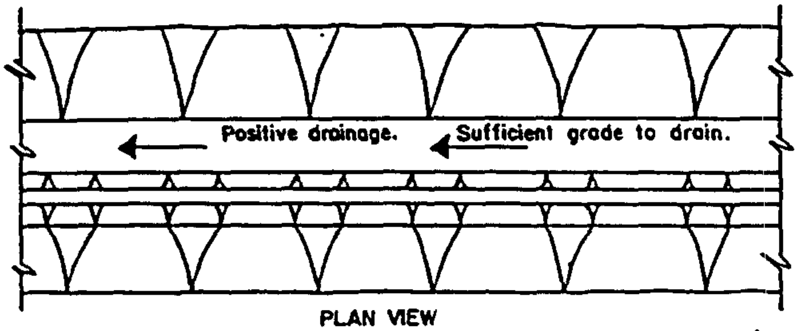
9. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	TEMPORARY SWALE	STANDARD DRAWING TS-1

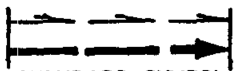
Figure 4.16
Perimeter Swale Dike Detail



CROSS SECTION



PLAN VIEW



STANDARD SYMBOL

CONSTRUCTION SPECIFICATIONS

1. ALL PERIMETER DIKE/SWALE SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTRUBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSION VELOCITY.
4. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED IN THE STANDARD.
5. STABILIZATION OF THE AREA DISTURBED BY THE DIKE AND SWALE SHALL BE DONE IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SEED AND STRAW MULCH, AND SHALL BE DONE WITHIN 10 DAYS.
6. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

Max. Drainage Area Limit: 2 Acres

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PERIMETER DIKE/SWALE	Standard Drawing PDS-1

ATTACHMENT A2-3

MONITORING, INSPECTION AND MAINTENANCE PLAN

MONITORING, INSPECTION, AND MAINTENANCE PLAN

IMPLEMENTATION

A. The Contractor at this site shall at all times, properly construct, operate and maintain all erosion controls and features, as part of the closure construction activities, in accordance with regulatory requirements, and with good engineering and construction practices. Erosion control measures and activities will be in accordance with currently accepted Best Management Practices (BMPs).

B. This erosion control monitoring, inspection, and maintenance plan has been developed to achieve compliance with the requirements of this construction site storm water and erosion control plan. The key elements of the monitoring effort include the following:

- Site Inspections and Maintenance;
- BMPs Monitoring;
- Recordkeeping;
- Review and Modifications; and
- Certification of Compliance.

SITE INSPECTIONS AND MAINTENANCE PRACTICES

A. The temporary erosion control features installed by the Contractor will be maintained by the contractor until no longer needed or permanent erosion control methods are installed.

Site inspections are required every seven days or within 24 hours of a rainfall of 0.5 inches or greater. All disturbed areas, areas for material storage, locations where vehicles enter or exit the site, and all of the erosion and sediment controls that are identified as part of this site's construction storm water and erosion control plan must be inspected. Controls must be in good operating condition until the affected area they protect has been completely stabilized and the construction activity is complete. If a repair is necessary, it must be completed within seven (7) days of receipt of a report or notice, if practical. Inspection for specific erosion and sediment controls will include the following:

- Silt fence will be inspected to determine the following:

  1) depth;

  2) condition of fabric;

  3) that the fabric is attached to the posts; and

  4) that the fence posts are firmly in the ground.

- The silt fences will be inspected weekly and within 24 hours of a 0.5 inch or greater storm event.

- Diversion berms, if used, will be inspected and any breaches promptly repaired.

- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and other potential erosion control problems.

- The Contractor shall designate individual(s) that will be responsible for erosion control, maintenance, and repair activities. The designated individual will also be responsible for inspecting the site and filling out the inspection and maintenance report.

- Personnel selected for inspection and maintenance responsibilities will receive training as directed by the Engineer. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used onsite in good working order.

B. The individual inspecting the site must record any damages or deficiencies on an inspection form (attached). These forms can be used to request maintenance and repair and to document inspection and maintenance activities. Damages or deficiencies must be corrected as soon as possible after the inspection. Any changes that may be required to correct deficiencies in the Erosion Control Plan should also be made as soon as possible, but in no case later than seven days after the inspection.

C. An Inspection and Maintenance Report Form is attached to record the inspection and assessment.

D. The Contractor's erosion control inspection records must be presented to the Engineer at the site.

RECORDKEEPING

A. Records Retention

A copy of the Storm Water Management and Erosion Control Plan and inspection and maintenance records must be kept at the construction site from the time construction begins until the site is stabilized.

The Plan and related records will be made available upon request to any regulatory agency representatives or members of the public.

MODIFICATIONS TO THE STORM WATER MANAGEMENT AND EROSION CONTROL PLAN

A. During the course of construction, unanticipated changes may occur which affect this plan such as schedule changes, phasing changes, staging area modifications, offsite drainage impacts and repeated failures of designed controls. Any changes to the activities and controls identified in this plan must be documented and the Plan revised accordingly.

B. Certification of revisions to this plan shall be included at the end of the document.

CONSTRUCTION SITE STORM WATER CONTROL PLAN INSPECTION AND MAINTENANCE REPORT FORM

To be completed every 7 days and within 24 hours of a rainfall event of 0.5 inches or more

Regular Inspector:______________ Rainfall Event Inspector:___________ Rainfall (inches):_____

Contractor Activities	OK	NO	N/A	Notes
Are construction onsite traffic routes, parking, and storage of equipment and supplies restricted to areas specifically designated for those uses?				
Are locations of temporary soil stock piles of construction materials in approved areas?				
Is there any evidence of spills and resulting cleanup procedures?				
General Erosion & Sediment Controls				
Are sediment and erosion BMPs installed in the proper location and according to the specifications set out in the SWM & ECP? Are all operational storm drain inlets protected from sediment inflow? Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching? Is there any evidence that sediment is leaving the site? Is there any evidence of erosion or cut fill slopes?				
Perimeter Road Use				
Does much sediment get tracked on to the perimeter road? Is the gravel clean or is it filled with sediment? Does all traffic use the perimeter road to leave the site? Is maintenance or repair required for the perimeter road?				

______________________________ Inspected by (Signature)

______________________________ Date

CONSTRUCTION SITE STORM WATER CONTROL PLAN
INSPECTION AND MAINTENANCE REPORT FORM

To be completed every 7 days and within 24 hours of a rainfall event of 0.5 inches or more

Inspector:______________________________

STABILIZATION MEASURES					
Area	Date Since Last Disturbed	Date of Next Disturbance	Stabilized? Yes/No	Stabilized with	Condition

Stabilization Required:____

____

____

____

____

____

To be performed by:_____________________ On or before:_____________________

ATTACHMENT A4

New York State Department of Environmental Conservation TAGM 4031

TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM #4031

FUGITIVE DUST SUPPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

TO: Regional Hazardous Waste Remediation Engrs., Bur. Directors & Section Chiefs

FROM: Michael J. O'Toole, Jr., Director, Division of Hazardous Waste Remediation

SUBJECT: DIVISION TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM -- FUGITIVE DUST SUPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

DATE: Oct 27, 1989

Michael J. O'Toole, Jr. (signed)

1. Introduction

Fugitive dust suppression, particulate monitoring, and subsequent action levels for such must be used and applied consistently during remedial activities at hazardous waste sites. This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2. Background

Fugitive dust is particulate matter--a generic term for a broad class of chemically and physically diverse substances that exist as discrete particles, liquid droplets or solids, over a wide range of sizes--which becomes airborne and contributes to air quality as a nuisance and threat to human health and the environment.

On July 1, 1987, the United States Environmental Protection Agency (USEPA) revised the ambient air quality standard for particulates so as to reflect direct impact on human health by setting the standard for particulate matter less than ten microns in diameter (PM_{10}); this involves fugitive dust whether contaminated or not. Based upon an examination of air quality composition, respiratory tract deposition, and health effects, PM_{10} is considered conservative for the primary standard--that requisite to protect public health with an adequate margin of safety. The primary standards are 150 ug/m^3 over a 24-hour averaging time and 50 ug/m^3 over an annual averaging time. Both of these standards are to be averaged arithmetically.

There exists real-time monitoring equipment available to measure PM_{10} and capable of integrating over a period of six seconds to ten hours. Combined with an adequate fugitive dust suppression program, such equipment will aid in preventing the off-site migration of contaminated soil. It will also protect both on-site personnel from exposure to high levels of dust and the public around the site from any exposure to any dust. While specifically intended for the protection of on-site personnel as well as the public, this program is not meant to replace long-term monitoring which may be required given the contaminants inherent to the site and its air quality.

3. <u>Guidance</u>

A program for suppressing fugitive dust and monitoring particulate matter at hazardous waste sites can be developed without placing an undue burden on remedial activities while still being protective of health and environment. Since the responsibility for implementing this program ultimately will fall on the party performing the work, these procedures must be incorporated into appropriate work plans. The following fugitive dust suppression and particulate monitoring program will be employed at hazardous waste sites during construction and other activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Such activities shall also include the excavation, grading, or placement of clean fill, and control measures therefore should be considered.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM_{10}) with the following minimum performance standards:

   Object to be measured: Dust, Mists, Aerosols
   Size range: <0.1 to 10 microns
   Sensitivity: 0.001 mg/m^3
   Range: 0.001 to 10 mg/m^3
   Overall Accuracy: ±10% as compared to gravimetric analysis of stearic acid or reference dust

   Operating Conditions:
   Temperature: 0 to 40°C
   Humidity: 10 to 99% Relative Humidity

   Power: Battery operated with a minimum capacity of eight hours continuous operation

   Automatic alarms are suggested.

   Particulate levels will be monitored immediately downwind <u>at</u> the working site and integrated over a period not to exceed 15 minutes. Consequently, instrumentation shall require necessary averaging hardware to accomplish this task: the P-5 Digital Dust Indicator as manufactured by MDA Scientific, Inc. or similar is appropriate.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the entity operating the equipment to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m^3 over the integrated period not to exceed 15 minutes. While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m^3, the upwind background level must be measured immediately using the same portable monitor. If the working site particulate measurement is greater than 100 ug/m^3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see Paragraph 7). Should the action level of 150 ug/m^3 be exceeded, the Division of Air Resources must be notified in writing within five working days; the notification shall include a description of the control measures implemented to prevent further exceedences.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM_{10} at or above the action level. Since this situation has the potential to migrate contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis. it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

    1. Applying water on haul roads.
    2. Wetting equipment and excavation faces.
    3. Spraying water on buckets during excavation and dumping.
    4. Hauling materials in properly tarped or watertight containers.
    5. Restricting vehicle speeds to 10 mph.
    6. Covering excavated areas and material after excavation activity ceases.
    7. Reducing the excavation size and/or number of excavations.

    Experience has shown that utilizing the above-mentioned dust suppression techniques, within reason as not to create excess water which would result in unacceptable wet conditions, the chance of exceeding the 150 ug/m^3 action level at hazardous waste site remediations is remote. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. If the dust suppression techniques being utilized at the site do not lower particulates to an acceptable level (that is, below 150 ug/m^3 and no visible dust), work must be suspended until appropriate corrective measures are approved to remedy the situation. Also, the evaluation of weather conditions will be necessary for proper fugitive dust control--when extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended.

There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require appropriate toxics monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

PART III

ENVIRONMENTAL EASEMENTS

DECLARATION OF COVENANTS AND RESTRICTIONS

THIS COVENANT, made the _____ day of _______2006 by Steelfields LTD ("Steelfields"), a corporation organized and existing under the laws of the State of New York having an office for the transaction of business at 300 Linden Oaks, Suite 220, Rochester, New York.

WHEREAS, Steelfields is the subject of a Voluntary Agreement executed by its Corporation Secretary as part of the New York State Department of Environmental Conservation's (the "Department's") Voluntary Cleanup Program relative to real property located on South Park and Abby Street in the City of Buffalo, County of Erie, State of New York; and

WHEREAS, for a parcel of the real property known as Area I (hereinafter referred to as "the Property") the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property and such remedy requires that the Property be subject to restrictive covenants.

NOW, THEREFORE, Steelfields, for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration of Covenants and Restrictions, is as shown on a legal description attached to this Declaration as Exhibit "A" and a map attached to this Declaration as Exhibit "B" and made a part hereof.

Second, unless prior written approval by the New York State Department of Environmental Conservation or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property, which threatens the integrity of the vegetative cover, or which results in unacceptable human exposure to contaminated soils.

Third, the owner of the Property shall maintain the vegetative cover in accordance with the Site Management Plan included in the Construction Closeout Report for Area I or, after obtaining the written approval of the Relevant Agency, by covering the Property with another material.

Fourth, the owner of the Property shall prohibit the Property from ever being used for purposes other than for industrial and/or commercial use without the express written waiver of such prohibition by the Relevant Agency.

Fifth, the owner of the Property shall prohibit the use of the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the Relevant Agency.

Sixth, the owner of the Property shall comply with the requirements of the Construction Closeout Report for Area I and maintain in full force and effect any required institutional and engineering controls unless the owner first obtains permission to discontinue such controls from the Relevant Agency;

Seventh, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner, and its successors and assigns, consents to enforcement by the Relevant Agency of the prohibitions and restrictions and hereby covenants not to contest the authority of the Relevant Agency to seek enforcement.

Eighth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

STATE OF NEW YORK)
COUNTY OF ERIE) ss:

On the _____ day of ____ in the year 2007, before me, the undersigned, a Notary Public in and for the State, personally appeared _________________, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument as ______________________ of Steelfields.

Notary Public

PUBLIC INFORMATION BULLETIN- February 2003

Progress Report and Upcoming Site Activities
for the
Steelfields Voluntary Cleanup Program

Purpose & Scope

Steelfields Ltd. has prepared this Public Information Bulletin to keep neighboring property owners and other interested parties informed of developments at the former Republic (LTV) Steel Plant and Donner Hanna Coke Plant site. This and future bulletins will include information about current and upcoming remedial design, construction and related activities. Additional informational bulletins are planned at the start of each Spring construction season and the start of major remediation tasks. The next information bulletin is anticipated to be issued in or around April 2003 when we expect to place construction trailers and equipment on-site in preparation for the 2003 construction season. As part of our outreach efforts and to answer any questions you may have, a public availability session will be held by by Steelfields Ltd., in cooperation with the New York State Department of Environmental Conservation (NYSDEC) prior to the start of any actual remedial activities (i.e. excavation of contaminated soil, construction of the groundwater pretreatment plant etc.).

Current and Upcoming Activities

Area II Soil Borings: Subsurface drilling was initiated in Area II (former Coke Plant parcel) and the Feine Property on February 10, 2003. These borings are for purposes of defining subsurface soil conditions for design of the Area II groundwater collection and containment system. This initial fieldwork is expected to be completed on or about February 21, 2003, weather permitting.

Off-Site Borrow Soil Stockpiling and Testing: Beginning on or about February 24th, soil from an off-site borrow source will begin arriving at the site. This soil is being excavated from a storm sewer construction project in the Hertel Avenue area of North Buffalo. Soils from this borrow source is expected to be delivered to the site through May. These soils are planned for use as subsurface backfill of future on-site excavations in Area I (former Republic Steel parcel) and possibly Area IV (former Coke Storage parcel) scheduled for later this year. It is expected that 20 to 40 truckloads/day will be delivered to the site via the South Park Avenue gate. Most of the soil is planned to be stockpiled in Area I and possibly Area II away from Abby Street in a location(s) that is accessible by trucks and away from future remedial excavations. The soils will be tested and handled in accordance with the NYSDEC-approved Soil/Fill Management Plan. Steelfields will also be undertaking dust control measures, in accordance with the requirements of the Work Plan, during the duration of the work.

Web Site: An internet web site is being developed by Steelfields as an additional information and communication resource to post information and receive comments or questions from neighbors and interested parties on a more timely basis. We'll keep you posted as it is developed and expect it to be on-line by the end of this month.

If you have any questions please contact:
Mr. Paul Werthman, Steelfields Ltd.
50 Fountain Plaza, Suite 1350, Buffalo, NY 14202
(716) 856-0635

PUBLIC INFORMATION BULLETIN- March 2003

Progress Report and Upcoming Site Activities
for the
Steelfields Voluntary Cleanup Program

Purpose & Scope

Steelfields Ltd. has prepared this Public Information Bulletin to keep neighboring property owners and other interested parties informed of developments at the former Republic (LTV) Steel Plant and Donner Hanna Coke Plant site. This and future bulletins will include information about current and upcoming remedial design, construction and related activities. Additional informational bulletins are planned at the start of each Spring construction season and the start of major remediation tasks.

Current and Upcoming Activities

Area II Soil Borings: Subsurface drilling was initiated in Area II (former Coke Plant parcel) and the Feine Property in February. These borings are for purposes of defining subsurface soil conditions for design of the Area II groundwater collection and containment system. Some additional field work is expected to be completed over the next two weeks.

Off-Site Borrow Soil Stockpiling and Testing: On February 24th, approximately ten truckloads of soil from an off-site borrow source was stockpiled in Area I of the site. This soil was excavated from a storm sewer construction project in the Hertel Avenue area of North Buffalo. These and other off-site soils are planned for use as subsurface backfill of future on-site excavations in Area I (former Republic Steel parcel) and possibly Area IV (former Coke Storage parcel) scheduled for later this year. The soils were tested in accordance with the NYSDEC-approved Soil/Fill Management Plan. No other deliveries of soil from the Hertel Avenue borrow source are planned at this time.

Web Site: An internet web site is being developed by Steelfields as an additional information and communication resource to post information and receive comments or questions from neighbors and interested parties on a more timely basis. We expect it to be on-line by the end of this month.

Project Schedule Update: An updated project schedule and description of remedial construction activities planned for 2003 will be presented at the upcoming Public Meeting.

If you have any questions please contact:
Mr. Paul Werthman, Steelfields Ltd.
50 Fountain Plaza, Suite 1350, Buffalo, NY 14202
(716) 270-0681

<u>PUBLIC INFORMATION BULLETIN-</u> August 2003

Progress Report and Upcoming Site Activities

for the

Steelfields Voluntary Cleanup Program

<u>Purpose & Scope</u>

Steelfields Ltd. has prepared this Public Information Bulletin to keep neighboring property owners and other interested parties informed of developments at the former Republic (LTV) Steel Plant and Donner Hanna Coke Plant site. This and future bulletins will include information about current and upcoming remedial construction and related activities. Additional informational bulletins are planned at the start of each Spring construction season and the start of major remediation tasks.

<u>Progress To Date</u>

<u>Area I Actions:</u> Excavation of petroleum and/or tar contaminated soil/fill from Area I (former Republic Steel Plant parcel) is essentially complete. Backfilling of excavated subareas with off-site replacement soils is ongoing. Petroleum contaminated soil/fill has been transported to an 8-acre clay-lined area known as the "biopad" located along the western perimeter of Area III (see Figure 1). The petroleum contaminated soil/fill will be treated on the biopad to meet clean-up goals.

<u>Area II Actions:</u> The design of the Area II slurry wall, groundwater collection and pretreatment system is complete. Area II is the former Donner Hanna Coke Plant parcel located south of Baraga Street (see Figure 1). A sewer discharge permit for the groundwater pretreatment facility has been issued by the Buffalo Sewer Authority. The dual vapor extraction (DVE) system wells have been installed in three of the six "hot spot" subareas. These wells are not operational yet. The contaminated soil/fill north of Baraga Street near the former small gas holder has been excavated and backfilled with off-site replacement soils (see Figure 2).

<u>Areas III & IV:</u> No remediation activities have occurred in these areas.

<u>Upcoming Planned Activities</u>

<u>Area I Activities:</u> Removal of petroleum and tar pipelines and backfilling excavated subareas continues and is expected to be complete by mid-August. River bank stabilization and excavation of Subarea Q metal-impacted soil/fill is also scheduled for completion in August. Final grading and seeding of the remediated subareas will be performed in late August or early September to reduce dust generation and surface erosion from the site.

<u>Area II Activities:</u>

Pretreatment Building- Groundbreaking for the pretreatment building construction is planned on or about August 8, 2003. The single-story building will face Baraga Street immediately east of the construction trailers. A metal gable roof, split face colored concrete block give the building a nice architectural treatment (see Figure 3). The building measures 22 feet by 36 feet and will house enclosed treatment tanks filled with granular activated carbon to filter out contaminants in groundwater pumped from the containment cell. Treated groundwater will be flow metered and tested to meet strict BSA permit requirements before it is discharged to the sewerage system. The pretreatment system should be operational in October.

Containment Cell- Installation of the slurry wall and groundwater collection system components of the former coke plant containment cell are scheduled to begin in mid- to late-August. Slurry wall construction will involve trench excavation along the southern and western perimeter of the containment cell (see Figure 2). Bentonite clay will be mixed with off-site soils and water to form a low-permeability slurry for backfilling the trench excavation. Slurry wall construction is scheduled to take four weeks. The groundwater collection system will form the north and east sides of the containment cell. The collection system is comprised of nearly one half mile of perforated drainage pipe to be placed in a gravel-filled trench connected to three submersible pump stations (located below ground in large concrete manholes). The collected groundwater will be pumped from the pump stations through underground pipes to the pretreatment building for treatment prior to discharge to the BSA sewerage system. Some tar-like odors may be noticeable periodically during containment cell construction. These odors, like freshly paved blacktop, may be encountered as portions of the trench excavations encounter subsurface contaminants. Naphthalene, a primary constituent in coal tar and creosote, has a very low odor threshold. It can be smelled at concentrations in the air that are far lower than what is considered acceptable by State and Federal health standards. For this reason, stringent odor control procedures will be followed to minimize odor during these remediation tasks. Similarly, strict perimeter air quality monitoring procedures will be conducted daily during these remediation tasks.

In-Situ (In the Ground)"Hotspot" Treatment- A dual vapor extraction (DVE) system will be pilot tested on three subsurface locations in Area II that contain elevated concentrations organic contaminants. One of the test locations is on the backside (i.e. west side, away from Abby Street) of the berm south of Baraga Street (see Figure 2). The pilot-testing consists of removing groundwater and soil gas from subsurface wells using a trailer-mounted high-vacuum blower. The gas will be treated with granular activated carbon and the water vapor will be collected and treated off-site. Field data will be collected to evaluate the performance of the system which will form the basis of design for a full-scale system. The pilot testing is scheduled to begin the week of August 18, 2003 and take about 5 days to complete. Full-scale system installation and operation will occur later this Fall.

Area III Activities: The process called "landfarming" used to treat the petroleum contaminated soil/fill on the Area III biopad is scheduled to begin by mid-August and continue through September and possibly into October. The treatment process consists of tilling the soil/fill weekly and adding fertilizer and water to affect enhanced natural biological degradation of petroleum hydrocarbons. After testing of the treated soil/fill indicates that cleanup goals have been achieved, the treated soil/fill will be used on-site for subsurface backfill. Air quality monitoring will be conducted during all treatment activities.

Area IV Activities: Clearing of brush and trees from the former coke storage yard will begin this month to facilitate removal and off-site reclamation and use of the coke as a fuel or for steel making. Excavation of the coke product may begin in August or September.

Off-Site Replacement Soil: Off-site soils continue to be trucked to the site for use as subsurface backfill of excavations in Area I. The soils are being tested in accordance with the NYSDEC-approved Soil/Fill Management Plan.

Web Site

An internet web site has been developed by Steelfields as an additional information and communication resource to post information and receive comments or questions from neighbors and interested parties on a more timely basis. The web site can be accessed at www.steelfieldsltd.com . We appreciate any suggestions for improvements.

Project Schedule

The project is substantially on schedule.

Traffic Issues

Steelfields and their contractors have worked diligently to keep all remediation-related heavy equipment and truck traffic off Abby Street. Baraga Street and other Hickory Woods streets have been and continue to be used by Price Trucking, Klein Steel and the Norfolk Southern and CSX railroad. The NYSDEC, Steelfields and Modern Construction employees also use the Baraga Street entrance site for access to the field trailers. The NYSDEC has been called numerous times related to truck and other traffic unrelated to this project. If you have a complaint about vehicle traffic, please have a description and license for these vehicles before calling.

Security Issues

Modern Construction, LLC, the remediation contractor to Steelfields, has had expensive construction equipment vandalized on two occasions. A security guard was also harassed and threatened last month by four trespassers. Steelfields is working with the Buffalo police to prosecute these criminals to the full extent of the law. A cash reward is being offered for information leading to their arrest and conviction. Any information can be made confidentially to 998-4151.

Public Contacts

In the event of any concerns related to Steelfields remediation, please contact the NYSDEC on-site monitor, Mr. Jim Tuk, at his on-site field trailer on Baraga Street at 825-7355 or the Modern Construction field trailer at 825-1316. Both telephones have 24-hour answering machines.

PUBLIC INFORMATION BULLETIN- October 2003

Progress Report and Upcoming Site Activities

for the

Steelfields Voluntary Cleanup Program

Purpose & Scope

Steelfields Ltd. has prepared this Public Information Bulletin to keep neighboring property owners and other interested parties informed of developments at the former Republic (LTV) Steel Plant and Donner Hanna Coke Plant site. This and future bulletins will include information about current and upcoming remedial construction and related activities. Additional informational bulletins are planned at the start of each spring construction season and the start of major remediation tasks.

Progress To Date

Area I Actions: Area I is the former Republic Steel Plant parcel located between Baraga Street and the Buffalo River (see Figure 1). Excavation of petroleum and/or tar contaminated soil/fill and piping from Area I is essentially complete. Final river bank stabilization and grading and seeding of the remediated Subareas has been performed.

Area II Actions: Area II is the former Donner Hanna Coke Plant parcel located south of Baraga Street (see Figure 1). Construction of the Area II groundwater collection and pretreatment systems are nearly complete. The groundwater collection system is comprised of two main components: perforated collection piping installed in a gravel-filled trench in the water table; and a conveyance system incorporating three pump stations and a force main that transfers the collected water to the pretreatment building (see Figure 2). The collection component is substantially complete.

The new pretreatment building on Baraga Street is substantially complete with treatment and monitoring equipment currently being installed. The sewer connection is being made this week to convey treated groundwater from the pretreatment building to the Buffalo Sewer Authority's (BSA's) sanitary sewer along Abby Street.

Another component of the Area II containment system is the slurry wall, which is currently being constructed along the southern boundary of the containment system (see Figure 2). The slurry wall is built by excavating and concurrently backfilling a trench with a mixture of bentonite clay and clean, off-site soil. When complete, the slurry wall will provide a barrier against migration of impacted groundwater and effectively direct it to the collection system.

An in-situ (i.e., in the ground) remediation method using a trailer-mounted, dual vacuum extraction (DVE) system was pilot-tested onsite in August. DVE involves use of a powerful vacuum to simultaneously withdraw both contaminated groundwater and contaminated vapors from impacted, subsurface soils. The system was tested on isolated areas of subsurface contamination outside the Area II containment system, referred to as "hot spots" (see Figure 2). The results of the pilot test are being evaluated to determine how these "hotspot" locations will be treated.

Area III: Area III is the former Republic Steel warehouse parcel. The clay biopad in Area III has been used to stage and treat petroleum contaminated soil/fill excavated from the site. This treatment process, deemed "bioremediation" or "land farming," consists of tilling the soil/fill weekly and adding fertilizer and water to affect enhanced natural biological degradation of petroleum hydrocarbons.

Area IV: Area IV is the former Donner-Hanna coke yard parcel. Excavation of residual coke has been initiated in and adjacent to Area IV. Coke is being recycled at the Bethlehem Steel facility for reuse in the steel manufacturing industry.

Upcoming Planned Activities

Area I Activities: Excavation of Subarea "Q" metal-impacted soil/fill is scheduled for completion in November. Some new groundwater monitoring wells will also be installed. This will substantially complete the remediation efforts in Area I.

Area II Activities:

Containment Cell- Installation of the slurry wall component of the former coke plant containment cell will continue through early November. The pumping, conveyance pipes and control systems of the groundwater collection system as well as the pretreatment system are expected to be substantially completed and functional by the end of November. Some odors are anticipated as the slurry wall work is completed (see "Odor Issues" below)

In-Situ "Hotspot" Treatment- An Engineering Report will be submitted to the NYSDEC in early November detailing planned remedial actions related to the Area II "hot-spots." Full-scale system installation and operation will be initiated following NYSDEC approval of the Engineering Report.

August Feine and NFTA Property – Additional soil borings and monitoring wells will be installed in the former August Feine (currently occupied by Klein Steel) and NFTA property located north of Area II to compete the assessment of these parcels. This work is expected to take place in late fall of this year.

Area III Activities: The landfarming operation will be discontinued in the next few weeks as low temperatures and high moisture slow the treatment process. The biopad will be "winterized" by consolidating and rolling the surface to seal it. Landfarming operations will resume in April or May 2004. It is expected to take 1-2 years to reduce the contaminant levels to cleanup goals.

Area IV Activities: Excavation and off-site reclamation and reuse of the metallurgical coke will continue into November. Soil/fill verification testing and grading and backfilling of the excavation will continue as the weather permits.

Air Quality and Odor Issues

As discussed in the August 2003 Public Information Bulletin, some "tar-like" or "mothball-like" odors were anticipated during the Area II groundwater collection and containment system construction. These odors, similar to freshly paved blacktop, were expected where excavation through impacted soil/fill was necessary. Naphthalene, a primary constituent in coal tar and creosote, is the primary source of the odor. Naphthalene has a very low odor threshold. That means it can be smelled in the air at concentrations far lower than what is considered unacceptable by State and Federal health standards. For this reason, an Odor Control Plan requiring stringent control procedures was developed by Steelfields and approved by the NYSDEC and NYSDOH to minimize odor during collection and containment system construction. Measures called for under the Odor

Control Plan include minimizing the open area of the trenches, minimizing the working surface area of soil/fill placed on the biopad, and covering coal tar impacted soil/fill with tarps or non-impacted soil fill.

As expected, some soil/fill impacted by coal tar has been encountered during collection and containment system construction. The Odor Control Plan has been followed to minimize odors from these materials, but the low odor threshold of naphthalene and the nature of the remediation work make it impossible to completely suppress all naphthalene odor. Perimeter air quality monitoring with calibrated field instruments has been performed on a continuous basis during the workday to confirm compliance with the Community Air Monitoring Plan thresholds for the site. Documentation air monitoring, involving collection of downwind air samples for independent laboratory analysis, has also been performed on several occasions to confirm the field instrument results and quantify concentrations of contaminants of concern in ambient air. Documentation air monitoring was specifically performed to check volatile organic and naphthalene concentrations downwind of the biopad during both the workday and during an evening following mechanical tilling of soils on the biopad. The evening event indicated the presence of naphthalene at concentrations slightly above the detection level but substantially below levels that would be considered a potential health concern. The daytime event did not detect the presence of naphthalene in any of the samples.

Copies of the Community Air Monitoring results are made available for viewing at the document repositories, located at the JP Dudley branch of the Erie County Public Library at 2010 South Park Avenue and at the NYSDEC's Regional Office at 270 Michigan Avenue. Additional air monitoring results are produced monthly and all reports are submitted to the NYSDEC, NYSDOH and the document repository.

Odors and potential air quality issues are expected to become less significant over the next several weeks as the remaining collection system and slurry wall work is completed. The only major task necessary to complete the collection system is excavation of a shallow trench for the buried force main from the Area II containment cell to the pretreatment building, which is not expected to encounter impacted soil/fill. The slurry wall excavation will be performed through a soil-bentonite slurry (with soils coming from a clean, off-site source), which will inherently suppress potential odors from the trench. In addition, the slurry wall trenching operation is proceeding from east to west, away from neighboring residential properties. Colder temperatures will also help to suppress volatilization of odor-causing constituents. The Odor Control Plan and air monitoring programs will continue to be diligently followed to assure that odors are minimized and that perimeter air quality thresholds are maintained throughout construction.

Web Site

An internet web site has been developed by Steelfields as an additional information and communication resource to post information and receive comments or questions from neighbors and interested parties on a more timely basis. The web site can be accessed at www.steelfieldsltd.com . We appreciate any suggestions for improvements. We plan to periodically post a summary of the documentation air monitoring results on the web site.

Project Schedule

The overall project is substantially on or ahead of schedule.

Traffic Issues

Steelfields and their contractors have worked diligently to keep all remediation-related heavy equipment and truck traffic off Abby Street. Baraga Street and other Hickory Woods streets have been and continue to be used by Price Trucking, Klein Steel and the Norfolk Southern and CSX railroad. The NYSDEC, Steelfields and Modern Construction employees also use the Baraga Street entrance site for access to the field trailers. The NYSDEC has been called numerous times related to truck and other traffic unrelated to this project. If you have a complaint about vehicle traffic, please have a description and license plate information for these vehicles before calling.

Security

Steelfields provides site security by: fencing the property (although there are some gaps due to construction activities or damage); providing an onsite security guard on nights and weekends; posting the site with "no trespassing" signs; and placing construction fencing around open excavations. Despite these measures, the property is large and is accessible to trespassers who ignore these deterrents. Furthermore, construction activities and equipment may provide an attraction to curious children. We urge you to instruct your family and friends not to enter the property. On-going construction activities on the site involve excavations, manholes and mechanical and electrical installations that may pose extreme physical hazards.

Public Contacts

In the event of any concerns related to Steelfields remediation, please contact the NYSDEC on-site monitor, Mr. Jim Tuk, at his on-site field trailer on Baraga Street at 825-7355 or the Modern Construction field trailer at 825-1316. Both telephones have 24-hour answering machines. In addition, the following offices can be contacted with questions:

NYSDEC Region 9 Office (Mr. Gregory Sutton, Project Manager): 851-7220

NYSDOH Buffalo Office (Mr. Cameron O'Connor): 847-4385

Steelfields Office (Mr. Paul Werthman): 856-0635

STEELFIELDS LTD

PUBLIC INFORMATION BULLETIN

Site Description and History

In October, 2002 Steelfields, Ltd. purchased several vacant industrial properties in South Buffalo, NY out of bankruptcy from the LTV Steel Company and National Steel Corporation. At the same time, Steelfields entered into a Voluntary Cleanup Agreement (VCA) with the New York State Department of Environmental Conservation (NYSDEC). The property hereinafter referred to as the Former Steel and Coke Manufacturing Site, is subdivided into the following four parcels totaling 219 acres, shown in both the image adjacent and below, based on the operation and ownership history of each:

Aerial Photograph depicting Former Steel and Coke Plant sites.

- Area I—Former Republic (LTV) Steel Plant Parcel
- Area II—Former Donner-Hanna Coke Plant Parcel
- Area III—Former Republic (LTV) Warehouse Parcel
- Area IV—Former Donner-Hanna Coke Yard Parcel

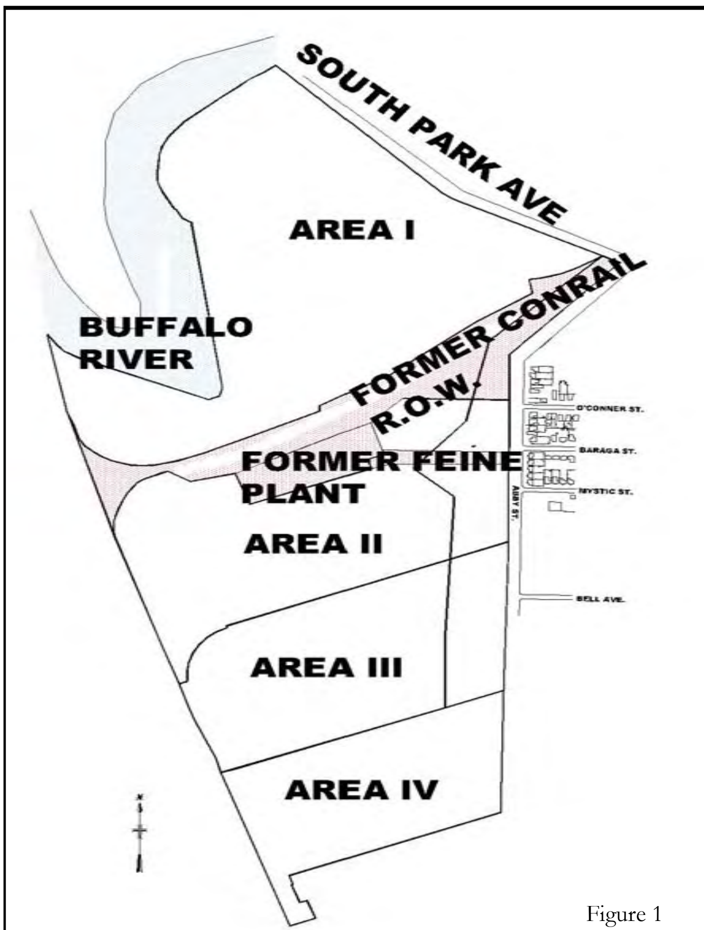


Figure 1

A Work Plan for Voluntary Cleanup Program Remedial Design/Remedial Action for the Former Steel and Coke Manufacturing Site was approved by the NYSDEC on October 10, 2002.

In this issue:

Summary of 2003 Construction Activities
Planned 2004 Construction Activities
Contact Information

Prepared for Steelfields, Ltd. By:

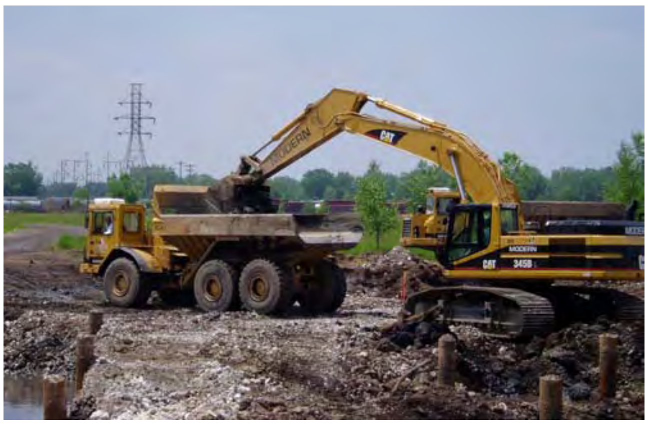
TurnKey Environmental Restoration, LLC

Progress to Date

Area I - Former Republic Steel Plant

The storage, conveyance, and use of petroleum resulted in historical releases to soil/fill in subareas of the Former Republic Steel Plant (see Figure 1). Remediation efforts in Area I involved removal of underground storage tank and pipes; removal and treatment or disposal of petroleum, tar, and/or metal-impacted soil/fill. Approximately 40,000 cubic yards were excavated from Area I and treated or disposed.

As of the end of the calendar year 2003, Area I has been fully remediated in accordance with the Voluntary Clean-up Agreement. Upon completion of a Construction Closeout Report documenting remediation efforts, Area I is expected to be released for industrial and/or commercial redevelopment sometime this Spring or early Summer.



Excavation of soil/fill in Area I

Area II - Former Donner-Hanna Coke Plant

The Donner-Hanna Coke Plant (see Figure 1) produced coke and recovered byproducts from coal in Area II. The Area II containment cell was designed to collect contaminated groundwater and contain in place subsurface soils/fill impacted with residual tar and other coke by-products. The containment system is comprised of four primary components (see Figure 2): (1) a 2,800 ft. long groundwater collection system along the northern and eastern perimeter to collect impacted groundwater both inside and adjacent to the containment cell; (2) a 2,400 ft. long bentonite/soil slurry wall to limit lateral migration of groundwater along the south and west perimeter; (3) a synthetic membrane cover system to eliminate direct contact and reduce infiltration and (4) a groundwater treatment plant (GWTP) to remove contaminant from collected groundwater before discharging to the City sewerage system.

The construction of the designed groundwater collection system and groundwater barrier wall were completed in the Fall of 2003.

Installation of Collection System in Area II

Area III - Former Republic Warehouse Parcel

A clay biopad constructed in Area III was used to bioremediate petroleum contaminated soil/fill excavated from the site. This "bioremediation" process consists of tilling the soil/fill weekly and adding fertilizer and water to enhance natural degradation of petroleum hydrocarbons. In November of 2003, approximately half of the petroleum contaminated soil/fill met required treatment levels and was removed and stockpiled for future on-site use. Placement of tar-impacted soils into the Area II Containment cell also began in December 2003.

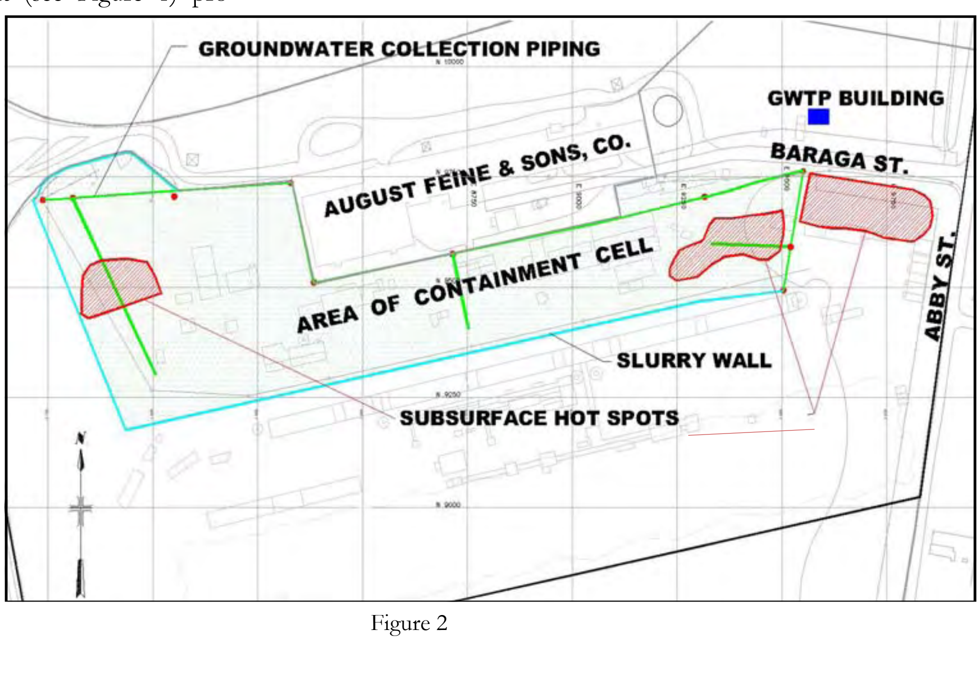


Figure 2

Progress to Date - (cont'd)

Area IV - Former Donner-Hanna Coke Yard Parcel

Area IV was historically used as a storage yard for coke from the former Donner-Hanna Coke Plant. As of December 2003, reclamation of nearly 40,000 tons of coke had been completed. Excavation of coke residual from a small off-site area to the east of Area IV was also completed.

Community Air Monitoring Program

Throughout the 2003 construction year, all remediation activities on site were strictly monitored according to the Community Air Monitoring Program. Three air monitoring stations continuously measured and recorded on-site quality for particulate (i.e. dust) and volatile organic compounds during all remedial activities. At the initiation of new activities, a Documentation Air Monitoring event was performed to quantify specific airborne contaminants near the property boundary. This practice will also continue through 2004.

Planned 2004 Activities

Area II - Former Donner-Hanna Coke Plant

Contaminated soil/fill excavated from Areas I, III, and IV not being bioremediated or recycled is ultimately destined for the Area II Containment cell. This includes the tar-impacted soil/fill; metal impacted soil/fill; and the blue-stained soil from Area III.

Several options for in-place treatment of "hot spots" (see Figure 2) located in the Area II Containment Cell are currently being considered for implementation.

Approximately half (i.e. 7 acres) of the containment cover system is scheduled to be installed in August 2004 after soil/fill is in place to design elevations. The cover system consists of a synthetic membrane, covered by 18" of soil (see Figure 4).

Figure 3

Area III - Former Republic Warehouse Parcel

Continued work in Area III will begin with the continuation of final transportation of tar impacted soil/fill (originally from Area I) stockpiled on the biopad to final disposition in the Area II Containment Cell. This activity is scheduled to be completed in early April.

Three subareas designated G, H, & I (see Figure 3) contain blue-stained soil with elevated lead and/or benzene. The blue-stained soil will be chemically treated in-place to control odors prior to excavation. The partially treated soil will undergo additional chemical and biological treatment on the biopad prior to placement in the Area II containment cell.

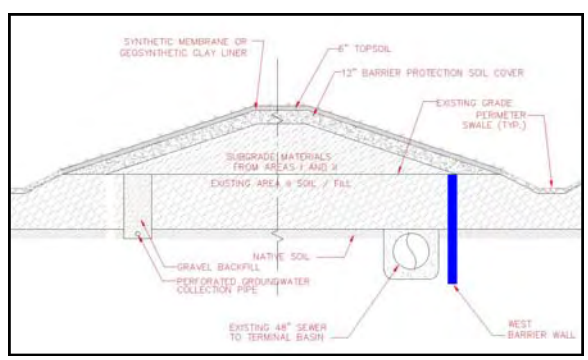


Figure 4

Area IV - Former Donner-Hanna Coke Yard Parcel

Additional metallurgical coke remains in Area IV in smaller sized particles. Removal and screening of these smaller particles is scheduled to during June and August to recycle this material.

Located on the western limit of both Areas III and IV, are several areas of tar impacted soil/fill (see Figure 3). These areas will be excavated, and either recycled, placed in the Area II Containment Cell, or disposed of off-site. This activity will be initiated as the construction schedule permits and will be completed by early 2005.

Public Contacts

In the event of any concerns related to Steelfields remediation, please contact the NYSDEC on-site monitor, Mr. Jim Tuk, at his on-site field office at 825-7355 or the Modern field office at 825-1316. Both telephones have 24-hour answering machines. In addition, the following offices can be contacted with questions:

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(Mr. Gregory Sutton, Project Manager)

NYSDOH Buffalo Office 847-4385
(Mr. Cameron O'Connor)

Steelfields Office 856-0635
(Mr. Paul Werthman)

Note: Copies of the Remediation Work Plan, air monitoring reports and other documents are available for viewing at the Dudley Branch Library on South Park Avenue.

STEELFIELDS LTD

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TurnKey Environmental Restoration, LLC

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Project Update

June 2004

STEELFIELDS LTD

PUBLIC INFORMATION BULLETIN

Purpose and Scope

A site description and history and summary of 2003 progress and planned 2004 activities was presented in the March 2004 bulletin. If you would like a copy of this bulletin please contact the Steelfields Office or our website at www.steelfieldsltd.com. This project update summarizes the remedial work that has been performed so far this year and additional details related to important remediation activities scheduled in Areas II, III and IV over the next few months. (See Figure 1).

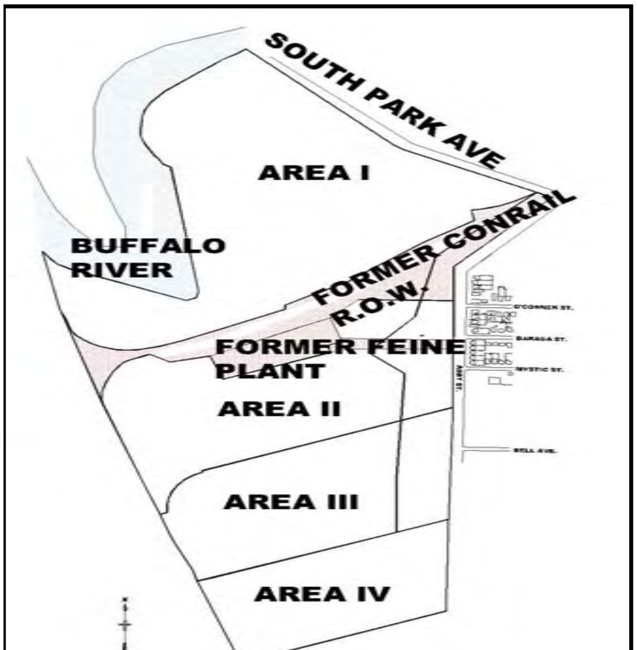

Figure 1

In this issue:

2004 Construction Progress

Planned 2004 Construction Activities

Contact

Prepared for Steelfields, Ltd. By:

TurnKey Environmental Restoration, LLC

Year-To-Date Progress

Area I - Former Republic Steel Plant Parcel

Area I has been remediated in accordance with the requirements of the Voluntary Clean-up Agreement. A Draft Construction Closeout Report documenting remediation efforts is pending approval by the New York State Department of Environmental Conservation. Figure 2 shows the restored river bank near the South Park Avenue lift bridge.

Figure 2

Area II - Former Donner-Hanna Coke Plant Parcel

A 14-acre containment cell is being constructed in Area II to collect contaminated groundwater and contain sub-surface parcel contaminated soils and fill (see Figure 3). The containment system is comprised of: (1) a groundwater collection system; (2) a bentonite/soil slurry wall to control lateral movement of groundwater; (3) a synthetic membrane cover system to eliminate direct contact and reduce surface water infiltration and (4) a groundwater treatment plant (GWTP) to remove contaminants from the collected groundwater before discharging to the City sewerage system. Construction of the groundwater collection system, slurry wall, and GWTP is complete. Figure 4 shows the completed GWTP as seen from Baraga Street.

Year-To-Date Progress—(cont'd)

Area II - Former Donner-Hanna Coke Plant - (cont'd)

In March 2004, a design report for remediation of Area II contaminated source areas was approved by the NYSDEC . The design report details methods to extract subsurface contamination in-place with above-ground treatment. Additional details are provided in the Planned 2004 Activities section of this update. A copy of the report can be found in the Site Document repository.

Area III - Former Republic Warehouse Parcel

Bioremediation of the remaining petroleum contaminated soils excavated from Area I was reinitiated last month, after the winter shutdown, and is expected to be complete by July. The remaining tar-impacted soils excavated from Area I and temporarily stockpiled on the biopad were placed into the containment cell in May of 2004.

Test pits were excavated throughout the "blue-stained" soil/fill subareas designated G, H and I shown on Figure 5. Samples were collected and analyzed to better delineate the nature and extent of soil/fill contamination in these subareas.

Area IV - Former Donner-Hanna Coke Yard Parcel

As of December 2003, the first phase of the excavation and reclamation of metallurgical coke residuals were completed in Area IV and for a small off-site area to the east of Area IV. The off-site excavations were backfilled with clean off-site borrow soils following testing. This Spring, water that had accumulated from rain and snowmelt was pumped out of the area to facilitate the completion of removal of residual coke and coke fines. Water quality testing was conducted in accordance with DEC requirements and was strictly monitored during dewatering activities. Work in the area will continue throughout the summer. As testing of remaining material is conducted to confirm that clean-goals have been met, excavated areas will be backfilled with clean soil starting from the east and proceeding west.

Figure 4

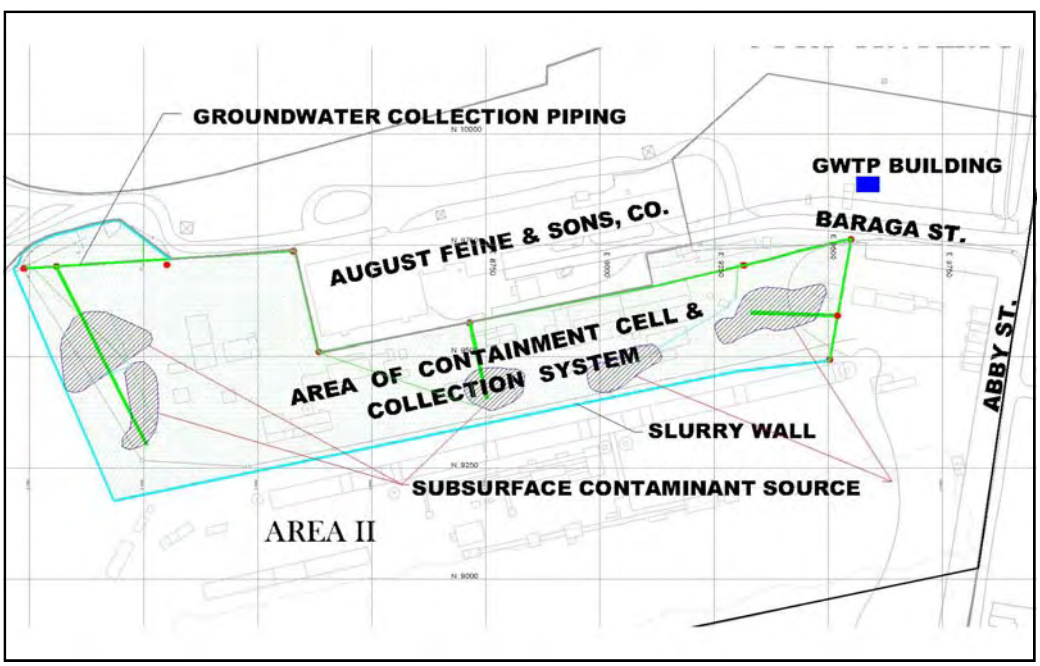

Figure 3

Planned 2004 Activities

Area II - Source Area Remediation

There are five subsurface soil contaminant sources within Area II containment cell and one beneath the berm. Soil contaminants will be "flushed" from the five sources areas within the containment cell using water applied through subsurface drainage pipes. Extraction water will be collected by the existing ground collection system for treatment at the GWTP. The berm source area will be remediated in place using soil vapor extraction (SVE). The soil gas will be "vacuumed" from the subsurface through wells and treated by granular activated carbon housed in a mobile trailer. The SVE system will be operated seasonally beginning late Summer or early Fall (i.e. April—December) until treatment objectives are met. Air emissions from the SVE system will be closely controlled and monitored.

Area III - Blue Stain Soil Remediation

Three subareas designed G, H. & I (See Figure 5) contain blue-stained soil with elevated lead and/or benzene. The blue-stained soil will be chemically treated in-place to control odors prior to excavation. The partially treated soil will undergo additional chemical and biological treatment on the biopad prior to placement in the Area II containment cell. Blue-stained soil remediation is scheduled to begin on or about June 8th. Some of these soils are odorous due to the presence of naphthalene which has a strong "moth ball"-like odor at very low concentrations. While the naphthalene is not a health concern at such low concentrations, it may be considered a nuisance. Special odor control methods will be employed as well as strict air quality monitoring during these remedial activities.

Area III & IV - Tar Soils Remediation

Tar-impacted soil/fill subareas designated as A-F (See Figure 5) are scheduled for remediation beginning in July or August. These soil/fill materials also contain naphthalene with similar potential for odor as the blue-stained soils. As such, strict odor controls and air quality monitoring will be performed. Coal tar and coke fines will be blended on-site for sale and reuse as a fuel in commercial electric power generator facilities. All blending activities will be performed in a membrane-lined temporary surface containment area in the western end of Area IV. This remediation activity is expected to run more-or-less continuously for approximately 8 months.

Figure 5

Public Contacts

In the event of any concerns related to Steelfields remediation activities at the site, please contact the NYSDEC on-site monitor, Mr. Jim Tuk, at his on-site field office at 825-7355 or the Modern Construction, LLC field office at 825-1316. Both telephones have 24-hour answering machines. In addition, the following offices can be contacted with questions:

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Note: Copies of the Remediation Work Plan, air monitoring reports and other documents are available for viewing at the Dudley Branch Library on South Park Avenue.

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Project Update

April 2005

STEELFIELDS LTD

PUBLIC INFORMATION BULLETIN

Purpose and Scope

This project update summarizes the remedial work performed to date and details related to important remediation activities scheduled in Areas II, III, and IV for 2005. (See Figure1). Remobilization for the start of the 2005 construction season has begun with excavation and earthmoving to resume the week of April 18th.

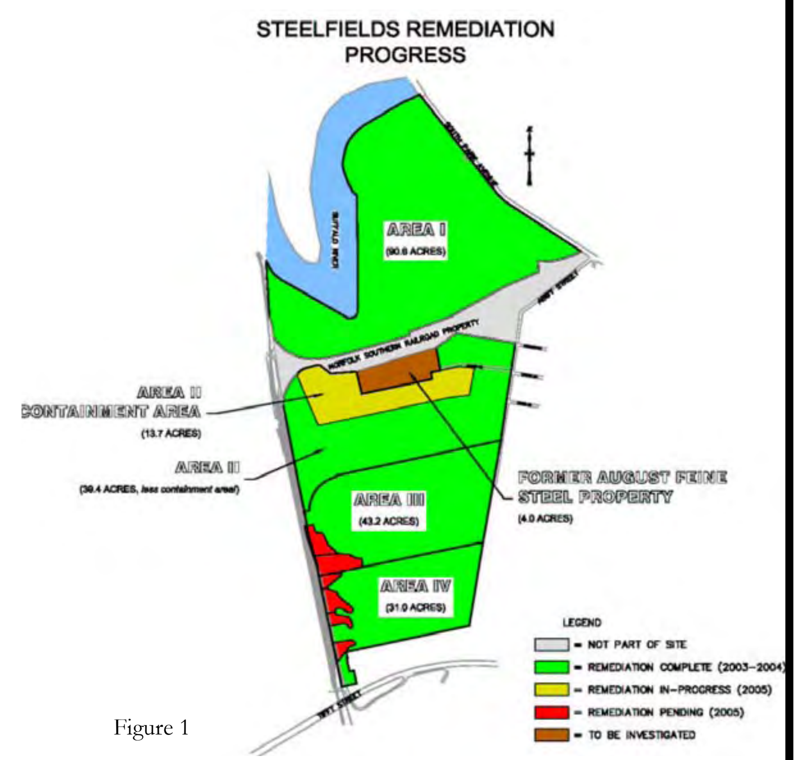

Figure 1

In this issue:

Progress To Date

Area I - Former Republic Steel Plant Parcel

Area I remediation was completed in accordance with the requirements of the Voluntary Clean-up Agreement in 2003.

Area II - Former Donner-Hanna Coke Plant Parcel

Construction of the 14-acre containment cell in Area II began in 2003 with: a bentonite/soil slurry wall to control lateral movement of groundwater completed in October 2003; and the groundwater collection and treatment systems which were completed and became fully operational in February 2004.

Placement of soil/fill material that exceeded site specific action levels (SSALs) from other portions of the site were consolidated into the containment cell during the 2003 and 2004 construction seasons.

Several "infiltration galleries" were constructed in 2004 to address the five subsurface soil contaminant sources within Area II containment cell. Soil contaminants will be "flushed" from these five source areas using a portion of the groundwater from the collection system and applied through subsurface drainage pipes.

Modifications and improvements to the GWTP were completed in 2004 including a gravity separation unit to remove sediment and extend bag filter and granular activated carbon life.

A soil vapor extraction (SVE) system was installed above the subsurface soil contaminant source in the Area II berm during the fall of 2004. The soil gas is "vacuumed" from the subsurface

Progress To Date—(cont'd.)

Area II - Former Donner-Hanna Coke Plant - (cont'd)

through wells and treated by granular activated carbon housed in a mobile trailer. Operation of this system is seasonal and was discontinued in January due to freezing conditions. Operation will be restarted in April and continue until treatment objectives are met.

A sprayed-on temporary cover system was applied to the Area II containment cell in late December 2004 (see Figure 2). This "Posi-shell" cover provided a temporary surface barrier to reduce surface water infiltration, fugitive dust and potential odor of the soil/fill over the dormant winter months.

Area III - Blue Stained Soil /Fill Remediation

Remediation of Area III blue-stained soil was significantly completed in 2004 (see Figure 3). Soil/fill with elevated lead and/or benzene was treated chemically, and placed in the Area II Containment cell for final disposition. Following sampling, analysis of treated soil/fill and approval by DEC, excavations were backfilled with soil tested to meet SSALs and then seeded . Excavation and treatment of the remaining western and southern limits of Subarea G is scheduled to be completed in 2005.

Figure 2

Temporary containment cover system being applied .

Area IV - Former Donner-Hanna Coke Yard Parcel

As of December 2003, the first phase of the excavation and reclamation of metallurgical coke residuals were completed in Area IV and for a small off-site area to the east of Area IV. The off-site excavations were backfilled with clean off-site borrow soils following testing. Full restoration (grading, backfill, and seeding) of Area IV continued through 2004 and is approximately 75% complete, awaiting Area III & IV tar soil/fill remediation.

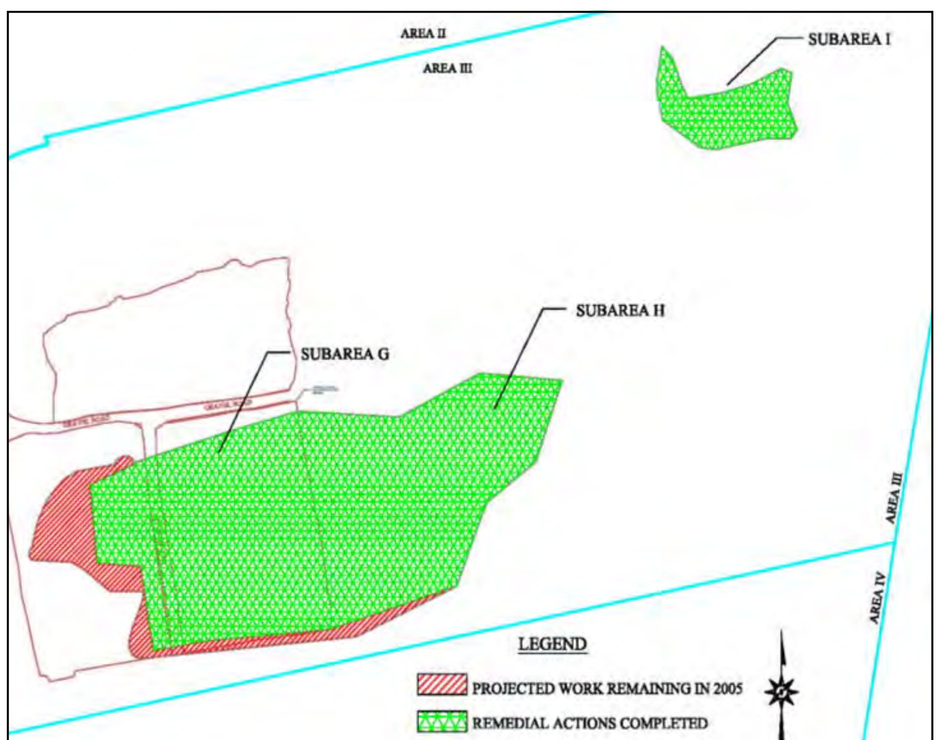

Figure 3

Planned 2005 Activities

Area II - Containment Cell and Source Area Remediation

The 14-Acre containment cell in Area II is scheduled for completion by the fall of 2005. All remaining soil/fill from the blue-stained and tar soil/fill remediation is scheduled to be placed in the cell this year, after which closure of the containment cell will begin. The containment cell cover system that will be constructed is shown in Figure 4. Soil/fill that has previously been placed in the containment cell will first be graded and compacted to designed elevations. Next a synthetic membrane liner will be placed and sealed over the soil/fill to eliminate direct contact and reduce surface water infiltration into the containment cell. An additional 18" of imported soil, will be placed upon the membrane and seeded.

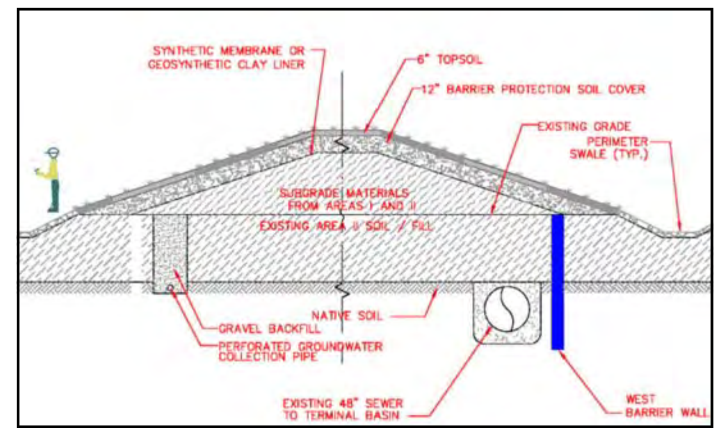

Figure 4

Area III - Blue Stained Soil/Fill Remediation

Completion of Subarea G blue-stained soil/fill remediation is scheduled for early 2005. (See Figure 3) The blue-stained soil will be chemically treated using the same techniques as in 2004 and placed in the Area II containment cell. Special odor control methods will be employed as well as strict air quality monitoring during these activities.

Area III & IV - Tar Soil/Fill Remediation

Tar-impacted soil/fill Subareas A-F (See Figure 5) are scheduled for remediation beginning in April or May. These soil/fill materials also contain naphthalene with similar potential for odor as the blue-stained soils. As such, strict odor controls and air quality monitoring will be performed. Ingress/egress of all traffic related to this activity will be via Tift street. This remediation activity is expected to run more-or-less continuously through 2005.

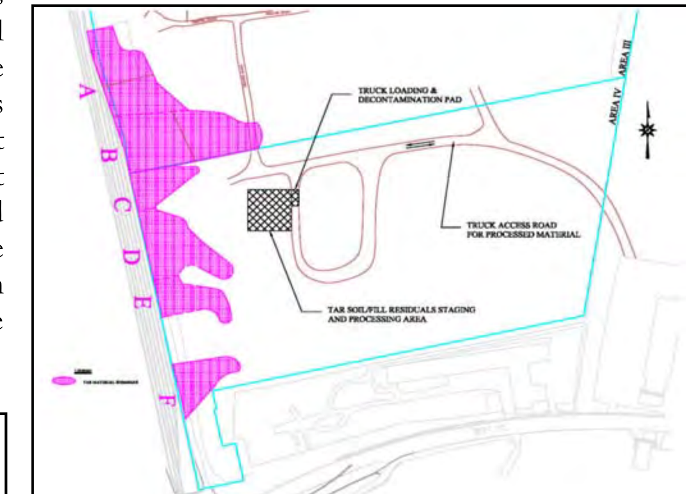

Figure 5

Public Contacts

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Air Monitoring and Odor Controls—(cont'd)

Figure 7
Odor Suppressant Posi-Shell® Application

Additional and on-going mitigation measures include: spray application of odor suppressant foam (see Figure 6) to the soil/fill stockpile throughout the work day; spray application of Posi-Shell® (see Figure 7) a thin-coat cementaceous cover to the soil/fill stockpile at the end of each work day; restricting stockpiling and loading of tar soil/fill to areas of the site remote from residential areas; keeping the exposed working face of excavation and open stockpile to a minimum; and performing these activities during colder temperatures.

Project Update
November 2005

STEELFIELDS LTD

PUBLIC INFORMATION BULLETIN

Purpose and Scope

This project update summarizes the remedial work performed to date and details related to important remediation activities scheduled in Areas II, III, and IV for the remainder of the project. (See Figure1).

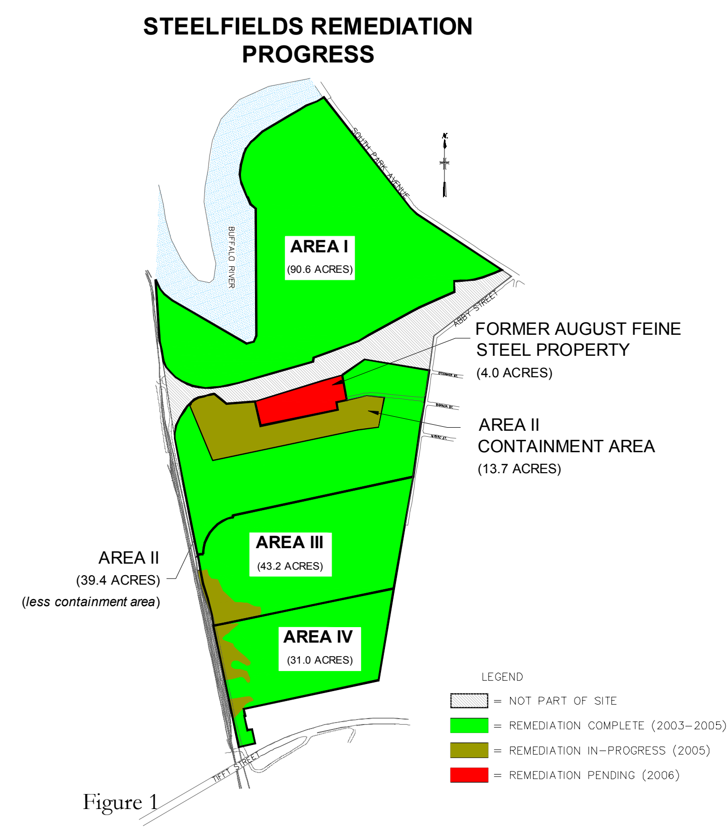

Figure 1

In this issue:

TurnKey Environmental Restoration, LLC

Progress To Date

Area I - Former Republic Steel Plant Parcel

Area I remediation was completed in accordance with the requirements of the Voluntary Cleanup Agreement in 2003.

Area II - Former Donner-Hanna Coke Plant Parcel

Construction of the 14-acre containment cell in Area II began in 2003 with: a bentonite/soil slurry wall to control lateral movement of groundwater completed in October 2003; and the groundwater collection and treatment systems which were completed and became fully operational in February 2004.

Placement of soil/fill material that exceeded site specific action levels (SSALs) from other portions of the site were consolidated into the containment cell during the 2003-2005 construction seasons.

A soil vapor extraction (SVE) system was installed above the subsurface soil contaminant source in the Area II berm during the fall of 2004. Operation of this system was completed in early October 2005, as treatment objectives were met.

Area III - Blue Stained Soil /Fill Remediation

Remediation of Area III blue-stained soil was substantially completed in 2004 with some perimeter excavation and cleanup carrying over into 2005. Soil/fill with elevated inorganic and/or volatile organic contaminants was treated prior to placement in the Area II Containment cell for final disposition. Following analysis of treated soil/fill and approval by DEC, excavations were backfilled with soils meeting SSALs and covered with grass seed. Excavation and treatment of the remaining western and southern perimeter was substantially completed in 2005.

Progress To Date—(cont'd.)

Area IV—Coke Residual Removal

In December 2003, the first phase of the excavation and reclamation of metallurgical coke residuals was completed in Area IV and for a small off-site area to the east of Area IV. The off-site excavations were backfilled with clean off-site borrow soils following testing. Full restoration (grading, backfill, and seeding) of Area IV continued through 2004 and is currently approximately 90% complete, awaiting Area III & IV tar soil/fill remediation completion.

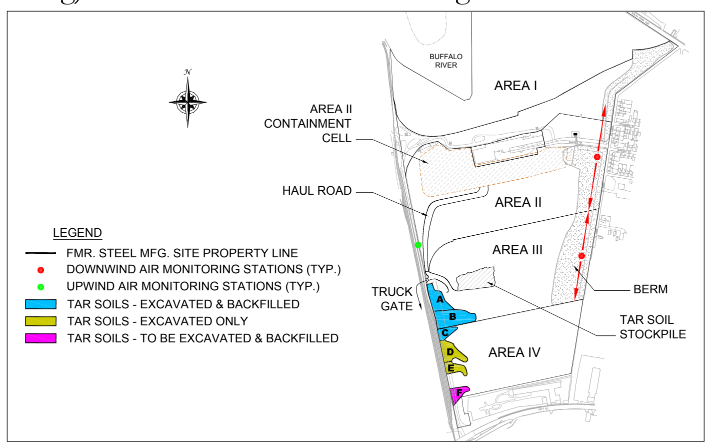

Figure 2

Area III & IV—Tar soil/Fill Remediation Status

Area III & IV—Tar Soil/Fill Remediation

Area III and IV tar soil/fill excavation began in June 2005, and is approximately 90% complete. Figure 2 depicts the progress of the tar soil/fill excavation in Areas III and IV. 32,000 cubic yards of excavated tar soil/fill will be transported and recycled or disposed off-site at a permitted facility. The remainder of tar soil/fill has been or is scheduled to be placed in the containment cell. Due to off-site permitting and capacity limitations, the schedule for this work element has been delayed beyond 2005. Presently, the tar soil/fill is being transported to a facility in Pennsylvania, blended with coal, and utilized as an alternative fuel to generate electric power.

Remaining Remedial Activities

Overall Remedial Construction Schedule

Overall site-wide remedial construction activities are approximately 80% complete to date. All major remaining construction activities are scheduled for completion in 2006, approximately one full year ahead of the Voluntary Cleanup Agreement schedule. Long-term operation, maintenance and monitoring will continue after remedial construction is complete. Figure 3 depicts current project status.

Area II - Containment Cell and Source Area Remediation

The construction of the containment cell is approximately 80% complete. Placement and grading of impacted soil/fill within the containment cell will continue, weather permitting, in preparation for the final cover system. The completion of the 14-acre containment cell in Area II is scheduled for completion by mid-2006. A schematic cross-section of the containment cell is presented in Figure 4.

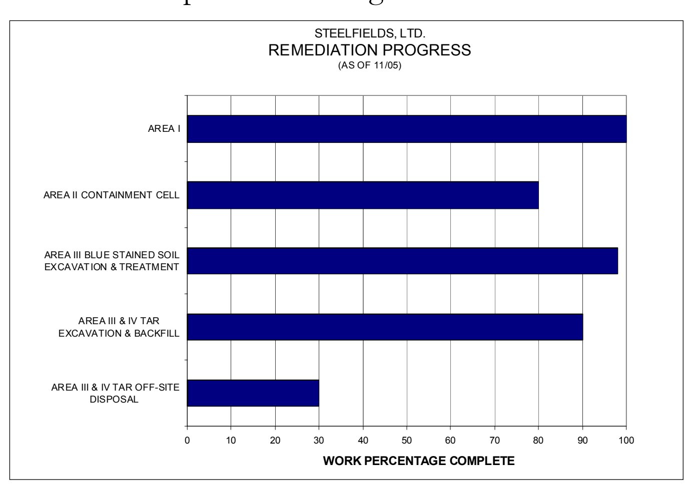

Figure 3

Current Project Status

Remaining Remedial Activities -(cont'd.)

Area III & IV - Tar Soil/Fill Remediation

Tar-impacted soil/fill excavated from Subareas A-F (See Figure 2) are scheduled for off-site transport and disposal through June-July 2006. All truck traffic related to this activity enters and leaves the site through the west gate to Tifft St.

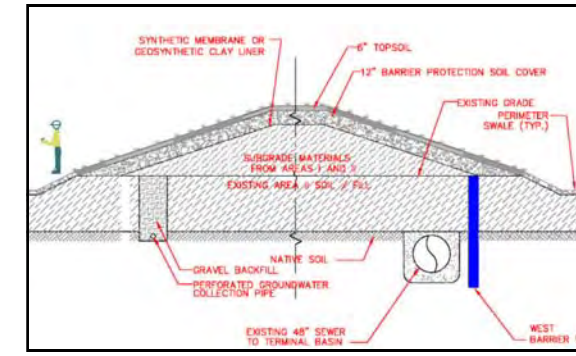

Figure 4

Area II Containment Cell Cover System Detail

Air Monitoring and Odor Controls

Community Air Monitoring

Strict adherence to the Voluntary Cleanup Agreement and Community Air Monitoring Work Plan is ongoing. Air monitoring stations (see Figure 5) are set at the perimeter of the property daily during remedial activities (weather permitting), and monitor for particulate and volatile organic constituents (VOCs). Typical monitoring station locations are shown in Figure 2. This air monitoring equipment operates in most weather conditions, however it cannot be used in fog, rain, or snow. Continuous real-time monitoring data is downloaded from the monitors and reviewed daily.

Figure 5

Since project initiation, no air quality exceedances for benzene, naphthalene, and other constituents of concern have been detected along the perimeter of the site. Twelve documentation air monitoring events (8-hour time weighted exposure testing) have been performed to verify ambient air quality at the site perimeter. Weekly construction progress meetings are held with the contractor, NYSDEC, NYSDOH, and Turn-Key to discuss current project progression including air monitoring and odor controls.

Odor Controls

The tar soil/fill materials being excavated from the west side of Area III & IV contain naphthalene which exhibits a "mothball-like" odor at concentrations well below those associated with health concerns. As such some odor generation related to the excavation and handling of the large quantity of tar soil/fill being remediated is unavoidable. In response to recent telephone complaints and in order to control odors to levels that are not objectionable or a nuisance in the nearby Hickory Woods neighborhood, Steelfields, in consultation with the New York State Department of Environmental Conservation, has undertaken additional odor mitigation measures during the handling of the tar soil/fill materials.

Figure 6

Odor Suppressant Foam Application

Public Contacts

In the event of any concerns related to Steelfields remediation activities at the site, please contact the NYSDEC's on-site monitor, Mr. Jim Tuk, at his on-site field office at 825-7355 or the Modern Construction, LLC field office at 825-1316. Both telephones have 24-hour answering machines. In addition, the following offices can be contacted with questions:

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Air Monitoring and Odor Controls—(cont'd)

Figure 7
Odor Suppressant Posi-Shell® Application

Additional and on-going mitigation measures include: spray application of odor suppressant foam (see Figure 6) to the soil/fill stockpile throughout the work day; spray application of Posi-Shell® (see Figure 7) a thin-coat cementaceous cover to the soil/fill stockpile at the end of each work day; restricting stockpiling and loading of tar soil/fill to areas of the site remote from residential areas; keeping the exposed working face of excavation and open stockpile to a minimum; and performing these activities during colder temperatures.

STEELFIELDS LTD

PUBLIC INFORMATION BULLETIN

Purpose and Scope

This project update summarizes the remedial work performed to date and details related to important remediation activities scheduled in Areas II, III, and IV for the remainder of the project. (See Figure1).

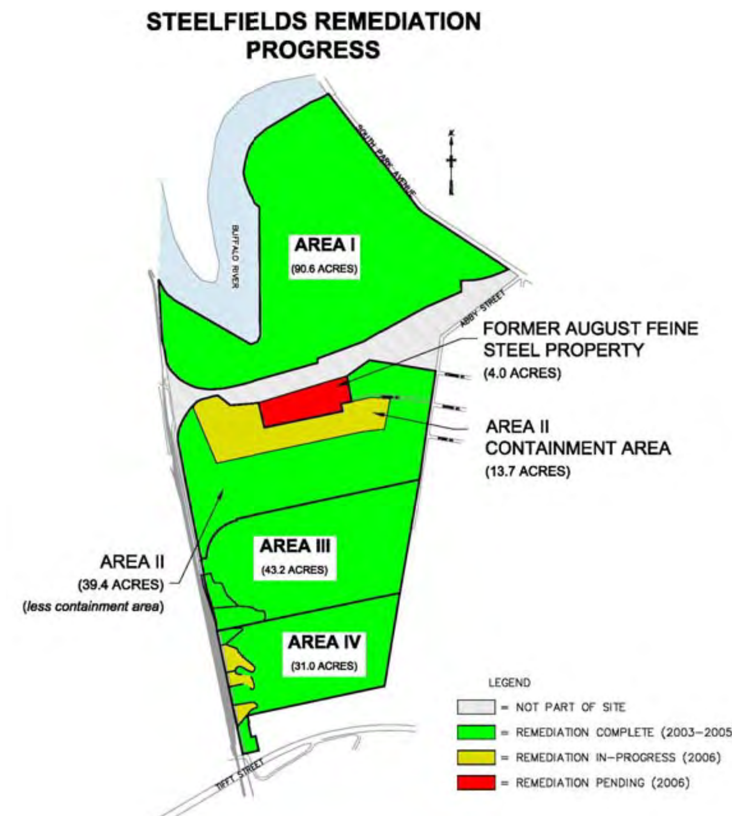

Figure 1

Progress To Date

Area I - Former Republic Steel Plant Parcel

Area I remediation is substantially complete in accordance with the requirements of the Voluntary Cleanup Agreement in 2003.

Area II - Former Donner-Hanna Coke Plant Parcel

Construction of the 14-acre containment cell in Area II began in 2003 with: a bentonite/soil slurry wall to control lateral movement of groundwater completed in October 2003; and the groundwater collection and treatment systems which were completed and became fully operational in February 2004.

Placement of soil/fill material that exceeded site specific action levels (SSALs) from other portions of the site were consolidated into the containment cell during the 2003-2005 construction seasons.

A soil vapor extraction (SVE) system was installed above the subsurface soil contaminant source in the Area II berm during the fall of 2004. Operation of this system was completed in early October 2005, as treatment objectives were met.

Area III - Blue Stained Soil /Fill Remediation

Remediation of Area III blue-stained soil was substantially completed in 2004 with some perimeter excavation and cleanup carrying over into 2005. Soil/fill with elevated inorganic and/or volatile organic contaminants was treated prior to placement in the Area II Containment cell for final disposition. Following analysis of treated soil/fill and approval by DEC, excavations were backfilled with soils meeting SSALs and covered with grass seed. Excavation and treatment of the remaining western and southern perimeter was substantially completed in 2005.

Progress To Date—(cont'd.)

Area IV—Coke Residual Removal

In December 2003, the first phase of the excavation and reclamation of metallurgical coke residuals was completed in Area IV and for a small off-site area to the east of Area IV. The off-site excavations were backfilled with clean off-site borrow soils following testing. Full restoration (grading, backfill, and seeding) of Area IV continued through 2004 and is currently approximately 90% complete, awaiting Area III & IV tar soil/fill remediation completion.

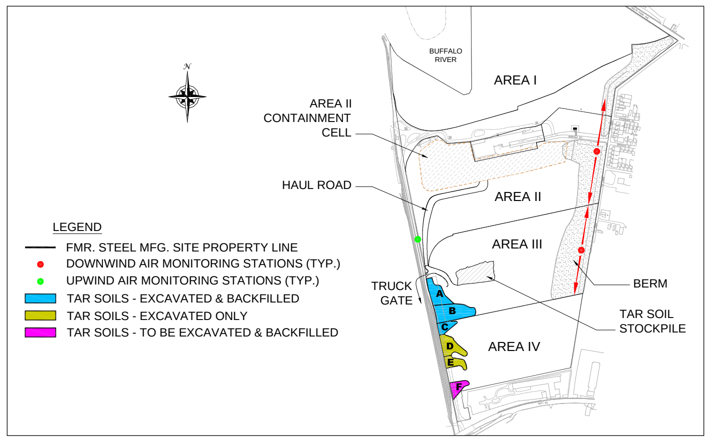

Figure 2

Area III & IV—Tar soil/Fill Remediation Status

Area III & IV—Tar Soil/Fill Remediation

Area III and IV tar soil/fill excavation began in June 2005, and is approximately 94% complete. Figure 2 depicts the progress of the tar soil/fill excavation in Areas III and IV. To date, approximately 24,300 cubic yards of excavated tar soil/fill has been transported and recycled or disposed off-site at a permitted facility. An additional 8,000 CY of tar soil/fill is estimated to be disposed of off-site during this construction season. The remainder of tar soil/fill has been or is scheduled to be placed in the containment cell. Due to off-site permitting and capacity limitations, the schedule for this work element has been delayed beyond 2005. Presently, the tar soil/fill is being transported to facilities in Pennsylvania and Ohio, blended with coal, and utilized as an alternative fuel to generate electric power.

Remaining Remedial Activities

Overall Remedial Construction Schedule

Overall site-wide remedial construction activities are approximately 90% complete to date. All major remaining construction activities are scheduled for completion in 2006, approximately one full year ahead of the Voluntary Cleanup Agreement schedule. Long-term operation, maintenance and monitoring will continue after remedial construction is complete. Figure 3 depicts current project status.

Area II - Containment Cell and Source Area Remedia-

The construction of the containment cell is approximately 85% complete. Placement and grading of impacted soil/fill within the containment cell will continue, weather permitting, in preparation for the final cover system (consisting of a geosynthetic liner, geotextile fabric, and 18 in. of barrio soil). The completion of the 14-acre containment cell in Area II is scheduled for completion by mid-2006. A schematic cross-section of the containment cell is presented in Figure 4.

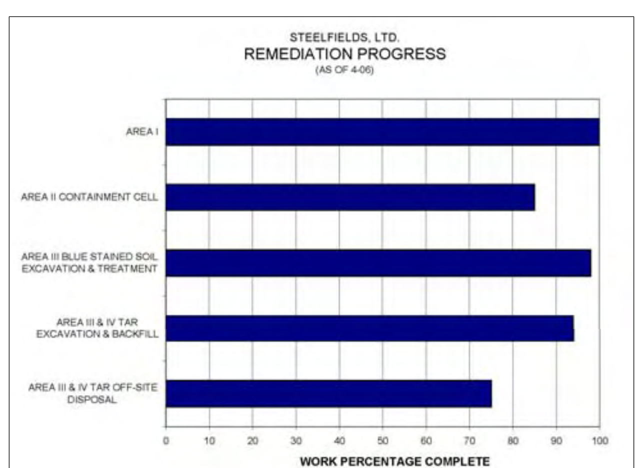

Figure 3

Current Project Status

Remaining Remedial Activities -(cont'd.)

Area III & IV - Tar Soil/Fill Remediation

Tar-impacted soil/fill excavated from Subareas A-F (See Figure 2) are scheduled for off-site transport and disposal through Summer 2006. All truck traffic related to this activity enters and leaves the site through the west gate to Tifft St.

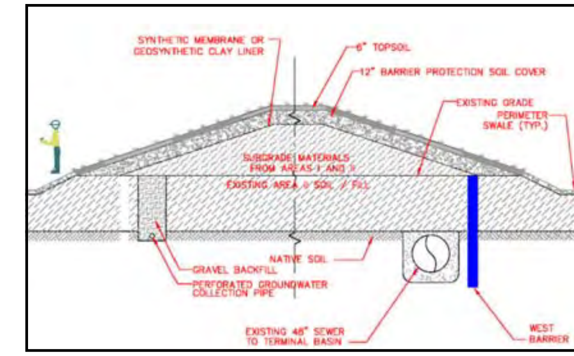

Figure 4

Area II Containment Cell Cover System Detail

Air Monitoring and Odor Controls

Community Air Monitoring

Strict adherence to the Voluntary Cleanup Agreement and Community Air Monitoring Work Plan is ongoing. Air monitoring stations (see Figure 5) are set at the perimeter of the property daily during remedial activities (weather permitting), and monitor for particulate and volatile organic constituents (VOCs). Typical monitoring station locations are shown in Figure 2. This air monitoring equipment operates in most weather conditions, however it cannot be used in fog, rain, or snow. Continuous real-time monitoring data is downloaded from the monitors and reviewed daily.

Figure 5

Since project initiation, no air quality exceedances for benzene, naphthalene, and other constituents of concern have been detected along the perimeter of the site. Twelve documentation air monitoring events (8-hour time weighted exposure testing) have been performed to verify ambient air quality at the site perimeter. Weekly construction progress meetings are held with the contractor, DEC, New York State Department of Health (NYSDOH), and TurnKey to discuss current project progression including air monitoring and odor controls.

Odor Controls

The tar soil/fill materials being excavated from the west side of Area III & IV contain naphthalene which exhibits a "mothball-like" odor at concentrations well below those associated with health concerns. As such some odor generation related to the excavation and handling of the large quantity of tar soil/fill being remediated is unavoidable. In response to recent telephone complaints and in order to minimize odors to levels that are not objectionable or a nuisance in the nearby Hickory Woods neighborhood, Steelfields, in consultation with the New York State Department of Environmental Conservation and New York State Department of Health, has undertaken additional odor mitigation measures, such as, applying odor suppression foam during the handling of the tar soil/fill materials.

Figure 6

Odor Suppressant Foam Application

Backfill of Subarea A

A1 – MW -6
Installation

Subarea D
Excavation & Backfill

Subarea D
ORC Application

Subarea N14
Excavation & Backfill

Subarea T3
Excavation

Subarea Q
Excavation