

Interim Remedial Measures (IRM) Work Plan

*Phase II Business Park
Sites II-10, II-11 and II-12
BCP Site Nos. C915198J, C915198K & C915198L
Lackawanna, New York*

February 2017
Revised April 2017

0071-017-326

Prepared For:

Tecumseh Redevelopment Inc.
Richfield, Ohio

Prepared By:



In Association With:



INTERIM REMEDIAL MEASURES (IRM) WORK PLAN

PHASE II BUSINESS PARK SITES II-10, II-11 & II-12

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**TECUMSEH REDEVELOPMENT INC.
LACKAWANNA, NEW YORK**

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CERTIFICATION

I, Thomas H. Forbes, P.E., certify that I am currently a NYS registered professional engineer and that this Interim Remedial Measures (IRM) Work Plan for the Phase II Business Park Sites II-10, II-11 and II-12 was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Date: 4-5-17

SEAL:



IRM WORK PLAN
SITES II-10, 11-11 & 11-12
LACKAWANNA, NEW YORK

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1.0 INTRODUCTION

This document presents the proposed scope of work for completion of an Interim Remedial Measure (IRM) within Sites II-10, II-11 & II-12 (Site Nos. C915198J, C915198K & C915198L) of the Tecumseh Phase II Business Park Brownfield Cleanup Program (BCP) Site in Lackawanna, New York (see Figures 1 and 2).

The IRM work is being performed on behalf of Tecumseh Redevelopment Inc. (Tecumseh) through the New York State Department of Environmental Conservation (NYSDEC) BCP to address petroleum/organic-impacted “hotspot” soil/fill previously identified within the subject areas. Remediation of these petroleum/organic-impacted hotspots under an IRM program will satisfy the intended goal of expediting cleanup of the associated impacts while facilitating redevelopment of the Site for commercial and industrial reuse.

1.1 Background

1.1.1 *Prior Investigation*

The approximately 144-acre Phase II Business Park formerly housed several facilities associated with the Bethlehem Steel Corporation’s (BSC’s) steel manufacturing processes. These included a pure oxygen generating station (known as South Linde Area); various mills; a structural shipping yard; a car repair shop; metal storage; and miscellaneous office production support buildings. Five historical SWMUs (i.e., P-38 through P-42) are present within the Phase II Business Park. BSC performed assessments for these SWMUs during a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) and subsequent RCRA Facility Investigation (RFI). Based on the findings, USEPA Region II issued “No Further Action” determination for the identified SWMUs within the Business Park II Business Park.

The BCP application for the Phase II Business Park was submitted May 20, 2005 and approved January 9, 2007. The July 2009 Remedial Investigation/Alternatives Analysis Report (RI/AAR) Work Plan (Ref. 1) identified Site characterization requirements to be completed pursuant to the BCP and NYSDEC DER-10 guidance (Ref. 2). Remedial Investigation (RI) field activities were initiated in March 2010 and substantially completed in April 2010.

The RI/AA Report was submitted to NYSDEC in May 2011 and finalized in March 2012 (Ref. 3). The RI/AA Report recommended remediation of hotspot soil/fill with deferred soil cover system placement during redevelopment as the final remedial measure for all areas of the Site.

1.1.2 Cleanup Approach

The Phase II Business Park as well as other Tecumseh Business Parks (i.e., I, IA, and III) were so designated by Tecumseh based on the concept of voluntarily remediating them and subsequently selling or leasing the “shovel-ready” Business Park parcels to local developers or private businesses interested in redeveloping the land for commercial or industrial uses consistent with City zoning. Recognizing the sheer size of these parcels, the cost and short-term impacts associated with cleanup (particularly for cover placement, which would require clearing and covering each of the large Business Parks), and the limited western NY commercial/industrial real estate market demand, a sub-parcel cleanup approach was conceived by Tecumseh and agreed upon by the NYSDEC. Under this approach, hotspot soil/fill remediation and other remedial measures (except cover placement) will be performed by Tecumseh on a priority bases (i.e., parcels pending potential sale, lease, and/or redevelopment, or where remedial measures are required to address significant threats, will be completed first). Placement of the final cover will also progress on a site-by-site basis by the buyer or lessee concurrent with building construction and/or other site improvements, thereby allowing the cover to be integrated with roads, buildings, parking areas, etc. Certificate of Completion (COC) issuance by the NYSDEC will occur on a site-by-site basis following cover placement by the owner or developer (subject to provisions of a NYSDEC-approved Site Management Plan and Environmental Easement encompassing the entire Business Park).

Based on this approach, Tecumseh prepared sub-parcel delineation maps for each of the three larger Business Park Areas (I, II, and III). Business Park II was subdivided into 12 sub-parcels designated as Sites II-1 through II-12 (BCP Site Nos. C915198 through C915198L).

1.2 Purpose and Scope

This IRM Work Plan presents a summary of petroleum/organic-impacted “hotspot” areas located on Sites II-10, II-11 & II-12, and the planned approach for implementation of IRM activities to address these hotspot areas.

Completion of the petroleum/organic-impacted hotspot cleanup work as an IRM will satisfy NYSDEC's requirements for these hotspot areas and further the remediation, making the Sites more attractive to prospective buyers. The proposed scope of IRM activities includes:

- Excavation of petroleum/organic-impacted hotspot soil/fill.
- On-site (Site II-9) biotreatment of petroleum/organic-impacted soil/fill.
- In-situ smear zone soil/fill remediation.
- Backfilling and/or re-grading the excavations.

This IRM Work Plan has been prepared in accordance with Section 5.3b of NYSDEC's May 2010 DER-10 Technical Guidance for Site Investigation and Remediation (Ref. 2). As such, it provides the following items:

- Description of the impacts and remedial actions to be undertaken as part of the IRM and the basis for the actions (Sections 2.0 and 3.0).
- Location and description of any temporary construction facilities to implement remedial action (Section 3.2).
- Description of erosion control measures, storm water management, and dust/vapor monitoring required for minimizing potential releases of soil/fill outside the work zone during construction (Section 3.2).
- Health, safety, and community air monitoring procedures (Sections 3.1.3 and 4.0).
- Description of documentation sampling (Section 3.3.1).
- Site restoration plans (Section 3.3.2).
- Project documentation requirements and anticipated construction schedule (Sections 5.0 and 6.0).
- Summary of drawings and information to be provided as part of the Construction Completion Report (Section 5.3).

1.3 Project Organization and Responsibilities

TurnKey Environmental Restoration, LLC in association with Benchmark Environmental Engineering & Science, PLLC (TurnKey-Benchmark) will implement the hotspot excavation work on behalf of Tecumseh Redevelopment on a design-build basis. The NYSDEC Division of Environmental Remediation, in consultation with the NY State

Department of Health (NYSDOH), will monitor the remedial actions to verify that the work is performed in accordance with the approved IRM Work Plan.

2.0 HOTSPOT AREAS

The location and estimated extent of the hotspot areas are shown on Figure 2 and described below.

- **Hotspot “A” (BPA2-TP-85):** Total PAHs were detected in the shallow (0-2 feet below ground surface; fbgs) soil/fill at a concentration of 1,577 ppm. Because the extent of the impact has not been delineated, an estimated 20-foot x 20-foot x 2-foot area has been assumed, for a corresponding in-place volume of approximately 30 cubic yards. Accounting for contingency and excavation inefficiencies, the volume for ex-situ treatment is estimated to be 45 cubic yards.
- **Hotspot “B” (BPA2-TP-80):** Total PAHs were detected in the shallow (0-2 fbgs) soil/fill at a concentration of 663 ppm. Because the extent of the impact has not been delineated, an estimated 20-foot x 20-foot x 2-foot area has been assumed, for a corresponding in-place volume of approximately 30 cubic yards. Accounting for contingency and excavation inefficiencies, the volume for ex-situ treatment is estimated to be 45 cubic yards.
- **Hotspot “C” (BPA2-TP-53):** Slight petroleum-like odor and floating product/sheen were observed on the water surface at approximately 5 fbgs. PID readings were 0 ppm to the end of the test pit at 10 fbgs. Four semi-volatile organic compounds (SVOCs) were detected in the 4 to 6 fbgs interval at concentrations above Part 375 commercial soil cleanup objectives (CSCOs), with a total SVOC concentration of 442 ppm. An additional six test pits were excavated in this area to check for a possible contaminant source. Slight sheen and blebs of product were observed in BPA2-TP-53D and -53E on the water at 5 fbgs. Slight sheen was noted in supplemental test pits BPA2-TP-53A and -53C; no evidence of impact was observed in test pits BPA2-TP-53B and -53F. The extent of impact is estimated to be 70 feet by 30 feet over a 3-foot depth from approximately 3.5 to 6.5 fbgs, for an in-place volume of approximately 240 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment is estimated to be 375 cubic yards.
- **Hotspot “D” (BPA2-TP-89):** Black staining and oily residue were identified in the soil/fill between 4 and 6 fbgs. Slight sheen and yellowish product were observed floating on the water table at approximately 4.5 fbgs. The maximum PID reading was 7.5 ppm at 5 fbgs, and moderate odor was noted. The total SVOC concentration of 57.6 ppm was detected in the 4 to 6 fbgs interval. An additional 18 test pits were excavated in this area. Floating product was observed within 3 of the 18 test pits. With the exception of two supplemental test pits with no evidence of impact; sheen and odor were noted in the remaining test pits with a maximum PID reading of 18 ppm. The extent of impact is estimated to be 150 feet by 90 feet over a 3-foot depth from approximately 3 to 6 fbgs, for an in-place volume of approximately 1,500 cubic

yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment is estimated to be 2,200 cubic yards.

- **Hotspot “E” (BPA2-TP-93):** Slight sheen and yellowish product were observed floating on the water table at approximately 6.5 fbgs in test pit BPA2-TP-93. The water table was observed below the soil/fill unit within a silty clay layer suspected to be non-native. The sample collected from the 4 to 6 fbgs interval detected SVOCs at concentrations above CSCOs with a total SVOC concentration of 3,958 ppm. Surrounding test pits BPA2-TP-93A and BPA2-TP-93B indicated similar findings. The observations noted in downgradient test pit BPA1-TP-73 (slight sheen, slight odor) will be further investigated during excavation of this upgradient hotspot. Therefore, the extent of impact is estimated to cover a 75-foot by 75-foot area within the smear zone at a depth of 5-8 fbgs, for a corresponding in-place volume of approximately 625 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment is estimated to be 900 cubic yards.
- **Hotspot “F” (BPA2-TP-95):** Black stained soil and yellowish floating product were identified at the water table, estimated at approximately 8 fbgs. The maximum PID reading was 11.7 ppm at 7 fbgs. Moderate odor and trapped product were observed within the non-native silty clay cracks between 4 and 9 fbgs. The sample collected from the 6 to 8 fbgs interval indicated three SVOC concentrations above the CSCOs, with a total SVOC concentration of 176 ppm. An additional two test pits (BPA2-TP-95A and -95B) were excavated in this area to check for a possible contamination source. No visual or olfactory evidence of impact was observed in BPA2-TP-95A, which was excavated 30 feet north of the original test pit and to 8 fbgs. Test pit BPA2-TP-95B was excavated 30 feet south of the original test pit. A red/orange staining was observed on the north side wall from approximately 3 to 4 fbgs. No other visual or olfactory impacts were noted. Test pit BPA2-TP-62 excavated east of and adjacent to BPA2-TP-95 noted no visual or olfactory evidence of impact. The extent of impact is estimated to be 60 feet by 40 feet over a 5-foot depth from approximately 4 to 9 fbgs, for an in-place volume of approximately 450 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment is estimated to be 675 cubic yards.
- **Hotspot “G” (BPA2-TP-81B):** This test pit was excavated within the former 48”-54” Roughing Mill near the oil cellars, and the remains of a drum were found. Sheen was observed on the water at approximately 9 fbgs and a slight to moderate odor was detected. These olfactory and visual impacts were corroborated by analytical results from the sample collected at 9-9.5 fbgs; five PAHs detected at concentrations above Part 375 CSCOs. However, the total PAH concentration was 204 ppm, which is below the site-specific action level (SSAL) of 500 ppm. The dimensions of the test pit were 15 feet long by 3 feet wide. The extent of impact surrounding test pit BPA2-TP-81B is estimated to be 20 feet by 20 feet over a 4-foot depth from

approximately 5 to 9 fbgs. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment is estimated to be 90 cubic yards.

3.0 IRM TECHNICAL APPROACH

3.1 Pre-Mobilization Tasks

3.1.1 *Pre-Construction Meeting*

A project coordination meeting will be held with key representatives of the Project Team before the hotspot excavation work begins. Attendees at the meeting will include TurnKey-Benchmark's Project Manager and the remediation sub-contractor. The designated NYSDEC Project Manager and New York State Department of Health (NYSDOH) representative will also be notified and invited to attend. Agenda items will include:

- Construction schedule.
- Work sequencing.
- Designation of responsibilities, contact personnel, and phone numbers.
- Project documentation requirements.
- Staging of equipment.
- Transportation routes/site egress.
- Health and safety requirements.
- Temporary controls (dust suppression, storm water management).
- Work hours.
- Site security.

TurnKey-Benchmark will prepare meeting minutes for distribution to attendees following the meeting.

3.1.2 *Underground Utilities Location*

Prior to excavation work, Site infrastructure drawings will be reviewed and the underground utilities locating service will be contacted to locate and mark any underground utilities in the vicinity. If active utilities are present, care will be taken to maintain appropriate set-backs or stabilize the utilities as necessary to allow hotspot removal to proceed.

3.1.3 Health and Safety Plan Development

The April 2010 Site Health and Safety Plan (HASP) for Brownfield Cleanup Program (Appendix A), prepared in accordance with the requirements of 40 CFR 300.150 of the NCP and 29 CFR 1910.120 and previously approved by the NYSDEC for Business Park investigation work, will be used for the IRM activities described herein. TurnKey-Benchmark will be responsible for site control and for the health and safety of its authorized site workers. All contractors and other parties involved in onsite construction will be required to develop a HASP as or more stringent than TurnKey-Benchmark's HASP. The HASP will be subject to revision, as necessary, based on new information that is discovered during the IRM.

TurnKey-Benchmark will also be responsible for the performance of community air monitoring during intrusive activities involving subgrade disturbance as discussed in Section 4.0 of this Work Plan.

3.1.4 Progress Meetings

Progress meetings will be conducted on a regular basis throughout the construction period. Progress meetings will be attended by TurnKey-Benchmark personnel, and, if appropriate, key subcontractors. NYSDEC and NYSDOH will have access to all progress meetings.

3.2 Temporary Facilities and Controls

3.2.1 Temporary Construction Facilities

The former Water Quality Control Station 3A garage located on the Phase III Business Park will serve as field office for the personnel involved in hotspot removal work. The location of the facilities will be discussed with the NYSDEC during the pre-construction meeting.

3.2.2 Dust Suppression

Dust suppression will be an integral component of the hotspot excavation and re-grading activities. During excavation and re-grading work, water will be sprayed across the surface of the work area as necessary to mitigate airborne dust formation and migration and assure conformance with community air monitoring thresholds. Water will also be sprayed as needed to control visible dust migration from the handling, placement, and

compaction of cover material. Other dust suppression techniques that may be used to supplement the water spray include:

- Applying water on haul roads.
- Hauling materials in properly tarped containers or vehicles.
- Restricting vehicle speeds on-site.

All reasonable attempts will be made to keep visible and/or fugitive dust to a minimum and adhere to particulate emissions limits identified in the Community Air Monitoring Plan (CAMP) discussed in Section 4.0.

3.2.3 Storm Water Management

Due to the highly permeable nature of the soil/fill material, its coarse gradation, and the relatively flat topography in the proposed work area, storm water ponding/runoff is not expected to pose a significant soil particulate or contaminant transport pathway during IRM activities. During the hotspot removal work, TurnKey-Benchmark will undertake specific measures to assure proper management of storm water and preclude migration of contaminants to surface waters or other areas of the Site. These will include:

- Direct loading of trucks where feasible to avoid staging of impacted materials.
- Use of poly sheeting for lay-down and daily cover if staging of impacted materials is necessary.
- Prompt re-grading of excavations upon completion.
- Employment of specific erosion control measures for the biotreatment area as further described below.

3.3 Excavation, Remediation, and Re-grading of Hotspot Areas

3.3.1 Excavation

Planned IRM activities involve excavation of petroleum/organic-impacted soil/fill hotspot areas to pre-established excavation limits based on test pit investigations. Excavation limits are shown on Figure 2 and described below:

- **Hotspot “A”**: Excavation will proceed to a depth of 2 fbs within the 20-foot by 20-foot area surrounding test pit BPA2-TP-85. Petroleum-impacted soil/fill will be excavated for ex-situ biotreatment.

- **Hotspot “B”**: Excavation will proceed to a depth of 2 fbgs within the 20-foot by 20-foot area surrounding test pit BPA2-TP-80. Petroleum-impacted soil/fill will be excavated for ex-situ biotreatment.
- **Hotspot “C”**: Petroleum-impacted soil/fill will be excavated over a 3-foot interval from 3.5 to 6.5 fbgs within the 70-foot by 30-foot area surrounding test pit BPA2-TP-53 for ex-situ biotreatment.
- **Hotspot “D”**: Petroleum-impacted soil/fill will be excavated over a 3-foot interval from 3.0 to 6.0 fbgs within the 150-foot by 90-foot area surrounding test pit BPA2-TP-89 for ex-situ biotreatment.
- **Hotspot “E”**: Petroleum-impacted soil/fill will be excavated over a 3-foot interval from 5.0 to 8.0 fbgs within the 75-foot by 75-foot area surrounding test pit BPA2-TP-93 for ex-situ biotreatment.
- **Hotspot “F”**: Petroleum-impacted soil/fill will be excavated over a 5-foot interval from 4.0 to 9.0 fbgs within the 60-foot by 40-foot area surrounding test pit BPA2-TP-95 for ex-situ biotreatment.
- **Hotspot “G”**: Organic-impacted soil/fill will be excavated over a 4-foot interval from 5.0 to 9.0 fbgs within the 20-foot by 20-foot area surrounding test pit BPA2-TP-95. Section 3.3.3 describes planned in-situ remediation to address potential residual smear zone soil/fill impacts.

Following completion of the excavation activities, post-excavation documentation samples will be collected from Hotspots A, B and E since soil/fill samples from these areas indicated total PAH concentrations above the SSAL of 500 ppm. One representative sidewall sample will be collected from each of the four sides of the excavation (i.e., N, S, E and W) for every 30 linear feet and one bottom sample will be collected from the base of the excavation for every 900 square feet of bottom area. The samples will be submitted to an NYSDOH-ELAP certified laboratory for analysis of SVOCs (base neutrals only) in accordance with USEPA SW-846 Method 8270. The analytical results will be summarized and provided to NYSDEC for review. If the data indicate acceptable residual concentrations relative to the SSAL of total PAHs <500 ppm, the hotspot excavation will be considered complete. Otherwise, additional removal and resampling may be required. Since the remaining hotspot delineations were not based on analytical results, these hotspots will be excavated until no visual or olfactory evidence of petroleum impacts remain.

Care will be taken to minimize dust formation during excavation and loading (see Section 3.2.2). The excavation equipment will have sufficient boom length to allow for placement of soil/fill into the truck bed. Side dumping (i.e., with a front-end loader) will only be permitted if fugitive dust can be consistently controlled within the CAMP action limits. The excavated areas will be surveyed (i.e., approximate boundaries as determined by GPS and average depth as manually measured) and the information will be transferred to a site map.

3.3.2 Excavation Dewatering

Previous experience during test pit excavations on the Tecumseh Site indicates the material is well-drained; however, if dewatering is required TurnKey-Benchmark will pump the water from the excavation and treat the water on-site using oil absorbent filter bags and granular activated carbon prior to discharge on-site. If heavy floating oils are encountered, TurnKey-Benchmark will employ a rope skimmer to remove and collect the oils prior to pumping. The collected oil would be properly disposed off-site.

3.3.3 In-Situ Remediation of Residual Impact

To address potential residual smear zone soil/fill impacts in Hotspot G, up to 320 pounds of RegenOx™ and 55 pounds of ORC Advanced® (both products to be provided by Regenesis) will be applied to the excavation bottom and mixed into the remaining soil with the excavator bucket prior to backfilling. ORC Advanced® is in pellet form so is easily spread across the excavation bottom. RegenOx™ consists of Part A (dry powder) and Part B (gel). Both parts are placed in the excavator bucket and mixed with approximately 1 gallon of water prior to evenly distribution. Appendix B contains the product data sheets for both amendments and installation instructions.

3.3.4 Backfilling and Re-grading of Excavations

Non-impacted overburden soil/fill will be returned to the hotspot excavation areas greater than 2 feet deep. Non-impacted soil/fill will have no visual (i.e., sheen, product) or olfactory (i.e., nuisance odors) evidence of impact. The sidewalls of the shallow excavations (<2 feet deep) will be gradually sloped. It is expected that impacted soils will not be biotreated in time to be returned to the deeper excavations. As such, these excavations will be backfilled with clean BUD-approved slag material supplied by Iron City and previously approved for use as cover material on other BCP Sites within the Tecumseh Phase II and

III Business Parks. Appendix C contains the BUD determination for the slag material. The backfill depth will be dependent on the overall size of the excavation but will, at a minimum, raise the base of the excavation to approximately one foot above the water table with the sidewalls tapered gently to prevent steep drop offs.

3.4 Ex-Situ Biotreatment of Petroleum/Organic-Impacted Soil/fill

3.4.1 Biotreatment Pad Preparation and Operation

Biotreatment or land farming involves the use of conventional farm and/or heavy construction earth-moving equipment to spread, fertilize, aerate, and control moisture in soil to promote and accelerate natural aerobic and facultative biological degradation of volatile and semi-volatile petroleum compounds by indigenous soil microbes. This provides a cost-effective alternative to off-site transportation and disposal in a commercial solid waste landfill.

As shown on Figure 2, the planned bioremediation pad will be located on adjacent Site II-9. The pad will be lined with poly sheeting followed by approximately four to six inches of wood chips to provide a base for tilling equipment. An erosion silt sock will be placed around the perimeter of the biotreatment pad to mitigate surface erosion from the stockpiled materials.

Primary segregation of large debris will occur at the excavation location. Petroleum-impacted soil/fill designated for bioremediation will be transported to the biotreatment pad in off-road dump trucks. As excavated materials are placed, graded, and tilled, secondary segregation will occur and debris not suitable for bioremediation or backfill will be disposed or scrapped. A visual inspection of loads handled at the biotreatment area will be performed and the approximate quantity of soil/fill will be determined by volume. Soil/fill will be placed and graded to a 12- to 18-inch lift thickness. The soil/fill excavated from Hotspot E (approximately 900 cubic yards) will be segregated on the biopad due to the elevated concentrations of PAHs, which may take longer to treat. Soil/fill designated as treated will remain within the treatment area until receipt of analytical results signifying the soil/fill has been adequately treated.

3.4.2 Monitoring and Sampling

At least once every two weeks, the soil/fill within the biotreatment area will be monitored to track system performance, with tilling, nutrient, and moisture addition

occurring as needed to expedite bioremediation. Qualitative assessment of treatment performance will be based on visual and olfactory conditions, with the goal of eliminating gross impacts. Once the soil/fill is considered treated¹, a confirmatory sample will be collected at a frequency of no less than 1 per 1,000 cubic yards of treated soil/fill. The samples will be analyzed for NYSDEC CP-51 List VOCs and SVOCs and RCRA metals. The results will be compared to lower of the NYSDEC Part 375 protection of groundwater SCOs or protection of public health CSCOs. Appendix D includes a Field Operating Procedure for post-treatment sample collection.

Once the samples meets the SCOs, the soil/fill will be transferred back to the original excavated area or otherwise placed in the Phase II Business Park. No bioremediated soil/fill will be transported off-site unless deemed necessary due to poor treatment response or as necessary to expedite the overall cleanup and redevelopment schedule. Soil/fill that does not meet these criteria within the 18-month timeframe will be disposed, with NYSDEC approval, at a permitted solid waste disposal facility.

¹ The NYSDEC has allowed for a maximum 18-month timeframe for biotreatment, which is a change from the 12-month timeframe in the approved Decision Documents.

4.0 COMMUNITY AIR MONITORING

Real-time community air monitoring will be performed by TurnKey-Benchmark during all intrusive IRM activities at the Site, including hotspot excavation and re-grading activities involving soil/fill cut. A Community Air Monitoring Plan (CAMP) is included with TurnKey-Benchmark's HASP (see Appendix A). Particulate and vapor monitoring will be performed at a distance of approximately 100 feet downwind of the work area during excavation and re-grading activities involving subgrade disturbance. In addition, no visible dust will be allowed beyond the Site perimeter during these activities. The CAMP is consistent with the requirements for community air monitoring at remediation sites as established by the NYSDOH and NYSDEC. Accordingly, it follows procedures and practices outlined under DER-10 (Ref. 2) Appendix 1A (NYSDOH's Generic CAMP) and Appendix 1B (Fugitive Dust and Particulate Monitoring), included as Appendix C of the HASP.

5.0 DOCUMENTATION AND REPORTING

TurnKey-Benchmark will be on-site during excavation and re-grading to document IRM activities. Such documentation will include, at minimum, reports of construction activities, community air monitoring results, and photographs and sketches, as necessary.

5.1 Construction Monitoring

Standard reporting procedures for site activities will include preparation of a daily report and, when appropriate, problem identification and corrective measures reports. Appendix E contains sample project documentation forms. Information that may be included on the daily report form includes:

- Processes and locations of construction under way.
- Equipment and personnel working in the area, including subcontractors.
- A description of off-site materials received, including any quality verification (certification) documentation.

The completed reports will be available on-site and will be submitted to the NYSDEC as part of the Construction Completion Report (CCR).

Problem identification and corrective measures reports will be completed whenever major field problems are encountered and corrective measures are necessary. These reports will be attached to the monthly progress reports. The NYSDEC will be promptly notified of problems requiring modifications to this Work Plan prior to proceeding or completion of the construction item. Changes or additions will be noted in the CCR.

Photo documentation of IRM activities will be prepared by TurnKey-Benchmark throughout the duration of the project as necessary to convey typical work activities and whenever changed conditions or special circumstances arise. Photos will be provided in digital format.

5.2 Progress Reports

TurnKey-Benchmark will prepare and submit to NYSDEC monthly progress reports that include:

- Activities performed during reporting period.
- Results of tests or other pertinent data.
- Work scheduled for the upcoming reporting period.

- Other actions/information pertinent to the project.
- Percentage of completion, delays encountered or anticipated that may affect the schedule, and a description of efforts made to mitigate those delays or anticipated delays.

5.3 Construction Completion Report

A CCR will be prepared and submitted to the NYSDEC at the completion of the IRM activities. The report will be submitted within 30 days of completion of the work. The CCR will be prepared consistent with the requirements of Section 5.8 of DER-10 and will include:

- Text describing the hotspot removal, re-grading, and remediation activities performed. This will include an evaluation of the IRM activities against the Remedial Action Objective for hotspot removal in the subject Phase II-10, II-11 and II-12 sub-parcels.
- A description of any problems encountered, deviations from the Work Plan, and associated corrective measures taken; and other pertinent information necessary to document that the Site activities were carried out in accordance with this Work Plan.
- A Site or area planimetric map showing the extent of hotspot areas excavated.
- Post-excavation documentation sampling and laboratory analytical data.
- Copies of daily inspection reports and, if applicable, problem identification and corrective measure reports.
- A certification by a licensed NYS Professional Engineer in accordance with Section 1.5 of DER-10

The CCR will be included as an appendix to the Final Engineering Report for Sites II-10, II-11 and II-12, which will be prepared by the buyer to document satisfactory cover placement and other requirements under the BCP as necessary to secure a COC.

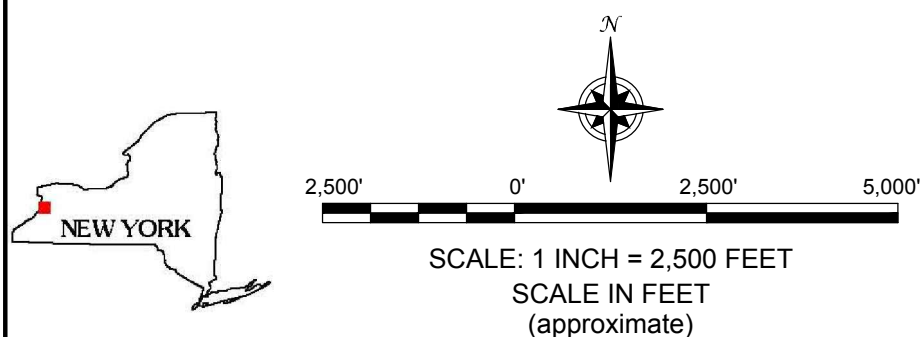
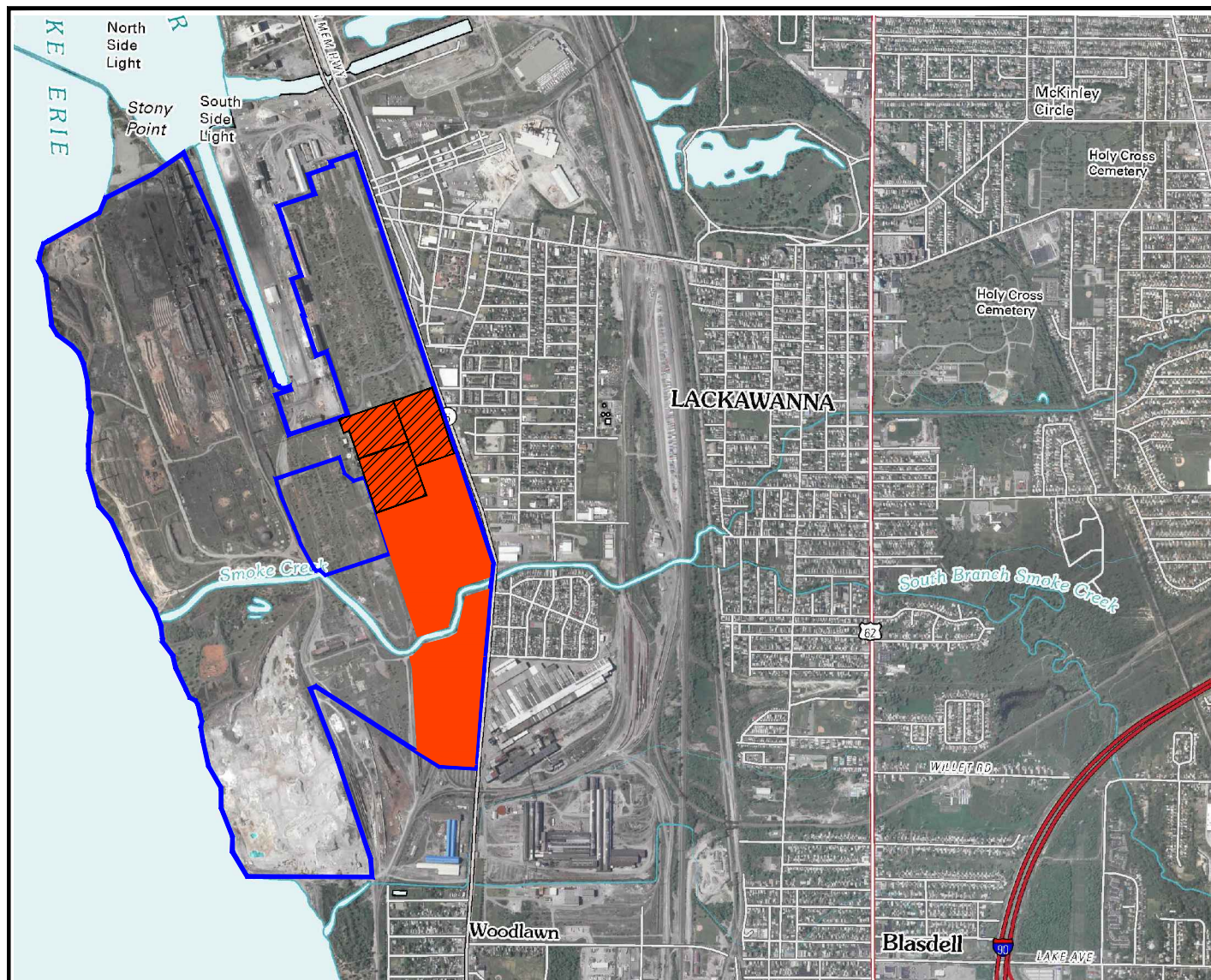
6.0 PROJECT SCHEDULE

It is anticipated that the IRM excavation activities will be completed within approximately eight weeks of initiation barring significant weather delays. The NYSDEC Project Manager will be notified seven days in advance of the start of work.



7.0 REFERENCES

1. TurnKey Environmental Restoration, LLC. *Remedial Investigation/Alternatives Analysis Report (RI/AAR) Work Plan for Phase II Business Park Area, Lackawanna, New York, BCP Site No. C915198*. November 2008, revised July 2009.
2. New York State Department of Environmental Conservation. *DER-10/Technical Guidance for Site Investigation and Remediation*. May 3, 2010.
3. TurnKey Environmental Restoration, LLC. *Remedial Investigation/Alternatives Analysis Report (RI/AAR) for Phase II Business Park, Lackawanna, New York, BCP Site No. C915198*. May 2011, revised March 2012.

FIGURES



LEGEND:

- APPROXIMATE TECUMSEH PROPERTY BOUNDARY
 TECUMSEH PHASE II BUSINESS PARK
 SITES II-10, II-11, II-12



2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0071-017-236

DATE: FEBRUARY 2017

DRAFTED BY: RFL

SITE LOCATION AND VICINITY MAP

IRM WORK PLAN

PHASE II BUSINESS PARK
SITES II-10, II-11, & II-12
LACKAWANNA, NEW YORK

PREPARED FOR

TECUMSEH REDEVELOPMENT INC.

DISCLAIMER:

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APPENDIX A

SITE HEALTH AND SAFETY PLAN AND COMMUNITY AIR MONITORING PLAN

Site-Wide Health and Safety Plan (HASP)

*Tecumseh Redevelopment BCP Sites
Lackawanna, New York*

April 2010
Revised July 2013

0071-012-322

Prepared By:



**TECUMSEH REDEVELOPMENT SITE
SITE-WIDE HEALTH AND SAFETY PLAN**

ACKNOWLEDGEMENT

Plan Reviewed by (initial):

Corporate Health and Safety Director: _____

Project Manager: _____

Designated Site Safety and Health Officer: _____

Acknowledgement:

I acknowledge that I have reviewed the information contained in this site-specific Health and Safety Plan, and understand the hazards associated with performance of the field activities described herein. I agree to comply with the requirements of this plan.

NAME (PRINT)	SIGNATURE	DATE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____



**TECUMSEH REDEVELOPMENT BCP SITES
SITE-WIDE HEALTH AND SAFETY PLAN**

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SITE-WIDE HEALTH AND SAFETY PLAN**

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1.0 INTRODUCTION

1.1 General

In accordance with OSHA requirements contained in 29 CFR 1910.120, this Health and Safety Plan (HASP) describes the specific health and safety practices and procedures to be employed by TurnKey Environmental Restoration, LLC and Benchmark Environmental Engineering & Science, PLLC employees (referred to jointly hereafter as “TurnKey-Benchmark”) during Brownfield Cleanup Program (BCP) activities on the Tecumseh Redevelopment Site (former Bethlehem Steel Lackawanna Works), located in the City of Lackawanna, New York. This HASP presents procedures for TurnKey-Benchmark employees who will be involved with investigation and remedial field activities; it does not cover the activities of other contractors, subcontractors, or other individuals on the Site. These firms will be required to develop and enforce their own HASPs as discussed in Section 2.0. TurnKey-Benchmark accepts no responsibility for the health and safety of contractor, subcontractor, or other personnel.

This HASP presents information on known Site health and safety hazards using available historical information, and identifies the equipment, materials, and procedures that will be used to eliminate or control these hazards. Environmental monitoring will be performed during the course of field activities to provide real-time data for on-going assessment of potential hazards.

1.2 Background

Tecumseh Redevelopment Inc. (Tecumseh) owns approximately 1,100 acres of land at 1951 Hamburg Turnpike, approximately 2 miles south of the City of Buffalo (see Figure 1). The majority of Tecumseh’s property is located in the City of Lackawanna (the City), with portions of the property extending into the Town of Hamburg. Tecumseh’s property is bordered by: NY State Route 5 (Hamburg Turnpike) on the east; Lake Erie to the west and northwest; and other industrial properties to the south and the northeast. Figure 2 provides an overview of the Tecumseh Property, including major leased or licensed parcels, and adjacent parcels owned by others.

The Tecumseh property is located on a portion of the Site of the former Bethlehem Steel Corporation (BSC) Lackawanna Works in a primarily industrial area. The property was

formerly used for the production of steel, coke, and related products by Bethlehem Steel Corporation (BSC). According to the Real Estate Records, in 1937, Bethlehem Steel Company owned the subject Site. In 1964, Bethlehem Steel Company merged into Bethlehem Steel Corporation. Steel production on the property was discontinued in 1983 and the coke ovens ceased activity in 2000. Tecumseh acquired the property, along with other BSC assets, out of bankruptcy in 2003.

A Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) of the entire former Bethlehem Steel Lackawanna Works was initiated by BSC under an Administrative Order issued by the United States Environmental Protection Agency (USEPA) in 1990. Tecumseh completed the RFI in January 2005. In September 2006, USEPA approved the RFI and terminated Bethlehem Steel's (and in turn Tecumseh's) obligation under the 1990 Administrative Order. Tecumseh has entered into an Order on Consent with the New York State Department of Environmental Conservation (NYSDEC) to undertake a corrective measures study (CMS) at certain solid waste management units (SWMUs) primarily on the western slag fill and coke manufacturing portion of the property.

Outside of the CMS Area, Tecumseh designated five parcels for redevelopment under the New York State Brownfield Cleanup Program (BCP). These include: The Phase I, IA, II, and III Business Park, which are at various points of investigation and cleanup under the BCP and are slated for commercial/industrial redevelopment, and the Steel Winds Site, which was remediated under the BCP and redeveloped as a commercial wind farm.

This Site-Wide Health and Safety Plan (HASP) applies to the Business Park Sites under the BCP.

1.3 Known and Suspected Environmental Conditions

The Phase I, IA, II, and III Business Parks were formerly used to house portions of BSC's steelmaking operations. The slag and other industrial fill materials contain highly variable and sometimes elevated concentrations of metals, as well as semi-volatile and volatile organic compounds (SVOCs and VOCs). In addition, groundwater in contact with the soil/fill materials described above may exhibit elevated concentrations of corresponding soluble COPCs (e.g., BTEX) in groundwater.

1.4 Parameters of Interest

Constituents of potential concern (COPCs) at the BCP Sites include:

- **Volatile Organic Compounds (VOCs)** – VOCs present at elevated concentration may include benzene, toluene, ethylbenzene, and xylene (i.e., BTEX). These VOCs are typically associated with storage and handling of petroleum products such as gasoline.
- **Semi-Volatile Organic Compounds (SVOCs)** – SVOCs present at elevated concentrations may include base-neutral semi-volatile organic compounds (SVOCs) from oils, greases, and fuels associated with the operation of locomotive engines, steel mills, petroleum bulk storage, and other historic steel manufacturing operations. Specifically, polycyclic aromatic hydrocarbons (PAHs), which are byproducts of incomplete combustion and impurities in petroleum products. Although PAHs are commonly found in urban soil environments, they may be present at the Site at concentrations that are elevated compared to typical “background” levels. Naphthalene is a natural component of fossil fuels such as petroleum and coal; it is also formed when natural products such as wood or tobacco are burned.
- **Polychlorinated Biphenyls (PCBs)** – The potential impact of surface and subsurface soils by PCBs in discrete areas associated with former substations, rail yards, and hydraulic pump houses.
- **Inorganic Compounds** – Inorganic COPCs potentially present at elevated concentrations due to steel making activities may include arsenic, cadmium, chromium, lead, and mercury. Several of these parameters are components of coke and slag which are prevalent in the planned work area.

In addition, groundwater in contact with the soil/fill materials described above may exhibit elevated concentrations of corresponding soluble COPCs (e.g., BTEX).

1.5 Overview of BCP Activities

TurnKey-Benchmark personnel will be on-site to observe BCP investigation and remedial activities. General field activities to be completed are described below. Detailed BCP activities are more fully described in the individual work plans for each property.

1. **Soil/Fill Excavation:** TurnKey-Benchmark will monitor all soil/fill excavations (e.g., wind turbine foundation excavation, test pit investigations) and related activities to visually inspect soil/fill for evidence of contamination.

2. **Soil/Fill Documentation Sampling:** TurnKey-Benchmark will collect surface and subsurface soil/fill documentation samples following excavation.
3. **Surface Water Management:** During excavation, surface water and/or perched groundwater infiltration may occur. TurnKey-Benchmark will direct the contractor to collect and characterize the surface water for proper disposal.
4. **Subgrade Work:** Significant grading may be required before implementation of remedial measures (e.g., cover system placement).
5. **Cover Soil Placement:** A soil cover system will be placed over select portions of the Site to reduce potential contact with impacted soil/fill. TurnKey-Benchmark will oversee installation of the cover system.
6. **Groundwater Monitoring Well Installation and Sampling:** TurnKey-Benchmark will install groundwater monitoring wells and collect samples for the long-term groundwater monitoring program.
7. **Groundwater Remediation:** TurnKey-Benchmark personnel will oversee the potential groundwater remediation at the Site, which may include installation of treatment (ORC/HRC) filter socks in groundwater monitoring wells.

2.0 ORGANIZATIONAL STRUCTURE

This chapter of the HASP describes the lines of authority, responsibility, and communication as they pertain to health and safety functions at the BCP Sites. The purpose of this chapter is to identify the personnel who impact the development and implementation of the HASP and to describe their roles and responsibilities. This chapter also identifies other contractors and subcontractors involved in work operations, and establishes the lines of communications among them for health and safety matters. The organizational structure described in this chapter is consistent with the requirements of 29 CFR 1910.120(b)(2). This section will be reviewed by the Project Manager and updated as necessary to reflect the current organizational structure at the BCP Sites.

2.1 Roles and Responsibilities

All Turnkey-Benchmark personnel on the Site must comply with the minimum requirements of this HASP. The specific responsibilities and authority of management, safety, and health, and other personnel on this site are detailed in the following paragraphs.

2.1.1 Corporate Health and Safety Director

The TurnKey-Benchmark Corporate Health and Safety Director is ***Mr. Thomas H. Forbes, P.E.*** The Corporate Health and Safety Director responsible for developing and implementing the Health and Safety program and policies for Benchmark Environmental Engineering & Science, PLLC and TurnKey Environmental Restoration, LLC, and consulting with corporate management to ensure adequate resources are available to properly implement these programs and policies. The Corporate Health and Safety Director coordinates TurnKey-Benchmark's Health and Safety training and medical monitoring programs and assists project management and field staff in developing site-specific health and safety plans.

2.1.2 Project Manager

The Project Manager for these Sites is ***Thomas H. Forbes, P.E.*** The Project Manager has the responsibility and authority to direct all TurnKey-Benchmark work operations at the site. The Project Manager coordinates safety and health functions with the

Site Safety and Health Officer, and bears ultimate responsibility for proper implementation of this HASP. He may delegate authority to expedite and facilitate any application of the program, including modifications to the overall project approach as necessary to circumvent unsafe work conditions. Specific duties of the Project Manager include:

- Preparing and coordinating the site work plan.
- Providing TurnKey-Benchmark workers with work assignments and overseeing their performance.
- Coordinating health and safety efforts with the Site Safety and Health Officer (SSHO).
- Reviewing the emergency response coordination plan to assure its effectiveness.
- Serving as the primary liaison with site contractors and the property owner.

2.1.3 Site Safety and Health Officer

The Site Safety and Health Officer (SSHO) for this site is ***Mr. Richard L. Dubisz***. The qualified alternate SSHO is ***Mr. Thomas Behrendt***. The SSHO reports to the Project Manager. The SSHO is on-site or readily accessible to the site during all work operations and has the authority to halt site work if unsafe conditions are detected. The specific responsibilities of the SSHO are:

- Managing the safety and health functions for TurnKey-Benchmark personnel on the site.
- Serving as the point of contact for safety and health matters.
- Ensuring that TurnKey-Benchmark field personnel working on the site have received proper training (per 29 CFR Part 1910.120(e)), that they have obtained medical clearance to wear respiratory protection (per 29 CFR Part 1910.134), and that they are properly trained in the selection, use and maintenance of personal protective equipment, including qualitative respirator fit testing.
- Performing or overseeing site monitoring as required by the HASP.
- Assisting in the preparation and review of the HASP
- Maintaining site-specific safety and health records as described in this HASP
- Coordinating with the Project Manager, Site Workers, and Contractor's SSHO as necessary for safety and health efforts.

2.1.4 Site Workers

Site workers are responsible for: complying with this HASP or a more stringent HASP, if appropriate (i.e., Contractor and Subcontractor's HASP); using proper PPE; reporting unsafe acts and conditions to the SSHO; and following the safety and health instructions of the Project Manager and SSHO.

2.1.5 Other Site Personnel

Other site personnel who will have health and safety responsibilities will include the Remedial Contractor, who will be responsible for developing, implementing, and enforcing a Health and Safety Plan equally stringent or more stringent than TurnKey-Benchmark's HASP. TurnKey-Benchmark assumes no responsibility for the health and safety of anyone outside its direct employ. Each Contractor's HASP shall cover all non-TurnKey/Benchmark site personnel. Each Contractor shall assign a SSHO who will coordinate with TurnKey-Benchmark's SSHO as necessary to ensure effective lines of communication and consistency between contingency plans.

In addition to TurnKey-Benchmark and Contractor personnel, other individuals who may have responsibilities in the work zone include subcontractors and governmental agencies performing site inspection work (i.e., the New York State Department of Environmental Conservation). The Contractor shall be responsible for ensuring that these individuals have received OSHA-required training (29 CFR 1910.120(e)), including initial, refresher and site-specific training, and shall be responsible for the safety and health of these individuals while they are on-site.

3.0 HAZARD EVALUATION

Due to the presence of certain contaminants at the BCP Sites, the possibility exists that workers will be exposed to hazardous substances during field activities. The principal points of exposure would be through direct contact with and incidental ingestion of soil/fill, and through the inhalation of contaminated particles or vapors, during test pit completion, monitoring well installation, and soil/fill excavation. In addition, the use of heavy construction equipment (e.g., dozer) will also present conditions for potential physical injury to workers. Further, since work will be performed outdoors, the potential exists for heat/cold stress to impact workers, especially those wearing protective equipment and clothing. Adherence to the medical evaluations, worker training relative to chemical hazards, safe work practices, proper personal protection, environmental monitoring, establishment work zones and site control, appropriate decontamination procedures and contingency planning outlined herein will reduce the potential for chemical exposures and physical injuries.

3.1 Chemical Hazards

As discussed in Section 1.3, historic activities related to the former steel-manufacturing operations and facilities have resulted in elevated concentrations of VOCs, SVOCs, PCBs, and inorganic compounds in soil/fill and groundwater. Table 1 identifies maximum concentrations of COPCs detected throughout the Tecumseh property. Table 2 lists exposure limits for airborne concentrations of the COPCs identified in Section 1.4 of this HASP. Brief descriptions of the toxicology of the prevalent constituents of potential concern and related health and safety guidance and criteria are provided below.

- **Arsenic (CAS #7440-38-2)** is a naturally occurring element and is usually found combined with one or more elements, such as oxygen or sulfur. Inhalation is a more important exposure route than ingestion. First phase exposure symptoms include nausea, vomiting, diarrhea and pain in the stomach. Prolonged contact is corrosive to the skin and mucus membranes. Arsenic is considered a Group A human carcinogen by the USEPA. Exposure via inhalation is associated with an increased risk of lung cancer. Exposure via the oral route is associated with an increased risk of skin cancer.
- **Benzene (CAS #71-43-2)** poisoning occurs most commonly through inhalation of the vapor; however, benzene can also penetrate the skin and poison in that way. Locally, benzene has a comparatively strong irritating effect, producing

erythema and burning and, in more severe cases, edema and blistering. Exposure to high concentrations of the vapor (i.e., 3,000 ppm or higher) may result in acute poisoning characterized by the narcotic action of benzene on the central nervous system. In acute poisoning, symptoms include confusion, dizziness, tightening of the leg muscles, and pressure over the forehead. Chronic exposure to benzene (i.e., long-term exposure to concentrations of 100 ppm or less) may lead to damage of the blood-forming system. Benzene is very flammable when exposed to heat or flame and can react vigorously with oxidizing materials.

- **Cadmium** is a natural element and is usually combined with one or more elements, such as oxygen, chloride, or sulfur. Breathing high levels of cadmium severely damages the lungs and can cause death. Ingestion of high levels of cadmium severely irritates the stomach, leading to vomiting and diarrhea. Long term exposure to lower levels of cadmium leads to a buildup of this substance in the kidneys and possible kidney disease. Other potential long term effects are lung damage and fragile bones. Cadmium is suspected to be a human carcinogen.
- **Chromium (CAS #7440-47-3)** is used in the production of stainless steel, chrome plated metals, and batteries. Two forms of chromium, hexavalent (CR+6) and trivalent (CR+3) are toxic. Hexavalent chromium is an irritant and corrosive to the skin and mucus membranes. Chromium is a potential occupational carcinogen. Acute exposures to dust may cause coughing, wheezing, headaches, pain and fever.
- **Ethylbenzene (CAS #100-41-4)** is a component of automobile gasoline. Over-exposure may cause kidney, skin liver and/or respiratory disease. Signs of exposure may include dermatitis, irritation of the eyes and mucus membranes, headache. Narcosis and coma may result in more severe cases.
- **Lead (CAS #7439-92-1)** can affect almost every organ and system in our bodies. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the immune system. The effects are the same whether it is breathed or swallowed. Lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect memory. Lead may cause anemia.
- **Mercury (CAS #7439-97-6)** is used in industrial applications for the production of caustic and chlorine, and in electrical control equipment and apparatus. Over-exposure to mercury may cause coughing, chest pains, bronchitis, pneumonia, indecision, headaches, fatigue, and salivation. Mercury is a skin and eye irritant.
- **Naphthalene (CAS #91-20-3)** is a white solid with a strong smell; is also called mothballs, moth flakes, white tar, and tar camphor. Naphthalene is a natural component of fossil fuels such as petroleum and coal; it is also formed when natural products such as wood or tobacco are burned. Acute exposure to naphthalene can cause systemic reactions, including nausea, headache,

diaphoresis, hematuria, fever, anemia, liver damage, vomiting, convulsions, and coma. Acute exposure can also cause eye irritation, confusion, excitement, malaise, abdominal pain, irritation to the bladder, profuse sweating, jaundice, hematopoietic, hemoglobinuria, renal shutdown, and dermatitis. Exposure to a large amount of naphthalene can cause red blood cells to be damaged or destroyed, a condition called hemolytic anemia, which leads to fatigue, lack of appetite, restlessness, and a pale appearance. Poisoning may occur by ingestion of large doses, skin and/or eye contact, inhalation, or skin absorption.

- **Polycyclic Aromatic Hydrocarbons (PAHs)** are formed as a result of the pyrolysis and incomplete combustion of organic matter such as fossil fuel. PAH aerosols formed during the combustion process disperse throughout the atmosphere, resulting in the deposition of PAH condensate in soil, water and on vegetation. In addition, several products formed from petroleum processing operations (e.g., roofing materials and asphalt) also contain elevated levels of PAHs. Hence, these compounds are widely dispersed in the environment. PAHs are characterized by a molecular structure containing three or more fused, unsaturated carbon rings. Seven of the PAHs are classified by USEPA as probable human carcinogens (USEPA Class B2). These are: benzo(a)pyrene; benzo(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; and indeno(1,2,3-cd)pyrene. The primary route of exposure to PAHs is through incidental ingestion and inhalation of contaminated particulates. PAHs are characterized by an organic odor, and exist as oily liquids in pure form. Acute exposure symptoms may include acne-type blemishes in areas of the skin exposed to sunlight.
- **Polychlorinated Biphenyls (PCBs)** are associated with former substations, rail yards, and hydraulic pump houses on the Site. PCBs can be absorbed into the body by inhalation of its aerosol, through the skin, and by ingestion. Repeated or prolonged contact with skin may cause dermatitis. PCBs may have effects on the liver. Animal tests show that PCBs possibly cause toxic effects in human reproduction. In the food chain, bioaccumulation takes place, specifically in aquatic organisms. A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.
- **Toluene (CAS #108-88-3)** is a common component of paint thinners and automobile fuel. Acute exposure predominantly results in central nervous system depression. Symptoms include headache, dizziness, fatigue, muscular weakness, drowsiness, and coordination loss. Repeated exposures may cause removal of lipids from the skin, resulting in dry, fissured dermatitis.
- **Xylenes (o, m, and p) (CAS #95-47-6, 108-38-3, and 106-42-3)** are colorless, flammable liquids present in paint thinners and fuels. Acute exposure may cause central nervous system depression, resulting in headache, dizziness, fatigue,

muscular weakness, drowsiness, and coordination loss. Repeated exposures may also cause removal of lipids from the skin, producing dry, fissured dermatitis. Exposure of high concentrations of vapor may cause eye irritation and damage, as well as irritation of the mucus membranes.

With respect to the anticipated BCP activities discussed in Section 1.5, possible routes of exposure to the above-mentioned contaminants are presented in Table 3. The use of proper respiratory equipment, as outlined in Section 7.0 of this HASP, will minimize the potential for exposure to airborne contamination. Exposure to contaminants through dermal and other routes will also be minimized through the use of protective clothing (Section 7.0), safe work practices (Section 6.0), and proper decontamination procedures (Section 12.0).

3.2 Physical Hazards

BCP investigation and remedial activities at the Tecumseh site may present the following physical hazards:

- The potential for physical injury during heavy construction equipment use, such as grading equipment, excavators, and tandem trucks.
- The potential for heat/cold stress to employees during the summer/winter months (see Section 10.0).
- The potential for slip and fall injuries due to rough, uneven terrain and/or open excavations.

These hazards represent only some of the possible means of injury that may be present during investigation and remedial activities at the Site. Since it is impossible to list all potential sources of injury, it shall be the responsibility of each individual to exercise proper care and caution during all phases of the work.

4.0 TRAINING

4.1 Site Workers

All personnel performing investigation and remedial activities at the Site (such as, but not limited to, equipment operators, general laborers, and supervisors) and who may be exposed to hazardous substances, health hazards, or safety hazards and their supervisors/managers responsible for the Site shall receive training in accordance with 29 CFR 1910.120(e) before they are permitted to engage in operations in the exclusion zone or contaminant reduction zone. This training includes an initial 40-hour Hazardous Waste Site Worker Protection Course, an 8-hour Annual Refresher Course subsequent to the initial 40-hour training, and 3 days of actual field experience under the direct supervision of a trained, experienced supervisor. Additional site-specific training shall also be provided by the SSHO prior to the start of field activities. A description of topics to be covered by this training is provided below.

4.1.1 Initial and Refresher Training

Initial and refresher training is conducted by a qualified instructor as specified under OSHA 29 CFR 1910.120(e)(5), and is specifically designed to meet the requirements of OSHA 29 CFR 1910.120(e)(3) and 1910.120(e)(8). The training covers, as a minimum, the following topics:

- OSHA HAZWOPER regulations.
- Site safety and hazard recognition, including chemical and physical hazards.
- Medical monitoring requirements.
- Air monitoring, permissible exposure limits, and respiratory protection level classifications.
- Appropriate use of personal protective equipment (PPE), including chemical compatibility and respiratory equipment selection and use.
- Work practices to minimize risk.
- Work zones and site control.
- Safe use of engineering controls and equipment.
- Decontamination procedures.
- Emergency response and escape.

- Confined space entry procedures.
- Heat and cold stress monitoring.
- Elements of a Health and Safety Plan.
- Spill containment.

Initial training also incorporates workshops for PPE and respiratory equipment use (Levels A, B and C), and respirator fit testing. Records and certification received from the course instructor documenting each employee's successful completion of the training identified above are maintained on file at TurnKey-Benchmark's Buffalo, NY office. Contractors and Subcontractors are required to provide similar documentation of training for all their personnel who will be involved in on-site work activities.

Any employee who has not been certified as having received health and safety training in conformance with 29 CFR 1910.120(e) is prohibited from working in the exclusion and contamination reduction zones, or to engage in any on-site work activities that may involve exposure to hazardous substances or wastes.

4.1.2 Site Training

Site workers are given a copy of the HASP and provided a site-specific briefing prior to the commencement of work to ensure that employees are familiar with the HASP and the information and requirements it contains. The site briefing shall be provided by the SSHO prior to initiating field activities and shall include:

- Names of personnel and alternates responsible for site safety and health.
- Safety, health and other hazards present on the Site.
- The Site lay-out including work zones and places of refuge.
- The emergency communications system and emergency evacuation procedures.
- Use of PPE.
- Work practices by which the employee can minimize risks from hazards.
- Safe use of engineering controls and equipment on the site.
- Medical surveillance, including recognition of symptoms and signs of over-exposure as described in Chapter 5 of this HASP.
- Decontamination procedures as detailed in Chapter 12 of this HASP.
- The emergency response plan as detailed in Chapter 15 of this HASP.
- Confined space entry procedures, if required, as detailed in Chapter 13 of this HASP.

- The spill containment program as detailed in Chapter 9 of this HASP.
- Site control as detailed in Chapter 11 of this HASP.

Supplemental health and safety briefings will also be conducted by the SSHO on an as-needed basis during the course of the work. Supplemental briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during ongoing site characterization and analysis. Conditions for which the SSHO may schedule additional briefings include, but are not limited to: a change in Site conditions (i.e., based on monitoring results); changes in the work schedule/plan; newly discovered hazards; and safety incidents occurring during Site work.

4.2 Supervisor Training

On-site safety and health personnel who are directly responsible for or who supervise the safety and health of workers engaged in hazardous waste operations (i.e., SSHO) shall receive, in addition to the appropriate level of worker training described in Section 4.1, above, 8 additional hours of specialized supervisory training, in compliance with 29 CFR 1910.120(e)(4).

4.3 Emergency Response Training

Emergency response training is addressed in Appendix A of this HASP, Emergency Response Plan.

4.4 Site Visitors

Each Contractor's SSHO will provide a site-specific briefing to all site visitors and other non-TurnKey/Benchmark personnel who enter the Site beyond the site entry point. The site-specific briefing will provide information about site hazards, the site layout including work zones and places of refuge, the emergency communications system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

Site visitors will not be permitted to enter the exclusion zone or contaminant reduction zones unless they have received the level of training required for site workers as described in Section 4.1.

5.0 MEDICAL MONITORING

Medical monitoring examinations are provided to TurnKey-Benchmark employees as stipulated under 29 CFR Part 1910.120(f). These exams include initial employment, annual and employment termination physicals for all TurnKey-Benchmark employees involved in hazardous waste site field operations. Post-exposure examinations are also provided for employees who may have been injured; received a health impairment; developed signs or symptoms of over-exposure to hazardous substances; or were accidentally exposed to substances at concentrations above the permissible exposure limits without necessary personal protective equipment. Such exams are performed as soon as possible following development of symptoms or the known exposure event.

Medical evaluations are performed by Health Works WNY, an occupational health care provider under contract with TurnKey-Benchmark. Health Works WNY's local facility is located at 1900 Ridge Road, West Seneca, New York 14224. The facility can be reached at (716) 823-5050 to schedule routine appointments or post-exposure examinations.

Medical evaluations are conducted according to the TurnKey-Benchmark Medical Monitoring Program and include an evaluation of the workers' ability to use respiratory protective equipment. The purpose of the medical evaluation is to determine an employee's fitness for duty on hazardous waste sites; and to establish baseline medical data. The examinations include:

- Occupational/medical history review.
- Physical exam, including vital sign measurement.
- Spirometry testing.
- Eyesight testing.
- Audio testing (minimum baseline and exit, annual for employees routinely exposed to greater than 85db).
- EKG (for employees >40 yrs age or as medical conditions dictate).
- Chest X-ray (baseline and exit, and every 5 years).
- Blood biochemistry (including blood count, white cell differential count, serum multiplastic screening).
- Medical certification of physical requirements (i.e., sight, musculoskeletal, cardiovascular) for safe job performance and to wear respiratory protection equipment.

In conformance with OSHA regulations, TurnKey-Benchmark will maintain and

preserve medical records for a period of 30 years following termination of employment. Employees are provided a copy of the physician's post-exam report, and have access to their medical records and analyses.

6.0 SAFE WORK PRACTICES

All TurnKey-Benchmark employees shall conform to the following safe work practices during all on-site work activities conducted within the exclusion and contamination reduction zones:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth contact is strictly prohibited.
- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.
- Respiratory protective equipment and clothing must be worn by all personnel entering the site as required by the HASP or as modified by the site safety officer. Excessive facial hair (i.e., beards, long mustaches, or sideburns) that interferes with the satisfactory respirator-to-face seal is prohibited.
- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, cross contamination and need for decontamination.
- Medicine and alcohol can synergize the effects of exposure to toxic chemicals. Due to possible contraindications, use of prescribed drugs should be reviewed with the TurnKey-Benchmark occupational physician. Alcoholic beverage and illegal drug intake are strictly forbidden during the workday.
- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in this Health and Safety Plan.
- On-site personnel shall use the “buddy” system. No one may work alone (i.e., out of earshot or visual contact with other workers) in the exclusion zone.
- Personnel and equipment in the contaminated area shall be minimized, consistent with effective site operations.
- All employees have the obligation to immediately report and if possible, correct unsafe work conditions.
- Use of contact lenses on-site will not be permitted. Spectacle kits for insertion into full-face respirators will be provided for TurnKey-Benchmark employees, as requested and required.

The recommended specific safety practices for working around the contractor’s equipment (e.g., backhoes, bulldozers, excavators, etc.) are as follows:

- Although the Contractor and subcontractors are responsible for their equipment and safe operation of the site, TurnKey-Benchmark personnel are also

- responsible for their own safety.
- Subsurface work will not be initiated without first clearing underground utility services.
 - Heavy equipment should not be operated within 20 feet of overhead wires. This distance may be increased if windy conditions are anticipated or if lines carry high voltage. The site should also be sufficiently clear to ensure the project staff can move around the heavy machinery safely.
 - Care should be taken to avoid overhead wires when moving heavy-equipment from location to location.
 - Hard hats, safety boots, and safety glasses should be worn at all times in the vicinity of heavy equipment. Hearing protection is also recommended.
 - The work site should be kept neat. This will prevent personnel from tripping and will allow for fast emergency exit from the site.
 - Proper lighting must be provided when working at night.
 - Construction activities should be discontinued during an electrical storm or severe weather conditions.
 - The presence of combustible gases should be checked before igniting any open flame.
 - Personnel shall stand upwind of any construction operation when not immediately involved in sampling/logging/observing activities.
 - Personnel will not approach the edge of an unsecured trench/excavation closer than 2 feet.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 Equipment Selection

Personal protective equipment (PPE) will be donned when work activities may result in exposure to physical or chemical hazards beyond acceptable limits, and when such exposure can be mitigated through appropriate PPE. The selection of PPE will be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the Site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

Equipment designed to protect the body against contact with known or suspect chemical hazards are grouped into four categories according to the degree of protection afforded. These categories designated A through D consistent with USEPA Level of Protection designation, are:

- **Level A:** Should be selected when the highest level of respiratory, skin and eye protection is needed.
- **Level B:** Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection is required. Level B protection is the minimum level recommended on initial site entries until the hazards have been further defined by on-site studies. Level B (or Level A) is also necessary for oxygen-deficient atmospheres.
- **Level C:** Should be selected when the types of airborne substances are known, the concentrations have been measured, and the criteria for using air-purifying respirators are met. In atmospheres where no airborne contaminants are present, Level C provides dermal protection only.
- **Level D:** Should not be worn on any site with elevated respiratory or skin hazards. This is generally a work uniform providing minimal protection.

OSHA requires the use of certain PPE under conditions where an immediate danger to life and health (IDLH) may be present. Specifically, OSHA 29 CFR 1910.120(g)(3)(iii) requires use of a positive pressure self-contained breathing apparatus, or positive pressure air-line respirator equipped with an escape air supply when chemical exposure levels present a substantial possibility of immediate serious injury, illness or death, or impair the ability to escape. Similarly, OSHA 29 CFR 1910.120(g)(3)(iv) requires donning totally encapsulating chemical protective suits (with a protection level equivalent to Level A protection) in

conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate serious illness, injury or death, or impair the ability to escape.

In situations where the types of chemicals, concentrations, and possibilities of contact are unknown, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be further characterized. The individual components of clothing and equipment must be assembled into a full protective ensemble to protect the worker from site-specific hazards, while at the same time minimizing hazards and drawbacks of the personal protective gear itself. Ensemble components are detailed below for levels A/B, C, and D protection.

7.2 Protection Ensembles

7.2.1 Level A/B Protection Ensemble

Level A/B ensembles include similar respiratory protection, however Level A provides a higher degree of dermal protection than Level B. Use of Level A over Level B is determined by: comparing the concentrations of identified substances in the air with skin toxicity data, and assessing the effect of the substance (by its measured air concentrations or splash potential) on the small area of the head and neck unprotected by Level B clothing.

The recommended PPE for level A/B is:

- Pressure-demand, full-face piece self-contained breathing apparatus (MSHA/-NIOSH approved) or pressure-demand supplied-air respirator with escape self-contained breathing apparatus (SCBA).
- Chemical-resistant clothing. For Level A, clothing consists of totally-encapsulating chemical resistant suit. Level B incorporates hooded one-or two-piece chemical splash suit.
- Inner and outer chemical resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

7.2.2 Level C Protection Ensemble

Level C protection is distinguished from Level B by the equipment used to protect the respiratory system, assuming the same type of chemical-resistant clothing is used. The main selection criterion for Level C is that conditions permit wearing an air-purifying device. The device (when required) must be an air-purifying respirator (MSHA/NIOSH approved) equipped with filter cartridges. Cartridges must be able to remove the substances encountered. Respiratory protection will be used only with proper fitting, training, and the approval of a qualified individual. In addition, an air-purifying respirator can be used only if: oxygen content of the atmosphere is at least 19.5% in volume; substances are identified and concentrations measured; substances have adequate warning properties; the individual passes a qualitative fit-test for the mask; and an appropriate cartridge/canister is used, and its service limit concentration is not exceeded.

Recommended PPE for Level C conditions includes:

- Full-face piece, air-purifying respirator equipped with MSHA and NIOSH approved organic vapor/acid gas/dust/mist combination cartridges or as designated by the SSHO.
- Chemical-resistant clothing (hooded, one or two-piece chemical splash suit or disposable chemical-resistant one-piece suit).
- Inner and outer chemical-resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

An air-monitoring program is part of all response operations when atmospheric contamination is known or suspected. It is particularly important that the air be monitored thoroughly when personnel are wearing air-purifying respirators. Continual surveillance using direct-reading instruments is needed to detect any changes in air quality necessitating a higher level of respiratory protection.

7.2.3 Level D Protection Ensemble

As indicated above, Level D protection is primarily a work uniform. It can be worn in areas where only boots can be contaminated, where there are no inhalable toxic substances and where the atmospheric contains at least 19.5% oxygen.

Recommended PPE for Level D includes:

- Coveralls.
- Safety boots/shoes.
- Safety glasses or chemical splash goggles.
- Hardhat.
- Optional gloves; escape mask; face shield.

7.2.4 Recommended Level of Protection for Site Tasks

Based on current information regarding both the contaminants suspected to be present at the Site and the various tasks that are included in the investigation and remedial activities, the minimum required Levels of Protection for these tasks shall be as identified in Table 4.

8.0 EXPOSURE MONITORING

8.1 General

Based on the results of historic sample analysis and the nature of the proposed work activities at the Site, the possibility exists that organic vapors and/or particulates may be released to the air during intrusive construction activities. Ambient breathing zone concentrations may at times, exceed the permissible exposure limits (PELs) established by OSHA for the individual compounds (see Table 2), in which case respiratory protection will be required. Respiratory and dermal protection may be modified (upgraded or downgraded) by the SSHO based upon real-time field monitoring data.

8.1.1 On-Site Work Zone Monitoring

TurnKey-Benchmark personnel will conduct routine, real-time air monitoring during all intrusive construction phases such as excavation, backfilling, drilling, etc. The work area will be monitored at regular intervals using a photo-ionization detector (PID), combustible gas meter and a particulate meter. Observed values will be recorded and maintained as part of the permanent field record.

Additional air monitoring measurements may be made by TurnKey-Benchmark personnel to verify field conditions during subcontractor oversight activities. Monitoring instruments will be protected from surface contamination during use. Additional monitoring instruments may be added if the situations or conditions change. Monitoring instruments will be calibrated in accordance with manufacturer's instructions before use.

8.1.2 Off-Site Community Air Monitoring

In addition to on-site monitoring within the work zone(s), monitoring at the downwind portion of the Site perimeter will be conducted. This will provide a real-time method for determination of substantial vapor and/or particulate releases to the surrounding community as a result of ground intrusive investigation work.

Ground intrusive activities are defined by NYSDOH Appendix 1A Generic Community Air Monitoring Plan (Reference 4) and attached as Appendix C. Ground intrusive activities include soil/waste excavation and handling, test pitting or trenching, and

the installation of soil borings or monitoring wells. Non-intrusive activities include the collection of soil and sediment samples or the collection of groundwater samples from existing wells. Continuous monitoring is required for ground intrusive activities and periodic monitoring is required for non-intrusive activities. Periodic monitoring consists of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring while bailing a well, and taking a reading prior to leaving a sampling location. This may be upgraded to continuous if the sampling location is in close proximity to individuals not involved in the site activity (i.e., on a curb of a busy street). The action levels below will be used during periodic monitoring. This will provide a real-time method for determination of substantial vapor and/or particulate releases to the surrounding community because of site investigation work.

8.2 Monitoring Action Levels

8.2.1 On-Site Work Zone Action Levels

The PID, explosimeter, or other appropriate instrument(s), will be used by TurnKey-Benchmark personnel to monitor organic vapor concentrations as specified in this HASP. In addition, fugitive dust/particulate concentrations will be monitored during major soil intrusion using a real-time particulate monitor as specified in this plan. In the absence of such monitoring, appropriate respiratory protection for particulates shall be donned. Sustained readings obtained in the breathing zone may be interpreted (with regard to other site conditions) as follows for TurnKey-Benchmark personnel:

- Total atmospheric concentrations of unidentified vapors or gases ranging from 0 to 1 ppm above background on the PID) - Continue operations under Level D (see Appendix A).
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings from >1 ppm to 5 ppm above background on the PID (vapors not suspected of containing high levels of chemicals toxic to the skin) - Continue operations under Level C (see Appendix A).
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings of >5 ppm to 50 ppm above background on the PID - Continue operations under Level B (see Attachment 1), re-evaluate and alter (if possible) construction methods to achieve lower vapor concentrations.

- Total atmospheric concentrations of unidentified vapors or gases above 50 ppm on the PID - Discontinue operations and exit the work zone immediately.

The explosimeter will be used to monitor levels of both combustible gases and oxygen during RD activities involving deep excavation, if required. Action levels based on the instrument readings shall be as follows:

- Less than 10% LEL - Continue engineering operations with caution.
- 10-25% LEL - Continuous monitoring with extreme caution, determine source/cause of elevated reading.
- Greater than 25% LEL - Explosion hazard, evaluate source and leave the Work Zone.
- 19.5-21% oxygen - Proceed with extreme caution; attempt to determine potential source of oxygen displacement.
- Less than 19.5% oxygen - Leave work zone immediately.
- 21-25% oxygen - Continue engineering operations with caution.
- Greater than 25% oxygen - Fire hazard potential, leave Work Zone immediately.

The particulate monitor will be used to monitor respirable dust concentrations during all intrusive activities and during handling of site soil/fill. Action levels based on the instrument readings shall be as follows:

- Less than 50 $\mu\text{g}/\text{m}^3$ - Continue field operations.
- 50-150 $\mu\text{g}/\text{m}^3$ - Don dust/particulate mask or equivalent
- Greater than 150 $\mu\text{g}/\text{m}^3$ - Don dust/particulate mask or equivalent. Initiate engineering controls to reduce respirable dust concentration (i.e., wetting of excavated soils or tools at discretion of SSHO).

Readings with the organic vapor analyzer, combustible gas meter, and particulate monitor will be recorded and documented on the appropriate Project Field Forms. All instruments will be calibrated before use on a daily basis and the procedure will be documented on the appropriate Project Field Forms.

8.2.2 Community Air Monitoring Action Levels

In addition to the action levels prescribed in Section 8.2.1 for Benchmark personnel on-site, the following criteria shall also be adhered to for the protection of downwind receptors consistent with NYSDOH requirements (Appendix C):

o **ORGANIC VAPOR PERIMETER MONITORING:**

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area exceeds 5 ppm above background for the 15-minute average, work activities will be halted and monitoring continued. If the total organic vapor level readily decreases below 5 ppm over background, work activities can resume but more frequent intervals of monitoring, as directed by the SSHO, must be conducted.
- If total organic vapor levels at the downwind perimeter of the work area persist at levels greater than 5 ppm over background but less than 25 ppm, work activities must be halted, corrective actions taken, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the work area or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less (but in no case <20 feet), is below 5 ppm over background for the 15-minute average.
- If the total organic vapor level is above 25 ppm at the perimeter of the work area, the SSHO must be notified and work activities shut down. The SSHO will determine when re-entry of the work area is possible and will implement downwind air monitoring to ensure vapor emissions do not impact the nearest off-site residential or commercial structure at levels exceeding those specified in the ***Organic Vapor Contingency Monitoring Plan*** below. All 15-minute readings will be recorded and available for NYSDEC and NYSDOH personnel to review.

o **ORGANIC VAPOR CONTINGENCY MONITORING PLAN:**

- If total organic vapor levels are greater than 5 ppm over background 200 feet downwind from the work area or half the distance to the nearest off-site residential/commercial structure (whichever is less), work activities must be halted.
- If, following the cessation of the work activities or as the result of an emergency, total organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest off-site residential/commercial structure from the work area, then the air quality must be

monitored within 20 feet of the perimeter of the nearest off-site residential or commercial structure (20-foot zone).

- If efforts to abate the emission source are unsuccessful and if total organic vapor levels approach or exceed 5 ppm above background within the 20-foot zone for more than 30 minutes, or are sustained at levels greater than 10 ppm above background for longer than one minute, then the ***Major Vapor Emission Response Plan*** (see below) will automatically be placed into effect.

o **Major Vapor Emission Response Plan:**

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in this Health and Safety Plan and the Emergency Response Plan (Appendix A) will be advised.
2. The local police authorities will immediately be contacted by the SSHO and advised of the situation.
3. Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two sustained successive readings below action levels are measured, air monitoring may be halted or modified by the SSHO.

The following personnel are to be notified in the listed sequence in the event that a Major Vapor Emission Plan is activated:

Responsible Person	Contact	Phone Number
SSHO	Police	911
SSHO	State Emergency Response Hotline	(800) 457-7362

Additional emergency numbers are listed in the Emergency Response Plan included as Appendix A.

o **EXPLOSIVE VAPORS:**

- Sustained atmospheric concentrations of greater than 10% LEL in the work area – Initiate combustible gas monitoring at the downwind portion of the Site perimeter.
- Sustained atmospheric concentrations of greater than 10% LEL at the downwind Site perimeter – Halt work and contact local Fire Department.

○ **Airborne Particulate Community Air Monitoring**

Respirable (PM-10) particulate monitoring will be performed on a continuous basis at the upwind and downwind perimeter of the exclusion zone. The monitoring will be performed using real-time monitoring equipment capable of measuring PM-10 and integrating over a period of 15-minutes for comparison to the airborne particulate action levels. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. All readings will be recorded and will be available for NYSDEC and NYSDOH review. Readings will be interpreted as follows:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) greater than the background (upwind perimeter) reading for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression provided that the downwind PM-10 particulate levels do not exceed 150 $\mu\text{g}/\text{m}^3$ above the upwind level and that visible dust is not migrating from the work area.
- If, after implementation of dust suppression techniques downwind PM-10 levels are greater than 150 $\mu\text{g}/\text{m}^3$ above the upwind level, work activities must be stopped and dust suppression controls re-evaluated. Work can resume provided that supplemental dust suppression measures and/or other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu\text{g}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

Pertinent emergency response information including the telephone number of the Fire Department is included in the Emergency Response Plan (Appendix A).

9.0 SPILL RELEASE/RESPONSE

This chapter of the HASP describes the potential for and procedures related to spills or releases of known or suspected petroleum and/or hazardous substances on the Site. The purpose of this Section of the HASP is to plan appropriate response, control, counter-measures and reporting, consistent with OSHA requirements in 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii). The spill containment program addresses the following elements:

- Potential hazardous material spills and available controls.
- Initial notification and evaluation.
- Spill response.
- Post-spill evaluation.

9.1 Potential Spills and Available Controls

An evaluation was conducted to determine the potential for hazardous material and oil/petroleum spills at this site. For the purpose of this evaluation, hazardous materials posing a significant spill potential are considered to be:

- CERCLA Hazardous Substances as identified in 40 CFR Part 302, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).
- Extremely Hazardous Substances as identified in 40 CFR Part 355, Appendix A, where such materials pose the potential for release in excess of their corresponding RQ.
- Hazardous Chemicals as defined under Section 311(e) of the Emergency Planning and Community Right-To-Know Act of 1986, where such chemicals are present or will be stored in excess of 10,000 lbs.
- Toxic Chemicals as defined in 40 CFR Part 372, where such chemicals are present or will be stored in excess of 10,000 lbs.
- Chemicals regulated under 6NYCRR Part 597, where such materials pose the potential for release in excess of their corresponding RQ.

Oil/petroleum products are considered to pose a significant spill potential whenever the following situations occur:

- The potential for a “harmful quantity” of oil (including petroleum and non-petroleum-based fuels and lubricants) to reach navigable waters of the U.S. exists (40 CFR Part 112.4). Harmful quantities are considered by USEPA to be volumes

that could form a visible sheen on the water or violate applicable water quality standards.

- The potential for any amount of petroleum to reach any waters of NY State, including groundwater, exists. Petroleum, as defined by NY State in 6NYCRR Part 612, is a petroleum-based heat source, energy source, or engine lubricant/maintenance fluid.
- The potential for any release, to soil or water, of petroleum from a bulk storage facility regulated under 6NYCRR Part 612. A regulated petroleum storage facility is defined by NY State as a site having stationary tank(s) and intra-facility piping, fixtures and related equipment with an aggregate storage volume of 1,100 gallons or greater.

The evaluation indicates that, based on site history and decommissioning records, a hazardous material spill and/or a petroleum product spill is not likely to occur during Remedial efforts.

9.2 Initial Spill Notification and Evaluation

Any worker who discovers a hazardous substance or oil/petroleum spill will immediately notify the Project Manager and SSHO. The worker will, to the best of his/her ability, report the material involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, if any, and any associated injuries. The Emergency Response Plan presented as Appendix A of this HASP will immediately be implemented if an emergency release has occurred.

Following initial report of a spill, the Project Manager will make an evaluation as to whether the release exceeds RQ levels. If an RQ level is exceeded, the Project Manager will notify the site owner and NYSDEC at 1-800-457-7362 within 2 hours of spill discovery. The Project Manager will also determine what additional agencies (e.g., USEPA) are to be contacted regarding the release, and will follow-up with written reports as required by the applicable regulations.

9.3 Spill Response

For all spill situations, the following general response guidelines will apply:

- Only those personnel involved in overseeing or performing containment operations will be allowed within the spill area. If necessary, the area will be

- roped, ribboned, or otherwise blocked off to prevent unauthorized access.
- Appropriate PPE, as specified by the SSHO, will be donned before entering the spill area.
 - Ignition points will be extinguished/removed if fire or explosion hazards exist.
 - Surrounding reactive materials will be removed.
 - Drains or drainage in the spill area will be blocked to prevent inflow of spilled materials or applied materials.

For minor spills, the Contractor will maintain a Spill Control and Containment Kit in the Field Office or other readily accessible storage location. The kit will consist of, at a minimum, a 50 lb. bag of “speedy dry” granular absorbent material, absorbent pads, shovels, empty 5-gallon pails and an empty open-top 55-gallon drum. Spilled materials will be absorbed, and shoveled into a 55-gallon drum for proper disposal (NYSDEC approval will be secured for on-site treatment of the impacted soils/absorbent materials, if applicable). Impacted soils will be hand-excavated to the point that no visible signs of contamination remains, and will be drummed with the absorbent.

In the event of a major release or a release that threatens surface water, a spill response contractor will be called to the site. The response contractor may use heavy equipment (i.e., excavator, backhoe, etc.) to berm the soils surrounding the spill site or create diversion trenching to mitigate overland migration or release to navigable waters. Where feasible, pumps will be used to transfer free liquid to storage containers. Spill control/cleanup contractors in the Western New York area that may be contacted for assistance include:

- The Environmental Service Group of NY, Inc.: (716) 695-6720
- Op-Tech: (716) 873-7680
- Environmental Products and Services, Inc.: (716) 447-4700

9.4 Post-Spill Evaluation

If a reportable quantity of hazardous material or oil/petroleum is spilled as determined by the Project Manager, a written report will be prepared as indicated in Section 9.2. The report will identify the root cause of the spill, type and amount of material released, date/time of release, response actions, agencies notified and/or involved in cleanup, and

procedures to be implemented to avoid repeat incidents. In addition, all re-useable spill cleanup and containment materials will be decontaminated, and spill kit supplies/disposable items will be replenished.

10.0 HEAT/COLD STRESS MONITORING

Since some of the work activities at the Site will be scheduled for both the summer and winter months, measures will be taken to minimize heat/cold stress to TurnKey-Benchmark employees. The SSHO and/or his or her designee will be responsible for monitoring TurnKey-Benchmark field personnel for symptoms of heat/cold stress.

10.1 Heat Stress Monitoring

Personal protective equipment may place an employee at risk of developing heat stress, a common and potentially serious illnesses often encountered at construction, landfill, waste disposal, industrial or other unsheltered sites. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning, and age. Personal protective equipment may severely reduce the body's normal ability to maintain temperature equilibrium (via evaporation and convection), and require increased energy expenditure due to its bulk and weight.

Proper training and preventive measures will mitigate the potential for serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress, the following steps should be taken:

- Adjust work schedules.
- Modify work/rest schedules according to monitoring requirements.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat (i.e., eight fluid ounces must be ingested for approximately every 1 lb of weight lost). The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost perspiration. When heavy sweating occurs, workers should be encouraged to drink more.
- Train workers to recognize the symptoms of heat related illness.

Heat-Related Illness - Symptoms:

- Heat rash may result from continuous exposure to heat or humid air.
- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include: muscle spasms; pain in the hands, feet, and abdomen.
- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include: pale, cool, moist skin; heavy sweating; dizziness; nausea; fainting.
- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are: red, hot, usually dry skin; lack of or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 100 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest periods stay the same. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%.
- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period remains the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the work cycle may be further shortened by 33%. Oral temperature should be measured at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No TurnKey-Benchmark employee will be permitted to continue wearing semi-permeable or impermeable garments when his/her oral temperature exceeds 100.6 degrees Fahrenheit.

10.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:
 - 1) **Frost nip** - This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation. Treatment consists of removing the victim from the cold conditions; removal of boots and gloves; soaking the injured part in warm water (102 to 108 degrees Fahrenheit); and drinking a warm beverage. Do not rub skin to generate friction/ heat.
 - 2) **Superficial Frostbite** - This is the second stage of the freezing process. It is characterized by a whitish gray area of tissue, which will be firm to the touch but will yield little pain. The treatment is identical for Frost nip.
 - 3) **Deep Frostbite** - In this final stage of the freezing process the affected tissue will be cold, numb and hard and will yield little to no pain. Treatment is identical to that for Frost nip.
- **Hypothermia** is a serious cold stress condition occurring when the body loses heat at a rate faster than it is produced. If untreated, hypothermia may be fatal. The stages of hypothermia may not be clearly defined or visible at first, but generally include:
 - 1) Shivering
 - 2) Apathy (i.e., a change to an indifferent or uncaring mood)
 - 3) Unconsciousness
 - 4) Bodily freezing

Employees exhibiting signs of hypothermia should be treated by medical professionals. Steps that can be taken while awaiting help include:

- 1) Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)
- 2) Perform active re-warming with hot liquids for drinking (Note: do not give the victim any liquid containing alcohol or caffeine) and a warm water bath (102 to 108 degrees Fahrenheit).
- 3) Perform passive re-warming with a blanket or jacket wrapped around

the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Education of workers to recognize the symptoms of frostbite and hypothermia.
- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.
- Personnel should remain active and keep moving.
- Personnel should be allowed to take shelter in a heated area, as necessary.
- Personnel should drink warm liquids (no caffeine or alcohol if hypothermia has set in).
- For monitoring the body's recuperation from excess cold, oral temperature recordings should occur:
 - At the Site Safety Technicians discretion when suspicion is based on changes in a worker's performance or mental status.
 - At a workers request.
 - As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind chill less than 20 degrees Fahrenheit or wind chill less than 30 degrees Fahrenheit with precipitation).
 - As a screening measure whenever anyone worker on site develops hypothermia.

Any person developing moderate hypothermia (a core body temperature of 92 degrees Fahrenheit) will not be allowed to return to work for 48 hours without the recommendation of a qualified medical doctor.

11.0 WORK ZONES AND SITE CONTROL

Work zones around the areas designated for construction activities will be established on a daily basis and communicated to all employees and other site users by the SSHO. It shall be each Contractor's SSHO's responsibility to ensure that all site workers are aware of the work zone boundaries and to enforce proper procedures in each area. The zones will include:

- **Exclusion Zone ("Hot Zone"):** The area where contaminated materials may be exposed, excavated, or handled and all areas where contaminated equipment or personnel may travel. The zone will be delineated by flagging tape. All personnel entering the Exclusion Zone must wear the prescribed level of personal protective equipment identified in Section 7.
- **Contamination Reduction Zone:** The zone where decontamination of personnel and equipment takes place. Any potentially contaminated clothing, equipment, and samples must remain in the Contamination Reduction Zone until decontaminated.
- **Support Zone:** The part of the site that is considered non-contaminated or "clean." Support equipment will be located in this zone, and personnel may wear normal work clothes within this zone.

In the absence of other task-specific work zone boundaries established by the SSHO, the following boundaries will apply to all investigation and construction activities involving disruption or handling of site soils or groundwater:

- **Exclusion Zone:** 50 foot radius from the outer limit of the sampling/construction activity.
- **Contaminant Reduction Zone:** 100 foot radius from the outer limit of the sampling/construction activity.
- **Support Zone:** Areas outside the Contaminant Reduction Zone.

Access of non-essential personnel to the Exclusion and Contamination Reduction Zones will be strictly controlled by the SSHO. Only personnel who are essential to the completion of the task will be allowed access to these areas if they are wearing the prescribed level of protection. Entrance of all personnel must be approved by the SSHO.

The SSHO will maintain a Health and Safety Logbook containing the names of TurnKey-Benchmark workers and their level of protection. The zone boundaries may be

changed by the SSHO as environmental conditions warrant, and to respond to the necessary changes in work locations on-site.

12.0 DECONTAMINATION

12.1 Decontamination for TurnKey-Benchmark Employees

The degree of decontamination required is a function of a particular task and the environment within which it occurs. The following decontamination procedure will remain flexible, thereby allowing the decontamination crew to respond appropriately to the changing environmental conditions that may arise at the site. All TurnKey-Benchmark personnel on-site shall follow the procedure below, or the Contractor's procedure (if applicable), whichever is more stringent.

Station 1 - Equipment Drop: Deposit visibly contaminated (if any) re-useable equipment used in the contamination reduction and exclusion zones (tools, containers, monitoring instruments, radios, clipboards, etc.) on plastic sheeting.

Station 2 - Boots and Gloves Wash and Rinse: Scrub outer boots and outer gloves.

Station 3 - Tape, Outer Boot, and Glove Removal: Remove tape, outer boots, and gloves. Deposit tape and gloves in waste disposal container.

Station 4 - Canister or Mask Change: If worker leaves exclusive zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot cover donned, and worker returns to duty.

Station 5 - Outer Garment/Face Piece Removal: Protective suit removed and deposited in separate container provided by Contractor. Face piece or goggles are removed if used. Avoid touching face with fingers. Face piece and/or goggles deposited on plastic sheet. Hard hat removed and placed on plastic sheet.

Station 6 - Inner Glove Removal: Inner gloves are the last personal protective equipment to be removed. Avoid touching the outside of the gloves with bare fingers. Dispose of these gloves in waste disposal container.

Following PPE removal, personnel shall wash hands, face, and forearms with absorbent wipes. If field activities proceed for six consecutive months or longer, shower facilities will be provided for worker use in accordance with OSHA 29 CFR 1910.120(n).

12.2 Decontamination for Medical Emergencies

In the event of a minor, non-life threatening injury, personnel should follow the decontamination procedures as defined, and then administer first-aid.

In the event of a major injury or other serious medical concern (e.g., heat stroke), immediate first-aid is to be administered and the victim transported to the hospital in lieu of further decontamination efforts unless exposure to a site contaminant would be considered “Immediately Dangerous to Life or Health.”

12.3 Decontamination of Field Equipment

Decontamination of heavy equipment will be conducted by the Contractor in accordance with his approved Health and Safety Plan in the Contamination Reduction Zone. As a minimum, this will include manually removing heavy soil contamination, followed by steam cleaning on an impermeable pad.

Decontamination of all tools used for sample collection purposes will be conducted by TurnKey-Benchmark personnel. It is expected that all tools will be constructed of nonporous, nonabsorbent materials (i.e., metal), which will aid in the decontamination effort. Any tool or part of a tool made of porous, absorbent material (i.e., wood) will be placed into suitable containers and prepared for disposal.

Decontamination of bailers, split-spoons, spatula knives, and other tools used for environmental sampling and examination shall be as follows:

- Disassemble the equipment.
- Wash with water to remove all visible foreign matter.
- Wash with detergent.
- Rinse all parts with distilled-deionized water.
- Allow to air dry.
- Wrap all parts in aluminum foil or polyethylene.

13.0 CONFINED SPACE ENTRY

OSHA 29 CFR 1910.146 identifies a confined space as a space that is large enough and so configured that an employee can physically enter and do assigned work, has limited or restricted means for entry and exit, and is not intended for continuous employee occupancy. Confined spaces include, but are not limited to, trenches, storage tanks, process vessels, pits, sewers, tunnels, underground utility vaults, pipelines, sumps, wells, and excavations.

Confined space entry by TurnKey-Benchmark employees is not anticipated to be necessary to complete the investigation and remedial activities identified in Section 2.0. In the event that the scope of work changes or confined space entry appears necessary, the Project Manager will be consulted to determine if feasible engineering alternatives to confined space entry can be implemented. If confined space entry by TurnKey-Benchmark employees cannot be avoided through reasonable engineering measures, task-specific confined space entry procedures will be developed and a confined-space entry permit will be issued through TurnKey-Benchmark's corporate Health and Safety Director. TurnKey-Benchmark employees shall not enter a confined space without these procedures and permits in place.

14.0 FIRE PREVENTION AND PROTECTION

14.1 General Approach

Recommended practices and standards of the National Fire Protection Association (NFPA) and other applicable regulations will be followed in the development and application of Project Fire Protection Programs. When required by regulatory authorities, the project management will prepare and submit a Fire Protection Plan for the approval of the contracting officers, authorized representative or other designated official. Essential considerations for the Fire Protection Plan will include:

- Proper site preparation and safe storage of combustible and flammable materials.
- Availability of coordination with private and public fire authorities.
- Adequate job-site fire protection and inspections for fire prevention.
- Adequate indoctrination and training of employees.

14.2 Equipment and Requirements

Fire extinguishers will be provided by each Contractor and are required on all heavy equipment and in each field trailer. Fire extinguishers will be inspected, serviced, and maintained in accordance with the manufacturer's instructions. As a minimum, all extinguishers shall be checked monthly and weighed semi-annually, and recharged if necessary. Recharge or replacement shall be mandatory immediately after each use.

14.3 Flammable and Combustible Substances

All storage, handling, or use of flammable and combustible substances will be under the supervision of qualified persons. All tanks, containers and pumping equipment, whether portable or stationary, used for the storage and handling of flammable and combustible liquids, will meet the recommendations of the NFPA.

14.4 Hot Work

If the scope of work necessitates welding or blowtorch operation, the hot work permit presented in Appendix B will be completed by the SSHO and reviewed/issued by the Project Manager.

15.0 EMERGENCY INFORMATION

In accordance with OSHA 29 CFR Part 1910, an Emergency Response Plan is attached to this HASP as Appendix A. The hospital route map is presented as Figure A-1.

16.0 REFERENCES

1. New York State Department of Health. 2002. *Generic Community Air Monitoring Plan, Appendix 1A, DER-10 Technical Guidance for Site Investigation and Remediation*. May 2010.

TABLES

TABLE 1

CONSTITUENTS OF POTENTIAL CONCERN

Site-Wide Health and Safety Plan
Tecumseh Redevelopment BCP Sites
Lackawanna, New York

Parameter ¹	CAS No.	Maximum Detected Concentration ²			
		Groundwater ³ (mg/L)	Surface Soil/Fill (mg/kg)	Sub-Surface Soil/Fill (mg/kg)	LNAPL (mg/kg)
Volatile Organic Compounds (VOCs):					
Benzene	71-43-2	570	0.0047	2800	14,000
Ethylbenzene	100-41-4	25	Note 4	170	4,600
Toluene	108-88-3	77	0.001	1700	5,700
Xylene, Total	1330-20-7	390	0.0017	1100	31,000
Polycyclic Aromatic Hydrocarbons (PAHs):					
Acenaphthene	83-32-9	0.36	Note 4	Note 4	400
Acenaphthylene	208-96-8	0.09	Note 4	Note 4	570
Anthracene	120-12-7	0.27	0.23	Note 4	240
Benz(a)anthracene	56-55-3	0.28	0.7	Note 4	27
Benzo(a)pyrene	50-32-8	0.23	0.56	Note 4	ND
Benzo(b)fluoranthene	205-99-2	0.069	0.86	Note 4	12
Benzo(ghi)perylene	191-24-2	0.033	0.35	Note 4	ND
Benzo(k)fluoranthene	207-08-9	0.071	0.38	Note 4	ND
Chrysene	218-01-9	0.26	0.67	Note 4	17
Dibenz(ah)anthracene	53-70-3	0.022	0.08	Note 4	ND
Fluoranthene	206-44-0	0.76	1.3	Note 4	200
Fluorene	86-73-7	1.7	Note 4	Note 4	9,600
Indeno(1,2,3-cd)pyrene	193-39-5	0.04	0.36	Note 4	ND
Naphthalene	91-20-3	280	0.29	1100	49,000
Phenanthrene	85-01-8	0.94	0.87	Note 4	800
Pyrene	129-00-0	0.41	0.87	Note 4	220
Inorganic Compounds:					
Arsenic	7440-38-2	70.6	30.5	17.7	28.2
Cadmium	7440-43-9	20.6	9.7	3.7	0.03
Chromium	7440-47-3	306	1190	508	1.7
Lead	7439-92-1	26.3	160	224	0.34
Mercury	7439-97-6	0.22	4.2	0.99	ND
Polychlorinated Biphenyls (PCBs):					
Aroclor 1242	53469-21-9	Note 4	Note 4	Note 4	2
Aroclor 1260	11096-82-5	Note 4	Note 4	Note 4	3.3

Notes:

1. Constituents were identified as parameters of interest during the RFI for the Benzol Plant Tank Storage Area (SWMU P-11).
2. Maximum detected concentrations as presented in the Final RFI Report for the Benzol Plant Tank Storage Area (SWMU P-11).
3. Groundwater analytical data collected from the Coke Oven Area of the Former Bethlehem Steel Lackawanna Coke Division Site.
4. Compounds with a detection frequency greater than 5% and a maximum concentration greater than the screening criteria were retained as potential parameters of interest during the RFI (Reference 1).

Acronyms:

- NA = Not analyzed.
ND = Parameter not detected above method detection limits.

TABLE 2

TOXICITY DATA FOR CONSTITUENTS OF POTENTIAL CONCERN

Site-Wide Health and Safety Plan
Tecumseh Redevelopment BCP Sites
Lackawanna, New York

Parameter	Synonyms	CAS No.	Code	Concentration Limits ¹		
				PEL	TLV	IDLH
Volatile Organic Compounds (VOCs): ppm						
Benzene	Benzol, Phenyl hydride	71-43-2	Ca	1	0.5	500
Ethylbenzene	Ethylbenzol, Phenylethane	100-41-4	none	100	100	800
Toluene	Methyl benzene, Methyl benzol	108-88-3	C-300	200	50	500
Xylene, Total	o-, m-, p-isomers	1330-20-7	none	100	100	900
Polycyclic Aromatic Hydrocarbons (PAHs) ² : ppm						
Acenaphthene	none	83-32-9	none	--	--	--
Acenaphthylene	none	208-96-8	none	--	--	--
Anthracene	none	120-12-7	none	--	--	--
Benz(a)anthracene	none	56-55-3	none	--	--	--
Benzo(a)pyrene	none	50-32-8	none	--	--	--
Benzo(b)fluoranthene	none	205-99-2	none	--	--	--
Benzo(ghi)perylene	none	191-24-2	none	--	--	--
Benzo(k)fluoranthene	none	207-08-9	none	--	--	--
Chrysene	none	218-01-9	none	--	--	--
Dibenz(ah)anthracene	none	53-70-3	none	--	--	--
Fluoranthene	none	206-44-0	none	--	--	--
Fluorene	none	86-73-7	none	--	--	--
Indeno(1,2,3-cd)pyrene	none	193-39-5	none	--	--	--
Naphthalene	Naphthalin, Tar camphor, White tar	91-20-3	none	10	10	250
Phenanthrene	none	85-01-8	none	--	--	--
Pyrene	none	129-00-0	none	--	--	--
Polychlorinated Inorganic Compounds: mg/m ³						
Aroclor 1242	Chlorodiphenyl, 42% chlorine	53469-21-9	Ca	--	--	--
Aroclor 1260	Chlorodiphenyl, 60% chlorine	11096-82-5	none	--	--	--
Inorganic Compounds: mg/m ³						
Arsenic	none	7440-38-2	Ca	0.01	0.01	5
Cadmium	none	7440-43-9	Ca	0.005	0.01	9
Chromium	none	7440-47-3	none	1	0.5	250
Lead	none	7439-92-1	none	0.05	0.15	100
Mercury	none	7439-97-6	C-0.1	0.1	0.05	10

Notes:

1. Concentration limits as reported by NIOSH Pocket Guide to Chemical Hazards, February 2004 (NIOSH Publication No. 97-140, fourth printing with changes and updates).
2. Individual parameters listed are those most commonly detected at steel/coke manufacturing sites.
3. "--" = concentration limit not available; exposure should be minimized to the extent feasible through appropriate engineering controls & PPE.

Explanation:

Ca = NIOSH considers constituent to be a potential occupational carcinogen.

C-## = Ceiling Level equals the maximum exposure concentration allowable during the work day.

IDLH = Immediately Dangerous to Life or Health.

ND indicates that an IDLH has not as yet been determined.

TLV = Threshold Limit Value, established by American Conference of Industrial Hygienists (ACGIH), equals the maximum exposure concentration allowable for 8 hours/day @ 40 hours/week.

TLVs are the amounts of chemicals in the air that almost all healthy adult workers are predicted to be able to tolerate without adverse effects. There are three types.

TLV-TWA (TLV-Time-Weighted Average) which is averaged over the normal eight-hour day/fourty-hour work week. (Most TLVs.)

TLV-STEL or Short Term Exposure Limits are 15 minute exposures that should not be exceeded for even an instant. It is not a stand alone value but is accompanied by the TLV-TWA.

It indicates a higher exposure that can be tolerated for a short time without adverse effect as long as the total time weighted average is not exceeded.

TLV-C or Ceiling limits are the concentration that should not be exceeded during any part of the working exposure.

Unless the initials "STEL" or "C" appear in the Code column, the TLV value should be considered to be the eight-hour TLV-TWA.

PEL = Permissible Exposure Limit, established by OSHA, equals the maximum exposure concentration allowable for 8 hours per day @ 40 hours per week

TABLE 3

**POTENTIAL ROUTES OF EXPOSURE TO
CONSTITUENTS OF POTENTIAL CONCERN**

**Site-Wide Health and Safety Plan
Tecumseh Redevelopment BCP Sites
Lackawanna, New York**

Activity ¹	Direct Contact with Soil/Fill	Inhalation of Vapors or Dust	Direct Contact with Groundwater
1. Soil/Fill Excavation	x	x	
2. Soil/Fill Documentation Sampling	x	x	
3. Surface Water Management			x
4. Slag/Fill Subgrade Preparation	x	x	
5. Cover Soil Placement	x	x	
6. Groundwater Monitoring Well Installation/Sampling	x	x	x
7. Groundwater Remediation	x	x	x

Notes:

1. Activity as described in Section 1.5 of the Health and Safety Plan.

TABLE 4

**REQUIRED LEVELS OF PROTECTION
FOR BCP INVESTIGATION AND REMEDIAL ACTIVITIES**

**Site-Wide Health and Safety Plan
Tecumseh Redevelopment BCP Sites
Lackawanna, New York**

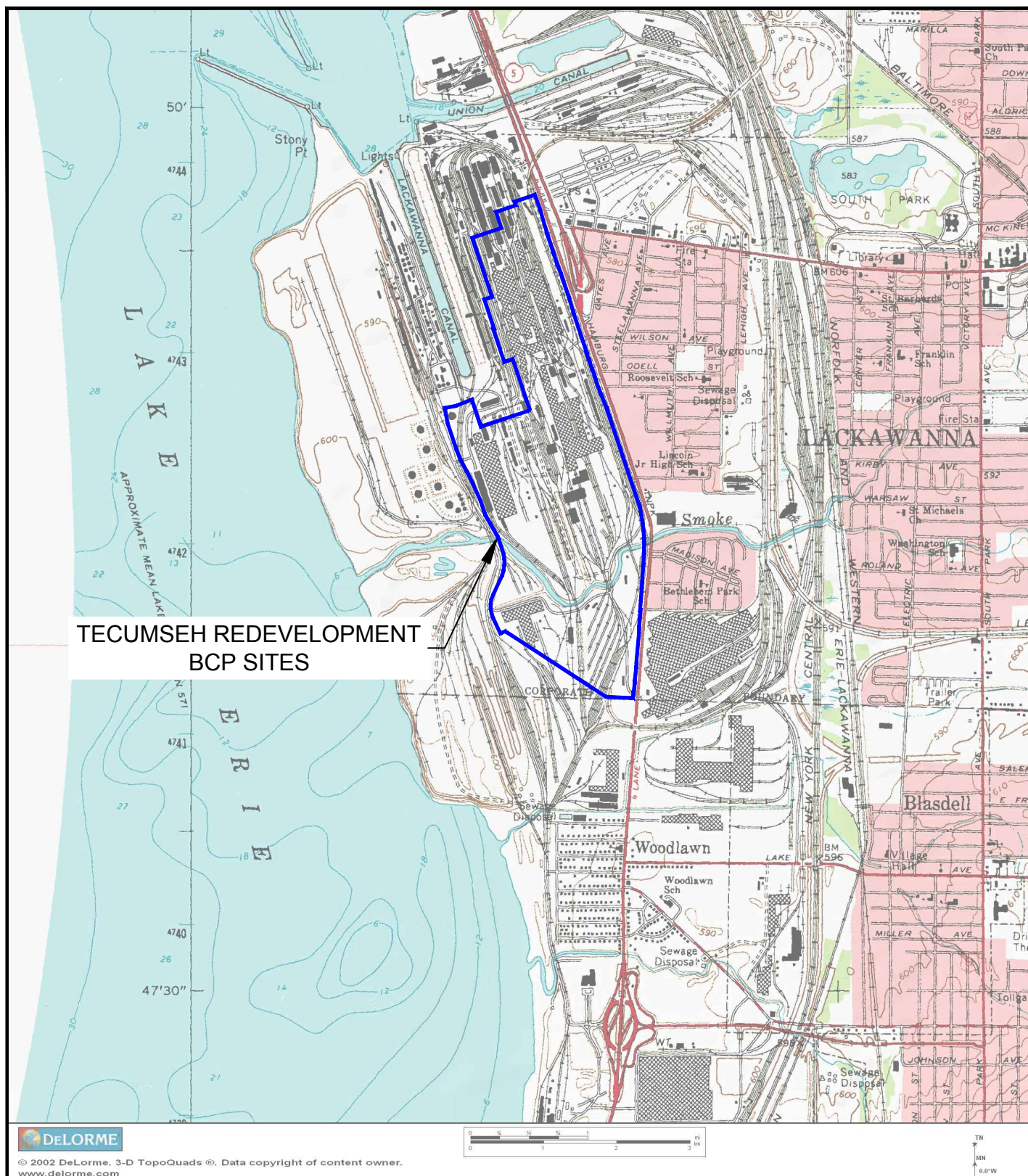
Activity	Respiratory Protection¹	Clothing	Gloves²	Boots^{2, 3}	Other Required PPE/Modifications^{2, 4}
1. Soil/Fill Excavation	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L	outer: L inner: STSS	HH SGSS
2. Soil/Fill Documentation Sampling	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L	outer: L inner: STSS	HH SGSS
3. Surface Water Management	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
4. Slag/Fill Subgrade Preparation	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L	outer: L inner: STSS	HH SGSS
5. Cover Soil Placement	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L	outer: L inner: STSS	HH SGSS
6. Groundwater Monitoring Well Installation/Sampling	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
7. Groundwater Remediation	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L	outer: L inner: STSS	HH SGSS

Notes:

1. Respiratory equipment shall conform to guidelines presented in Section 7.0 of this HASP. The Level C requirement is an air-purifying respirator equipped with organic compound/acid gas/dust cartridge.
2. HH = hardhat; L = Latex; L/N = latex inner glove, nitrile outer glove; N = Nitrile; S = Saranex; SG = safety glasses; SGSS = safety glasses with sideshields; STSS = steel toe safety shoes.
3. Latex outer boot (or approved overboot) required whenever contact with contaminated materials may occur. SSSHO may downgrade to STSS (steel-toed safety shoes) if contact will be limited to cover/replacement soils.
4. Dust masks shall be donned as directed by the SSSHO (site safety and health officer) or site safety technician whenever potentially contaminated airborne particulates (i.e., dust) are present in significant amounts in the breathing zone. Goggles may be substituted with safety glasses w/side-shields whenever contact with contaminated liquids is not anticipated.

FIGURES

FIGURE 1



2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 858-0835

SITE LOCATION & VICINITY MAP

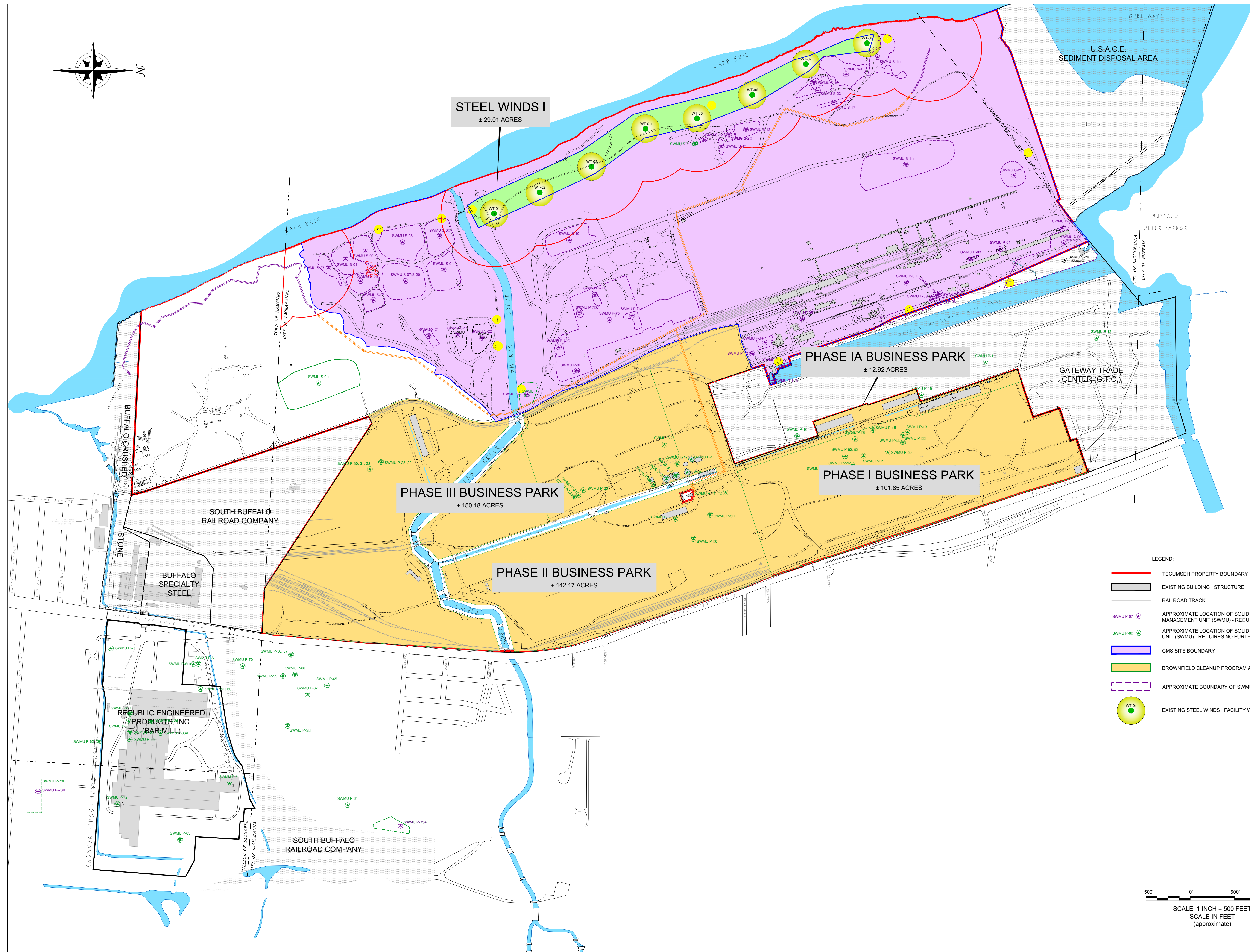
SITE-WIDE HEALTH AND SAFETY PLAN

TECUMSEH REDEVELOPMENT BCP SITES
LACKAWANNA, NEW YORK

PROJECT NO.: 0071-012-322

DATE: JULY 2013

DRAFTED BY: BLR

[illegible]

DRAWN BY:	BLR
DATE:	JULY 2013
CHECKED BY:	
APPROVED BY:	

SITE PLAN

SITE-WIDE HEALTH AND SAFETY PLAN
TECUMSEH REDEVELOPMENT BCP SITES
LACKAWANNA, NEW YORK

FIGURE 2

APPENDIX A

EMERGENCY RESPONSE PLAN



EMERGENCY RESPONSE PLAN for BROWNFIELD CLEANUP PROGRAM

**TECUMSEH REDEVELOPMENT BCP SITES
LACKAWANNA, NEW YORK**

April 2010
Revised July 2013

0071-012-322

**TECUMSEH REDEVELOPMENT BCP SITES
SITE-WIDE HEALTH AND SAFETY PLAN
APPENDIX A: EMERGENCY RESPONSE PLAN**

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Figure A-1 Hospital Route Map

1.0 GENERAL

This report presents the site-specific Emergency Response Plan (ERP) referenced in the Site-Wide Health and Safety Plan (HASP) prepared for BCP investigation and remedial activities conducted at the Tecumseh Redevelopment BCP Sites (former Bethlehem Steel Lackawanna Works), Lackawanna, New York. This appendix of the Site-Wide HASP describes potential emergencies that may occur at the Site; procedures for responding to those emergencies; roles and responsibilities during emergency response; and training all workers must receive in order to follow emergency procedures. This ERP also describes the provisions this Site has made to coordinate its emergency response planning with other contractors on-site and with off-site emergency response organizations.

This ERP is consistent with the requirements of 29 CFR 1910.120(l) and provides the following site-specific information:

- Pre-emergency planning.
- Personnel roles, lines of authority, and communication.
- Emergency recognition and prevention.
- Safe distances and places of refuge.
- Evacuation routes and procedures.
- Decontamination procedures.
- Emergency medical treatment and first aid.
- Emergency alerting and response procedures.
- Critique of response and follow-up.
- Emergency personal protective equipment (PPE) and equipment.

2.0 PRE-EMERGENCY PLANNING

This Site has been evaluated for potential emergency occurrences, based on site hazards, the required work tasks, the site topography, and prevailing weather conditions. The results of that evaluation indicate the potential for the following site emergencies to occur at the locations indicated.

Type of Emergency:

1. Medical, due to physical injury
2. Fire

Source of Emergency:

1. Slip/trip/fall
2. Fire

Location of Source:

1. Non-specific

APPENDIX A: EMERGENCY RESPONSE PLAN

3.0 ON-SITE EMERGENCY RESPONSE EQUIPMENT

Emergency procedures may require specialized equipment to facilitate worker rescue, contamination control and reduction, or post-emergency clean up. Emergency response equipment available on the Site is listed below. The equipment inventory and storage locations are based on the potential emergencies described above. This equipment inventory is designed to meet on-site emergency response needs and any specialized equipment needs that off-site responders might require because of the hazards at this Site but not ordinarily stocked.

Any additional personal protective equipment (PPE) required and stocked for emergency response is also listed in below. During an emergency, the Emergency Response Coordinator (ERC) is responsible for specifying the level of PPE required for emergency response. At a minimum, PPE used by emergency responders will comply with Section 7.0, Personal Protective Equipment, of this HASP. Emergency response equipment is inspected at regular intervals and maintained in good working order. The equipment inventory is replenished as necessary to maintain response capabilities.

Emergency Equipment	Quantity	Location
Spill Response Kit	2	Benzol Yard ICM Treatment Building; Wastewater Treatment Plant Garage (Phase III parcel)
First Aid Kit	3	Site Vehicle; Benzol Yard ICM Treatment Building; Field Office in Coke Oven Office Building
Chemical Fire Extinguisher	2 (minimum)	All heavy equipment and Site Vehicle

Emergency PPE	Quantity	Location
Full-face respirator	1 for each worker	Site Vehicle
Chemical-resistant suits	4 (minimum)	Site Vehicle

4.0 EMERGENCY PLANNING MAPS

An area-specific map of the Tecumseh Redevelopment Site will be developed on a daily basis during performance of field activities. The map will be marked to identify critical on-site emergency planning information, including: emergency evacuation routes, a place of refuge, an assembly point, and the locations of key site emergency equipment. Site zone boundaries will be shown to alert responders to known areas of contamination. There are no major topographical features; however, the direction of prevailing winds/weather conditions that could affect emergency response planning are also marked on the map. The map will be posted at site-designated place of refuge and inside the TurnKey personnel field vehicle.

5.0 EMERGENCY CONTACTS

The following identifies the emergency contacts for this ERP.

Emergency Telephone Numbers:

Project Manager: *Thomas H. Forbes, P.E.*

Work: (716) 856-0599

Mobile: (716) 864-1730

Corporate Health and Safety Director: *Michael M. Yount, CESCO*

Work: (716) 856-0599

Mobile: (716) 983-3143

Site Safety and Health Officer (SSHO): *Richard L. Dubisz*

Work: (716) 856-0635

Mobile: (716) 998-4334

Alternate SSHO: *Thomas A. Behrendt*

Work: (716) 856-0635

Mobile: (716) 818-8358

MERCY HOSPITAL (ER):	(716) 826-7000
FIRE:	911
AMBULANCE:	911
BUFFALO POLICE:	911
STATE EMERGENCY RESPONSE HOTLINE:	(800) 457-7362
NATIONAL RESPONSE HOTLINE:	(800) 424-8802
NYSDOH:	(716) 847-4385
NYSDEC:	(716) 851-7220
NYSDEC 24-HOUR SPILL HOTLINE:	(800) 457-7252

The Site location is:

Tecumseh Redevelopment Inc.

1951 Hamburg Turnpike

Lackawanna, New York 14218

Site Phone Number: (Insert Cell Phone or Field Trailer): _____

6.0 EMERGENCY ALERTING & EVACUATION

Internal emergency communication systems are used to alert workers to danger, convey safety information, and maintain site control. Any effective system can be employed. Two-way radio headsets or field telephones are often used when work teams are far from the command post. Hand signals and air-horn blasts are also commonly used. Every system must have a backup. It shall be the responsibility of each contractor's SSHO to ensure an adequate method of internal communication is understood by all personnel entering the site. Unless all personnel are otherwise informed, the following signals shall be used.

- 1) Emergency signals by portable air horn, siren, or whistle: two short blasts, personal injury; continuous blast, emergency requiring site evacuation.
- 2) Visual signals: hand gripping throat, out of air/cannot breathe; hands on top of head, need assistance; thumbs up, affirmative/everything is OK; thumbs down, no/negative; grip partner's wrist or waist, leave area immediately.

If evacuation notice is given, site workers leave the worksite with their respective buddies, if possible, by way of the nearest exit. Emergency decontamination procedures detailed in Section 12.0 of the HASP are followed to the extent practical without compromising the safety and health of site personnel. The evacuation routes and assembly area will be determined by conditions at the time of the evacuation based on wind direction, the location of the hazard source, and other factors as determined by rehearsals and inputs from emergency response organizations. Wind direction indicators are located so that workers can determine a safe up wind or cross wind evacuation route and assembly area if not informed by the emergency response coordinator at the time the evacuation alarm sounds. Since work conditions and work zones within the site may be changing on daily basis, it shall be the responsibility of the construction SSHO to review evacuation routes and procedures as necessary and to inform all TurnKey-Benchmark workers of any changes.

Personnel exiting the site will gather at a designated assembly point. To determine that everyone has successfully exited the site, personnel will be accounted for at the assembly site. If any worker cannot be accounted for, notification is given to the SSHO (***Thomas Behrendt*** or ***Richard Dubisz***) so that appropriate action can be initiated. Contractors and subcontractors on this Site have coordinated their emergency response plans to ensure that

APPENDIX A: EMERGENCY RESPONSE PLAN

these plans are compatible and that source(s) of potential emergencies are recognized, alarm systems are clearly understood, and evacuation routes are accessible to all personnel relying upon them.

7.0 EXTREME WEATHER CONDITIONS

In the event of adverse weather conditions, the SSHO in conjunction with the Contractor's SSHO will determine if engineering operations can continue without sacrificing the health and safety of site personnel. Items to be considered prior to determining if work should continue include but are not limited to:

- Potential for heat/cold stress.
- Weather-related construction hazards (i.e., flooding or wet conditions producing undermining of structures or sheeting, high wind threats, etc).
- Limited visibility.
- Potential for electrical storms.
- Limited site access/egress (e.g., due to heavy snow)

8.0 EMERGENCY MEDICAL TREATMENT & FIRST AID

Personnel Exposure:

The following general guidelines will be employed in instances where health impacts threaten to occur acute exposure is realized:

- Skin Contact: Use copious amounts of soap and water. Wash/rinse affected area for at least 15 minutes. Decontaminate and provide medical attention. Eyewash stations will be provided on site. If necessary, transport to Mercy Hospital.
- Inhalation: Move to fresh air and, if necessary, transport to Mercy Hospital.
- Ingestion: Decontaminate and transport to Mercy Hospital.

Personal Injury:

Minor first-aid will be applied on-site as deemed necessary. In the event of a life threatening injury, the individual should be transported to Mercy Hospital via ambulance. The SSHO will supply available chemical specific information to appropriate medical personnel as requested.

First aid kits will conform to Red Cross and other applicable good health standards, and shall consist of a weatherproof container with individually sealed packages for each type of item. First aid kits will be fully equipped before being sent out on each job and will be checked weekly by the SSHO to ensure that the expended items are replaced.

Directions to Mercy Hospital (see Figure A-1):

The following directions describe the best route to Mercy Hospital:

- From Gate 2, proceed onto the Hamburg Turnpike (SR 5).
- Proceed east on Hamburg Turnpike (SR 5) to the Tifft Street Exit and turn right onto Tifft Street.
- Take Tifft Street east crossing South Park Avenue and McKinley Parkway. Bear left on Edgewood Avenue.
- Turn right on Abbott Road and Mercy Hospital will be on right hand side. Follow signs to emergency room (ER).

9.0 EMERGENCY RESPONSE CRITIQUE & RECORD KEEPING

Following an emergency, the SSHO and Project Manager shall review the effectiveness of this Emergency Response Plan (ERP) in addressing notification, control, and evacuation requirements. Updates and modifications to this ERP shall be made accordingly. It shall be the responsibility of each contractor to establish and assure adequate records of the following:

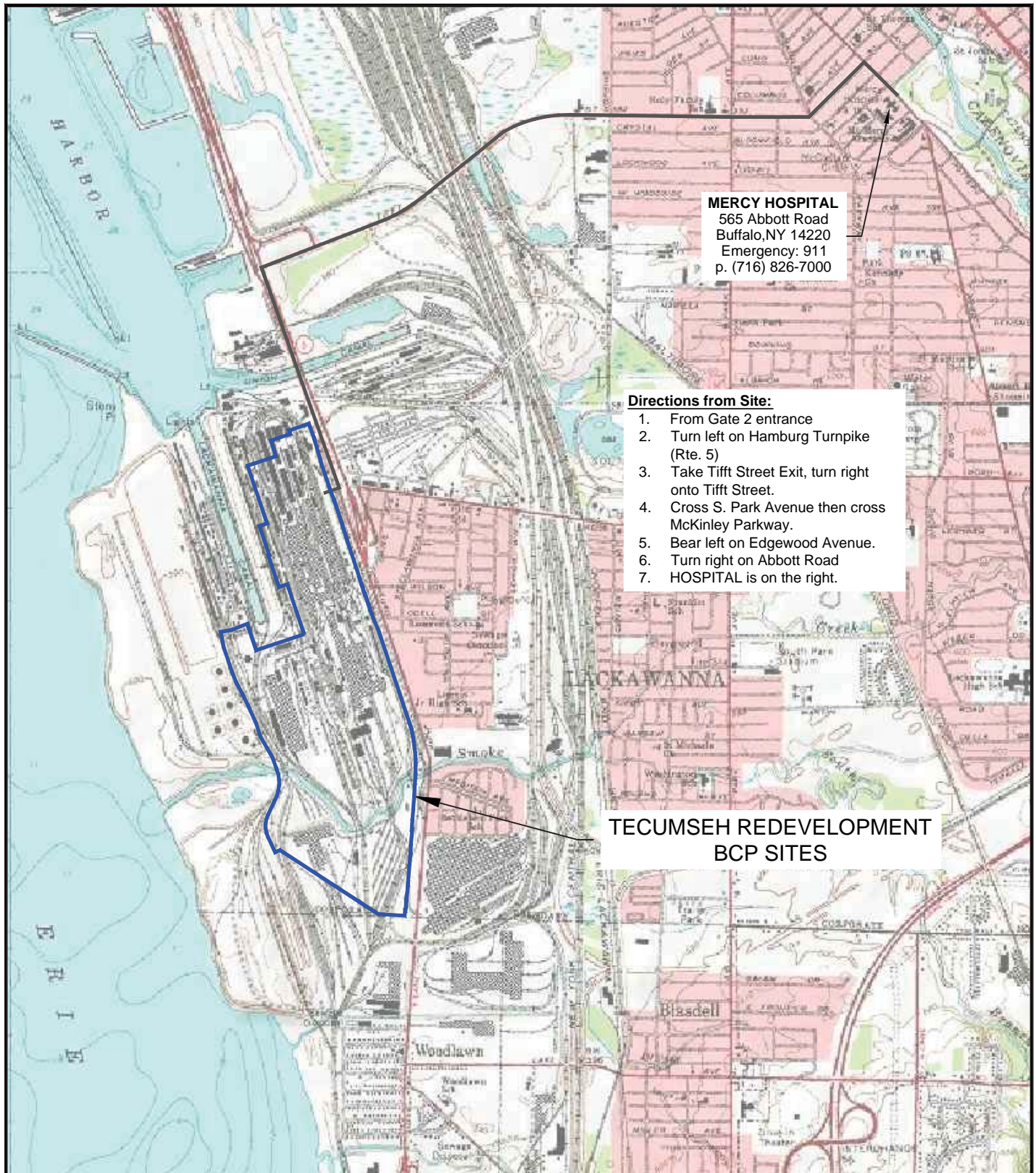
- Occupational injuries and illnesses.
- Accident investigations.
- Reports to insurance carrier or State compensation agencies.
- Reports required by the client.
- Records and reports required by local, state, federal, and/or international agencies.
- Property or equipment damage.
- Third party injury or damage claims.
- Environmental testing logs.
- Explosive and hazardous substances inventories and records.
- Records of inspections and citations.
- Safety training.

10.0 EMERGENCY RESPONSE TRAINING

All persons who enter the worksite, including visitors, shall receive a site-specific briefing about anticipated emergency situations and the emergency procedures by the SSHO. Where this site relies on off-site organizations for emergency response, the training of personnel in those off-site organizations has been evaluated and is deemed adequate for response to this site.

FIGURES

FIGURE A-1



2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

HOSPITAL ROUTE MAP
SITE-WIDE HEALTH AND SAFETY PLAN
TECUMSEH REDEVELOPMENT BCP SITES
LACKAWANNA, NEW YORK

PROJECT NO.: 0071-012-322

DATE: JULY 2013

DRAFTED BY: BLR

APPENDIX B

HOT WORK PERMIT FORM





HOT WORK PERMIT

PART 1 - INFORMATION

Issue Date:

Date Work to be Performed: Start:

Finish (permit terminated):

Performed By:

Work Area:

Object to be Worked On:

PART 2 - APPROVAL

(for 1, 2 or 3: mark Yes, No or NA)*

Will working be on or in:

Finish (permit terminated):

- | | | |
|--|-----|----|
| 1. Metal partition, wall, ceiling covered by combustible material? | yes | no |
| 2. Pipes, in contact with combustible material? | yes | no |
| 3. Explosive area? | yes | no |

* = If any of these conditions exist (marked "yes"), a permit will not be issued without being reviewed and approved by Thomas H. Forbes (Corporate Health and Safety Director). Required Signature below.

PART 3 - REQUIRED CONDITIONS**

(Check all conditions that must be met)

PROTECTIVE ACTION		PROTECTIVE EQUIPMENT	
<input type="checkbox"/>	Specific Risk Assessment Required	<input type="checkbox"/>	Goggles/visor/welding screen
<input type="checkbox"/>	Fire or spark barrier	<input type="checkbox"/>	Apron/fireproof clothing
<input type="checkbox"/>	Cover hot surfaces	<input type="checkbox"/>	Welding gloves/gauntlets/other:
<input type="checkbox"/>	Move movable fire hazards, specifically	<input type="checkbox"/>	Wellintons/Knee pads
<input type="checkbox"/>	Erect screen on barrier	<input type="checkbox"/>	Ear protection: Ear muffs/Ear plugs
<input type="checkbox"/>	Restrict Access	<input type="checkbox"/>	B.A.: SCBA/Long Breather
<input type="checkbox"/>	Wet the ground	<input type="checkbox"/>	Respirator: Type:
<input type="checkbox"/>	Ensure adequate ventilation	<input type="checkbox"/>	Cartridge:
<input type="checkbox"/>	Provide adequate supports	<input type="checkbox"/>	Local Exhaust Ventilation
<input type="checkbox"/>	Cover exposed drain/floor or wall cracks	<input type="checkbox"/>	Extinguisher/Fire blanket
<input type="checkbox"/>	Fire watch (must remain on duty during duration of permit)	<input type="checkbox"/>	Personal flammable gas monitor
<input type="checkbox"/>	Issue additional permit(s):	<input type="checkbox"/>	

Other precautions:

** Permit will not be issued until these conditions are met.

SIGNATURES

Originating Employee:

Date:

Project Manager:

Date:

Part 2 Approval:

Date:

APPENDIX C

NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN



Appendix 1A

New York State Department of Health Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B

Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive 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. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.
3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM₁₀) with the following minimum performance standards:
 - (a) Objects to be measured: Dust, mists or aerosols;
 - (b) Measurement Ranges: 0.001 to 400 mg/m³ (1 to 400,000 :ug/m³);
 - (c) Precision (2-sigma) at constant temperature: +/- 10 :g/m³ for one second averaging; and +/- 1.5 g/m³ for sixty second averaging;
 - (d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
 - (e) Resolution: 0.1% of reading or 1g/m³, whichever is larger;
 - (f) Particle Size Range of Maximum Response: 0.1-10;
 - (g) Total Number of Data Points in Memory: 10,000;
 - (h) Logged Data: Each data point with average concentration, time/date and data point number
 - (i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
 - (j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
 - (k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
 - (l) Operating Temperature: -10 to 50° C (14 to 122° F);
 - (m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.
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 remedial party 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/m³ (15 minutes average). 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/m³, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m³ 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/m³ continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

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 PM₁₀ at or above the action level. Since this situation has the potential to allow for the migration of 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:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m³ action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is 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 additional 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.

APPENDIX B

REGENESIS PRODUCT DATA SHEETS AND APPLICATION INSTRUCTIONS

ORC Advanced® Pellets Technical Specification

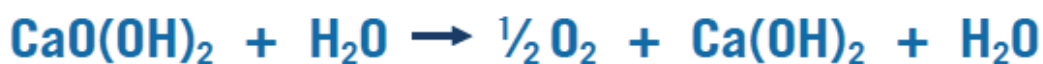
ORC Advanced Pellets are a dust-minimizing, dry application, pelletized form of the widely-used ORC Advanced controlled-release oxygen compound.

They are designed specifically for the treatment of dissolved-phase petroleum hydrocarbons through direct application into excavations, petroleum storage tank pits, trenches and backfill.

Oxygen is released from ORC Advanced for a period of 9 to 12 months *in situ*.



Example of ORC Advanced Pellets



ORC Advanced is a formulation of calcium oxyhydroxide which, upon hydration, releases oxygen and forms simple calcium hydroxide and water.

For a list of treatable contaminants with the use of ORC Advanced, view the [Range of Treatable Contaminants Guide](#).

Chemical Composition

- Calcium Oxyhydroxide
- Calcium Hydroxide
- Monopotassium Phosphate
- Ammonium Phosphate Dibasic

Properties

- Pellet size: 3-10 mm
- Contains micro-nutrients such as nitrogen, phosphorous, and potassium (N,P,K) which can be beneficial to aerobic biodegradation processes

ORC Advanced® Pellets Technical Specification

Storage and Handling Guidelines

Storage

Store in a cool, dry place out of direct sunlight

Store in original tightly closed container

Store in a well-ventilated place

Do not store near combustible materials

Store away from incompatible materials

Provide appropriate exhaust ventilation in places where dust is formed

Handling

Minimize dust generation and accumulation

Keep away from heat

Routine housekeeping should be instituted to ensure that dust does not accumulate on surfaces

Observe good industrial hygiene practices

Take precaution to avoid mixing with combustibles

Keep away from clothing and other combustible materials

Avoid contact with water and moisture

Avoid contact with eyes, skin, and clothing

Avoid prolonged exposure

Wear appropriate personal protective equipment

Applications

- *In situ* or *ex situ* out of the bag
- Direct application into open excavations, petroleum storage tank pits and trenches
- Direct application to contaminated backfill or contaminated soils
- *Ex situ* biopile applications (requires a source of hydration)

Health and Safety

Wash thoroughly after handling. Wear protective gloves, eye protection, and face protection. Please review the Material Safety Data Sheet for additional storage, usage, and handling requirements here: [ORC Advanced SDS](#).



www.regenesis.com
1011 Calle Sombra, San Clemente CA 92673
949.366.8000

REGENESIS ORC ADVANCED® PELLETS

Dust Minimizing Formulation for Excavations, Tank Pits and Trenches

PRODUCT APPLICATION INSTRUCTIONS

Introduction

The features and benefits of controlled-release, ORC Advanced are posted in other areas (product brochure, www.regenesis.com, and MSDS). From the field application standpoint, the benefits of ORC Advanced® Pellets (ORC-A Pellets) are in ease of handling and Health & Safety. Pelletized ORC Advanced is much easier to use because it eliminates the need for water and equipment associated with spray application and Health & Safety are dramatically improved by elimination of ORC Advanced dust and associated respiration issues. The later feature makes the material much easier to handle in open-air application approaches such as excavations and trenches.

Design Considerations

The new configuration of this material does not change the quantity estimated in the design process. The materials' available oxygen is up to 17% by weight and its physical attributes are designed to be easier to handle through the use of a pelletized version of the product and the elimination of the dust associated with dry application of ORC Advanced powder.

Application Methods

The pelletized form allows the user to simply and easily apply the ORC Advanced in a dry format using existing on-site operations or by manual methods. Some typical methods include:

- Application via the excavator bucket:
 - Simply insert a pre-determined quantity (unit - bucket or bag) of ORC-A Pellets into an excavator bucket and use the excavator to mix and distribute the ORC-A Pellets into previously backfilled soil
- Application via manual or mechanical broadcasting/spreaders:
 - Manually or mechanically broadcast/spread pelletized ORC-A Pellets into the excavation at a pre-determined rate per unit of backfill material or per soil lift (as the soil is being backfilled)
 - Follow the manual broadcast step with mechanically mixing the ORC-A Pellets directly into the backfill using the excavator equipment

Example Estimates:

Using an example unit weight of ORC-A Pellets (40 lb. bag)

For a 0.1% weight of ORC-Advanced to backfill:

- Each 100,000 lbs. of soil
- Apply 100 lbs. (4 buckets) ORC-A Pellets

REGENESIS ORC ADVANCED® PELLETS

Dust Minimizing Formulation for Excavations, Tank Pits and Trenches

PRODUCT APPLICATION INSTRUCTIONS

For a 0.2% weight of ORC-Advanced to backfill:

- Each 100,000 lbs. of soil
- Apply 200 lbs. (approx. 5 bags) ORC-A Pellets

Example Estimates (SI Units):

Using an example unit weight of ORC-A Pellets (18.1 kg bag)

For a 0.1% weight of ORC-A Pellets to backfill:

- Each 45 metric tons of soil
- Apply 45 kg (approx. 3 bags) ORC-A Pellets

For a 0.2% weight of ORC-A Pellets to backfill:

- Each 90 metric tons of soil
- Apply 90 kg (approx. 5 bags) ORC-A Pellets

RegenOx® Technical Description

RegenOx is an advanced chemical oxidation technology that destroys contaminants through powerful, yet controlled chemical reactions. This product maximizes *in situ* chemical oxidation (ISCO) performance through use of a two-part product system; a sodium percarbonate oxidizer complex activated by a patented surface catalyst system. The technology degrades pollutants through direct oxidation, as well as through the generation of a suite of free radical compounds which in turn oxidize recalcitrant contaminants. RegenOX rapidly and effectively destroys a range of target contaminants including petroleum hydrocarbons and chlorinated compounds.

RegenOx is especially effective in destroying target contaminants present in high concentration source areas within the saturated and vadose zones. For petroleum hydrocarbon treatment, RegenOx produces oxygen as a result of its reactions, providing seamless transition from ISCO to enhanced aerobic bioremediation. RegenOx produces minimal heat when applied, and continues to destroy contaminants for up to 30 days on a single application. RegenOx is safe for use in direct contact with underground utilities, since it is non-corrosive to concrete and most metals.



Close up of RegenOx



• Free Radical Oxidation via production of:

- Peroxyl Radical (HO_2^\bullet)
- Hydroxyl Radical (OH^\bullet)
- Superoxide Radical ($\text{O}_2^{\bullet-}$)

For a list of treatable contaminants with the use of RegenOx, view the [Range of Treatable Contaminants Guide](#)

Chemical Composition – Part A Oxidant

- Sodium Percarbonate – CAS #15630-89-4
- Sodium Carbonate Monohydrate - CAS #5968-11-6
- Silicic Acid – CAS #7699-11-6
- Silica Gel – CAS #63231

Chemical Composition – Part B Activator Complex

- Silicic Acid, Sodium Salt, Sodium Silicate - CAS#1344-09-08
- Silica Gel – CAS #63231
- Ferrous Sulfate – CAS #7720-78-7
- Water – CAS#7732-18-5

Properties

- Bulk Density – Part A 0.9-1.2 g/cm³; Part B – 1.39 g/cm³
- pH - 10-11 per recommended mixing ratios (3-5% oxidant in solution)
- Solubility – Oxidant - 14.5 g/100 g water; Activator – miscible in water
- Appearance – Brown to orange-brown when mixed with water
- Odor – Not detectable
- Vapor Pressure – None
- Non-hazardous

RegenOx® Technical Description

Storage and Handling Guidelines

Storage

- Store in a cool, dry place out of heat/direct sunlight
- Store at temperatures not to exceed 40°C/104°F
- Store in original tightly closed container
- Store in a well-ventilated place
- Do not store near combustible materials
- Store away from incompatible materials
- Protect from contamination
- Provide appropriate exhaust ventilation in places where dust is formed

Handling

- Minimize dust generation and accumulation
- Observe good industrial hygiene practices
- Keep away from clothing and combustible materials
- Take any precaution to avoid mixing with combustibles
- Avoid contact with eyes
- Do not taste or swallow
- Do not eat, drink or smoke nearby
- Wear appropriate personal protective equipment
- Wash hands thoroughly after handling
- Avoid release to the environment

Applications

RegenOx is applied using direct-injection techniques or wells. The application process enables the two- part product to be combined, then pressure-injected into the zone of contamination and moved out into the aquifer media. Application instructions for this product are contained in the [RegenOx Application Instructions Guide](#).

Health and Safety

Material is relatively safe to handle; however, we recommend avoiding contact with eyes, skin and clothing. OSHA Level D personal protection equipment including vinyl or rubber gloves, eye protection and dust mask are recommended when handling this product. Please review the Material Safety Data Sheet for additional storage, packaging, usage, and handling requirements here: [RegenOx Part A SDS](#) and [RegenOx Part B SDS](#).

APPENDIX C

BUD DETERMINATION

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials, Region 9
270 Michigan Avenue, Buffalo, New York, 14203-2999
Phone: (716) 851-7220 • **FAX:** (716) 851-7226
Website: www.dec.state.ny.us



Denise M. Sheehan
Commissioner

September 21, 2006

Mr. Patrick T. Martin, P.E., D.E.E.
Turnkey Environmental Restoration LLC
726 Exchange Street
Suite 624
Buffalo, New York 14210

Dear Mr. Martin:

**BUD # 555-9-15 and # 050-9-15 for use by
Tecumseh Redevelopment, Inc.**

I'm writing in response to your September 7, 2006 letter on behalf of your client Tecumseh Redevelopment, Inc. (Tecumseh). It is our understanding that Tecumseh would like to use two previously approved Beneficial Use Determinations (BUDs) for the former Bethlehem Steel property in Lackawanna, New York.

BUD # 555-9-15 was previously issued to Bethlehem Steel Corporation for the reclamation and reuse of steel/blast furnace slag as asphaltic concrete aggregate, railroad ballast, road base, anti-skid material, and portland cement amendment. BUD# 050-9-15 was previously issued to Buffalo Crushed Stone for the reuse of blast furnace slag as road base, sub-base, and chip and seal aggregate.

Tecumseh may use the above mentioned material for the uses outlined in both of these formerly approved BUDs. We have decided to keep the BUD numbers the same and add Tecumseh as an additional user of this material in the approved manners. The conditions outlined in the original BUD approvals must be adhered to.

Should you have any questions please contact Ms. Efrat Forget of my staff at 851-7220.

Sincerely,

Mr. Mark J. Hans, P.E.
Regional Solid Materials Engineer

ESF:mh
forget\martin-a2.ltr

cc: Mr. Tom Lynch, P.E., NYSDEC, Albany (Code 7253)

New York State Department of Environmental Conservation

Division of Solid and Hazardous Materials, Region 9

270 Michigan Avenue, Buffalo, New York, 14203-2999

Phone: (716) 851-7220 FAX: (716) 851-7226

FOIL

Releasable X

Non-Releasable _____

John P. Cahill
Commissioner

BUD # 555-9-15

New File

July 2, 1998

Ms. Ana Maria Caram
Senior Environmental Engineer
Bethlehem Steel Corporation
Bethlehem, PA 18016-7699

Post-it® Fax Note	7671	Date	8/24	# of pages	5
To	Tom Forbes	From	Efrat Forget		
Co./Dept.	Benchmark	Co.	NYS DEC		
Phone #		Phone #			
Fax #		Fax #			

Dear Ms. Caram:

Beneficial Use Determination #555-9-15

The Division of Solid & Hazardous Materials has reviewed the Beneficial Use Determination (BUD) petition by the Bethlehem Steel Corporation (BSC), dated March 31, 1998. BSC has petitioned the Department to determine that the following uses of steel making slag (steel slag) located at their Lackawanna, New York facility, constitute beneficial uses of this material: fill, asphaltic concrete aggregate, railroad ballast, road base, chip and seal aggregates, anti-skid material, acid mine drainage treatment material, and portland cement amendment.

As identified in the BUD petition, the Lackawanna facility was involved in the production of steel since the early part of this century. BSC produced steel making slag in open hearth furnaces and later in basic oxygen furnaces. The molten steel was separated from the slag, and the slag was allowed to cool into rock-like material. Following the cooling, the slag was crushed and screened through magnetic separators to reclaim the entrained steel from the slag. The slag was either sold for off-site construction and fill material, or stockpiled onsite. The Lackawanna facility ceased its active steel making operations in 1983. BSC stockpiled their slag within the Slag Fill Area, consisting of five different stockpile areas identified as Zones 1 through 5.

BSC is in the process of reclaiming / redeveloping the Slag Fill Area at its Lackawanna facility, with the intention of making it suitable for future commercial and/or industrial development. BSC is planning to reclaim approximately 4.5 million tons of steel slag stockpiled in the northwestern portion of this facility. The steel making slag, which is the subject of this BUD petition, is located in Zones 3 and 5. Zone 3 contains approximately 2.0 million tons of slag, while Zone 5 contains approximately 2.5 million tons. BSC's objectives for the reclamation / redevelopment program is to perform onsite reclamation activities, offsite reuse of recovered materials, and onsite re-grading.

With regard to the use of slag as fill, more information is needed regarding the specific fill applications. In certain fill applications the presence of heavy metals (chromium, cadmium, selenium, etc.) may cause contravention of groundwater standards or impact the terrestrial environment. Without more specific information, the unlimited, widespread use of the slag as fill can be considered landfilling or disposal, an activity that is regulated under Part 360, Subpart 2. BSC should re-evaluate the petition to limit fill to more specific applications such as structural fill, etc.

At present, we do not have enough information regarding the proposed uses of slag in chip and seal aggregates and as acid mine drainage treatment material. Please provide us with more information specific to these two uses in order for us to determine whether they constitute beneficial uses, and what the potential environmental impacts may be.

Based on our review of the petition, and pending the receipt of additional information documenting the marketing and final destination of slag materials, the following proposed uses of reclaimed steel slag from the BSC Lackawanna facility have been determined to qualify as beneficial uses, and, therefore, are exempt from solid waste regulations: **asphaltic concrete aggregate, railroad ballast, road base, anti-skid material, and portland cement amendment.** The following conditions shall apply:

1. This determination only applies as long as the reclaimed steel slag does not significantly deviate in physical and/or chemical characteristics from that described in the petition. The Department must be immediately notified, in writing, of any changes in the quality of the reclaimed steel slag. The reclaimed steel slag shall be sampled and analyzed as per the attached Steel Slag Sampling and Analysis Plan. The analytical data shall be reported to the Department no later than 60 days following completion of each sampling as described in the plan.
2. Any material that fails to meet the characteristics of the steel slag described in this petition should be properly managed as a solid waste per 6 NYCRR Part 360 regulations.
3. The petitioner shall be responsible for ensuring that the quality of the finished product is consistent with the data submitted with the petition, and is adequate for the intended use. Where appropriate, the material must comply with the applicable specifications of the agency / entity (such as the New York State Department of Transportation) having jurisdiction over the use.
4. An annual report must be submitted to:

NYSDEC
270 Michigan Avenue
Buffalo, New York 14203-2999
Attn: Regional Solid Materials Engineer

NYSDEC
Bureau of Waste Reduction &
Recycling
Division of Solid & Hazardous
Materials
50 Wolf Road
Albany, New York 12233

no later than 60 days following the last day of the year for which the data is being reported. This report shall include the consolidated (tabulated) analytical data per condition 1 above, and the quantity of reclaimed steel slag which are utilized in this manner during the reporting year.

5. The Department reserves the right to modify, suspend, or revoke this determination at any time, should conditions warrant such action. Additionally, this determination does not exempt the operation from any other local, State, or Federal requirements.

Upon receipt of the appropriate additional information on the use of slag as fill, in chip and seal aggregates, and as acid mine drainage treatment materials, the Department may modify this beneficial use determination to also include these uses.

If you have any questions, please do not hesitate to contact our office at 716/851-7220.

Sincerely,



Mark J. Hans, P.E.
Regional Solid Materials Engineer

MJH/lj

Enclosure

cc: Mr. Jeff Schmitt, NYSDEC/Albany

(a:caram.mjh)

**New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
Bethlehem Steel Corporation - Lackawanna, NY
Beneficial Use Determination
Steel Slag Sampling and Analysis Plan**

1. In order to ensure a consistent quality of the processed steel slag, one composite sample shall be analyzed for each 10,000 tons of processed steel slag generated for the first 100,000 tons of slag processed. Thereafter, one composite sample shall be analyzed for each 200,000 tons of slag.
2. For the initial sampling, each sample will be a composite of at least five grab samples at 2,000-ton intervals. Each grab shall consist of random aliquots taken from the lower, middle, and upper sections of the working face of an excavation area or from the stockpile. The grab samples will be homogenized by mixing equal volumes of each grab into the test sample container.
3. The samples shall be analyzed by a NYSDOH-approved (ELAP certified) analytical laboratory.
4. Each composite sample shall be analyzed for target compound list (TCL) metals (total and SPLP extraction). The analytical data shall identify the sample collector's name, date and location sample was collected, description of sample, and sample identification number.
5. Upon successful completion of Initial Sampling (first 100,000 tons of slag processed), the sampling frequency may be reduced to one composite sample per 200,000 tons of slag. Each sample will be a composite of at least five grab samples at 40,000-ton intervals. Each grab shall consist of random aliquots taken from the lower, middle, and upper sections of the working face of an excavation area or from the stockpile. The grab samples will be homogenized by mixing equal volumes of each grab into the test sample container.
6. Additional contingency sampling and analysis may be required if analytical data shows significantly different concentrations than the Initial Sampling. For Contingency Sampling, one composite sample shall be analyzed for each 10,000 tons of excavated slag. Each sample will be a composite of at least five grab samples at 2,000-ton intervals. Each grab shall consist of random aliquots taken from the lower, middle, and upper sections of the working face of an excavation area or from the stockpile. The grab samples will be homogenized by mixing equal volumes of each grab into the test sample container. This sampling shall continue until the quality of the recovered steel slag consistently meets the quality requirements of this BUD.
7. The data shall be tabulated and reported to the Department quarterly. The data package shall include copies of the lab reports as supporting documentation.

**New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
Bethlehem Steel Corporation - Lackawanna, NY
Beneficial Use Determination
Steel Slag Sampling and Analysis Plan**

<i>Sampling</i>	<i>Sample Quantity and Frequency</i>	<i>Testing Methods</i>
<u>Initial Sampling</u> : First 100,000 tons	1 composite/10,000 tons of slag processed	TCL Metals (Total & SPLP)
<u>Subsequent Sampling</u> : After first 100,000 tons	1 composite/200,000 tons of slag processed	TCL Metals (Total & SPLP)
<u>Contingency Sampling</u>	1 composite/10,000 tons of slag processed	TCL Metals (Total & SPLP)

Notes:

1. Contingency sampling may be required if quarterly sampling shows significantly different concentrations than the Verification Sampling.
2. TCL metals include: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc.
3. For Initial Sampling and Contingency Sampling, composite samples shall consist of 5 grab samples taken at 2,000-ton intervals. Each grab sample shall include random aliquots from the top, middle, and bottom of the working face of the excavation or from the stockpile.
4. For Subsequent Sampling, composite samples shall consist of 5 grab samples taken at 40,000-ton intervals. Each grab sample shall include random aliquots from the top, middle, and bottom of the working face of the excavation or from the stockpile.



May 23, 2012

Ms. Sally Rowland
New York State Dept. of Environmental Conservation
Division of Materials Management
Bureau of Waste Reduction & Recycling, 9th Floor
625 Broadway, Albany, NY 12233-7253

Re: Tecumseh Redevelopment Inc.
BUD # 050-9-15 – Slag - Blast Furnace

Dear Ms. Rowland:

On behalf of ArcelorMittal Tecumseh Redevelopment and in accordance with the requirements of the above referenced BUD # 050-9-15, please be advised that we are reporting 7,500 cubic yards of blast furnace slag that has been used during the 2011 reporting period, on a limited use on-site. Slag material usage will continue to be monitored for this BUD and additional slag composite samples will be obtained (as per approved tonnage limits) during the reporting period per the BUD requirements and submit analytical test results per the NYSDEC Sampling and Analysis Plan.

Sincerely,
TurnKey Environmental Restoration, LLC

John T. Deth

John T. Deth
Manager Construction Services

CC: K. Nagel, ArcelorMittal Tecumseh Redevelopment

New York State Department of Environmental Conservation

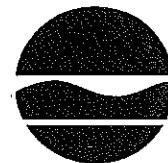
Division of Solid & Hazardous Materials

Bureau of Solid Waste, Reduction & Recycling, 9th Floor

625 Broadway, Albany, NY 12233-7253

Phone: (518) 402-8678 • Fax: (518) 402-9024

Website: www.dec.ny.gov



January 25, 2012

Mr. Paul Werthman, PE
President
Tecumseh Redevelopment c/o BEES
2558 Hamburg Turnpike, Suite 300
Lackawanna, NY 14218

Dear Mr. Werthman:

Re: Beneficial Use Determination No. 050-9-15

A Beneficial Use Determination (BUD) was granted to your company by the New York State Department of Environmental Conservation (Department). The Department is in the process of compiling data to estimate the quantity of solid waste beneficially used during calendar year 2011 (January 1, 2011 - December 31, 2011). For this purpose, the Department requests that the following table be completed and returned to the address on this letterhead by March 15, 2012. If you have already submitted this information to the Department, please disregard this request.

Quantity of Waste Beneficially Used During January 1, 2011 - December 31, 2011

BUD No. 050-9-15

Waste Type: SLAG (BLAST FURNACE)

Beneficial Use: BASE (ROAD: SUB) AGGREGATE

Contact Person: (please make corrections above) PAUL WERTHMAN

Telephone Number: 716-856-0599

Quantity: 7500 Unit (ton (preferred) or yd³ or gal): _____

*Please indicate an email address where you would like this notice sent:

Remarks: limited to use on site only

NOTE: In addition to information listed above, please attach to this form all reporting information required by BUD No. 050-9-15.

I appreciate your continued cooperation in providing the above information. If you have any questions, please call Stephen Condon at 518-402-8706.

Sincerely,

Sally Rowland

Sally Rowland, PhD, P.E.
Chief, Organic Recycling & Beneficial Use Section



May 23, 2012

Ms. Sally Rowland
New York State Dept. of Environmental Conservation
Division of Materials Management
Bureau of Waste Reduction & Recycling, 9th Floor
625 Broadway, Albany, NY 12233-7253

Re: Tecumseh Redevelopment Inc.
BUD # 555-9-15 – Steel Blast Furnace Slag

Dear Ms. Rowland:

On behalf of ArcelorMittal Tecumseh Redevelopment and in accordance with the requirements of the above referenced BUD # 555-9-15, please be advised that Iron City Recovery has reported 42,642 tons of steel blast furnace slag has been used during the 2011 reporting period, for an approximate total through 2011 of 295,000-345,000 tons of slag. As we approached processing of the 300,000 tons of slag this past year, we obtained additional composite samples per the BUD requirements and have attached these analytical test results per the NYSDEC Sampling and Analysis Plan.

Sincerely,
TurnKey Environmental Restoration, LLC

John T. Deth

John T. Deth
Manager Construction Services

CC: K. Nagel, ArcelorMittal Tecumseh Redevelopment

New York State Department of Environmental Conservation

Division of Solid & Hazardous Materials

Bureau of Solid Waste, Reduction & Recycling, 9th Floor

625 Broadway, Albany, NY 12233-7253

Phone: (518) 402-8678 • Fax: (518) 402-9024

Website: www.dec.ny.gov



January 25, 2012

Mr. Paul Werthman, PE
President
Tecumseh Redevelopment c/o BEES
2558 Hamburg Turnpike, Suite 300
Lackawanna, NY 14218

Dear Mr. Werthman:

Re: Beneficial Use Determination No. 555-9-15

A Beneficial Use Determination (BUD) was granted to your company by the New York State Department of Environmental Conservation (Department). The Department is in the process of compiling data to estimate the quantity of solid waste beneficially used during calendar year 2011 (January 1, 2011 - December 31, 2011). For this purpose, the Department requests that the following table be completed and returned to the address on this letterhead by March 15, 2012. If you have already submitted this information to the Department, please disregard this request.

Quantity of Waste Beneficially Used During January 1, 2011 - December 31, 2011

BUD No. 555-9-15

Waste Type: STEEL / PLAST FURNACE SLAG

Beneficial Use: AGGREGATE, ROAD & SUB BASE

Contact Person: (please make corrections above) PAUL WERTHMAN

Telephone Number: 716-856-0599

Quantity: 42,642 Unit (ton (preferred) or yd³ or gal): _____

*Please indicate an email address where you would like this notice sent:

J.Deth@BenchmarkTurnkey.com

Remarks: _____

NOTE: In addition to information listed above, please attach to this form all reporting information required by BUD No. 555-9-15.

I appreciate your continued cooperation in providing the above information. If you have any questions, please call Stephen Condon at 518-402-8706.

Sincerely,

Sally Rowland

Sally Rowland, PhD, P.E.
Chief, Organic Recycling & Beneficial Use Section

IRON CITY - BOD Sampling
Spring 2011
BUD # 555-9-15

1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Buffalo

10 Hazelwood Drive

Amherst, NY 14228-2298

Tel: (716)691-2600

TestAmerica Job ID: 480-3935-1

Client Project/Site: Tecumseh - Iron City site

For:

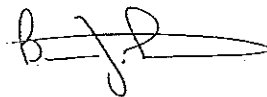
Turnkey Environmental Restoration, LLC

2558 Hamburg Turnpike

Suite 300

Lackawanna, New York 14218

Attn: John Deth



Authorized for release by:

05/03/2011 05:45:23 PM

Brian Fischer

Project Manager II

brian.fischer@testamericainc.com

LINKS

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results through

Total Access

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www.testamericainc.com

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all 2003 NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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Qualifier Definition/Glossary

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Qualifiers

Metals

Qualifier	Qualifier Description
*	LCS or LCSD exceeds the control limits
4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis.
EPA	United States Environmental Protection Agency
ND	Not Detected above the reporting level.
MDL	Method Detection Limit
RL	Reporting Limit
RE, RE1 (etc.)	Indicates a Re-extraction or Reanalysis of the sample.
%R	Percent Recovery
RPD	Relative Percent Difference, a measure of the relative difference between two points.

Case Narrative

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Job ID: 480-3935-1

Laboratory: TestAmerica Buffalo

Narrative

Job Narrative
480-3935-1

Comments

No additional comments.

Receipt

1 sample jar was broken for slag comp-1 on 4/29/2011.

All other samples were received in good condition within temperature requirements.

Metals

Method(s) 6010B: The following samples were diluted due to the abundance of target analytes total calcium and iron: Slag Comp-1 (480-3935-1), Slag Comp-2 (480-3935-2). Elevated reporting limits (RLs) are provided.

Method(s) 6010B: The Serial Dilution (480-3935-2 SD), in batch 480-14413, exhibited results outside the quality control limits for total chromium. However, the Post Digestion Spike was compliant so no corrective action was necessary.

Method(s) 6010B: Due to the nature of sodium and barium in the SPLP extraction fluid, the Extractor Blank, LB 480-14349, in batch 480-14413 is elevated for these elements. This causes the Laboratory Control Sample (LCS 480-14413) to be elevated for these elements, however sodium is the only analyte that exhibits results outside control limits. It can be expected that because total sodium and barium are present in the extraction fluid, it may be present at elevated levels in samples Slag Comp-1 (480-3935-1), Slag Comp-2 (480-3935-2).

No other analytical or quality issues were noted.

Organic Prep

No analytical or quality issues were noted.

Detection Summary

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Client Sample ID: Slag Comp-1

Lab Sample ID: 480-3935-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	7670		11.0		mg/Kg	1	*	6010B	Total/NA
Arsenic	4.2		2.2		mg/Kg	1	*	6010B	Total/NA
Barium	118		0.55		mg/Kg	1	*	6010B	Total/NA
Beryllium	0.81		0.22		mg/Kg	1	*	6010B	Total/NA
Cadmium	0.65		0.22		mg/Kg	1	*	6010B	Total/NA
Calcium	202000		1100		mg/Kg	20	*	6010B	Total/NA
Chromium	525		0.55		mg/Kg	1	*	6010B	Total/NA
Cobalt	6.2		0.55		mg/Kg	1	*	6010B	Total/NA
Copper	20.8		1.1		mg/Kg	1	*	6010B	Total/NA
Iron	156000		221		mg/Kg	20	*	6010B	Total/NA
Lead	31.5		1.1		mg/Kg	1	*	6010B	Total/NA
Magnesium	30100		22.1		mg/Kg	1	*	6010B	Total/NA
Manganese	48900		11.0		mg/Kg	50	*	6010B	Total/NA
Nickel	9.4		5.5		mg/Kg	1	*	6010B	Total/NA
Potassium	344		33.1		mg/Kg	1	*	6010B	Total/NA
Selenium	9.3		4.4		mg/Kg	1	*	6010B	Total/NA
Silver	2.9		0.55		mg/Kg	1	*	6010B	Total/NA
Sodium	441		155		mg/Kg	1	*	6010B	Total/NA
Thallium	18.5		6.6		mg/Kg	1	*	6010B	Total/NA
Vanadium	609		0.55		mg/Kg	1	*	6010B	Total/NA
Zinc	44.1		2.2		mg/Kg	1	*	6010B	Total/NA
Aluminum	0.42		0.20		mg/L	1		6010B	SPLP East
Barium	0.052	B	0.0020		mg/L	1		6010B	SPLP East
Calcium	111		0.50		mg/L	1		6010B	SPLP East
Chromium	0.033		0.0040		mg/L	1		6010B	SPLP East
Iron	0.16		0.050		mg/L	1		6010B	SPLP East
Magnesium	0.21		0.20		mg/L	1		6010B	SPLP East
Manganese	0.041		0.0030		mg/L	1		6010B	SPLP East
Sodium	7.3	* B	1.0		mg/L	1		6010B	SPLP East
Vanadium	0.043		0.0050		mg/L	1		6010B	SPLP East
Mercury	0.024		0.023		mg/Kg	1	*	7471A	Total/NA

Client Sample ID: Slag Comp-2

Lab Sample ID: 480-3935-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	6580		11.2		mg/Kg	1	*	6010B	Total/NA
Arsenic	6.3		2.2		mg/Kg	1	*	6010B	Total/NA
Barium	89.7		0.56		mg/Kg	1	*	6010B	Total/NA
Beryllium	0.79		0.22		mg/Kg	1	*	6010B	Total/NA
Cadmium	0.53		0.22		mg/Kg	1	*	6010B	Total/NA
Calcium	244000		1120		mg/Kg	20	*	6010B	Total/NA
Chromium	653		0.56		mg/Kg	1	*	6010B	Total/NA
Cobalt	5.0		0.56		mg/Kg	1	*	6010B	Total/NA
Copper	25.4		1.1		mg/Kg	1	*	6010B	Total/NA
Iron	147000		223		mg/Kg	20	*	6010B	Total/NA
Lead	25.1		1.1		mg/Kg	1	*	6010B	Total/NA
Magnesium	30600		22.3		mg/Kg	1	*	6010B	Total/NA
Manganese	36500		11.2		mg/Kg	50	*	6010B	Total/NA
Nickel	16.3		5.6		mg/Kg	1	*	6010B	Total/NA
Potassium	251		33.5		mg/Kg	1	*	6010B	Total/NA
Selenium	6.0		4.5		mg/Kg	1	*	6010B	Total/NA
Silver	1.7		0.56		mg/Kg	1	*	6010B	Total/NA
Sodium	225		156		mg/Kg	1	*	6010B	Total/NA
Thallium	8.8		6.7		mg/Kg	1	*	6010B	Total/NA

TestAmerica Buffalo

Detection Summary

Client: Turnkey Environmental Restoration, LLC

TestAmerica Job ID: 480-3935-1

Project/Site: Tecumseh - Iron City site

Client Sample ID: Slag Comp-2 (Continued)

Lab Sample ID: 480-3935-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vanadium	528		0.56		mg/Kg	1	✱	6010B	Total/NA
Zinc	36.7		2.2		mg/Kg	1	✱	6010B	Total/NA
Aluminum	0.53		0.20		mg/L	1		6010B	SPLP East
Barium	0.079	B	0.0020		mg/L	1		6010B	SPLP East
Calcium	208		0.50		mg/L	1		6010B	SPLP East
Chromium	0.043		0.0040		mg/L	1		6010B	SPLP East
Iron	0.34		0.050		mg/L	1		6010B	SPLP East
Magnesium	0.28		0.20		mg/L	1		6010B	SPLP East
Manganese	0.085		0.0030		mg/L	1		6010B	SPLP East
Sodium	3.8	*B	1.0		mg/L	1		6010B	SPLP East
Vanadium	0.0091		0.0050		mg/L	1		6010B	SPLP East

Analytical Data

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Client Sample ID: Slag Comp-1

Lab Sample ID: 480-3935-1

Date Collected: 04/19/11 11:30

Matrix: Solid

Date Received: 04/19/11 13:20

Percent Solids: 90.4

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	7670		11.0		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Antimony	ND		16.6		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Arsenic	4.2		2.2		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Barium	118		0.55		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Beryllium	0.81		0.22		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Cadmium	0.65		0.22		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Calcium	202000		1100		mg/Kg	*	04/20/11 17:25	04/22/11 10:25	20
Chromium	525		0.55		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Cobalt	6.2		0.55		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Copper	20.8		1.1		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Iron	156000		221		mg/Kg	*	04/20/11 17:25	04/22/11 10:25	20
Lead	31.5		1.1		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Magnesium	30100		22.1		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Manganese	48900		11.0		mg/Kg	*	04/20/11 17:25	04/22/11 11:15	50
Nickel	9.4		5.5		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Potassium	344		33.1		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Selenium	9.3		4.4		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Silver	2.9		0.55		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Sodium	441		155		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Thallium	18.5		6.6		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Vanadium	609		0.55		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1
Zinc	44.1		2.2		mg/Kg	*	04/20/11 17:25	04/21/11 20:10	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.42		0.20		mg/L		05/02/11 08:25	05/02/11 17:33	1
Antimony	ND		0.020		mg/L		05/02/11 08:25	05/02/11 17:33	1
Arsenic	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:33	1
Barium	0.052	B	0.0020		mg/L		05/02/11 08:25	05/02/11 17:33	1
Beryllium	ND		0.0020		mg/L		05/02/11 08:25	05/02/11 17:33	1
Cadmium	ND		0.0010		mg/L		05/02/11 08:25	05/02/11 17:33	1
Calcium	111		0.50		mg/L		05/02/11 08:25	05/02/11 17:33	1
Chromium	0.033		0.0040		mg/L		05/02/11 08:25	05/02/11 17:33	1
Cobalt	ND		0.0040		mg/L		05/02/11 08:25	05/02/11 17:33	1
Copper	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:33	1
Iron	0.16		0.050		mg/L		05/02/11 08:25	05/02/11 17:33	1
Lead	ND		0.0050		mg/L		05/02/11 08:25	05/02/11 17:33	1
Magnesium	0.21		0.20		mg/L		05/02/11 08:25	05/02/11 17:33	1
Manganese	0.041		0.0030		mg/L		05/02/11 08:25	05/02/11 17:33	1
Nickel	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:33	1
Potassium	ND		0.50		mg/L		05/02/11 08:25	05/02/11 17:33	1
Selenium	ND		0.015		mg/L		05/02/11 08:25	05/02/11 17:33	1
Silver	ND		0.0030		mg/L		05/02/11 08:25	05/02/11 17:33	1
Sodium	7.3	* B	1.0		mg/L		05/02/11 08:25	05/02/11 17:33	1
Thallium	ND		0.020		mg/L		05/02/11 08:25	05/02/11 17:33	1
Vanadium	0.043		0.0050		mg/L		05/02/11 08:25	05/02/11 17:33	1
Zinc	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:33	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		05/02/11 10:00	05/02/11 14:16	1

TestAmerica Buffalo

Analytical Data

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Client Sample ID: Slag Comp-1

Lab Sample ID: 480-3935-1

Date Collected: 04/19/11 11:30

Matrix: Solid

Date Received: 04/19/11 13:20

Percent Solids: 90.4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.024		0.023		mg/Kg	*	04/20/11 15:00	04/20/11 17:46	1

Client Sample ID: Slag Comp-2

Lab Sample ID: 480-3935-2

Date Collected: 04/19/11 11:45

Matrix: Solid

Date Received: 04/19/11 13:20

Percent Solids: 90.6

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	6580		11.2		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Antimony	ND		16.8		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Arsenic	6.3		2.2		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Barium	89.7		0.56		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Beryllium	0.79		0.22		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Cadmium	0.53		0.22		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Calcium	244000		1120		mg/Kg	*	04/20/11 17:25	04/22/11 10:28	20
Chromium	653		0.56		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Cobalt	5.0		0.56		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Copper	25.4		1.1		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Iron	147000		223		mg/Kg	*	04/20/11 17:25	04/22/11 10:28	20
Lead	25.1		1.1		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Magnesium	30600		22.3		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Manganese	36500		11.2		mg/Kg	*	04/20/11 17:25	04/22/11 11:17	50
Nickel	16.3		5.6		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Potassium	251		33.5		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Selenium	6.0		4.5		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Silver	1.7		0.56		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Sodium	225		156		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Thallium	8.8		6.7		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Vanadium	528		0.56		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1
Zinc	36.7		2.2		mg/Kg	*	04/20/11 17:25	04/21/11 20:13	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.53		0.20		mg/L		05/02/11 08:25	05/02/11 17:35	1
Antimony	ND		0.020		mg/L		05/02/11 08:25	05/02/11 17:35	1
Arsenic	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:35	1
Barium	0.079	B	0.0020		mg/L		05/02/11 08:25	05/02/11 17:35	1
Beryllium	ND		0.0020		mg/L		05/02/11 08:25	05/02/11 17:35	1
Cadmium	ND		0.0010		mg/L		05/02/11 08:25	05/02/11 17:35	1
Calcium	208		0.50		mg/L		05/02/11 08:25	05/02/11 17:35	1
Chromium	0.043		0.0040		mg/L		05/02/11 08:25	05/02/11 17:35	1
Cobalt	ND		0.0040		mg/L		05/02/11 08:25	05/02/11 17:35	1
Copper	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:35	1
Iron	0.34		0.050		mg/L		05/02/11 08:25	05/02/11 17:35	1
Lead	ND		0.0050		mg/L		05/02/11 08:25	05/02/11 17:35	1
Magnesium	0.28		0.20		mg/L		05/02/11 08:25	05/02/11 17:35	1
Manganese	0.085		0.0030		mg/L		05/02/11 08:25	05/02/11 17:35	1
Nickel	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:35	1
Potassium	ND		0.50		mg/L		05/02/11 08:25	05/02/11 17:35	1
Selenium	ND		0.015		mg/L		05/02/11 08:25	05/02/11 17:35	1
Silver	ND		0.0030		mg/L		05/02/11 08:25	05/02/11 17:35	1

TestAmerica Buffalo

Analytical Data

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Client Sample ID: Slag Comp-2

Lab Sample ID: 480-3935-2

Date Collected: 04/19/11 11:45

Matrix: Solid

Date Received: 04/19/11 13:20

Method: 6010B - Metals (ICP) - SPLP East (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	3.8	* B	1.0		mg/L		05/02/11 08:25	05/02/11 17:35	1
Thallium	ND		0.020		mg/L		05/02/11 08:25	05/02/11 17:35	1
Vanadium	0.0091		0.0050		mg/L		05/02/11 08:25	05/02/11 17:35	1
Zinc	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:35	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		05/02/11 10:00	05/02/11 14:18	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.021		mg/Kg	✱	04/20/11 15:00	04/20/11 17:48	1

Quality Control Data

Client: Turnkey Environmental Restoration, LLC

TestAmerica Job ID: 480-3935-1

Project/Site: Tecumseh - Iron City site

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 480-12970/1-A

Client Sample ID: MB 480-12970/1-A

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 13217

Prep Batch: 12970

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	DII Fac
Aluminum	ND		10.4		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Antimony	ND		15.6		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Arsenic	ND		2.1		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Barium	ND		0.52		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Beryllium	ND		0.21		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Cadmium	ND		0.21		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Calcium	ND		52.1		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Chromium	ND		0.52		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Cobalt	ND		0.52		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Copper	ND		1.0		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Iron	ND		10.4		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Lead	ND		1.0		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Magnesium	ND		20.9		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Manganese	ND		0.21		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Nickel	ND		5.2		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Potassium	ND		31.3		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Selenium	ND		4.2		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Silver	ND		0.52		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Sodium	ND		146		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Thallium	ND		6.3		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Vanadium	ND		0.52		mg/Kg		04/20/11 17:25	04/21/11 19:45	1
Zinc	ND		2.1		mg/Kg		04/20/11 17:25	04/21/11 19:45	1

Lab Sample ID: LCSSRM 480-12970/2-A

Client Sample ID: LCSSRM 480-12970/2-A

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 13217

Prep Batch: 12970

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	% Rec	% Rec. Limits
Aluminum	10700	8304		mg/Kg		78	46 - 153
Antimony	117	75.47		mg/Kg		64	23 - 253
Arsenic	138	141.5		mg/Kg		102	70 - 130
Barium	269	260.7		mg/Kg		97	74 - 126
Beryllium	157	165.6		mg/Kg		105	75 - 125
Cadmium	71.1	82.68		mg/Kg		116	73 - 127
Calcium	9670	9957		mg/Kg		103	75 - 124
Chromium	105	112.5		mg/Kg		107	69 - 130
Cobalt	142	164.2		mg/Kg		115	74 - 125
Copper	110	118.8		mg/Kg		108	74 - 125
Iron	19100	14180		mg/Kg		74	43 - 156
Lead	144	158.8		mg/Kg		110	73 - 126
Magnesium	4420	4051		mg/Kg		92	70 - 130
Manganese	540	554.3		mg/Kg		103	77 - 123
Nickel	130	156.9		mg/Kg		121	73 - 127
Potassium	5010	4660		mg/Kg		93	66 - 134
Selenium	200	226.7		mg/Kg		113	69 - 132
Silver	45.2	51.20		mg/Kg		113	66 - 134
Sodium	654	661.0		mg/Kg		101	55 - 145
Thallium	161	171.2		mg/Kg		106	68 - 132
Vanadium	67.1	61.12		mg/Kg		91	58 - 142
Zinc	223	216.2		mg/Kg		97	70 - 130

TestAmerica Buffalo

Quality Control Data

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MB 480-14413/2-A

Matrix: Solid

Analysis Batch: 14581

Client Sample ID: MB 480-14413/2-A

Prep Type: Total/NA

Prep Batch: 14413

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.20		mg/L		05/02/11 08:25	05/02/11 17:24	1
Antimony	ND		0.020		mg/L		05/02/11 08:25	05/02/11 17:24	1
Arsenic	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:24	1
Barium	ND		0.0020		mg/L		05/02/11 08:25	05/02/11 17:24	1
Beryllium	ND		0.0020		mg/L		05/02/11 08:25	05/02/11 17:24	1
Cadmium	ND		0.0010		mg/L		05/02/11 08:25	05/02/11 17:24	1
Calcium	ND		0.50		mg/L		05/02/11 08:25	05/02/11 17:24	1
Chromium	ND		0.0040		mg/L		05/02/11 08:25	05/02/11 17:24	1
Cobalt	ND		0.0040		mg/L		05/02/11 08:25	05/02/11 17:24	1
Copper	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:24	1
Iron	ND		0.050		mg/L		05/02/11 08:25	05/02/11 17:24	1
Lead	ND		0.0050		mg/L		05/02/11 08:25	05/02/11 17:24	1
Magnesium	ND		0.20		mg/L		05/02/11 08:25	05/02/11 17:24	1
Manganese	ND		0.0030		mg/L		05/02/11 08:25	05/02/11 17:24	1
Nickel	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:24	1
Potassium	ND		0.50		mg/L		05/02/11 08:25	05/02/11 17:24	1
Selenium	ND		0.015		mg/L		05/02/11 08:25	05/02/11 17:24	1
Silver	ND		0.0030		mg/L		05/02/11 08:25	05/02/11 17:24	1
Sodium	ND		1.0		mg/L		05/02/11 08:25	05/02/11 17:24	1
Thallium	ND		0.020		mg/L		05/02/11 08:25	05/02/11 17:24	1
Vanadium	ND		0.0050		mg/L		05/02/11 08:25	05/02/11 17:24	1
Zinc	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:24	1

Lab Sample ID: LCS 480-14413/3-A

Matrix: Solid

Analysis Batch: 14581

Client Sample ID: LCS 480-14413/3-A

Prep Type: Total/NA

Prep Batch: 14413

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec Limits
Aluminum	10.0	9.84		mg/L		98	80 - 120
Antimony	0.200	0.199		mg/L		100	80 - 120
Arsenic	0.200	0.202		mg/L		101	80 - 120
Barium	0.200	0.215		mg/L		108	80 - 120
Beryllium	0.200	0.207		mg/L		103	80 - 120
Cadmium	0.200	0.198		mg/L		99	80 - 120
Calcium	10.0	10.77		mg/L		108	80 - 120
Chromium	0.200	0.201		mg/L		101	80 - 120
Cobalt	0.200	0.198		mg/L		99	80 - 120
Copper	0.200	0.203		mg/L		101	80 - 120
Iron	10.0	9.93		mg/L		99	80 - 120
Lead	0.200	0.195		mg/L		98	80 - 120
Magnesium	10.0	10.41		mg/L		104	80 - 120
Manganese	0.200	0.206		mg/L		103	80 - 120
Nickel	0.200	0.194		mg/L		97	80 - 120
Potassium	10.0	10.13		mg/L		101	80 - 120
Selenium	0.200	0.204		mg/L		102	80 - 120
Silver	0.0500	0.0539		mg/L		108	80 - 120
Sodium	10.0	15.02 *		mg/L		150	80 - 120
Thallium	0.200	0.198		mg/L		99	80 - 120
Vanadium	0.200	0.190		mg/L		95	80 - 120
Zinc	0.200	0.214		mg/L		107	80 - 120

TestAmerica Buffalo

Quality Control Data

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LB 480-14349/1-B LB
Matrix: Solid
Analysis Batch: 14581

Client Sample ID: LB 480-14349/1-B
Prep Type: SPLP East
Prep Batch: 14413

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.20		mg/L		05/02/11 08:25	05/02/11 17:22	1
Antimony	ND		0.020		mg/L		05/02/11 08:25	05/02/11 17:22	1
Arsenic	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:22	1
Barium	0.0106		0.0020		mg/L		05/02/11 08:25	05/02/11 17:22	1
Beryllium	ND		0.0020		mg/L		05/02/11 08:25	05/02/11 17:22	1
Cadmium	ND		0.0010		mg/L		05/02/11 08:25	05/02/11 17:22	1
Calcium	ND		0.50		mg/L		05/02/11 08:25	05/02/11 17:22	1
Chromium	ND		0.0040		mg/L		05/02/11 08:25	05/02/11 17:22	1
Cobalt	ND		0.0040		mg/L		05/02/11 08:25	05/02/11 17:22	1
Copper	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:22	1
Iron	ND		0.050		mg/L		05/02/11 08:25	05/02/11 17:22	1
Lead	ND		0.0050		mg/L		05/02/11 08:25	05/02/11 17:22	1
Magnesium	ND		0.20		mg/L		05/02/11 08:25	05/02/11 17:22	1
Manganese	ND		0.0030		mg/L		05/02/11 08:25	05/02/11 17:22	1
Nickel	ND		0.010		mg/L		05/02/11 08:25	05/02/11 17:22	1
Potassium	ND		0.50		mg/L		05/02/11 08:25	05/02/11 17:22	1
Selenium	ND		0.015		mg/L		05/02/11 08:25	05/02/11 17:22	1
Silver	ND		0.0030		mg/L		05/02/11 08:25	05/02/11 17:22	1
Sodium	5.24		1.0		mg/L		05/02/11 08:25	05/02/11 17:22	1
Thallium	ND		0.020		mg/L		05/02/11 08:25	05/02/11 17:22	1
Vanadium	ND		0.0050		mg/L		05/02/11 08:25	05/02/11 17:22	1
Zinc	0.0124		0.010		mg/L		05/02/11 08:25	05/02/11 17:22	1

Lab Sample ID: 480-3935-2 MS
Matrix: Solid
Analysis Batch: 14581

Client Sample ID: Slag Comp-2
Prep Type: SPLP East
Prep Batch: 14413

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
Aluminum	0.53		10.0	10.13		mg/L		96	75 - 125
Antimony	ND		0.200	0.194		mg/L		97	75 - 125
Arsenic	ND		0.200	0.203		mg/L		102	75 - 125
Barium	0.079	B	0.200	0.268		mg/L		94	75 - 125
Beryllium	ND		0.200	0.204		mg/L		102	75 - 125
Cadmium	ND		0.200	0.193		mg/L		97	75 - 125
Calcium	208		10.0	205.6	4	mg/L		-29	75 - 125
Chromium	0.043		0.200	0.232		mg/L		94	75 - 125
Cobalt	ND		0.200	0.193		mg/L		96	75 - 125
Copper	ND		0.200	0.198		mg/L		97	75 - 125
Iron	0.34		10.0	9.77		mg/L		94	75 - 125
Lead	ND		0.200	0.193		mg/L		96	75 - 125
Magnesium	0.28		10.0	9.92		mg/L		96	75 - 125
Manganese	0.085		0.200	0.269		mg/L		92	75 - 125
Nickel	ND		0.200	0.189		mg/L		94	75 - 125
Potassium	ND		10.0	10.28		mg/L		103	75 - 125
Selenium	ND		0.200	0.201		mg/L		100	75 - 125
Silver	ND		0.0500	0.0514		mg/L		103	75 - 125
Sodium	3.8	* B	10.0	13.40		mg/L		96	75 - 125
Thallium	ND		0.200	0.190		mg/L		95	75 - 125
Vanadium	0.0091		0.200	0.195		mg/L		93	75 - 125
Zinc	ND		0.200	0.201		mg/L		97	75 - 125

TestAmerica Buffalo

Quality Control Data

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: 480-3935-2 MSD

Matrix: Solid

Analysis Batch: 14581

Client Sample ID: Slag Comp-2

Prep Type: SPLP East

Prep Batch: 14413

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Aluminum	0.53		10.0	10.09		mg/L		96	75 - 125	0	20
Antimony	ND		0.200	0.196		mg/L		98	75 - 125	1	20
Arsenic	ND		0.200	0.205		mg/L		102	75 - 125	1	20
Barium	0.079	B	0.200	0.270		mg/L		95	75 - 125	1	20
Beryllium	ND		0.200	0.205		mg/L		102	75 - 125	0	20
Cadmium	ND		0.200	0.194		mg/L		97	75 - 125	0	20
Calcium	208		10.0	206.2	4	mg/L		-22	75 - 125	0	20
Chromium	0.043		0.200	0.233		mg/L		95	75 - 125	0	20
Cobalt	ND		0.200	0.193		mg/L		97	75 - 125	0	20
Copper	ND		0.200	0.199		mg/L		98	75 - 125	1	20
Iron	0.34		10.0	9.74		mg/L		94	75 - 125	0	20
Lead	ND		0.200	0.193		mg/L		97	75 - 125	0	20
Magnesium	0.28		10.0	10.0		mg/L		97	75 - 125	1	20
Manganese	0.085		0.200	0.269		mg/L		92	75 - 125	0	20
Nickel	ND		0.200	0.189		mg/L		94	75 - 125	0	20
Potassium	ND		10.0	10.26		mg/L		103	75 - 125	0	20
Selenium	ND		0.200	0.204		mg/L		102	75 - 125	1	20
Silver	ND		0.0500	0.0520		mg/L		104	75 - 125	1	20
Sodium	3.8	* B	10.0	13.39		mg/L		96	75 - 125	0	20
Thallium	ND		0.200	0.193		mg/L		96	75 - 125	1	20
Vanadium	0.0091		0.200	0.196		mg/L		93	75 - 125	0	20
Zinc	ND		0.200	0.202		mg/L		97	75 - 125	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 480-14482/9-A

Matrix: Solid

Analysis Batch: 14535

Client Sample ID: MB 480-14482/9-A

Prep Type: Total/NA

Prep Batch: 14482

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		05/02/11 10:00	05/02/11 14:31	1

Lab Sample ID: LCS 480-14482/8-A

Matrix: Solid

Analysis Batch: 14535

Client Sample ID: LCS 480-14482/8-A

Prep Type: Total/NA

Prep Batch: 14482

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Mercury	0.00668	0.00648		mg/L		97	80 - 120

Lab Sample ID: LB 480-14349/1-C LB

Matrix: Solid

Analysis Batch: 14535

Client Sample ID: LB 480-14349/1-C

Prep Type: SPLP East

Prep Batch: 14482

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		05/02/11 10:00	05/02/11 14:28	1

TestAmerica Buffalo

Quality Control Data

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 480-3935-2 MS

Matrix: Solid

Analysis Batch: 14535

Client Sample ID: Slag Comp-2

Prep Type: SPLP East

Prep Batch: 14482

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
Mercury	ND		0.00668	0.00665		mg/L		100	75 - 125

Lab Sample ID: 480-3935-2 MSD

Matrix: Solid

Analysis Batch: 14535

Client Sample ID: Slag Comp-2

Prep Type: SPLP East

Prep Batch: 14482

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Mercury	ND		0.00668	0.00667		mg/L		100	75 - 125	0	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 480-12947/16-A

Matrix: Solid

Analysis Batch: 13129

Client Sample ID: MB 480-12947/16-A

Prep Type: Total/NA

Prep Batch: 12947

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	DII Fac
Mercury	ND		0.021		mg/Kg		04/20/11 15:00	04/20/11 17:54	1

Lab Sample ID: LCSSRM 480-12947/15-A

Matrix: Solid

Analysis Batch: 13129

Client Sample ID: LCSSRM 480-12947/15-A

Prep Type: Total/NA

Prep Batch: 12947

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	% Rec	% Rec. Limits
Mercury	2.90	2.94		mg/Kg		101	51 - 149

QC Association Summary

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Metals

Prep Batch: 12947

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-3935-1	Slag Comp-1	Total/NA	Solid	7471A	
480-3935-2	Slag Comp-2	Total/NA	Solid	7471A	
LCSSRM 480-12947/15-A	LCSSRM 480-12947/15-A	Total/NA	Solid	7471A	
MB 480-12947/16-A	MB 480-12947/16-A	Total/NA	Solid	7471A	

Prep Batch: 12970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 480-12970/1-A	MB 480-12970/1-A	Total/NA	Solid	3050B	
480-3935-1	Slag Comp-1	Total/NA	Solid	3050B	
480-3935-1	Slag Comp-1	Total/NA	Solid	3050B	
480-3935-1	Slag Comp-1	Total/NA	Solid	3050B	
480-3935-2	Slag Comp-2	Total/NA	Solid	3050B	
480-3935-2	Slag Comp-2	Total/NA	Solid	3050B	
480-3935-2	Slag Comp-2	Total/NA	Solid	3050B	
LCSSRM 480-12970/2-A	LCSSRM 480-12970/2-A	Total/NA	Solid	3050B	

Analysis Batch: 13129

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-3935-1	Slag Comp-1	Total/NA	Solid	7471A	12947
480-3935-2	Slag Comp-2	Total/NA	Solid	7471A	12947
LCSSRM 480-12947/15-A	LCSSRM 480-12947/15-A	Total/NA	Solid	7471A	12947
MB 480-12947/16-A	MB 480-12947/16-A	Total/NA	Solid	7471A	12947

Analysis Batch: 13217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 480-12970/1-A	MB 480-12970/1-A	Total/NA	Solid	6010B	12970
LCSSRM 480-12970/2-A	LCSSRM 480-12970/2-A	Total/NA	Solid	6010B	12970
480-3935-1	Slag Comp-1	Total/NA	Solid	6010B	12970
480-3935-2	Slag Comp-2	Total/NA	Solid	6010B	12970

Analysis Batch: 13296

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-3935-1	Slag Comp-1	Total/NA	Solid	6010B	12970
480-3935-2	Slag Comp-2	Total/NA	Solid	6010B	12970
480-3935-1	Slag Comp-1	Total/NA	Solid	6010B	12970
480-3935-2	Slag Comp-2	Total/NA	Solid	6010B	12970

Leach Batch: 14349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 480-14349/1-C LB	LB 480-14349/1-C	SPLP East	Solid	1312	
LB 480-14349/1-B LB	LB 480-14349/1-B	SPLP East	Solid	1312	

Prep Batch: 14413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 480-14349/1-B LB	LB 480-14349/1-B	SPLP East	Solid	3010A	14349
MB 480-14413/2-A	MB 480-14413/2-A	Total/NA	Solid	3010A	
LCS 480-14413/3-A	LCS 480-14413/3-A	Total/NA	Solid	3010A	
480-3935-1	Slag Comp-1	SPLP East	Solid	3010A	14517
480-3935-2	Slag Comp-2	SPLP East	Solid	3010A	14517
480-3935-2 MS	Slag Comp-2	SPLP East	Solid	3010A	14517
480-3935-2 MSD	Slag Comp-2	SPLP East	Solid	3010A	14517

QC Association Summary

Client: Turnkey Environmental Restoration, LLC

TestAmerica Job ID: 480-3935-1

Project/Site: Tecumseh - Iron City site

Metals (Continued)

Prep Batch: 14482

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-3935-1	Slag Comp-1	SPLP East	Solid	7470A	14517
480-3935-2	Slag Comp-2	SPLP East	Solid	7470A	14517
480-3935-2 MS	Slag Comp-2	SPLP East	Solid	7470A	14517
480-3935-2 MSD	Slag Comp-2	SPLP East	Solid	7470A	14517
LB 480-14349/1-C LB	LB 480-14349/1-C	SPLP East	Solid	7470A	14349
LCS 480-14482/8-A	LCS 480-14482/8-A	Total/NA	Solid	7470A	
MB 480-14482/9-A	MB 480-14482/9-A	Total/NA	Solid	7470A	

Leach Batch: 14517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-3935-1	Slag Comp-1	SPLP East	Solid	1312	
480-3935-1	Slag Comp-1	SPLP East	Solid	1312	
480-3935-2	Slag Comp-2	SPLP East	Solid	1312	
480-3935-2 MS	Slag Comp-2	SPLP East	Solid	1312	
480-3935-2 MSD	Slag Comp-2	SPLP East	Solid	1312	
480-3935-2	Slag Comp-2	SPLP East	Solid	1312	
480-3935-2 MS	Slag Comp-2	SPLP East	Solid	1312	
480-3935-2 MSD	Slag Comp-2	SPLP East	Solid	1312	

Analysis Batch: 14535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-3935-2 MSD	Slag Comp-2	SPLP East	Solid	7470A	14482
LB 480-14349/1-C LB	LB 480-14349/1-C	SPLP East	Solid	7470A	14482
LCS 480-14482/8-A	LCS 480-14482/8-A	Total/NA	Solid	7470A	14482
MB 480-14482/9-A	MB 480-14482/9-A	Total/NA	Solid	7470A	14482
480-3935-1	Slag Comp-1	SPLP East	Solid	7470A	14482
480-3935-2	Slag Comp-2	SPLP East	Solid	7470A	14482
480-3935-2 MS	Slag Comp-2	SPLP East	Solid	7470A	14482

Analysis Batch: 14581

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 480-14349/1-B LB	LB 480-14349/1-B	SPLP East	Solid	6010B	14413
MB 480-14413/2-A	MB 480-14413/2-A	Total/NA	Solid	6010B	14413
LCS 480-14413/3-A	LCS 480-14413/3-A	Total/NA	Solid	6010B	14413
480-3935-1	Slag Comp-1	SPLP East	Solid	6010B	14413
480-3935-2	Slag Comp-2	SPLP East	Solid	6010B	14413
480-3935-2 MS	Slag Comp-2	SPLP East	Solid	6010B	14413
480-3935-2 MSD	Slag Comp-2	SPLP East	Solid	6010B	14413

General Chemistry

Analysis Batch: 13623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-3935-1	Slag Comp-1	Total/NA	Solid	Moisture	
480-3935-2	Slag Comp-2	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Client Sample ID: Slag Comp-1

Lab Sample ID: 480-3935-1

Date Collected: 04/19/11 11:30

Matrix: Solid

Date Received: 04/19/11 13:20

Percent Solids: 90.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			12947	04/20/11 15:00	MM	TestAmerica Buffalo
Total/NA	Analysis	7471A		1	13129	04/20/11 17:46	MM	TestAmerica Buffalo
Total/NA	Prep	3050B			12970	04/20/11 17:25	MM	TestAmerica Buffalo
Total/NA	Analysis	6010B		1	13217	04/21/11 20:10	LH	TestAmerica Buffalo
Total/NA	Analysis	6010B		20	13296	04/22/11 10:25	AH	TestAmerica Buffalo
Total/NA	Analysis	6010B		50	13296	04/22/11 11:15	AH	TestAmerica Buffalo
SPLP East	Leach	1312			14517	04/29/11 18:30	LT	TestAmerica Buffalo
SPLP East	Prep	7470A			14482	05/02/11 10:00	MM	TestAmerica Buffalo
SPLP East	Analysis	7470A		1	14535	05/02/11 14:16	MM	TestAmerica Buffalo
SPLP East	Prep	3010A			14413	05/02/11 08:25	MM	TestAmerica Buffalo
SPLP East	Analysis	6010B		1	14581	05/02/11 17:33	AH	TestAmerica Buffalo
Total/NA	Analysis	Moisture		1	13623	04/25/11 20:57	AS	TestAmerica Buffalo

Client Sample ID: Slag Comp-2

Lab Sample ID: 480-3935-2

Date Collected: 04/19/11 11:45

Matrix: Solid

Date Received: 04/19/11 13:20

Percent Solids: 90.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			12947	04/20/11 15:00	MM	TestAmerica Buffalo
Total/NA	Analysis	7471A		1	13129	04/20/11 17:48	MM	TestAmerica Buffalo
Total/NA	Prep	3050B			12970	04/20/11 17:25	MM	TestAmerica Buffalo
Total/NA	Analysis	6010B		1	13217	04/21/11 20:13	LH	TestAmerica Buffalo
Total/NA	Analysis	6010B		20	13296	04/22/11 10:28	AH	TestAmerica Buffalo
Total/NA	Analysis	6010B		50	13296	04/22/11 11:17	AH	TestAmerica Buffalo
SPLP East	Leach	1312			14517	04/29/11 18:30	LT	TestAmerica Buffalo
SPLP East	Prep	7470A			14482	05/02/11 10:00	MM	TestAmerica Buffalo
SPLP East	Analysis	7470A		1	14535	05/02/11 14:18	MM	TestAmerica Buffalo
SPLP East	Prep	3010A			14413	05/02/11 08:25	MM	TestAmerica Buffalo
SPLP East	Analysis	6010B		1	14581	05/02/11 17:35	AH	TestAmerica Buffalo
Total/NA	Analysis	Moisture		1	13623	04/25/11 20:57	AS	TestAmerica Buffalo

Certification Summary

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Buffalo		USDA		P330-08-00242
TestAmerica Buffalo	Arkansas	State Program	6	88-0686
TestAmerica Buffalo	California	NELAC	9	1169CA
TestAmerica Buffalo	Connecticut	State Program	1	PH-0568
TestAmerica Buffalo	Florida	NELAC	4	E87672
TestAmerica Buffalo	Georgia	Georgia EPD	4	N/A
TestAmerica Buffalo	Georgia	State Program	4	956
TestAmerica Buffalo	Illinois	NELAC	5	100325 / 200003
TestAmerica Buffalo	Iowa	State Program	7	374
TestAmerica Buffalo	Kansas	NELAC	7	E-10187
TestAmerica Buffalo	Kentucky	Kentucky UST	4	30
TestAmerica Buffalo	Kentucky	State Program	4	90029
TestAmerica Buffalo	Louisiana	NELAC	6	02031
TestAmerica Buffalo	Maine	State Program	1	NY0044
TestAmerica Buffalo	Maryland	State Program	3	294
TestAmerica Buffalo	Massachusetts	State Program	1	M-NY044
TestAmerica Buffalo	Michigan	State Program	5	9937
TestAmerica Buffalo	Minnesota	NELAC	5	036-999-337
TestAmerica Buffalo	New Hampshire	NELAC	1	68-00281
TestAmerica Buffalo	New Hampshire	NELAC	1	2337
TestAmerica Buffalo	New Jersey	NELAC	2	NY455
TestAmerica Buffalo	New York	NELAC	2	10026
TestAmerica Buffalo	North Dakota	State Program	8	R-176
TestAmerica Buffalo	Oklahoma	State Program	6	9421
TestAmerica Buffalo	Oregon	NELAC	10	NY200003
TestAmerica Buffalo	Pennsylvania	NELAC	3	68-00281
TestAmerica Buffalo	Tennessee	State Program	4	TN02970
TestAmerica Buffalo	Texas	NELAC	6	T104704412-08-TX
TestAmerica Buffalo	Virginia	State Program	3	278
TestAmerica Buffalo	Washington	State Program	10	C1677
TestAmerica Buffalo	West Virginia	West Virginia DEP	3	252
TestAmerica Buffalo	Wisconsin	State Program	5	998310390

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method Summary

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL BUF
7470A	Mercury (CVAA)	SW846	TAL BUF
7471A	Mercury (CVAA)	SW846	TAL BUF
Moisture	Percent Moisture	EPA	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Turnkey Environmental Restoration, LLC
Project/Site: Tecumseh - Iron City site

TestAmerica Job ID: 480-3935-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-3935-1	Slag Comp-1	Solid	04/19/11 11:30	04/19/11 13:20
480-3935-2	Slag Comp-2	Solid	04/19/11 11:45	04/19/11 13:20

TAL-4124 (1007)

Drinking Water? Yes ☐ No ☐

THE LEADER IN ENVIRONMENTAL TESTING

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Alt	Agmt	Spec	Sur	Ugwt	1/250M	1/100M	1/50M	1/25M	1/10M	1/5M	1/1M	1/500K	1/250K	1/100K	1/50K	1/25K	1/10K	1/5K	1/1K	1/500	1/250	1/100	1/50	1/25	1/10	1/5	1/1
Slag Comp - 1	4-19-11	1150				X	Z													X	X									
Slag Comp - 2	4-19-11	1145				X	Z													X	X									

Comments

DISTRIBUTION: WHITE - Returned to Client with Report, CANARY - Stays with the Sample, PINK - Field Copy

Login Sample Receipt Checklist

Client: Turnkey Environmental Restoration, LLC

Job Number: 480-3935-1

Login Number: 3935

List Source: TestAmerica Buffalo

List Number: 1

Creator: Wienke, Robert

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	Benchmark/Turnkey
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

APPENDIX D

FIELD OPERATING PROCEDURES



FIELD OPERATING PROCEDURES

Stockpile & Borrow Source Sampling Procedures for Physical Analysis

**STOCKPILE & BORROW SOURCE SAMPLING PROCEDURES
FOR PHYSICAL ANALYSIS**

PURPOSE

This guideline presents a method for collecting representative soil samples from stockpiled borrow source material for physical analysis.

GENERAL

Generally, one of two methods will be utilized to collect soil samples for analysis. One method is to collect the samples by digging a series of representative test pits at the borrow source area and obtaining samples from those test pits. The other method involves collecting samples from representative stockpiles (normally after the material has been mechanically screened). Both procedures are discussed within this method.

Sample collection equipment will include stainless steel mixing bowls, stainless steel mixing spoons, and a stainless steel hand auger with extension rods or a stainless steel spade or equivalent. It may be necessary to use a backhoe or drilling rig to facilitate sample collection.

STOCKPILED SOIL SAMPLING METHOD

As shown in the attached Figure 1, twelve (12) samples of approximate equal volume should be collected from the top, middle and bottom of each 1000 CY stockpile by CQA personnel and composited in the field to give one representative aliquot per 1000 CY.

Stockpile Sampling Procedure

1. Using a shovel or backhoe, penetrate the pile to a depth of about two to three feet.
2. Collect a sample using the shovel.

**STOCKPILE & BORROW SOURCE SAMPLING PROCEDURES
FOR PHYSICAL ANALYSIS**

3. Transfer the sample to a specially prepared mixing area.
4. Repeat Steps 1 through 3 at each 1,000 CY stockpile.
5. Mix subsamples using shovel into one homogenous mass and place in a properly labeled 5-gallon bucket. Fill each bucket completely and cover.
6. Attach a label to each container and record location referencing the stockpile identification number. The label may be made with permanent marker on the side (not top) of the container or using adhesive-back paper labels affixed to the side of the container. At a minimum, the labels should be identified with the following information:
 - Project Name
 - Sample number.
 - Initials of CQA inspector or sample collection personnel.
 - Date of collection.
 - Location of collection (i.e. stockpile I.D.)
7. Return remaining contents of composite sample to stockpile.
8. Deliver the samples to the laboratory for analysis as soon as possible.
9. All information pertinent to each sampling event should be recorded by sampling personnel in the field at the time of sample collection. Each report should correspond to each stockpile and will contain the following information:
 - Project Name
 - Sample number or numbers collected
 - Field observations.
 - Climatologic conditions.
 - Date and time of collection.
 - Approximate location of test pit.
 - Name of person who collected sample.

BORROW AREA TEST PIT SAMPLING METHOD

Prior to obtaining representative soil samples, test holes should be excavated at the borrow area to determine the actual depth and lateral extent of the borrow source soil material. A base line should then be established and a grid system staked in the field. Five samples

**STOCKPILE & BORROW SOURCE SAMPLING PROCEDURES
FOR PHYSICAL ANALYSIS**

should be collected at equidistant locations for each 5000 cubic yards (CY) of soil designated for use in the borrow areas (at approximately mid-depth).

Borrow Area Sampling Procedure

1. Using a shovel, collect a representative sample at approximately mid-depth at each of the sampling locations representing 1000 CY of the proposed excavation area.
2. Transfer each sample into a labeled separate 5-gallon bucket. Fill each bucket completely and cover.
3. Attach a label to each container and record location referencing the established grid system in the borrow area. The label may be made with permanent marker on the side (not top) of the container or using adhesive-back paper labels affixed to the side of the container. At a minimum, the labels should be identified with the following information:
 - Project Name
 - Sample number.
 - Initials of CQA inspector or sample collection personnel.
 - Date of collection.
 - Location of collection (i.e. location of borrow area grid system location)
4. Deliver the samples to the laboratory for analysis as soon as possible.
5. All information pertinent to each sampling event should be recorded by sampling personnel in the field at the time of sample collection. Each report should correspond to each test pit and will contain the following information:
 - Project Name
 - Sample number or numbers collected
 - Field observations.
 - Climatologic conditions.
 - Date and time of collection.
 - Approximate location of test pit.
 - Name of person who collected sample.

ATTACHMENTS

Figure 1; Stockpile Sampling Methodology



FOP 080.0

**STOCKPILE & BORROW SOURCE SAMPLING PROCEDURES
FOR PHYSICAL ANALYSIS**

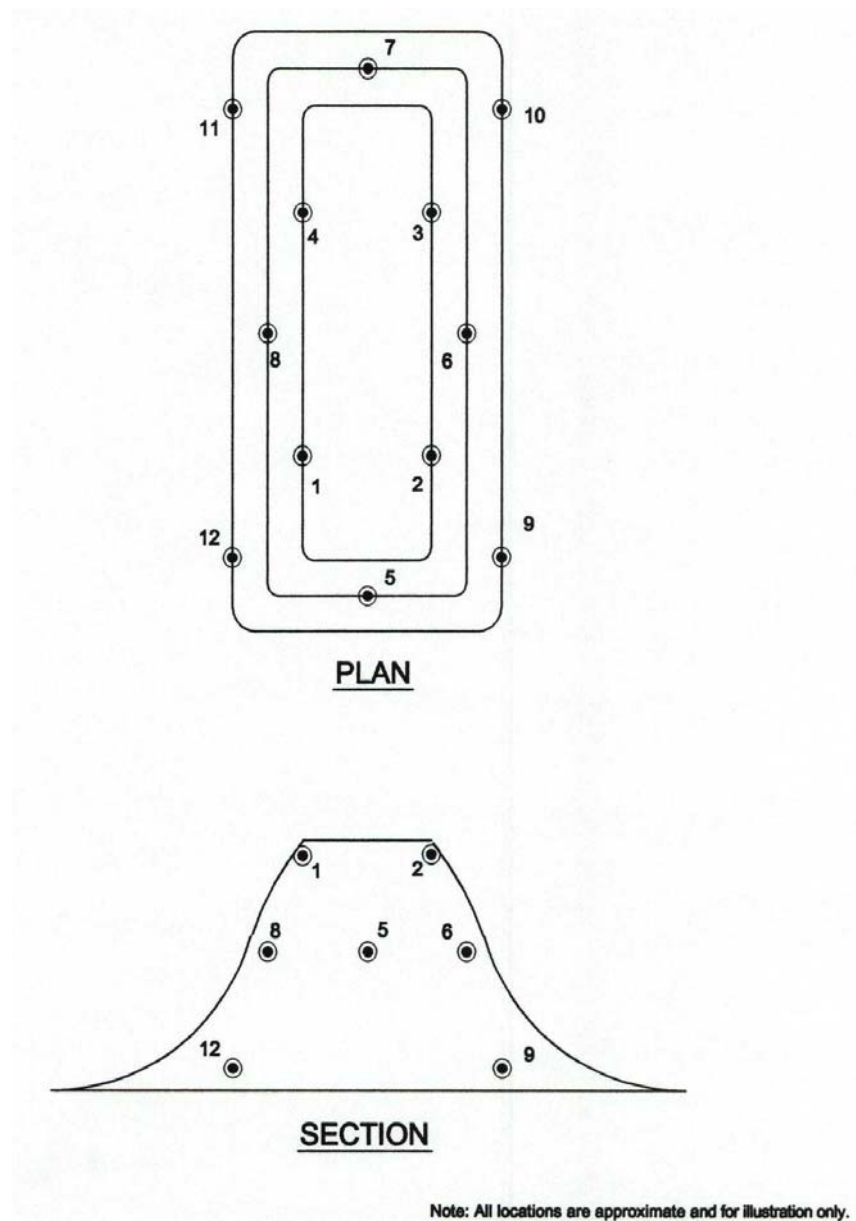
REFERENCES

None



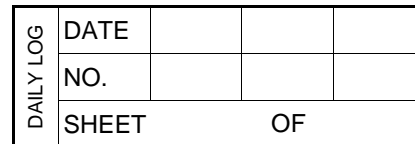
**STOCKPILE & BORROW SOURCE SAMPLING PROCEDURES
FOR PHYSICAL ANALYSIS**

**FIGURE 4
1,000 CY STOCKPILE SAMPLING METHODOLOGY**

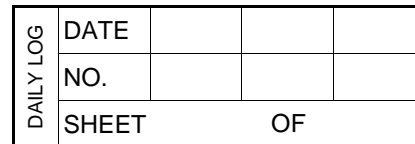


APPENDIX E

PROJECT DOCUMENTATION FORMS

[illegible]

Field Activity Daily Log (FADL).xls

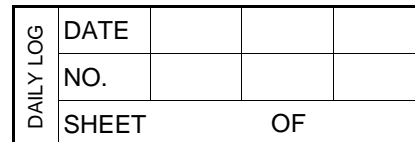


PROJECT NAME:	PROJECT NO.
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[illegible]

DATE:

PROJECT NAME:	PROJECT NO.
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DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

[illegible]

REFERENCED PROJECT FIELD FORMS:

<input type="checkbox"/> Aquifer Test Data Sheet	<input type="checkbox"/> Impacted Soil Excavation Log	<input type="checkbox"/> Soil Gas Survey Log
<input type="checkbox"/> Chain-of-Custody Form	<input type="checkbox"/> Impacted Soil Transportation Log	<input type="checkbox"/> Step-Drawdown Test Data Sheet
<input type="checkbox"/> Construction Sample Summary Log	<input type="checkbox"/> Monitoring Well Inspection Form	<input type="checkbox"/> Survey Elevation Log
<input type="checkbox"/> Corrective Measures Report	<input type="checkbox"/> Nuclear Densitometer Field Log	<input type="checkbox"/> Tailgate Safety Meeting Form
<input type="checkbox"/> Daily Drilling Report	<input type="checkbox"/> Photographic Log	<input type="checkbox"/> Test Pit Excavation Log
<input type="checkbox"/> Drilling Safety Checklist	<input type="checkbox"/> Pipe Leakage Testing Log	<input type="checkbox"/> Underground/Overhead Utility Checklist
<input type="checkbox"/> Equipment Calibration Log	<input type="checkbox"/> Post-Closure Field Inspection Report	<input type="checkbox"/> Variance Log
<input type="checkbox"/> Field Borehole Log	<input type="checkbox"/> Pressure Packer Testing Log	<input type="checkbox"/> Water Level Monitoring Record
<input type="checkbox"/> Field Borehole/Monitoring Well Installation Log	<input type="checkbox"/> Problem Identification Report	<input type="checkbox"/> Water Quality Field Collection Log
<input type="checkbox"/> Field Investigation Report	<input type="checkbox"/> Real-Time Air Monitoring Log	<input type="checkbox"/> Water Sample Collection Log
<input type="checkbox"/> Field Slug Test Log	<input type="checkbox"/> Record of Telecom Meeting	<input type="checkbox"/> Well Abandonment/Decomm. Log
<input type="checkbox"/> Groundwater Elevation Log	<input type="checkbox"/> Sample Summary Collection Log	<input type="checkbox"/> Well Completion Detail
<input type="checkbox"/> GW Well Development and Purge Log	<input type="checkbox"/> Sediment Sample Collection Log	<input type="checkbox"/>
<input type="checkbox"/> Hot Work Permit	<input type="checkbox"/> Seep Sample Collection Log	<input type="checkbox"/>
<input type="checkbox"/> IDW Container Log	<input type="checkbox"/> Seepage Meter Sample Collection Log	<input type="checkbox"/>

SIGNATURE	DATE:
-----------	-------



DAILY LOG	DATE				
	REPORT NO.				
	PAGE		OF		

Date: _____

PROBLEM IDENTIFICATION REPORT

Project: _____

Job No: _____

WEATHER CONDITIONS:

Location: _____

Ambient Air Temp. - A.M.: _____

CQA Monitor(s): _____

Ambient Air Temp. - P.M.: _____

Client: _____

Wind Direction: _____

Contractor: _____

Wind Speed: _____

Contractor's Supervisor: _____

Precipitation: _____

Problem Description:

Problem Location (reference test location, sketch on back of form as appropriate):

Problem Causes:

Suggested Corrective Measures or Variances:

Linked to Corrective Measures Report No. _____ or Variance Log No. _____

Approvals (initial):

CQA Engineer: _____

Project Manager: _____

Signed:

CQA Representative



DAILY LOG	DATE				
	REPORT NO.				
	PAGE	OF			

CORRECTIVE MEASURES REPORT

Date: _____

Project: _____

Job No: _____

Location: _____

CQA Monitor(s): _____

Client: _____

Contractor: _____

Contractor's Supervisor: _____

WEATHER CONDITIONS:

Ambient Air Temp. - A.M.: _____

Ambient Air Temp. - P.M.: _____

Wind Direction: _____

Wind Speed: _____

Precipitation: _____

Corrective Measures Undertaken (reference Problem Identification Report No.)

Retesting Location:

Suggested Method of Minimizing Re-Occurrence:

Approvals (initial):

CQA Engineer: _____

Project Manager: _____

Signed:

CQA Representative