MALCOLM PIRNIE | ARCADIS

The Water Division of ARCADIS

Malcolm Pirnie, Inc.
855 Route 146
Suite 210
Clifton Park
New York 12065
Tel 518 250 7300
Fax 518 250 7301
www.arcadis-us.com

WATER - ENVIRONMENT

Jason Pelton
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233-7017

Subject:
Contaminated Soil Removal and Disposal Work Plan
Abandoned Chemical Sales Facility
Rochester, New York
Site Number 828105

Date:
July 3, 2013

Contact:
David Hiss

Phone:
518.250.7309

Email:
david.hiss@
arcadis-us.com

Our ref:
00266397.0000

Dear Mr. Pelton:

Arcadis (Malcolm Pirnie) is pleased to present the Contaminated Soil Removal and Disposal Work Plan for the Abandoned Chemical Sales Facility in Rochester, New York. We have also included our Engineer's Estimate of Probable Construction Cost for the work. One hard copy and one electronic version of these documents are enclosed herein.

We appreciate this opportunity to assist the NYSDEC on this project. Please call me at 518.250.7309 if you have any questions.

Sincerely,

Malcolm Pirnie, Inc.

David R Hiss

David Hiss., P.E., BCEE
Senior Engineer

Enclosures

cc: Todd Minehardt, PE
Daniel Lang, PHG

df

Imagine the result

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF ENVIRONMENTAL REMEDIATION

CONTAMINATED SOIL REMOVAL AND DISPOSAL

ABANDONED CHEMICAL SALES FACILITY

1600 JAY STREET

NYSDEC SITE NUMBER 828105

ROCHESTER,

MONROE COUNTY,

NEW YORK

WORK PLAN

July 2013

ARCADIS MALCOLM PIRNIE

Infrastructure · Water · Environment · Buildings

855 Route 146, Suite 210

Clifton Park, NY 12065

Appendices

A	**6 NYCRR Part 375 PGW SCOs**
B	**Photo Log**
C	**PSA Soil Boring and Soil Sample Data**
D	**Passive Gas Survey Results**
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I	**Contractor's Cost Quotation Form**

1.0 INTRODUCTION

This remedial Work Plan (WP) presents the description of the work necessary to conduct the following at the Abandoned Chemical Sales Facility (Site):

- Excavation, transport and off-site disposal of soil contaminated with volatile organic compounds (VOCs) from four areas on the Site;
- Backfill of the areas of excavation with select materials;
- Installation of subsurface injection points in the backfill of each excavation area; and
- Restoration of the surface media disturbed during the excavation activities.

1.1 Objective

In March 2011, the New York State Department of Environmental Conservation (NYSDEC) selected the preferred remedial mechanism for contamination from the Abandoned Chemical Sales Facility (ACSF). This included remediation of soil containing VOCs at concentrations in excess of the protection of groundwater soil cleanup objectives. The Record of Decision (ROD) for the Site includes the following remedial elements to address four areas of contaminated soil, including one location inside and under the Site building:

> ROD Element 2: Contaminated soil from four areas of the Site will be excavated to fractured bedrock, which is estimated to occur at a depth of approximately eight feet beneath the ground surface. It is expected that the four excavations will remove contaminant source areas and will achieve the protection of groundwater soil cleanup objectives (PGW SCOs) to the extent practicable. The contaminated soil will be removed from the Site and transported to a permitted disposal facility. Verification samples will be collected from the four excavations to document the quality of soil left in-place following excavation.
>
> ROD Element 3: Following removal of the source areas, each of the excavations will be backfilled. Prior to backfilling the excavations, a demarcation material will be placed in the excavations to differentiate between material left in place and clean fill material used as backfill. Any fill material brought to the Site will meet the requirements for the identified Site use as set forth in 6 NYCRR Part 375-6.7(d).

The PGW SCOs are included in Appendix A.

To accomplish these remedial objectives, the following four contaminated locations will be excavated to remove the contaminated soil:

- Excavation Area (EA) 1 – Approximately 30 cubic yards to be removed from a lawn in the north-central portion of the property north of the Site building;

- EA 2 – Approximately 50 cubic yards to be removed from a gravel driveway located immediately north of the Site building;
- EA 3 – Approximately 130 cubic yards to be removed from near the sump under the center of the Site building; and
- EA-4 – approximately 30 cubic yards to be removed from a gravel area immediately to the west of the Site building.

Select photos documenting the excavation areas and their surroundings are included as Appendix B. This Work Plan (WP) has been prepared to provide information to be utilized by the NYSDEC's regional remedial callout contractor (contractor) to conduct the excavation and disposal of contaminated soil at the Abandoned Chemical Sales Facility Site.

1.2 Site Description and Background

The Abandoned Chemical Sales Facility (NYSDEC site number 828105) is located on a 2.29-acre parcel at 1600 Jay Street in the City of Rochester, Monroe County, New York. Figure 1 depicts the general location of the Site. The commercially-zoned Site is situated in a mixed residential, commercial and industrial area of the city. It is generally bordered by Dodge Street to the east, an industrial facility housing the Monroe Fire Extinguisher Company, Inc. to the north, the Rochester and Southern Railroad immediately to the west, Jay Street to the south, and three single- and multi-tenant residential buildings to the southeast. Further to the west, beyond the railroad tracks, lies the Valeo Property, the site of a former GM-Delco Facility, which is also on the NYSDEC's Registry of Inactive Hazardous Waste Disposal Sites (NYSDEC site number 828099).

Prior to being purchased by M.A. Ferrauilo in 1994, the property was owned by the Chemreal Corp and utilized by the Chemical Sales Corporation (a.k.a. Chemcore, Inc.) from November 1952 through September 1994 as a location for manufacturing and distributing chemicals. Chemical Sales Corporation constructed a building on the Site from which their operations were conducted. The existing structure on the Site has two primary tenants. The southern portion of the building is currently utilized by M.A. Farrauilo Plumbing, a plumbing, heating and ventilation contractor. A high performance motor shop is located in the northern portion of the structure.

The Site is generally flat, with a gradual slope from west to east. Surface elevations vary by less than five feet across the Site. The northern third of the Site is covered by a grassed lawn, with a few trees present. The middle portion of the Site contains the 11,000 square foot single-story concrete masonry unit (CMU or concrete block) commercial building and appurtenant supply storage trailers. The building is founded on a concrete slab. A fenced, asphalt-paved parking and storage area is located immediately east of the building, and gravel parking lots and driveways are present to the west, north and east of the building. The southern portion of the Site contains an asphalt-paved parking area and driveways. Vehicular access to the Site is provided from Jay

Street to the south and Dodge Street to the east. Overhead electric utilities serving the Site run from Jay Street to the southern portion of the Site structure. Figure 2 shows the known physical features at the Abandoned Chemical Sales Facility Site.

Three high-tension electrical transmission lines are present approximately 30 feet overhead along the western property line of 1600 Jay Street. A support tower for these power lines is located approximately six feet off of the midpoint of the western wall of the Site building. The tower is on property of the Rochester and Southern Railroad, which owns a north-south track along the west side of the Site. The tracks are reportedly used intermittently, mainly by slow-moving tankers. Approximately two to three times per week, off-track railroad vehicles drive along the gravel driveway on the west side of the Site building.

Overburden soil at the Site consists of one to two feet of fill overlying seven to eight feet of native soil. The fill consists of a dry medium to coarse-grained sand, with trace amounts of silt, some gravel and debris, including concrete, bricks and wood. The native soil is poorly-graded silty sand, with a mixture of gravelly sand. Below this, at a depth of approximately eight feet below the ground surface, dolomite bedrock with minor amounts of limestone and shale is present. The upper two to three feet of the bedrock is weathered and highly fractured. Groundwater is generally not present in the Site overburden.

1.3 Investigatory History

In 1994, at the time of the transfer of the Site from the Chemical Sales Corporation to M.A. Farrauilo, D.J. Parrone and Associates conducted a Phase 1 Environmental Site Assessment (ESA), investigating methanol and ethylene glycol spills in and around former chemical storage tanks at the Site. These tanks were reportedly formerly located to the south and west of the Site building. Although one soil sample indicated elevated concentrations of methanol, it was concluded that it “posed no additional concern.”

In 2001, the NYSDEC, in response to releases identified at another Chemical Sales Corporation Site, retained Ecology and Environment Engineers, P.C. (E & E) to conduct a Preliminary Site Assessment (PSA) at the Site. The PSA Report, issued in March 2002 identified the presence of tetrachloroethene (PCE) in two subsurface soil samples at levels above potential cleanup standards. This suggested that chlorinated solvents may have been spilled at the site in the past. Fifteen other VOCs were detected at levels below potential cleanup standards during the PSA. The highest concentration of total VOCs identified was 6,200 micrograms per kilogram (ug/kg) in a sample obtained in the west-central portion of the Site. Semi volatile organic compounds (SVOCs) were also detected at levels above potential cleanup standards in surface and subsurface soil samples collected during the PSA.

Surface soil samples were collected from locations across the Site as part of the PSA. VOCs above potential cleanup standards were not identified from the analyses of these samples. The

Sample Location Map (PSA Figure 2-1) and Summary of Positive Analytical Results for Surface Soil Samples (PSA Table 3-1) are included in this Work Plan in Appendix C.

During the PSA direct push borings were advanced to obtain soil cores from surface to bedrock at locations throughout the Site. The lithology at each location was documented and an organic vapor analyzer (OVA) was used to screen the cores to select the intervals for which laboratory analyses would be conducted. The logs for the investigations in areas adjacent to the areas of excavation described in this Work Plan (Generally GP-1 through GP-8 and GP-13), the Geoprobe and Subsurface Soil Sample Summary Table (PSA Table 2-3) and the Summary Tables of Positive Analytical Results (PSA Tables 3-4A, 3-4B, and 3-4C) are also included in Appendix C.

Groundwater was not encountered in the overburden during the investigations associated with the PSA.

Based on the results of the PSA, the Site was listed by the NYSDEC as a Class 2 site on the Registry of Inactive Hazardous Waste Disposal Sites in April 2002.

A Remedial Investigation (RI) conducted by EA Engineering, P.C. for the NYSDEC in February 2011 identified the presence of contamination in soil at four locations on the Site, in groundwater beneath the Site, and in soil vapors under the building slab. Site contaminants identified were VOCs, including the chlorinated compounds PCE, TCE, cis-1, 2 DCE and vinyl chloride, and some petroleum-related contaminants.

A passive soil gas survey supplemented by the laboratory analysis of select samples was conducted at the Site during the RI. Three areas indicated the presence of elevated concentrations of Site contaminants:

- The grassy area north of the Site building;
- Adjacent to the northeast corner of the Site Building; and
- The east-central part of the Site Building near the loading dock.

A figure depicting the results of the soil gas survey is included as Appendix D.

During the RI, direct-push soil borings were advanced at locations in the overburden at the Site. Subsurface soil samples were collected from intervals with the highest VOC contamination potential, as determined form screening using a photoionization detector (PID). Fifty five soil borings were advanced outside the Site building and 51 samples were sent for laboratory analyses. A second direct-push sampling event conducted at 12 locations inside the Site building resulted in the analysis of 16 soil samples. Figure 2 presents the locations of the samples from this investigation which indicated contaminant concentrations in excess of the PGW SCOs, along with the contaminants which were identified as present and the concentrations at which they were found.

Seven test pits were also excavated north of the Site building during the RI. Soil excavated from the test pits was screened for the presence of VOCs using a PID. Five samples were collected from intervals indicating higher PID readings and sent for laboratory analyses. The locations of select test pits, the contaminants which were identified in excess of the PGW SCOs, and the concentrations of those contaminants are included on Figure 2.

Groundwater was not encountered in the overburden during the RI.

Appendix E contains a summary of data from the Remedial Investigation/Feasibility Study (RI/FS) Report, including:

- Groundwater Elevation Data From August 2010 (RI/FS Table 3-1);
- Subsurface Soil Boring Locations (RI/FS Figure 2-2);
- Sub-Slab Soil Sampling Results (RI/FS Figure 3-5);
- Detected VOCs in Soil Analytical Data From January 2007 (RI/FS Table 3-2);
- Detected VOCs in Subsurface Soil Analytical Data (RI/FS Table 3-3);
- Detected Compounds in Subsurface Soil at Test Pits Analytical Data (RI/FS Table 3-4); and
- Soil Boring Logs for Monitoring Wells installed near the excavation areas.

Malcolm Pirnie/Arcadis (engineer) was retained by the NYSDEC in 2012 to develop this Work Plan for the removal of contaminated soil from the Site. Data from the previous investigations, supplemented by Site-specific information compiled by the engineer, was utilized in the development of the Work Plan. It is the intent of the NYSDEC to issue a callout to the contractor to conduct the work identified herein. The engineer will observe the work on behalf of the NYSDEC, and will document the activities associated therewith.

2.0 REMEDIAL ACTIVITIES

The work described in this Work Plan is a component of the remedy for the Site as selected in the March 2011 Record of Decision as prepared by the NYSDEC.

2.1 Scope

To complete the work of this project, the contractor shall conduct, at a minimum, the following:

- Obtain permits and permission to access the premises for all work activities;
- Mobilize to the Site;
- Establish Site controls;
- Implement the contractor's Health and Safety Plan (HASP), including a Community Air Monitoring Plan (CAMP);
- Provide temporary services and utilities;
- Relocate and protect existing equipment, materials, structures, utilities, landscaping and vegetation;
- Obtain all baseline measurements and data, and document the pre-excavation Site conditions;
- Conduct the initial contaminated soil excavations, while establishing and maintaining stable excavation conditions;
- Appropriately stockpile and characterize all excavated soil;
- Collect and analyze samples from the sidewalls of the resulting excavations;
- Using an iterative approach, conduct any supplemental soil excavation that is necessary;
- Collect and analyze documentation samples from the excavations;
- Obtain post-excavation survey data;
- Load, transport and dispose of soil and demolition debris at an off-site facility or facilities;
- Install subsurface injection points in the backfill of each excavation area;
- Backfill the areas of excavation with specified select materials;
- Restore the surface media disturbed during the excavation activities;
- Demobilize from the Site; and
- Submit required documentation of the project activities.

The work shall be conducted in accordance with the Figures and the technical specifications included in this Work Plan as Appendix F.

2.2 Site Controls

The contractor shall prepare and submit a project Operations Plan which provides a detailed description of the planned means and methods to be implemented to control the Site during the work. Following approval of the Operations Plan, the contractor shall mobilize to the Site and

establish all Site controls required. These include providing for security for the personnel, completed work, equipment and materials of the project. Also, access controls, storm water controls, on-site and community health and safety elements and any engineering controls necessary shall be implemented. Actions which are intrusive into the ground shall not be initiated until these elements are in place.

2.3 Access Controls

The contractor shall confine the work to within the Limits of Work as shown on the Figures. The Site is currently active and contractor is required to coordinate with the owner and Site building tenants during the work. Some equipment and materials will be required to be moved by the owner prior to the work. Other equipment and materials owned by the owner or Site tenants shall be temporarily relocated by the contractor to locations acceptable to the owner or tenants during the project. These items shall be re-placed by the contractor prior to the end of the project.

Access to the Site shall be from the western-most driveway off Jay Street or the eastern entrance off Dodge Street. Additionally, work at the locations to the west and the north of the Site building may require that the contractor coordinate with the adjacent property owner and the Rochester and Southern Railroad and its tenants, to preserve their operational functionality during the work. Access to other off-site properties shall not be permitted during the work without prior approval of the property owner, the NYSDEC and the engineer.

2.4 Storm Water Controls

The contractor shall utilize storm water controls to prevent the release of materials, including contaminated soil and water, to local storm water during the work. At a minimum, the contractor shall install sediment fencing as shown on the Figures at the perimeter of each area of excavation and around all stockpile and laydown areas. Controls to prevent the discharge of storm water, snow, or melted snow collected during the work in lined storage areas, excavations and decontamination facilities shall be implemented by the contractor. All such controlled and collected materials shall be contained, characterized and disposed of in accordance with all governing laws and regulations. Collected waters may be disposed either:

- To the municipal storm sewer system, after attaining the pretreatment requirements included in Appendix G and obtaining permission from the utility; or
- At an off-site treatment or disposal facility after meeting the requirements of the receiving facility.

In no case shall collected waters be discharged to the ground surface at the Site.

2.5 Air Monitoring

The soil contaminants at the Site include VOCs. Data obtained during the PSA and the RI are presented in Appendices C and E, respectively. Appendix D contains a figure summarizing the results of a passive soil gas survey conducted at the Site. It indicates that elevated concentrations of VOCs may be expected to be present in the soil gases during excavation activities. During the remedial work, the contractor shall monitor air quality as part of a Community Air Monitoring Program to ensure the safety of personnel and the public. Air monitoring shall be conducted in accordance with the requirements of:

- Specification Section 00003 Minimum Requirements for Health and Safety;
- The NYSDOH gCAMP SR Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures; and
- The NYSDOH gCAMP SR Special Requirements for Indoor Work With Co-Located Residences of Facilities.

Each of these is included in Appendix F.

2.6 Health and Safety

2.6.1 Site Worker HASP

Prior to mobilization to the site, the standby callout contractor shall prepare a Site-specific Health and Safety Plan for use during the work. This HASP shall supplement the existing Health and Safety Plan prepared for the callout contractor's standby construction contract, and shall address any subcontractors, suppliers and vendors contemplated for work associated with the project. The HASP shall address provisions for protecting the health and safety of contractor's personnel and the public, including on-site personnel not associated with the work, from harm related to the work.

The standby callout contractor shall be required to implement the elements contained in the sections of the NYSDOH gCAMP SR identified in Section 2.5 of this Work Plan while conducting work at the excavation areas in, and immediately to the west of the Site building (EA3 and EA4). This includes disconnecting ventilation systems serving the indoor area of excavation during work in that area and any ventilation system intakes adjacent to any of the excavation areas.

The HASP shall be prepared in accordance with the requirements in the documents listed in Section 2.5 of this Work Plan, which are included in Appendix F. The plan shall be submitted to the NYSDEC prior to the start of work, and fully implemented during the work.

2.6.2 Community Air Monitoring Plan

In conjunction with the HASP, the standby callout contractor shall also prepare a Community Air Monitoring Program for use during the remedial work. The CAMP shall provide provisions to protect the public in the area of the work from exposure to particulates, dust and contaminants that could be released during demolition. The CAMP shall be prepared in accordance with NYSDEC's DER 10 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/der10.pdf), the Technical and Administrative Guidance Memorandum (TAGM) 4031 included in Appendix H and the documents listed in Section 2.5 of this Work Plan. It shall be submitted to the NYSDEC prior to the start of work, and fully implemented during the work.

Due to the potential presence of confounding sources associated with the routine operations of the businesses at the site, pre-construction background monitoring of the indoor air for the presence of the VOC contaminants of concern shall be conducted by the standby callout contractor in the room immediately to the south of the indoor excavation. This data will be used as a baseline to which construction-related air monitoring results may be compared. The provisions of the NYSDOH gCAMP SR guidance will be enforced and implemented if excursions from baseline occur at, or greater than the magnitude identified in the guidance.

2.7 Staging Areas

The contractor shall utilize the grassy lawn to the north of the Site building as a staging, storage, stockpiling and lay down area for equipment and materials. The contractor shall use only areas within the Limit of Work for these activities.

2.8 Utility Summary

The approximate locations of known underground, surface and overhead utilities have been shown on the Figures. Prior to any intrusive work, the contractor shall confirm these locations and shall utilize an underground utility search service to mark out all utilities within the Limit of Work. Any modified or newly-identified utilities shall be identified to the engineer and the NYSDEC prior to the initiation of intrusive activities. The contractor shall coordinate with the individual utility companies and the service users to temporarily relocate, interrupt service from, or modify the utilities on or near the Site in any way.

3.0 CONTAMINATED SOIL EXCAVATION AND DISPOSAL

Prior to the initial excavation in any excavation area, the contractor shall conduct a topographical survey of the surface of the area and shall submit the survey data to the engineer. During the initial excavation, the contractor shall excavate soil from the areas shown on the Figures and described in Table 3-1 below. The limits of the initial soil excavations have been determined based upon information provided through previous surface and subsurface investigations described in Section 1 of this Work Plan. Analytical data from a sample (EAs 1, 3 and 4) or multiple samples (EA 2) from previous investigatory processes has indicated the presence of at least one VOC above the PGW SCOs in these areas. The initial soil excavation limits were established based upon those data and the likely mechanism which resulted in the constituents to be present in the identified locations. Although consideration was given to segregating shallow soil from the excavation and analyzing it to determine its suitability for use as backfill, the likely mechanisms for contaminant dispersion into the soil in each area includes surface spills or near-surface discharges. Thus, all of the soil contained within the horizontal and vertical limits identified on Figure 3, and described in Table 3-1 shall be removed from the excavation by the contractor and ultimately disposed at an approved off-site facility licensed to accept soils of this type.

In addition, to facilitate the removal of soil to the initial excavation limits, the utilization of layback slopes or benching, or sheeting the excavation, shall be necessary. For the initial excavation, it is assumed that left-in-place sheeting shall be installed to protect the eastern face of EA 3 along the western wall of the Site building. Other sheeting shall be used as necessary by the contractor in accordance with the requirements of the technical specifications in Appendix F. Table 3-1 indicates the calculated quantity of soil to be removed from the excavation areas including any supplemental material to be removed to facilitate excavation stability. This volume is the quantity assumed for payment under the initial excavation item on the Contractor's Cost Quotation Form included in Appendix I. The determination of the necessary sidewall configuration for each excavation, including layback slopes, benching and sheeting shall be conducted as indicated in the technical specifications in Appendix F.

It is noted that the excavation and restoration activities associated with EA 3 shall occur inside and under the Site building. Access to this area is limited, and the building roof, walls, floor, utilities and other appurtenances will restrict maneuverability of equipment. This will require special consideration by the contractor to complete the work. The contractor shall also be responsible for protecting these features and coordinating with the building owner and tenants to minimize disruption to non-project operations at the Site.

Table 3-1 – Areas Designated for Excavation

Area	Location Description	Initial Excavation Dimension (feet)	Sheeting	Initial Volume of Contaminated Soil To Be Excavated (Cubic Yards)	Initial Volume of Soil To Be Excavated Including Layback Material (Cubic Yards)
EA 1	Grassed area in the north-central portion of the property	North and South Walls - 10 East and West Walls - 10 Depth – 8	No No NA	30	97
EA 2	Gravel area immediately north of the Site building	North and South Walls - 20 East and West Walls - 8 Depth – 8	No No NA	50	134
EA 3	Adjacent to the sump under the center of the Site building	North and South Walls - 22 East and West Walls - 19 Depth – 8	No No NA	130	241
EA 4	Gravel area immediately to the west of the Site building	North and South Walls - 10 East and West Walls - 10 Depth - 8	No East-Yes NA	30	75
		Total		**240**	**547**

3.1 Sampling and Characterization

Representative samples of excavated soil shall be collected and analyzed by the contractor to characterize the material for disposal acceptance in accordance with Specification Section 02 51 41, Off-Site Transportation and Disposal and the requirements of the off-site disposal facility or facilities receiving the contaminated soil.

Following soil removal to the identified initial excavation limits, including removal of all soil necessary to construct layback slopes and benches, the excavation sidewalls shall be sampled and characterized by the contractor to determine whether supplemental excavation will be necessary. The contractor shall obtain a minimum of one soil sample from each excavation sidewall for each 160 square feet of sidewall at locations selected by the engineer. A minimum of one soil sample shall be obtained from each sidewall, including at least one sample to be collected through any sheeting that is installed during the work. Where sheeting is scheduled to be installed, sidewall samples shall be collected either from behind the sheeting at the bottom or edges, through coupons removed from the sheeting, or by coring small diameter holes through the sheeting. A PID shall be used by the contractor to identify the area(s) of the sidewalls which are likely the most-contaminated. Visual examination of sidewall surface material shall also be used as a screening mechanism for sidewall sample collection. Depending upon the analytical results, the objectives of the sidewall sampling are to:

- Confirm that the PGW SCOs have been attained in the remaining soil adjacent to the initial excavations; or
- Define area(s) which require supplemental excavation in order to achieve the PGW SCOs in remaining soil adjacent to the excavations; or
- Document the concentrations of constituents present in the remaining soil adjacent to the excavation, in the event that further soil removal into the sidewall is determined to be not possible or practicable by the NYSDEC.

At a minimum, the contractor shall analyze all excavation samples, regardless of their purpose, for VOCs and SVOCs using methods SW-846 8260B and SW-846 8270C, respectively at a NYS-certified ELAP laboratory. Sample analysis turn-around times (TATs) shall be a maximum of 72 hours, but shall be established by the contractor in accordance with the proposed sequence and schedule of excavation activities. All analytical results shall be submitted to the NYSDEC's Project Manager and the engineer promptly upon receipt by the contractor.

The contractor shall be solely responsible for coordinating excavation activities with excavation area access, laboratory testing and supplemental soil excavation activities to minimize the period between excavating and backfilling/restoration.

3.2 Supplemental Excavation

In the event that the analytical results from a soil sample collected from an excavation sidewall indicate the presence of contamination in excess of the PGW SCOs, and following receipt of instruction from the NYSDEC or the engineer as to the geometry and magnitude of such removals, the contractor shall conduct supplemental contaminated soil excavation. The contractor shall, as necessary, also remove additional collateral soil from the sidewall to maintain the excavation in a stable condition in compliance with the requirements of the technical specifications in Appendix F. The newly-exposed sidewalls resulting from supplemental

excavation shall be sampled and characterized by the contractor in accordance with the procedure outlined in Paragraph 3.1. The contractor shall continue to remove supplemental soil from the excavation areas based upon the results of laboratory testing and as directed by the NYSDEC or the engineer, in an iterative process, until the analytical results of the sidewall samples indicate that no constituent is present in excess of the PGW SCOs, the physical constraints render further excavation impracticable, or the NYSDEC indicates that further excavation will not be conducted. Supplemental excavation shall not occur in areas "under any building or other foundation" or providing support to other structures, including the railroad tracks. "Under any building or other foundation" shall be defined as a trapezoidal volume extending downward and outward from the bottom of any footing at a slope of 2/3 (1 vertical on 1.5 horizontal).

At the conclusion of all soil removal activities in any excavation area, the contractor shall conduct a topographical survey of the area, including the excavation sidewalls and bottom, and shall submit the survey to the engineer and the NYSDEC. Payment for supplemental soil excavation shall be for the volume of soil removed after the initial excavation was complete. This volume is the sum total of each of the excavation quantities, as determined by comparing the pre- and post-excavation topography using a suitable electronic earthworks program, less the initial excavation quantity identified in Paragraph 3.1. This is the quantity to be paid for under the supplemental excavation item on the Contractor's Cost Quotation Form included in Appendix I.

3.3 Contaminated Soil Handling and Stockpiling

All soil removed from the excavation areas shall be assumed to be contaminated at the maximum concentration identified on Figure 2 and shall be handled and managed on-site in accordance with that assumption. At a minimum, the excavated soil shall be placed either in secure roll-off containers or on polyethylene sheeting in stockpiles to be located within the Limit of Work in areas that do not interfere with the operations of the Site tenants, adjacent property owners, or subsequent soil excavation processes at other excavation areas. Stockpiles shall be a maximum of 100 cubic yards each, and construction and demolition and any other debris shall be stockpiled separately. Polyethylene sheeting shall be used to cover on-site roll-offs or stockpiles at all times, and mechanisms to prevent storm water run-on to, or run-off from, the sheeted piles shall be installed by the contractor. The contractor shall install temporary fencing or other physical barriers to prevent unauthorized access to the roll-offs and stockpiles. Air and particulate dust discharges from the storage areas shall be managed by the contractor in accordance with the project HASP and CAMP.

3.4 Loading and Hauling

During all soil excavation activities, including demolition of the building slab in EA 3, debris shall be separated from contaminated soil by the contractor and stored in a segregated manner

based upon disposal requirements. All material shall be transported off-site in accordance with Specification Section 02 51 41, Off-Site Transportation and Disposal and all New York State Laws and Regulations. Hauling vehicles shall be appropriately licensed to carry the materials of the type and nature to be encountered, and also approved to transport and dispose of materials at the facility(ies) selected by the contractor to receive the wastes. All transport vehicles shall be decontaminated in accordance with the contractor's HASP prior to exiting the Site, and all loads shall be covered. Bills of lading or manifests for the materials to be transported shall be prepared by the contractor, and copies of these documents, along with weight receipts from the disposal facility(ies) shall be submitted to the NYSDEC's Project Manager and the engineer. Measurement for payment for all transport of disposed solid materials will be on a per-ton basis as a component of the per-ton disposal price included on the Contractor's Cost Quotation Form included in Appendix I.

3.5 Off-Site Disposal

The contractor shall remove from the Site all excavated soil and debris resulting from remedial operations. The location for disposal shall be based upon data received from sampling and characterization of the materials to be conducted by the contractor. All material shall be disposed of off-site by the contractor in accordance with Specification Section 02 51 41, Off-Site Transportation and Disposal, New York State Laws and Regulations and the specific disposal requirements of the receiving facility(ies). Payment for the disposal of excavated soil and other debris will be on a per ton basis for the material as measured by truck weight receipts for each load obtained from a certified truck scale at the disposal facility(ies). Measurement for payment for disposal of solid materials will be on a per-ton basis as a component of the per-ton disposal price included on the Contractor's Cost Quotation Form included in Appendix I.

4.0 RESTORATION

Upon completion of the excavation and removal of contaminated soil, disturbed areas of the Site shall be restored in accordance with the technical specifications in Appendix F and the Figures, with the general objective of returning the remediated Site to pre-excavation conditions.

4.1 Post-Excavation Backfill

Following confirmation that the removal of contaminated soil has been completed for a given excavation, the engineer will notify the contractor that the excavation is acceptable to be backfilled. A demarcation material shall be placed in the excavation to differentiate between material left in-place and clean fill material to be used as backfill.

All fill material brought to the Site shall meet the requirements for the identified Site use as set forth in 6 NYCRR Part 375-6.7(d). Specifically, the actual material to be brought to the Site shall be tested by a NYS-certified ELAP laboratory, and the contractor shall submit the analytical results on a frequency of 1 sample per 100 cubic yards of backfill material to be imported. The analyses shall consist of the testing required to determine whether the soil contains the constituents identified in the table in Appendix 5 of DER-10, The Technical Guidance for Site Investigation and Remediation. Only soil that does not contain any of the identified constituents at concentrations greater than the values indicated in the "Unrestricted Use" column shall be used as backfill.

Fill material that achieves all of the requirements included in the technical specifications attached to this Work Plan in Appendix F shall be placed in accordance with those specifications.

4.2 Compaction

Backfill which is imported to the Site shall be placed in lifts and compacted in accordance with the requirements included in the technical specifications attached in Appendix F. As necessary, backfill may be hand or manually-placed around the injection point components or other utilities which may be present in the excavation. The sump, sanitary sewer cleanout and drain pipe which enters the existing sump in EA 3 shall be protected from damage during backfill and compaction processes.

4.3 Installation of Injection Points

The contractor shall install injection point assemblies, as shown on the Figures, in each excavation during the backfill process. The discharge piping of the assemblies shall be leveled with stone fill during installation, and the risers shall be plumbed vertically. Prior to backfilling, the assemblies shall be tested by pouring up to twenty gallons of potable water into each assembly in the presence of the engineer. The assemblies shall be supported during backfill processes to prevent damage to their components. The geometry of the assemblies shall be

coordinated with any in-excavation utilities, such as the sump, sanitary sewer cleanout and drain pipe in EA 3, to prevent conflicts. The top of each injection point shall have a lockable plug-type monitoring well cap. Keyed-alike locks shall be provided for each injection point. Flush-mount curb boxes with bolting lids suitable for H-20 truck traffic shall be installed around each injection point riser. The curb boxes shall be installed in the restored concrete floor in EA 3, and shall be installed in a 24 inch by 24 inch by six inch thick concrete pad at each of the other excavations.

4.4 Surface Restoration

Three types of surfaces must be restored due to disturbance from the work of this project. These include a vegetated lawn area in EA 1, gravel driving surfaces in EA 2 and EA 4, and a concrete floor inside the Site building in EA 3. Details for the restoration of the areas of disturbance are included on Figure 4. The contractor shall restore all disturbed surfaces in accordance with the Figures and the technical specifications included in Appendix F of this Work Plan.

Restoration activities that cannot be completed due to weather or seasonal constraints shall be completed in a temporary manner approved by the engineer until the conditions are suitable to complete the specified restoration. All materials, equipment or facilities moved or altered to complete the work shall be restored to their previous location and at least, or better than, their condition at the beginning of the work, prior to the contractor's demobilization from the Site.

5.0 REPORTING

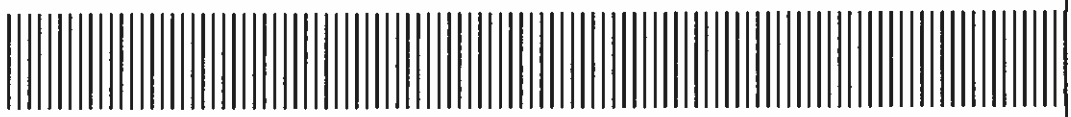
At the conclusion of the work, the contractor shall participate in a substantial completion inspection of the work with the engineer and project representatives of the NYSDEC. The engineer will prepare a punch list of items requiring completion based upon this inspection. The contractor shall subsequently complete the items on the punch list, as the weather and Site conditions allow. The contractor shall then notify the engineer that the work is complete and shall participate in a final inspection of the project. Residual work to be completed, if any, shall subsequently be finished by the contractor within one week of the final inspection.

Following the soil removal and disposal activities, and the backfill and restoration of the areas of disturbance, the engineer will prepare and submit to the NYSDEC a summary report documenting the remedial activities. Appended to the report will be actual field data, including information which shall be collected by the contractor and provided to the engineer. Prior to preparation of the report, the contractor shall submit to the engineer the following for use in preparation of the report:

- Daily reports for all work days indicating the work accomplished and the labor, equipment, materials and other resources utilized;
- Progress photos depicting the work on a daily basis;
- Records of contacts, decisions, conversations and discussions conducted with the Site owner, representatives of the firms occupying the Site, property owners and residents adjacent to the Site, utility representatives, regulatory staff and personnel from the municipal and special districts having jurisdiction at the Site;
- Laboratory analytical data, with category B deliverables, for all samples;
- Bills of lading, manifests and disposal documentation for all hazardous and non-hazardous materials;
- Weight slips from disposal of all materials;
- Survey data, indicating the horizontal and vertical location of all project features;
- Compiled survey data, including, but not limited to, surfaces defining the areas of excavation prior to excavation, following excavation and following backfill and restoration;
- All other survey data and field measurements obtained during the execution of the work;
- A final comprehensive Site survey map, prepared, signed and sealed by a licensed land surveyor from the state of New York, depicting the conditions at the conclusion of the work;
- Annotated Work Plan figures and specifications, with any necessary supplementary supporting sketches, details or descriptions, indicating changes or modifications made to the work during the project; and
- Documentation of any pre- and post-project measurements, photos and other information obtained by the contractor.

Abandoned Chemical Sales Facility
Rochester, New York

Work Plan
Figures



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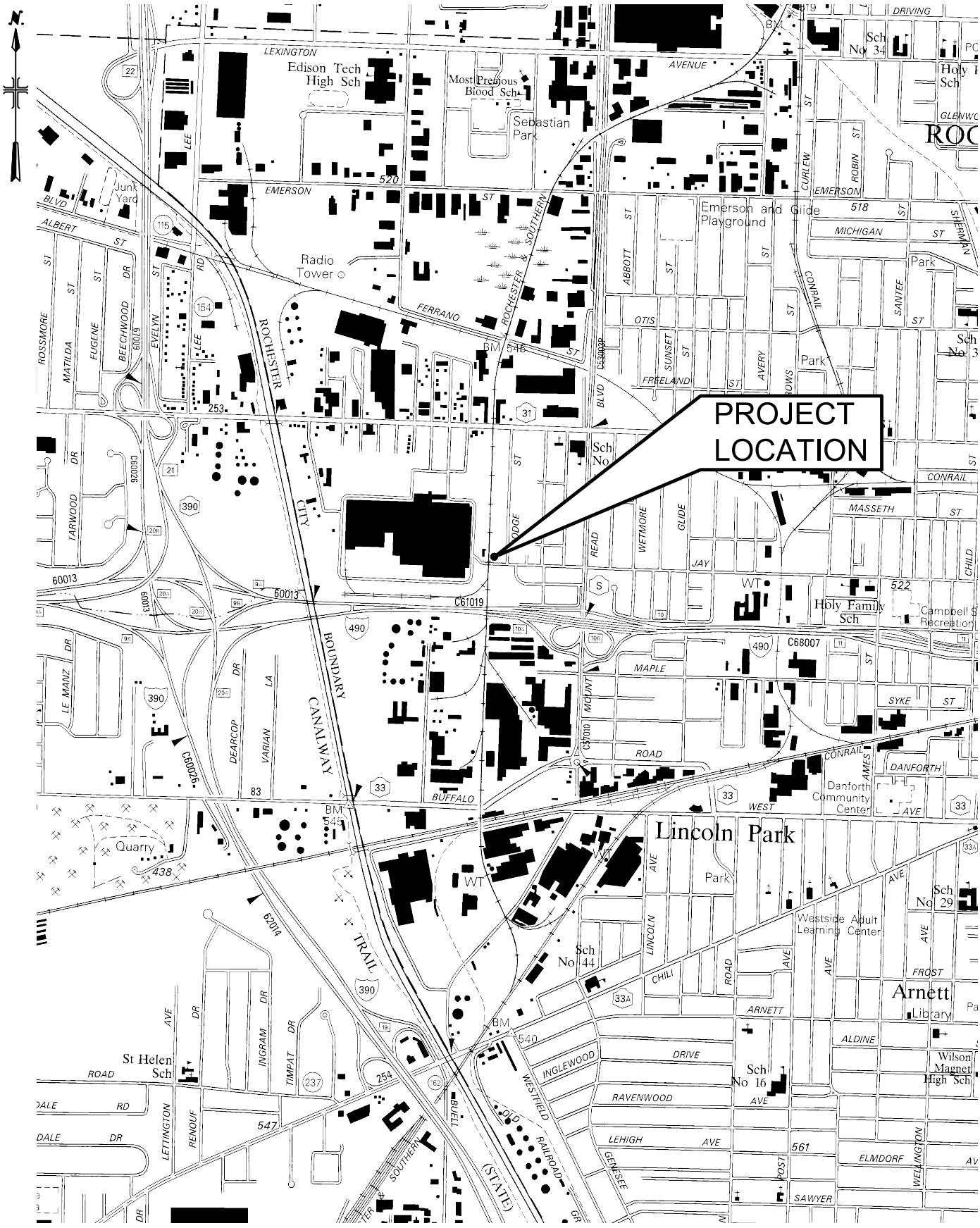

MALCOLM PIRNIE / ARCADIS The Water Division of ARCADIS	NYSDEC, DIVISION OF ENVIRONMENTAL REMEDIATION ABANDONED CHEMICAL SALES FACILTY REMEDIATION	SITE LOCATION MAP SCALE: AS SHOWN	DECEMBER 2012 FIGURE 1

XREFS: IMAGES: G:\ACAD\PROJ\00266397.0000\IMAGES\o17plan.tif
User: Hausmann Spec: PIRNIE STANDARD File: G:\ACAD\PROJ\00266397.0000\FIGURES\FIGURE 1.DWG Scale: 1:1 Date: 12/11/2012 Time: 13:09 Layout: Blank

TP1–S1 (1'–3')	CONCENTRATION (ppm)
Ethylbenzene	5.5
o–xylene	4.4
Toluene	0.76
Xylene (total)	28

SB–16 (7')	
VOCs	mg/kg
1,2,4–Trimethylbenzene	57J
1,3,5–Trimethylbenzene	16J
Xylenes (Total)	3.5

SS–7	CONCENTRATION (ppm)
Total VOC	0.3276

SS–10	CONCENTRATION (ppm)
Total VOC	0.1183

SS–12	CONCENTRATION (ppm)
Total VOC	6.7059

SS–9	CONCENTRATION (ppm)
Total VOC	16.2471

SS–4	CONCENTRATION (ppm)
Total VOC	0.584

SS–3	CONCENTRATION (ppm)
Total VOC	0.352

SS–6 (6'–8')	CONCENTRATION (ppm)
Total VOC	370.400

SS–2	CONCENTRATION (ppm)
Total VOC	0.271

SS–5	CONCENTRATION (ppm)
Total VOC	0.987

SB–36 (6')	
VOCs	mg/kg
cis–1,2,–Dichloroethene	0.85

SS–1	CONCENTRATION (ppm)
Total VOC	0.196

SB–31 (3')	
VOCs	mg/kg
Tetrachloroethene	5E

TP2–S1 (1'–5')	CONCENTRATION (ppm)
1,2,4–Trimethylbenzene	31

SB–55 (6.5')	
VOCs	mg/kg
1,2,4–Trimethylbenzene	54
1,3,5–Trimethylbenzene	13
Xylenes (Total)	0.34

SS–8	CONCENTRATION (ppm)
Total VOC	N/A

SS–11	CONCENTRATION (ppm)
Total VOC	0.1355

SB–22 (5.5')	
VOCs	mg/kg
Acetone	0.05J

SB–47 (3.5')	
VOCs	mg/kg
Acetone	0.054

SB–48 (3.5')	
VOCs	mg/kg
Acetone	0.068

LEGEND

- TP1–S1 — TEST PIT
- SB–55 — SOIL BORING
- SS–8 — SUB–SLAB SOIL SAMPLE
- BENCHMARK
- G.V. P–3 — GAS VALVE
- HYD 4 — FIRE HYDRANT
- WV — WATER VALVE
- IRON PIPE FOUND
- UTILITY POLE
- LIGHT POLE W/ LIGHT
- LIGHT POLE
- MONITORING WELL
- CATCH BASIN
- STORM MANHOLE
- SANITARY MANHOLE
- OH — OH — APPROXIMATE LOCATION OF BURIED ELECTRIC
- G — APPROXIMATE LOCATION OF BURIED GAS LINE
- WOODEN FENCE
- CHAINLINK FENCE
- RAILROAD TRACKS
- PROPERTY LINE
- 534 — TOPOGRAPHIC CONTOUR

NOTES:

1. BASEMAP PREPARED BY PRUDENT ENGINEERING LLP AUGUST 3, 2007, UPDATED BY ARCADIS OCTOBER 18, 2012.
2. CONTRACTOR SHALL LIMIT WORK TO THE AREA AS DESIGNATED ON THE DRAWINGS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS WHICH ARE REQUIRED PRIOR TO WORK.
4. LOCATIONS OF BURIED GAS WATER, SEWER AND ELECTRIC FACILITIES SHOWN ON THIS DRAWING ARE APPROXIMATE AND MUST BE VERIFIED IN THE FIELD BEFORE WORK COMMENCES.

40' 0 40' 80'

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REVISIONS			
NO.	BY	DATE	REMARKS

DES .
DWN SMH
CKD .

NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

ABANDONED CHEMICAL SALES FACILITY REMEDIATION

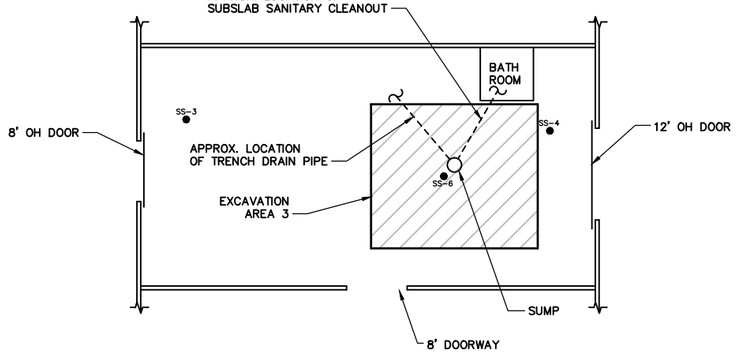
EXISTING SITE PLAN AND SUMMARY OF ANALYTICAL RESULTS

SCALE: AS SHOWN

DATE DECEMBER 2012

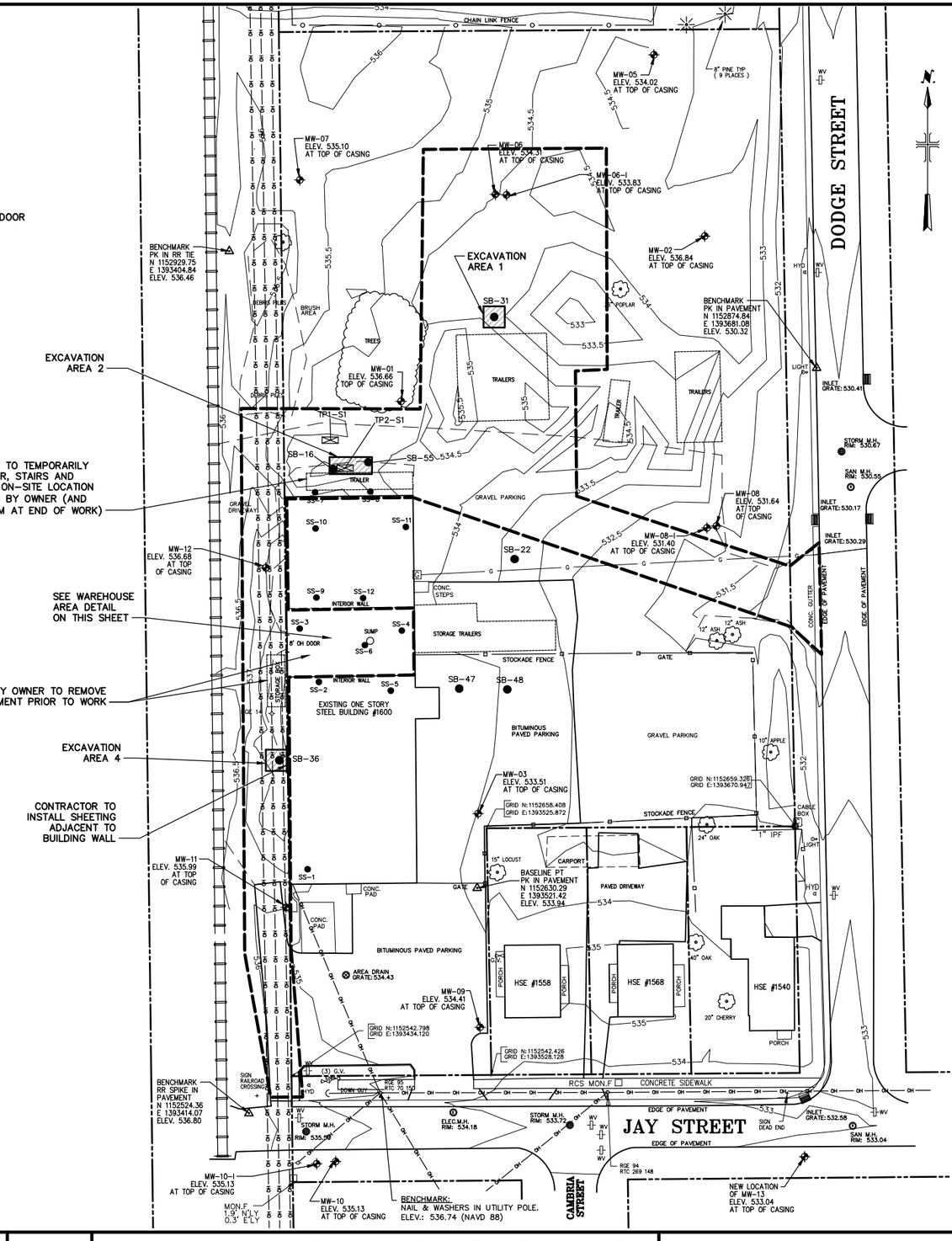
FIGURE 2

XREFS:G:\ACAD\PROJ\00266397.0000\XREFS\BASEMAP1.dwg G:\ACAD\PROJ\00266397.0000\XREFS\22x34-TB.dwg IMAGES:None
User:Hausmann Spec:PIRNIE STANDARD File:G:\ACAD\PROJ\00266397.0000\FIGURES\FIGURE 2.DWG Scale:1:1 Date:12/14/2012 Time:07:49 Layout:Blank



WAREHOUSE AREA DETAIL

10' 0 10' 20'



LEGEND

- TP1-S1 — TEST PIT
- SB-55 — SOIL BORING
- SS-8 — SUB-SLAB SOIL SAMPLE
- BENCHMARK
- G.V. — GAS VALVE
- HYD — FIRE HYDRANT
- WV — WATER VALVE
- IRON PIPE FOUND
- UTILITY POLE
- LIGHT POLE W/ LIGHT
- LIGHT POLE
- MONITORING WELL
- CATCH BASIN
- STORM MANHOLE
- SANITARY MANHOLE
- OH — OH — APPROXIMATE LOCATION OF BURIED ELECTRIC
- G — APPROXIMATE LOCATION OF BURIED GAS LINE
- WOODEN FENCE
- CHAINLINK FENCE
- RAILROAD TRACKS
- PROPERTY LINE
- 534 — TOPOGRAPHIC CONTOUR
- LIMIT OF WORK
- EXCAVATION AREA

NOTES:

1. BASEMAP PREPARED BY PRUDENT ENGINEERING LLP AUGUST 3, 2007, UPDATED BY ARCADIS OCTOBER 18, 2012.
2. CONTRACTOR SHALL LIMIT WORK TO THE AREA AS DESIGNATED ON THE DRAWINGS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS WHICH ARE REQUIRED PRIOR TO WORK.
4. LOCATIONS OF BURIED GAS WATER, SEWER AND ELECTRIC FACILITIES SHOWN ON THIS DRAWING ARE APPROXIMATE AND MUST BE VERIFIED IN THE FIELD BEFORE WORK COMMENCES.

30' 0 30' 60'

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REVISIONS			
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NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

ABANDONED CHEMICAL SALES FACILITY REMEDIATION

EXCAVATION PLAN

SCALE: AS SHOWN

DATE DECEMBER 2012

FIGURE 3

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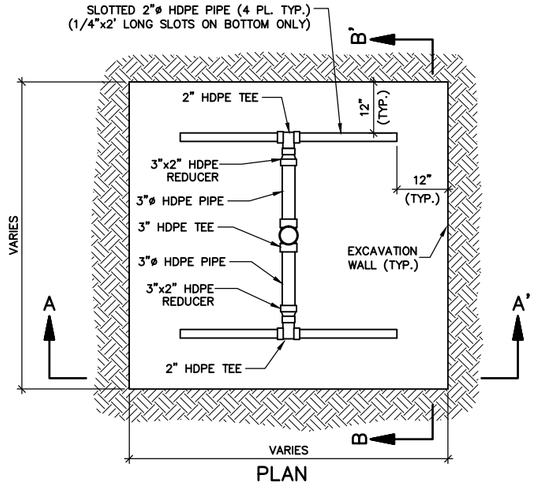
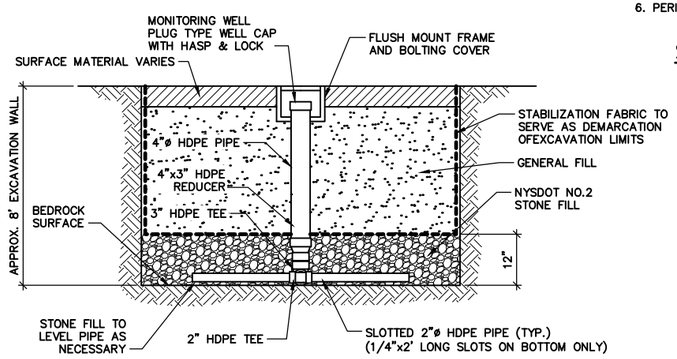
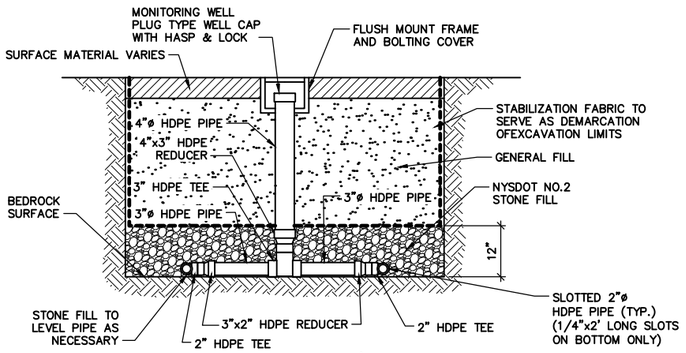
User: Hausmann Spec: PIRNIE STANDARD File: G:\ACAD\PROJ\00266397.0000\FIGURES\FIGURE 3.DWG Scale: 1:1 Date: 12/14/2012 Time: 08:29 Layout: Blank



PLAN



SECTION A–A'

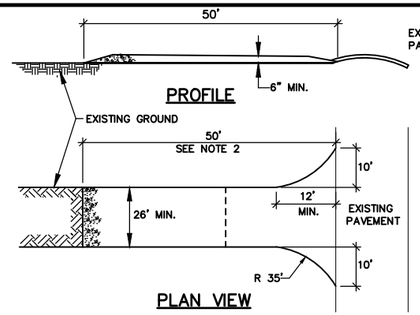


SECTION B–B'

NOTE:
LOCATE INJECTION POINT IN EXCAVATION AREA 3 TO AVOID CONFLICT WITH SANITARY CLEANOUT AND TRENCH DRAIN LINE.

INJECTION POINT DETAIL

NOT TO SCALE

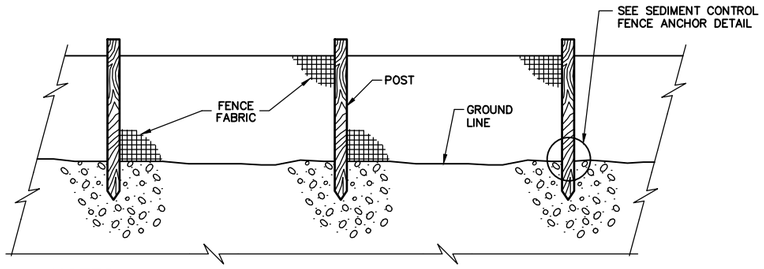


NOTES:

1. STONE SIZE–USE NYSDOT ITEM 304.03, CRUSHED STONE SUBBASE COURSE.
2. LENGTH–AS REQUIRED, BUT NOT LESS THAN 50'.
3. THICKNESS–NOT LESS THAN 6".
4. GEOTEXTILE FABRIC WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
5. MAINTENANCE–THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
6. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ENTRANCE DETAIL

NOT TO SCALE

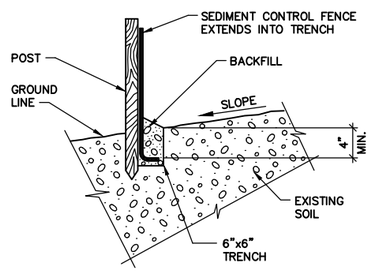


NOTES:

1. CONTRACTOR SHALL FURNISH AND INSTALL SEDIMENT CONTROL FENCE AT LOCATIONS SHOWN.
2. FENCE FABRIC SHALL BE FASTENED SECURELY TO FENCE POSTS WITH TIES OR STAPLES
3. WHEN TWO SECTIONS OF FENCE FABRIC ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE FENCE.

SEDIMENT CONTROL FENCING DETAIL

NOT TO SCALE

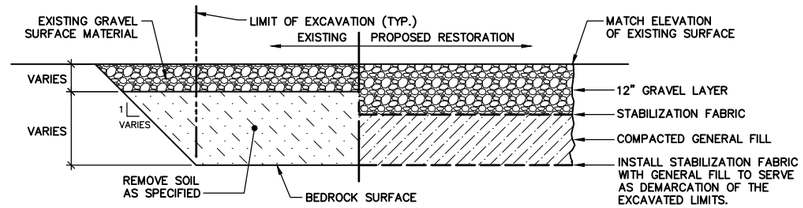


SEDIMENT CONTROL FENCE ANCHOR DETAIL

NOT TO SCALE

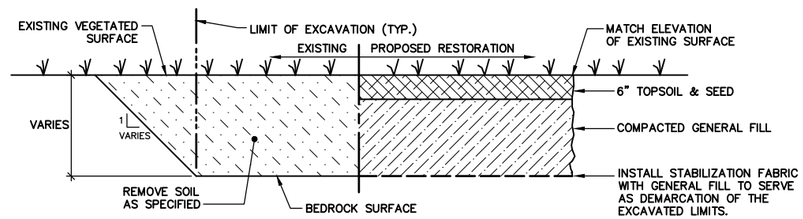
GENERAL EROSION AND SEDIMENT CONTROL NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE NEW YORK GUIDELINES FOR URBAN EROSION AND SEDIMENT CONTROL, CURRENT EDITION. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE STORMWATER PERMITS, INCLUDING THE NYSDEC SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES, AND WITH THE REQUIREMENTS OF THE APPROVED STORMWATER POLLUTION PREVENTION PLAN.
2. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED. CONTRACTOR SHALL INSPECT AND REPAIR SEDIMENT AND EROSION CONTROL MEASURES DAILY.
3. UPON COMPLETION OF FINAL GRADING, IF THE SEASON PREVENTS THE ESTABLISHMENT OF A PERMANENT COVER, THE DISTURBED AREA WILL BE TEMPORARILY SEEDED IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.
4. PERMANENT VEGETATION TO BE SEEDED ON ALL EXPOSED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADING. MULCH TO BE USED AS NECESSARY FOR PROTECTION UNTIL SEEDING IS ESTABLISHED.
5. AT THE TIME WHEN THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER SHALL BE REMOVED OR TREATED IN SUCH A WAY THAT WILL PERMANENTLY ADJUST THE SOIL CONDITIONS AND RENDER THEM SUITABLE FOR VEGETATIVE GROUND COVER. IF THE REMOVAL OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE CONDITIONS, NON–VEGETATIVE MEANS OF PERMANENT GROUND STABILIZATION SHALL BE EMPLOYED.
6. LIME, FERTILIZE AND SEED IN THE AREAS OF EROSION CONTROL FABRIC IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.



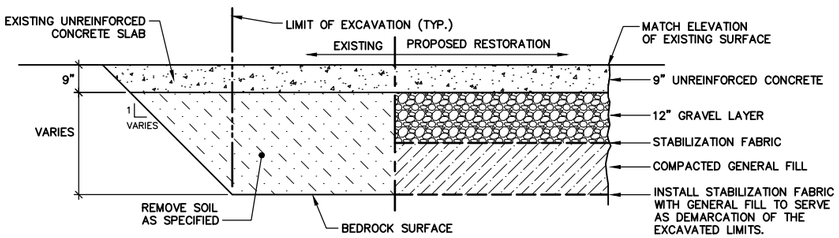
RESTORATION OF EXISTING GRAVEL SURFACES

NOT TO SCALE



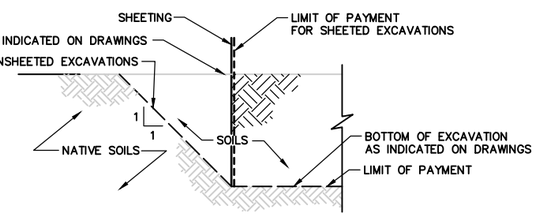
RESTORATION OF EXISTING VEGETATED SURFACES

NOT TO SCALE



RESTORATION OF EXISTING CONCRETE SURFACES

NOT TO SCALE



PAYMENT LIMIT – EXCAVATION AND BACKFILL OF SOILS

NOT TO SCALE

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User: Hausmann Spec: PIRNIE STANDARD File: G:\ACAD\PROJ\00266397.0000\FIGURES\FIGURE 4.DWG Scale: 1:1 Date: 12/14/2012 Time: 08:01 Layout: Blank

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REVISIONS			
NO.	BY	DATE	REMARKS

DES .
DWN SMH
CKD .

NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

ABANDONED CHEMICAL SALES FACILITY REMEDIATION

CONSTRUCTION DETAILS

SCALE: AS SHOWN

DATE DECEMBER 2012

FIGURE 4

Abandoned Chemical Sales Facility
Rochester, New York

Work Plan Appendices

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Abandoned Chemical Sales Facility
Rochester, New York

Work Plan
Appendix A

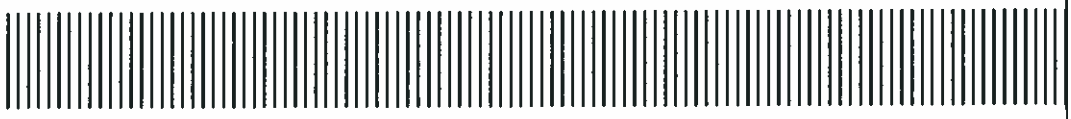

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Table 375-6.8(b): Restricted Use Soil Cleanup Objectives							
Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39-3	350[f]	400	400	10,000 [d]	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent[h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96-5	2,000[f]	2,000[f]	10,000 [d]	10,000 [d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02-0	140	310	310	10,000 [d]	30	130

Selenium	7782-49-2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109[f]	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'-DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102

Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07-8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2
Semivolatiles							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]

Dibenz(a,h)anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Volatiles							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33

1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[e]	0.12

Methyl tert-butyl ether	1634-04-4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5-Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm). NS=Not specified. See Technical Support Document (TSD). Footnotes

[a] The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

[b] The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

[c] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

[d] The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

[e] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

[f] For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

[g] This SCO is derived from data on mixed isomers of BHC.

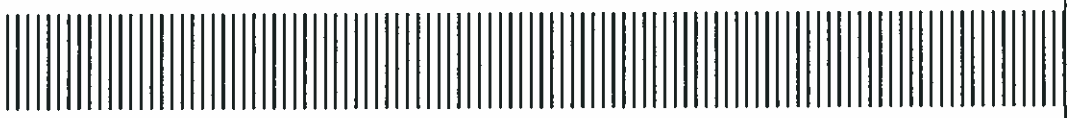
[h] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[i] This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.

[j] This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.

Abandoned Chemical Sales Facility
Rochester, New York

Work Plan
Appendix B



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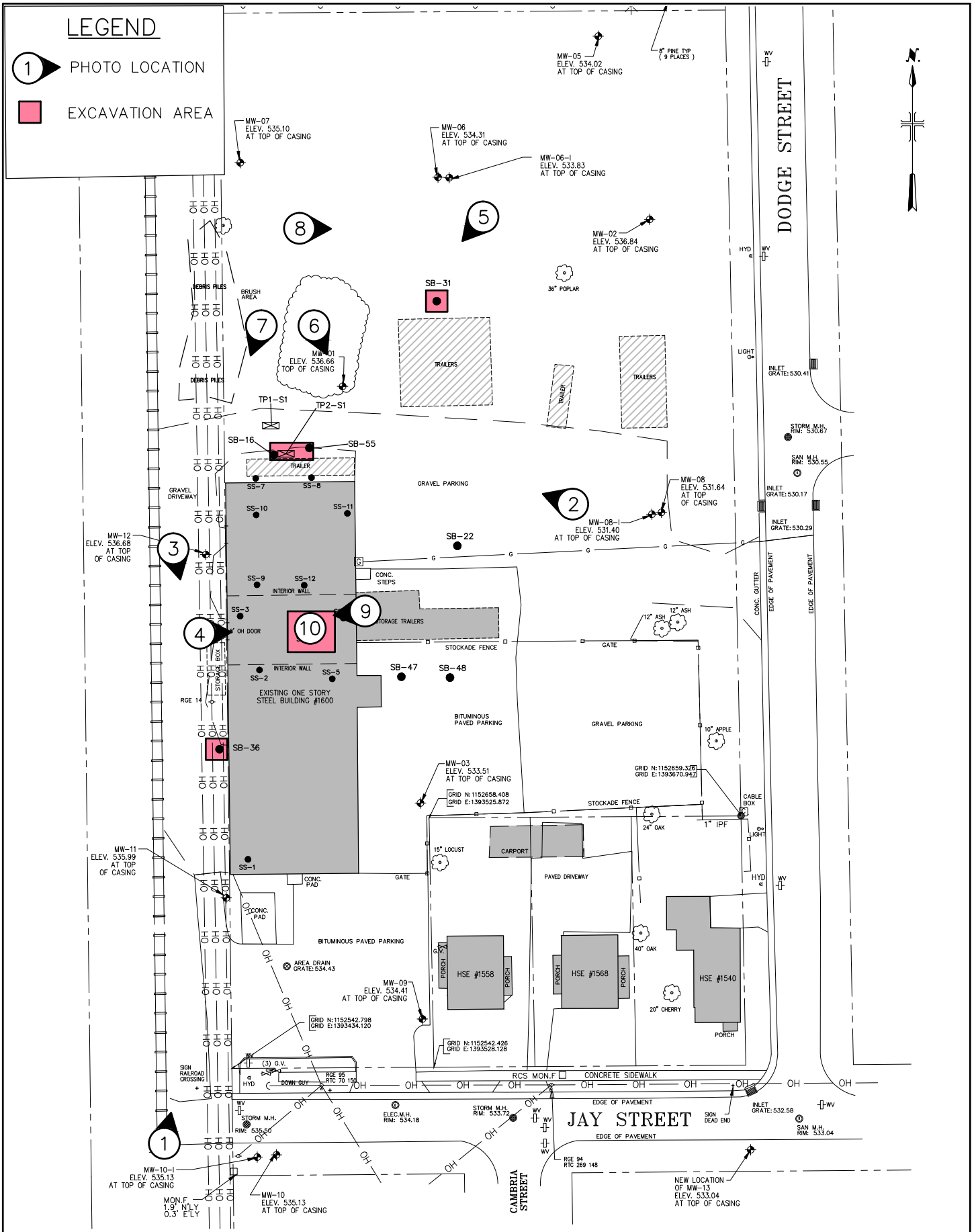
MALCOLM PIRNIE



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MALCOLM PIRNIE
ARCADIS
The Water Division of ARCADIS

NYSDEC, DIVISION OF ENVIRONMENTAL REMEDIATION
ABANDONED CHEMICAL SALES FACILITY REMEDIATION

PHOTO LOCATIONS

30' 0 30' 60'

DECEMBER 2012

PHOTO 1
Looking north at the west and south sides of building.

PHOTO 2
Looking northwest at the northeast corner of the building.

PHOTO 3
Looking south at the west side of the building.

PHOTO 4
Looking east through the overhead door into the building.

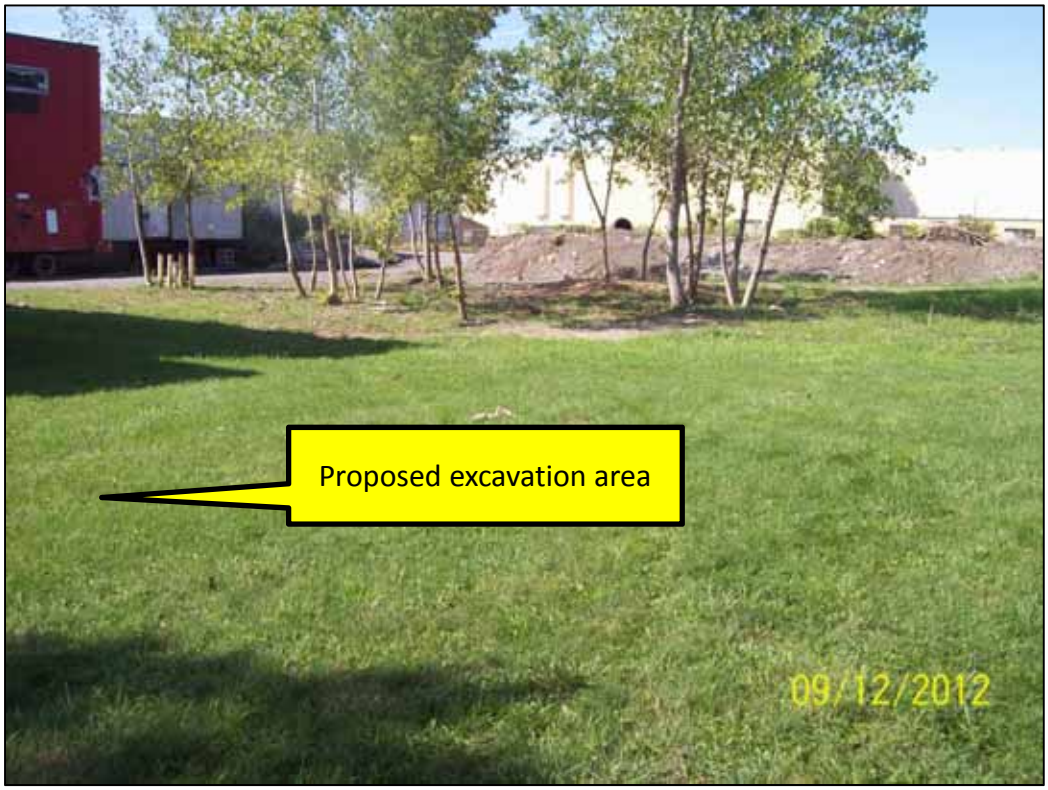


PHOTO 5
Looking southwest toward the north side of building.

PHOTO 6
Looking southeast at the northeast corner of building.

PHOTO 7
Looking southwest at the northwest corner of the of the building.

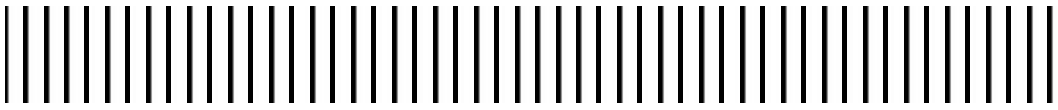
PHOTO 8
Looking east towards Dodge Street. MW-02 visible in background.

PHOTO 9
Looking west towards overhead door in warehouse area. Sump pit is shown in the foreground.

PHOTO 10
Overhead view looking inside the sump pit.

Abandoned Chemical Sales Facility
Rochester, New York

Work Plan
Appendix C



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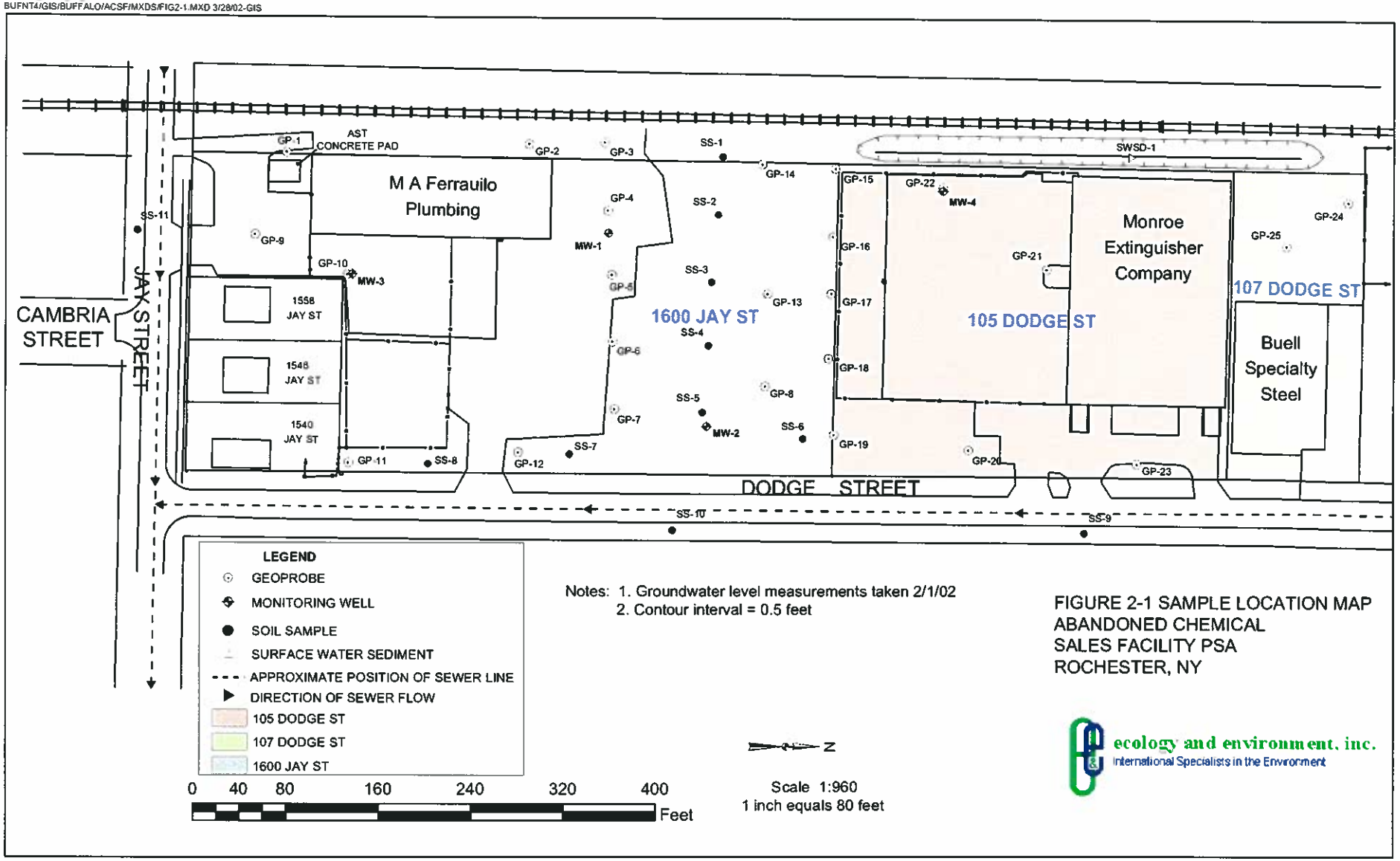


Notes: 1. Groundwater level measurements taken 2/1/02
2. Contour interval = 0.5 feet

FIGURE 2-1 SAMPLE LOCATION MAP
ABANDONED CHEMICAL
SALES FACILITY PSA
ROCHESTER, NY

ecology and environment, inc.
International Specialists in the Environment

Table 3-1
Summary of Positive Analytical Results for Surface Soil Samples
Abandoned Chemical Sales Facility Site

Analyte	NYSDEC TAGM 4046 Soil Cleanup Objectives[1]	Sample ID: / Date:	SS01 11/14/01	SS02 11/14/01	SS02-D 11/14/01	SS03 11/14/01	SS04 11/14/01	SS05 11/14/01
VOCs by Method OLM04.2 (µg/Kg)								
Methylene chloride	100		11 U	13 U	12 U	13 U	**1 J**	13 U
Tetrachloroethene	1400		11 U	13 U	12 U	**5 J**	**7 J**	13 U
Semivolatile Organics by Method OLM04.2 (µg/Kg)								
1,1´-Biphenyl	NA		730 U	420 U	2400 U	**110 J**	420 U	440 U
2-Methylnaphthalene	36400		730 U	**70 J**	2400 U	**550**	420 U	440 U
4-Methylphenol	0.9		730 U	**76 J**	2400 U	**47 J**	420 U	440 U
Acenaphthene	50000		730 U	**64 J**	2400 U	**1600**	420 U	440 U
Acenaphthylene	41000		**150 J**	**2200**	**1500 J**	**710**	**900**	**300 J**
Acetophenone	NA		730 U	**93 J**	2400 U	**64 J**	**45 J**	**45 J**
Anthracene	50000		**79 J**	**630**	**710 J**	**3600 J**	**380 J**	**150 J**
Benz(a)anthracene	224		**260 J**	**1200**	**1300 J**	**4500 J**	**510**	**840**
Benzaldehyde	NA		730 U	420 U	2400 U	400 U	420 U	**48 J**
Benzo(a)pyrene	61		**370 J**	**2000**	**1700 J**	**4300 J**	**830**	**1100**
Benzo(b)fluoranthene	1100		**460 J**	**960 J**	**1300 J**	**8200 J**	**1000**	**320 J**
Benzo(g,h,i)perylene	50000		**120 J**	**350 J**	**2200 J**	**380 J**	**200 J**	**310 J**
Benzo(k)fluoranthene	1100		**450 J**	**2300**	**1300 J**	**3900 J**	**790**	**970**
Bis(2-ethylhexyl)phthalate	50000		**190 J**	420 U	2400 U	400 U	420 U	440 U
Butyl benzyl phthalate	50000		730 U	420 U	2400 U	400 U	420 U	440 U
Carbazole	NA		730 U	**150 J**	2400 U	**3900 J**	**87 J**	**68 J**
Chrysene	400		**400 J**	**1600**	**1400 J**	**4000 J**	**650**	**1200**
Dibenz(a,h)anthracene	14		730 U	**210 J**	**880 J**	**330 J**	**110 J**	**210 J**
Dibenzofuran	6200		730 U	**55 J**	2400 U	**1600**	420 U	440 U
Di-n-butyl phthalate	8100		730 U	420 U	2400 U	400 U	420 U	440 U
Di-n-octyl phthalate	50000		730 U	420 U	2400 U	400 U	420 U	440 U
Fluoranthene	50000		**610 J**	**3300**	**1700 J**	**14000 J**	**1100**	**1100**
Fluorene	50000		730 U	420 U	2400 U	**2800**	420 U	440 U
Indeno(1,2,3-cd)pyrene	3200		**130 J**	**510**	**2300 J**	**680**	**280 J**	**450**

Table 3-1
Summary of Positive Analytical Results for Surface Soil Samples
Abandoned Chemical Sales Facility Site

Analyte	NYSDEC TAGM 4046 Soil Cleanup Objectives[1]	Sample ID:	SS01	SS02	SS02-D	SS03	SS04	SS05
		Date:	11/14/01	11/14/01	11/14/01	11/14/01	11/14/01	11/14/01
Naphthalene	13000		730 U	**98 J**	2400 U	**490**	420 U	440 U
Phenanthrene	50000		**240 J**	**680**	**590 J**	**13000 J**	**310 J**	**310 J**
Pyrene	50000		**680 J**	**1900**	**1600 J**	**5600 J**	**430**	**390 J**
Glycols by Method NYSDEC ASP 89-9 (µg/Kg)								
Glycols were not detected in surface soil samples.								
Pesticide/PCB by Method OLM04.2 (µg/Kg)								
4,4´-DDD	2900		**1.6 J**	**2.7 J**	**2.4 J**	3.7 U	1.9 U	**1.2 J**
4,4´-DDE	2100		3.5 U	4.1 U	4.0 U	**3.9 J**	4.2 U	4.1 U
4,4´-DDT	2100		**4.5**	**8.6 J**	**9.3 J**	**8.0**	**2.3 J**	**3.1 J**
Aldrin	41		**0.44 J**	2.1 U	**1.4 J**	**1.5 J**	**0.52 J**	**0.51 J**
alpha-Chlordane	540		**8.6 J**	**1.6 J**	**2.4 J**	**100 J**	**1.2 J**	**1.5 J**
Aroclor 1254	1000		35 U	41 U	40 U	37 U	42 U	41 U
delta-BHC	300		**0.37 J**	0.54 U	0.83 U	1.9 U	2.1 U	2.1 U
Dieldrin	44		**3.5 J**	1.7 U	2.1 U	**140 J**	0.79 U	**0.65 J**
Endosulfan I	900		1.8 U	**0.99 J**	**1.7 J**	1.9 U	**0.44 J**	**0.64 J**
Endosulfan II	900		2.7 U	4.1 U	4.0 U	3.7 U	4.2 U	1.8 U
Endosulfan sulfate	1000		3.5 U	**7.9**	**8.5 J**	3.7 U	**2.1 J**	**0.86 J**
Endrin	100		0.89 U	4.1 U	4.0 U	**0.81 J**	**1.4 J**	0.77 U
Endrin aldehyde	NA		**0.47 J**	**5.0 J**	**6.2 J**	3.7 U	**0.87 J**	**0.91 J**
Endrin ketone	NA		**5.1 J**	**6.5 J**	**15 J**	**3.9 J**	**4.4 J**	**1.3 J**
gamma-Chlordane	540		**5.1**	**1.0 J**	**0.94 J**	**47 J**	**0.20 J**	2.1 U
Heptachlor	100		0.54 U	0.41 U	0.44 U	**0.96 J**	0.21 U	0.22 U
Heptachlor epoxide	20		**11**	**18 J**	**28 J**	**22 J**	**10 J**	**6.5**
Methoxychlor	NA		**18 J**	**43**	**62 J**	**15 J**	**24**	**14 J**
TAL Metals by Method ILM04.0 (mg/Kg)								
Aluminum	NA		**3950**	**3520**	**5040**	**5210**	**4520**	**4320**
Antimony	NA		**2.3 J**	**2.2 J**	**2.6 J**	**3.9 J**	**2.5 J**	**3.3 J**
Arsenic	7.5		**5.8**	**5.0**	**4.6**	**5.4**	**3.0**	**5.1**

Table 3-1
Summary of Positive Analytical Results for Surface Soil Samples
Abandoned Chemical Sales Facility Site

Analyte	NYSDEC TAGM 4046 Soil Cleanup Objectives[1]	Sample ID: / Date:	SS01 11/14/01	SS02 11/14/01	SS02-D 11/14/01	SS03 11/14/01	SS04 11/14/01	SS05 11/14/01
Barium	300		**33.1 J**	**32.5 J**	**40.9 J**	**40.0 J**	**38.4 J**	**36.5 J**
Beryllium	NA		0.23 U	0.27 U	0.34 U	**0.35 J**	0.26 U	0.28 U
Cadmium	1		**0.37 J**	**0.35 J**	**0.50 J**	**0.45 J**	**0.38 J**	**0.40 J**
Calcium	NA		**95100**	**19400**	**23300**	**20700**	**25900**	**25200**
Chromium	10		**7.3**	**6.4**	**8.8**	**9.0**	**7.7**	**7.1**
Cobalt	30		**3.0 J**	**3.6 J**	**4.6 J**	**4.9 J**	**4.3 J**	**3.7 J**
Copper	25		**10.5**	**16.7**	**22.6**	**22.3**	**18.6**	**17.9**
Iron	2000		**6170**	**7270**	**10000**	**10800**	**9700**	**8470**
Lead	NA		**71.5**	**42.9**	**49.4**	**44.7**	**38.3**	**43.8**
Magnesium	NA		**12900**	**8870**	**9390**	**8910**	**11000**	**10500**
Manganese	NA		**232 J**	**308 J**	**402 J**	**435 J**	**289 J**	**276 J**
Nickel	13		**5.0 J**	**6.5 J**	**9.0 J**	**9.0 J**	**8.5**	**6.8 J**
Potassium	NA		**348 J**	**415 J**	**757 J**	**830 J**	**648 J**	**597 J**
Selenium	2		**3.7 R**	**3.6 R**	1.1 UR	**1.3 R**	**3.2 R**	**1.1 R**
Silver	NA		**1.1 J**	**0.67 J**	**0.68 J**	**0.84 J**	**0.68 J**	**0.58 J**
Sodium	NA		**187 J**	**187 J**	**262 J**	**96.8 J**	**108 J**	**84.1 J**
Vanadium	150		**6.9 J**	**7.8 J**	**11.3 J**	**11.4 J**	**9.1 J**	**8.5 J**
Zinc	20		**37.6 J**	**62.5 J**	**76.3 J**	**68.9 J**	**57.1 J**	**56.5 J**
Mercury	0.1		**0.096 J**	**0.075 J**	**0.093 J**	**0.30 J**	**0.27 J**	**0.40 J**
Total Cyanide by ILM04.0 (mg/Kg)								
Cyanide	NA		**0.087 J**	**0.16 J**	**0.15 J**	**0.14 J**	**0.17 J**	**0.17 J**

Source: Ecology and Environment, Inc., 2000

Table 2-3 Geoprobe and Subsurface Soil Sample Summary
Abandoned Chemical Sales Facility Site

Sampling Date	Geoprobe Borehole Location ID	Total Depth (feet BGS)	Maximum Downhole OVA Reading (ppm)	Maximum OVA Reading from Soil Core (ppm)	Sample Number	Sample Interval (feet BGS)	Analyses
11/12/01	GP-1	5	2.5	0	ACS-GP01-SB-3-5-O	3 - 5	TCL VOCs, TCL SVOCs, TCL Pesticides, TCL PCBs, TAL Metals, Cyanide, Glycols, Percent Solids
					ACS-GP01-SB-3-5-D (Duplicate)	3 - 5	TCL VOCs, TCL SVOCs, TCL Pesticides, TCL PCBs, TAL Metals, Cyanide, Glycols, Percent Solids
11/12/01	GP-2	5.2	> 100	20	ACS-GP02-SB-4-5-O	4 - 5	TCL VOCs, Glycols
11/12/01	GP-3	3.3	2	1	ACS-GP03-SB-2.3-3.3-O	2.3 - 3.3	TCL VOCs
11/12/01	GP-4	6.1	> 100	70	ACS-GP04-SB-5-5.5-O	5 - 5.5	TCL VOCs, TCL SVOCs, TCL Pesticides, TCL PCBs, TAL Metals, Cyanide, Percent Solids
11/12/01	GP-5	6.4	> 100	100	ACS-GP05-SB-5-5.5-O	5 - 5.5	TCL VOCs, Glycols (MS/MSD glycols)
11/12/01	GP-6	4.5	5	5	ACS-GP06-SB-4-4.5-O	4 - 4.5	TCL VOCs, Glycols
11/12/01	GP-7	4.7	1	0	ACS-GP07-SB-4-4.7-O	4 - 4.7	TCL VOCs
11/12/01	GP-8	4.9	19	1	ACS-GP08-SB-4-4.9-O	4 - 4.9	TCL VOCs, TCL SVOCs, TCL Pesticides, TCL PCBs, TAL Metals, Cyanide, Percent Solids
11/12/01	GP-9	3.4	20	7	ACS-GP09-SB-3-3.4-O	3 - 3.4	TCL VOCs, Glycols
11/13/01	GP-10	3.4	>100	50	ACS-GP10-SB-2.6 - 2.9-O	2.6 - 2.9	TCL VOCs
11/13/01	GP-11	1.7	0	0	ACS-GP11-SB-1.3-1.7-O	1.3 - 1.7	TCL VOCs
11/13/01	GP-12	3.5	0	0	ACS-GP12-SB-2.3-2.9-O	2.3 - 2.9	TCL VOCs
11/13/01	GP-13	2.9	0	0	ACS-GP13-SB-1.5-2.0-O	1.5 - 2.0	TCL VOCs
11/13/01	GP-14	6.8	0	0	ACS-GP14-SB-4-6.8-O	4 - 6.8	TCL VOCs (MS/MSD)
11/13/01	GP-15	7.4	5	2	ACS-GP15-SB-5.3-6.2-O	5.3 - 6.2	TCL VOCs
					ACS-GP15-SB-5.3-6.2-D (Duplicate)	5.3 - 6.2	TCL VOCs
11/13/01	GP-16	7.1	13	0	ACS-GP16-SB-6.1-7.1-O	6.1 - 7.1	TCL VOCs
11/13/01	GP-17	5.8	0.5	0	ACS-GP17-SB-4.0-5.8-O	4.0 - 5.8	TCL VOCs (MS/MSD)
11/13/01	GP-18	4.6	0	0	ACS-GP18-SB-4-4.6-O	4 - 4.6	TCL VOCs
11/13/01	GP-19	4.5	14	0	ACS-GP19-SB-4-4.5-O	4 - 4.5	TCL VOCs
11/13/01	GP-20	4.1	3	0.5	ACS-GP20-SB-3.5-4.1-O	3.5 - 4.1	TCL VOCs
11/13/01	GP-21	4.1	>1000	70	ACS-GP21-SB-2.8-3.5-O	2.8 - 3.5	TCL VOCs, TCL SVOCs, TCL Pesticides, TCL PCBs, TAL Metals, Cyanide, Percent Solids
11/14/01	GP-22	4.5	>1000	120	ACS-GP22-SB-2.2-4.5-O	2.2 - 4.5	TCL VOCs, TCL SVOCs, TCL Pesticides, TCL PCBs, TAL Metals, Cyanide, Percent Solids (MS/MSD all parameters except VOCs)
11/14/01	GP-23	4.7	1	1.5	ACS-GP23-SB-4-4.7-O	4 - 4.7	TCL VOCs
11/14/01	GP-24	6	12	8	ACS-GP24-SB-4.9-5.4-O	4.9 - 5.4	TCL VOCs
11/14/01	GP-25	3.3	22	0	ACS-GP25-SB-2-3.3-O	2 - 3.3	TCL VOCs

Key:
BGS = Below ground surface.
OVA = Organic vapor analyzer.
PCB = Polychlorinated biphenyl.
ppm = Parts per million.
SVOC = Semivolatile organic compound.
TAL = Target analyte list.
TCL = Target compound list.
VOC = Volatile organic compound.

Table 3-4A
Summary of Positive Volatile Analytical Results for Subsurface Soil Samples

Abandoned Chemical Sales Facility Site

Analyte	NYSDEC TAGM 4046 Soil Cleanup Objectives[1]		Sample ID:	GP01	GP01-D	GP02	GP03	GP04	GP05
			Depth (ft):	3 - 5	3 - 5	4 - 5	2.3 - 3.3	5 - 5.5	5 - 5.5
			Date:	11/12/01	11/12/01	11/12/01	11/12/01	11/12/01	11/12/01
VOCs by Method OLM04.2 (µg/Kg)									
1,1,1-Trichloroethane	800			**15**	**24**	**4 J**	12 U	65 U	12 U
1,1-Dichloroethane	200			11 U	11 U	**8 J**	12 U	65 U	**59**
2-Butanone	300			11 U	11 U	11 U	12 U	65 U	12 U
Acetone	200			11 U	11 U	11 U	12 U	65 U	**19**
Chloroethane	1900			11 U	11 U	11 U	12 U	65 U	**5 J**
cis-1,2-Dichloroethene	NA			11 U	**2 J**	**13**	12 U	65 U	12 U
Cyclohexane	NA			11 U	11 U	11 U	12 U	**50 J**	12 U
Ethylbenzene	5500			11 U	11 U	11 U	12 U	**120**	**1 J**
Isopropylbenzene	NA			11 U	11 U	11 U	12 U	**5100 J**	**1 J**
Methylcyclohexane	NA			11 U	11 U	11 U	12 U	**530**	12 U
Tetrachloroethene	1400			**2 J**	**3 J**	**6 J**	12 U	**7 J**	12 U
Toluene	1500			11 U	11 U	**1 J**	12 U	**20 J**	**4 J**
Trichloroethene	700			**14**	**34**	**9 J**	12 U	65 U	12 U
Vinyl chloride	200			11 U	11 U	11 U	12 U	65 U	**8 J**
Xylenes, Total	1200			11 U	11 U	11 U	12 U	**330**	12 U

Key:

D = Duplicate sample.

ft = Feet.

J = Estimated value.

U = Non detected.

mg/L = Milligrams per liter.

µg/L = Micrograms per liter.

Notes: Shaded cells exceed the screening value.

Bolded values represent positive detections.

(1) New York State Department of Environmental Conservation, Technical and Administrative Guidance Memorandum #4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1994.

Table 3-4A
Summary of Positive Volatile Analytical Results for Subsurface Soil Samples
Abandoned Chemical Sales Facility Site

Analyte	NYSDEC TAGM 4046 Soil Cleanup Objectives[1]		Sample ID:	GP06	GP07	GP08	GP09	GP10
			Depth (ft):	4.4 - 5	4 - 4.7	4 - 4.9	3 - 3.4	2.6 - 2.9
			Date:	11/12/01	11/12/01	11/12/01	11/13/01	11/13/01
VOCs by Method OLM04.2 (µg/Kg)								
1,1,1-Trichloroethane	800			11 U	11 U	13 U	11 U	13 U
1,1-Dichloroethane	200			11 U	11 U	13 U	11 U	13 U
2-Butanone	300			11 U	11 U	13 U	11 U	**19**
Acetone	200			11 U	11 U	13 U	**25**	**67**
Chloroethane	1900			11 U	11 U	13 U	11 U	13 U
cis-1,2-Dichloroethene	NA			**2 J**	11 U	13 U	11 U	13 U
Cyclohexane	NA			11 U	11 U	13 U	11 U	13 U
Ethylbenzene	5500			11 U	11 U	13 U	11 U	13 U
Isopropylbenzene	NA			11 U	11 U	13 U	11 U	13 U
Methylcyclohexane	NA			11 U	11 U	13 U	11 U	13 U
Tetrachloroethene	1400			11 U	11 U	**24**	11 U	13 U
Toluene	1500			11 U	11 U	**1 J**	11 U	13 U
Trichloroethene	700			**200**	11 U	13 U	11 U	13 U
Vinyl chloride	200			11 U	11 U	13 U	11 U	13 U
Xylenes, Total	1200			11 U	11 U	13 U	11 U	13 U

Key:

D = Duplicate sample.

ft = Feet.

J = Estimated value.

U = Non detected.

mg/L = Milligrams per liter.

µg/L = Micrograms per liter.

Notes: Shaded cells exceed the screening value.

Bolded values represent positive detections.

(1) New York State Department of Environmental Conservation, Technical and Administrative Guidance Memorandum #4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1994.

Table 3-4A
Summary of Positive Volatile Analytical Results for Subsurface Soil Samples
Abandoned Chemical Sales Facility Site

Analyte	NYSDEC TAGM 4046 Soil Cleanup Objectives[1]		Sample ID:	GP11	GP12	GP13	GP14	GP15	GP15-D
			Depth (ft):	1.3 - 1.7	2.3 - 2.9	1.5 - 2.0	4 - 6.8	5.3 - 6.2	5.3 - 6.2
			Date:	11/13/01	11/13/01	11/13/01	11/13/01	11/13/01	11/13/01
VOCs by Method OLM04.2 (µg/Kg)									
1,1,1-Trichloroethane	800			11 U	10 U	11 U	12 U	15 U	13 U
1,1-Dichloroethane	200			11 U	10 U	11 U	12 U	15 U	13 U
2-Butanone	300			11 U	10 U	11 U	12 U	15 U	13 U
Acetone	200			11 U	10 U	11 U	12 U	15 U	13 U
Chloroethane	1900			11 U	10 U	11 U	12 U	15 U	13 U
cis-1,2-Dichloroethene	NA			11 U	10 U	11 U	12 U	15 U	13 U
Cyclohexane	NA			11 U	10 U	11 U	12 U	15 U	13 U
Ethylbenzene	5500			11 U	10 U	11 U	12 U	15 U	13 U
Isopropylbenzene	NA			11 U	10 U	11 U	12 U	15 U	13 U
Methylcyclohexane	NA			11 U	10 U	11 U	12 U	15 U	13 U
Tetrachloroethene	1400			11 U	10 U	**190**	**17**	15 U	13 U
Toluene	1500			11 U	10 U	11 U	12 U	15 U	13 U
Trichloroethene	700			11 U	10 U	**14**	**2 J**	15 U	13 U
Vinyl chloride	200			11 U	10 U	11 U	12 U	15 U	13 U
Xylenes, Total	1200			11 U	10 U	11 U	12 U	15 U	13 U

Key:

D = Duplicate sample.

ft = Feet.

J = Estimated value.

U = Non detected.

mg/L = Milligrams per liter.

µg/L = Micrograms per liter.

Notes: Shaded cells exceed the screening value.

Bolded values represent positive detections.

(1) New York State Department of Environmental Conservation, Technical and Administrative Guidance Memorandum #4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1994.

Table 3-4B
Summary of Positive Analytical Results for Subsurface Soil Samples
Abandoned Chemical Sales Facility Site

Analyte	NYSDEC TAGM 4046 Soil Cleanup Objectives[1]		Sample ID: GP01	GP01-D	GP04	GP08	GP21	GP22
		Depth (ft):	3 - 5	3 - 5	5 - 5.5	4 - 4.9	2.8 - 3.5	2.2 - 4.5
		Date:	11/12/01	11/12/01	11/12/01	11/12/01	11/12/01	11/12/01
Semivolatile Organics by Method OLM04.2 (µg/Kg)								
2-Methylnaphthalene	36400		360 U	**51 J**	420 U	410 U	420 U	380 U
Acenaphthene	50000		**96 J**	**180 J**	420 U	410 U	420 U	380 U
Acenaphthylene	41000		**55 J**	**39 J**	**68 J**	410 U	420 U	380 U
Acetophenone	NA		**47 J**	**40 J**	420 U	410 U	420 U	380 U
Anthracene	50000		**260 J**	**450**	420 U	410 U	420 U	380 U
Benz(a)anthracene	224		**550**	**860**	**75 J**	410 U	420 U	**45 J**
Benzo(a)pyrene	61		**580**	**860**	**66 J**	410 U	420 U	**39 J**
Benzo(b)fluoranthene	1100		**320 J**	**740**	**50 J**	410 U	420 U	**39 J**
Benzo(g,h,i)perylene	50000		**91 J**	**260 J**	**43 J**	410 U	420 U	380 U
Benzo(k)fluoranthene	1100		**570**	**660**	**59 J**	410 U	420 U	380 U
Bis(2-ethylhexyl)phthalate	50000		360 U	**380**	**63 J**	410 U	**230 J**	**46 J**
Carbazole	NA		**76 J**	**140 J**	420 U	410 U	420 U	380 U
Chrysene	400		**530**	**870**	**73 J**	410 U	420 U	**50 J**
Dibenz(a,h)anthracene	14		**51 J**	**140 J**	420 U	410 U	420 U	380 U
Dibenzofuran	6200		**46 J**	**120 J**	420 U	410 U	420 U	380 U
Fluoranthene	50000		**2300**	**2300**	**110 J**	410 U	420 U	**130 J**
Fluorene	50000		**79 J**	**190 J**	420 U	410 U	420 U	380 U
Indeno(1,2,3-cd)pyrene	3200		**140 J**	**350 J**	**46 J**	410 U	420 U	380 U
Naphthalene	13000		360 U	**76 J**	420 U	410 U	420 U	380 U
Phenanthrene	50000		**900**	**1600**	**100 J**	410 U	420 U	**130 J**
Pyrene	50000		**770**	**1000**	**100 J**	410 U	420 U	**93 J**
Pesticide/PCB by Method OLM04.2 (µg/Kg)								
4,4'-DDD	2900		**1.0 J**	1.1 U	0.38 U	0.46 U	0.51 U	**0.32 J**
4,4'-DDT	2100		**2.6 J**	0.82 U	0.46 U	1.1 U	0.58 U	0.57 U
Aldrin	41		**0.52 J**	**0.90 J**	0.12 U	2.0 U	0.19 U	0.60 U
alpha-Chlordane	540		**0.96 J**	**0.64 J**	2.0 U	0.42 U	2.0 U	0.64 U

Source: Ecology and Environment, Inc., 2000

Table 3-4B
Summary of Positive Analytical Results for Subsurface Soil Samples

Abandoned Chemical Sales Facility Site

Analyte	NYSDEC TAGM 4046 Soil Cleanup Objectives[1]	Sample ID: / Depth (ft): / Date:	GP01 3 - 5 11/12/01	GP01-D 3 - 5 11/12/01	GP04 5 - 5.5 11/12/01	GP08 4 - 4.9 11/12/01	GP21 2.8 - 3.5 11/12/01	GP22 2.2 - 4.5 11/12/01
Endosulfan I	900		1.8 U	**0.48 J**	2.0 U	0.13 U	2.0 U	1.9 U
Endosulfan II	900		**0.54 J**	3.3 U	0.21 U	0.25 U	3.8 U	3.6 U
Endosulfan sulfate	1000		**0.67 J**	1.8 U	3.9 U	3.8 U	3.8 U	3.6 U
Endrin aldehyde	NA		**0.50 J**	1.7 U	0.22 U	0.23 U	0.26 U	0.22 U
Endrin ketone	NA		**2.4 J**	**7.7**	2.6 U	3.8 U	3.8 U	3.6 U
gamma-Chlordane	540		1.3 U	**0.32 J**	2.0 U	0.37 U	0.23 U	0.12 U
Heptachlor epoxide	20		0.69 U	**0.77 J**	1.3 U	**0.30 J**	**0.27 J**	**0.61 J**
Methoxychlor	NA		**7.4 J**	**17**	1.2 U	20 U	2.4 U	2.8 U
TAL Metals by Method ILM04.0 (mg/Kg)								
Aluminum	NA		**3800**	**2340**	**6090**	**4610**	**2660**	**5680**
Antimony	NA		**0.95 J**	**0.62 J**	15.7 U	**0.70 J**	**0.74 J**	**3.5 J**
Arsenic	7.5		**4.8**	**3.5**	**3.4**	**4.9**	**9.7**	**4.2**
Barium	300		**34.4 J**	**25.3 J**	**60.2**	**55.6**	**44.4 J**	**37.8 J**
Cadmium	1		**0.67 J**	**0.52 J**	**0.54 J**	**0.79 J**	**0.90 J**	**0.31 J**
Calcium	NA		**70800**	**83200**	**9120**	**90000**	**32500**	**40100**
Chromium	10		**8.2**	**6.7**	**13.3**	**11.8**	**11.7**	**7.8**
Cobalt	30		**5.0 J**	**3.9 J**	**4.7 J**	**6.4 J**	**7.0 J**	**4.0 J**
Copper	25		**27.3**	**25.3**	**14.7**	**23.1**	**9.5**	**6.8**
Iron	2000		**12900**	**10300**	**14800**	**17500**	**23400**	**10200**
Lead	NA		**22.3**	**20.4**	**8.1**	**8.7**	**24.5**	**12.4**
Magnesium	NA		**25200 J**	**31900 J**	**3310 J**	**20700 J**	**18400 J**	**16600**
Manganese	NA		**481**	**378**	**149**	**556**	**253**	**319 J**
Nickel	13		**11.8**	**9.4**	**11.3**	**13.5**	**12.8**	**5.8 J**
Potassium	NA		**1300 J**	**961 J**	**349 J**	**1040 J**	**1480 J**	**451 J**
Silver	NA		**0.099 J**	2.3 U	2.6 U	2.5 U	2.6 U	**0.15 J**
Sodium	NA		**299 J**	**381 J**	**86.3 J**	**159 J**	**183 J**	**151 J**
Vanadium	150		**12.9**	**9.0 J**	**25.3**	**19.5**	**16.6**	**11.1 J**
Zinc	20		**62.3**	**48.7**	**31.3**	**43.6**	**36.0**	**30.8 J**
Mercury	0.1		**0.22**	**0.23**	**0.056 J**	**0.087 J**	**0.082 J**	**0.082 J**

Source: Ecology and Environment, Inc., 2000

Table 3-4B
Summary of Positive Analytical Results for Subsurface Soil Samples

Abandoned Chemical Sales Facility Site

Analyte	NYSDEC TAGM 4046 Soil Cleanup Objectives[1]	Sample ID:	GP01	GP01-D	GP04	GP08	GP21	GP22
		Depth (ft):	3 - 5	3 - 5	5 - 5.5	4 - 4.9	2.8 - 3.5	2.2 - 4.5
		Date:	11/12/01	11/12/01	11/12/01	11/12/01	11/12/01	11/12/01
Total Cyanide by ILM04.0 (mg/Kg)								
Cyanide	NA		0.055 U	**0.062 J**	**0.071 J**	0.064 U	0.063 U	**0.058 J**

Key:

D = Duplicate sample.

ft = Feet.

J = Estimated value.

U = Non detected.

mg/L = Milligrams per liter.

µg/L = Micrograms per liter.

Notes: Shaded cells exceed the screening value.

Bolded values represent positive detections.

(1) New York State Department of Environmental Conservation, Technical and Administrative Guidance Memorandum #4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1994.

Table 3-4C
Summary of Positive Volatile Analytical Results for Subsurface Soil Samples
Abandoned Chemical Sales Facility Site

Analyte	NYSDEC TAGM 4046 Soil Cleanup Objectives[1]	Sample ID: / Depth (ft): / Date:	GP01 3 - 5 11/12/01	GP01-D 3 - 5 11/12/01	GP02 4 - 5 11/12/01	GP05 5 - 5.5 11/12/01	GP06 4.4 - 5 11/12/01	GP09 3 - 3.4 11/13/01
Glycols by Method NYSDEC ASP 89-9 (µg/Kg)								
Glycol	NA		**4700**	290 U	270 U	280 U	320 U	280 U

Key:

D = Duplicate sample.

ft = Feet.

J = Estimated value.

NA = Standard not available.

U = Non detected.

mg/L = Milligrams per liter.

µg/L = Micrograms per liter.

Notes: Shaded cells exceed the screening value.

Bolded values represent positive detections.

(1) New York State Department of Environmental Conservation, Technical and Administrative Guidance Memorandum #4046: Determination of Soil Cleanup Objectives and Cleanup Levels, 1994.

DRILLING LOG FOR GP-1

Project Name: ACSF

Site Location: Rochester NY

Date Started/Finished: 11/12/01

Drilling Company: SJB

Driller's Name: Frank + Matt

Geologist's Name: S. Reynolds Smith

Geologist's Signature: S Reynolds Smith

Rig Type (s): Geoprobe

Drilling Method (s): Geoprobe (1.5")

Bit Size (s): ______ Auger Size (s): ______

Auger/Split Spoon Refusal: 5 ft

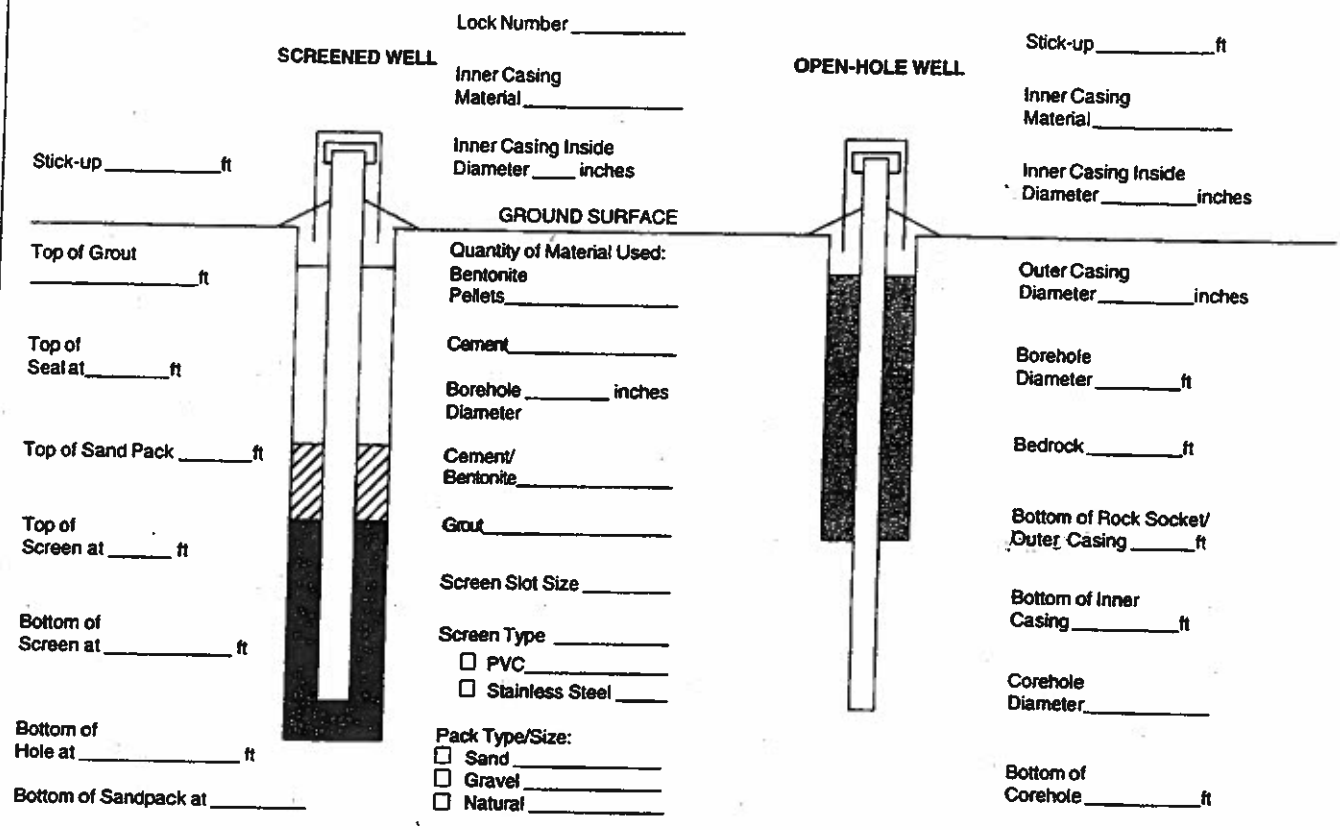
Total Depth of Borehole Is: 5 ft

Total Depth of Corehole Is: ______

Water Level (TOIC)		
Date	Time	Level(Feet)

Well Location Sketch

Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery ft	RQD	Fracture Sketch	HNu/OVA (ppm)	Comments
1									2. Soil sample @ Breathing zone + core	
2	1			1421	1	3.3'				
3										
4	2			1432	2	1			2 Drum hole @ BZ	@ soil
5										Sample ACS-GP01-SB-3-5-0 + -D VOCs, metals(?) (14:35)
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-5 Brown SAND with clay, silt & gravel (1mm-4cm) No water	X	○	○
2		○	○	○
3		○	○	○
4		○	○	○
5		○	○	○
6		○	○	○
7		○	○	○
8		○	○	○
9		○	○	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

DRILLING LOG FOR GP-2

Project Name: ACSF

Site Location: Rochester, NY

Date Started/Finished: 11/12/01

Drilling Company: SJB

Driller's Name: Frank Minnelaser Matt Matthies

Geologist's Name: A. Reynolds Smith

Geologist's Signature: A Reynolds Smith

Rig Type (s): Geoprobe

Drilling Method (s): Geoprobe (1.5")

Bit Size (s): ______ Auger Size (s): ______

Auger/Split Spoon Refusal: 5.2'

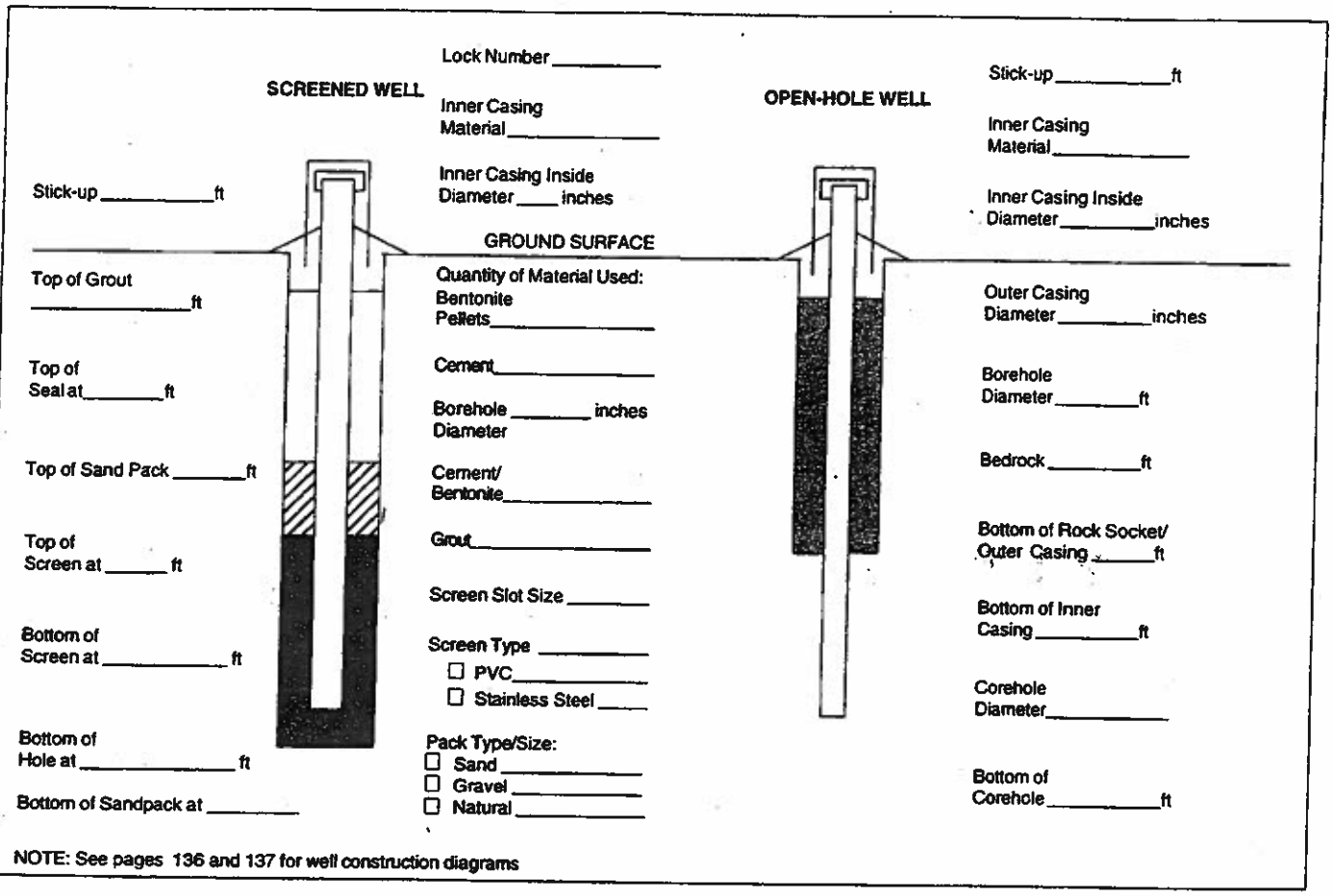
Total Depth of Borehole Is: 5.2'

Total Depth of Corehole Is: ______

Water Level (TOIC)		
Date	Time	Level (Feet)

Well Location Sketch

Depth (Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery ft	RQD	Fracture Sketch	HNu/OVA (ppm)	Comments
									1' 1.5 >100 Downhole	
1									1.5' 5	
2	1			1450		4			2' 10 ppm	
3									2.5' 20 ppm	
4	2			1457		1.2				sample 4-5'
5										
6										Novettis sample for VOCs, glycol (15:07)
7										
8										
9										
10										
11										
12										
13										
14										
15										



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-0.75' Fill - black/brown fine sand w/ gravel	⊗	○	○
2	0.75-1.5 Brown fine sand w/ some silt, trace gravel	○	○	○
3		○	○	○
4	1.5-2 Black sand w/ gravel	○	○	○
5	2-3 Brown fine Sand w/ some gravel	○	○	○
6	3-4.3 Brown fine sand w/ Some Clay	⊗	○	○
7	4.3-5.2 gray gravel	⊗	○	○
8		○	○	○
9		○	○	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

DRILLING LOG FOR GP-3

Project Name ACSF

Site Location Rochester, NY

Date Started/Finished 11/12/01

Drilling Company SJB

Driller's Name Frank Minnuler + Matt Matthews

Geologist's Name S. Reynolds Smith

Geologist's Signature S. Reynolds Smith

Rig Type (s) Geoprobe

Drilling Method (s) Geoprobe (1.5")

Bit Size (s) _____ Auger Size (s) _____

Auger/Split Spoon Refusal 3.3'

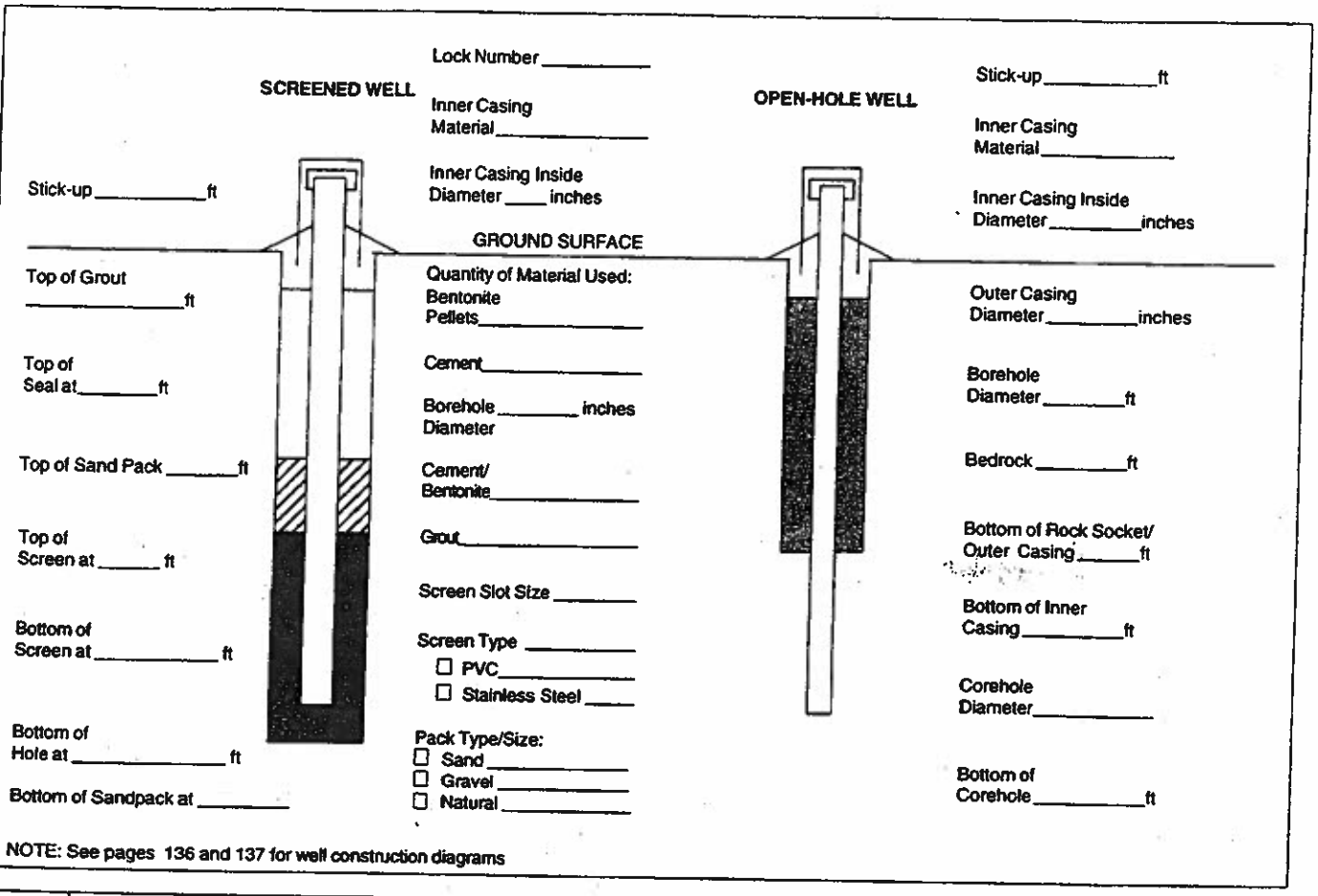
Total Depth of Borehole is 3.3'

Total Depth of Corehole is _____

Water Level (TOIC)		
Date	Time	Level(Feet)

Well Location Sketch

Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery ft	RQD	Fracture Sketch	HNu/OVA (ppm)	Comments
									1 downhole	
1	1			1517		2.75			0	2.3-3.3 sample soil for VOCs no water (15:20)
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-3.3 Brown sand w/ some gravel	X	○	○
2		○	○	○
3		○	○	○
4		○	○	○
5		○	○	○
6		○	○	○
7		○	○	○
8		○	○	○
9		○	○	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

DRILLING LOG FOR GP-4

Project Name ACSF

Site Location Rochester, NY

Date Started/Finished 11/12/01

Drilling Company

Driller's Name SJB Frank M. + Matt M.

Geologist's Name S. Reynolds Smith

Geologist's Signature S Reynolds Smith

Rig Type (s) Geoprobe

Drilling Method (s) Geoprobe

Bit Size (s) _____ Auger Size (s) _____

Auger/Split Spoon Refusal 6.1'

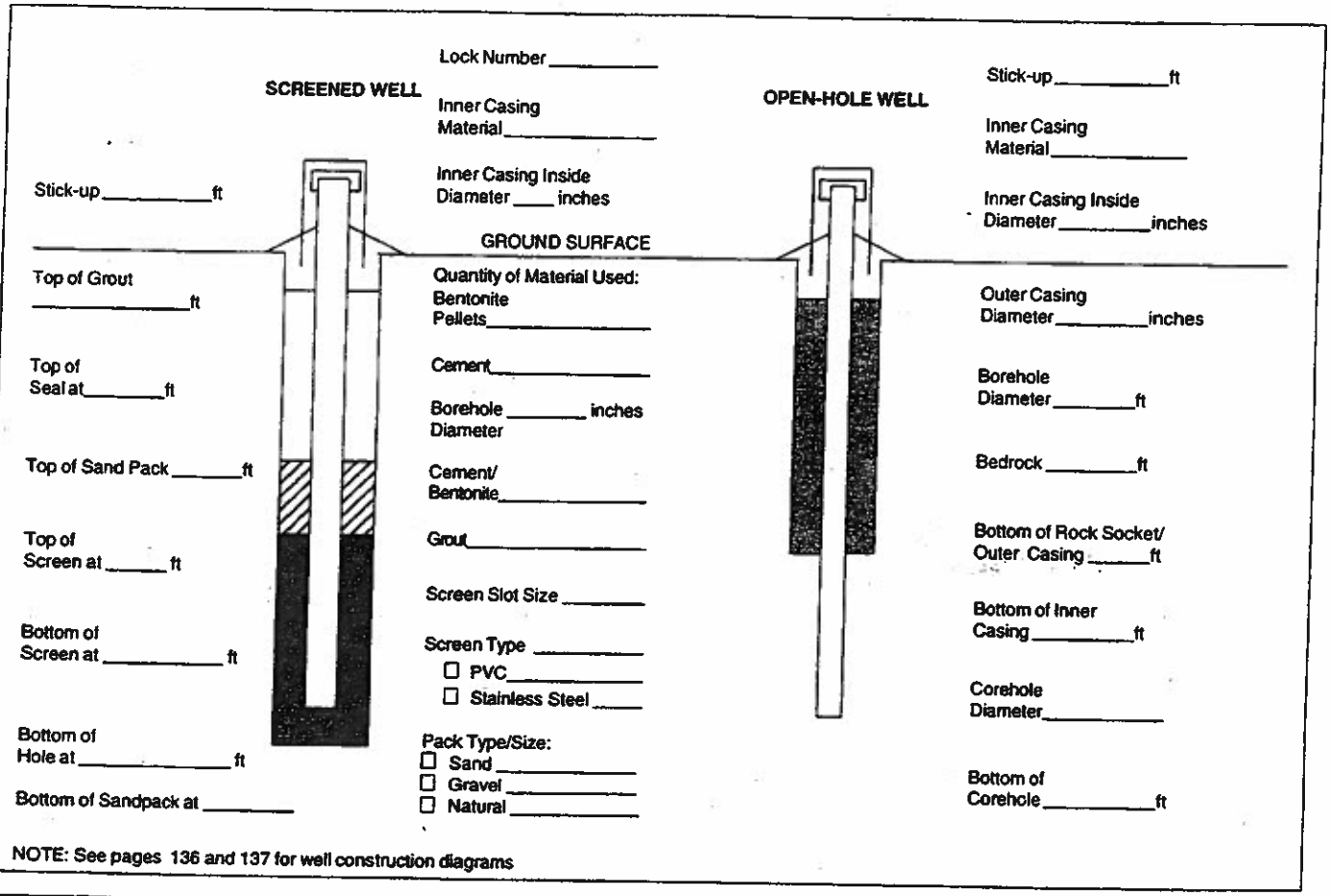
Total Depth of Borehole Is 6.1'

Total Depth of Corehole Is _____

Water Level (TOIC)		
Date	Time	Level(Feet)

Well Location Sketch

Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery ft	RQD	Fracture Sketch	HNu/OVA (ppm)	Comments
1				1526	1	3.5			>100 Downhole PBZ (Breathing zone)	
2									150	
3										
4				1531	2	full			50@4' 70@5'	NO VC
5										
6										
7										Sample for VOCs 5-5.5 (15:40) & Metals, SVOCs etc
8										
9										
10										
11										
12										No water
13										
14										
15										



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-1 Black sandy gravelly fill, dry	✗	○	○
2	1-4 Brown fine sand, lit fine to coarse gravel	○	○	○
3	4-6.1 Brown fine sand, trace gravel & clay	✗	○	○
4		○	○	○
5		○	○	○
6		○	○	○
7		○	○	○
8		○	○	○
9		○	○	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

DRILLING LOG FOR 6P5

Project Name: ACSF

Site Location: Rochester, NY

Date Started/Finished: 11/12/01

Drilling Company: SJB

Driller's Name: Frank Minnaker / Matt Matthies

Geologist's Name: S. Reynolds Smith

Geologist's Signature: S. Reynolds Smith

Rig Type (s): Geoprobe

Drilling Method (s): Geoprobe

Bit Size (s): ______ Auger Size (s): ______

Auger/Split Spoon Refusal: 6.4'

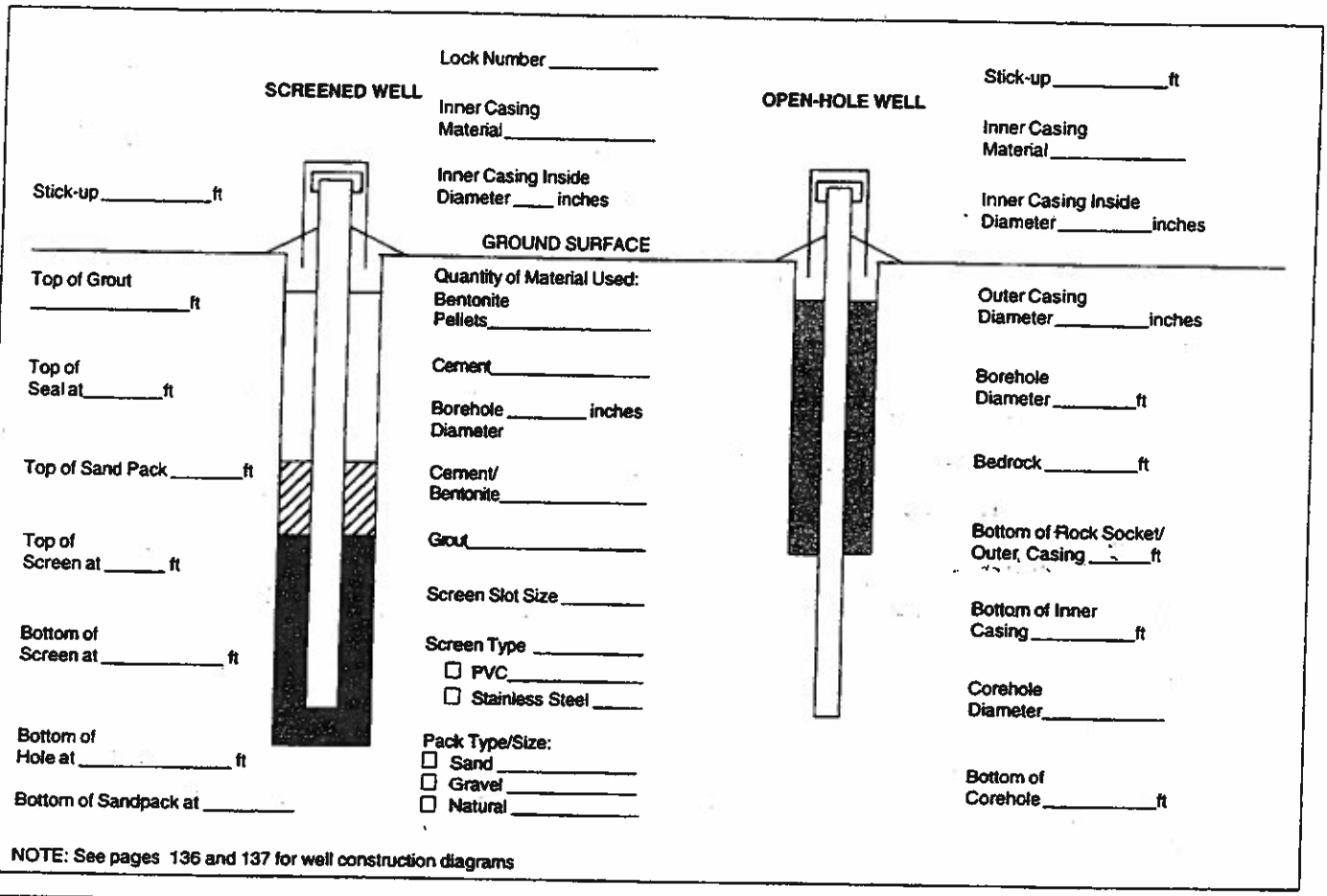
Total Depth of Borehole Is: 6.4'

Total Depth of Corehole Is: ______

Water Level (TOIC)		
Date	Time	Level(Feet)

Well Location Sketch

Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery	RQD	Fracture Sketch	HNu/OVA (ppm)	Comments
									>100 downhole	
1				1555	1	3ft				
2										
3									290ppm	
4										
5				1600	2	2ft			50ppm	
6									30ppm	100ppm @ 5.7
7										Sample 5-5.5 for VOCs a glycol (glycol MS/MSD)
8										
9										
10										
11										
12										(16:11)
13										
14										
15										



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-3 Fine brown sand, some fine-coarse gravel	⊘	○	○
2	3-4 Fine brown sand, some clay, trace gravel, moist	○	X	○
3		○	○	○
4	4-6 Fine brown sand becoming more clayey with depth, trace gravel	○	X	○
5		○	○	○
6	no water	○	○	○
7		○	○	○
8		○	○	○
9		○	○	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

DRILLING LOG FOR GP-6

Project Name: ACSF

Site Location: Rochester, NY

Date Started/Finished: 11/12/01

Drilling Company: SJB

Driller's Name: M. Matthies Frank Manuelos

Geologist's Name: S. Reynolds Smith

Geologist's Signature: S. Reynolds Smith

Rig Type (s): Geoprobe

Drilling Method (s): Geoprobe

Bit Size (s): ______ Auger Size (s): ______

Auger/Split Spoon Refusal: 4.5'

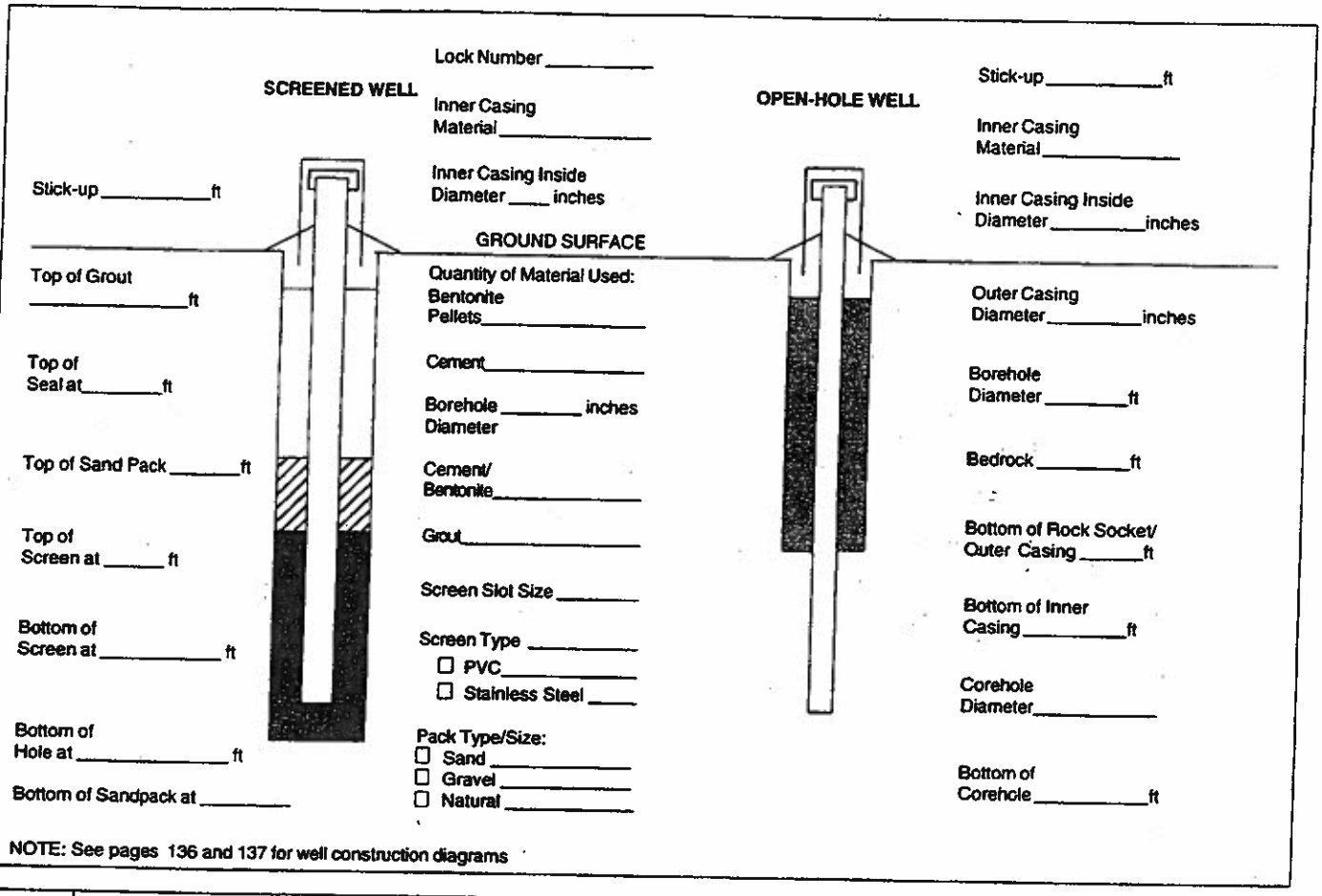
Total Depth of Borehole Is: 4.5'

Total Depth of Corehole Is: ______

Water Level (TOIC)		
Date	Time	Level(Feet)

Well Location Sketch

Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery ft	RQD	Fracture Sketch	HNu/OVA (ppm)	Comments
1				1417	1	4			5ppm downhole	~~[illegible]~~ 5ppm @ 3.3'
2										
3										
4				1425	2	0.5			ϕ	
5										
6										No water Sample taken VOCs + [illegible] 4-4.5 (16:30)
7										
8										
9										
10										
11										
12										
13										
14										
15										



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-0.6 Dark brown fill sand w/ gravel	X		
2	0.6-0.8 Gray coarse gravel			
3	0.8-1.4 Brown fine silty sand	X		
4	1.4-1.9 Asphalt? Black gravel			
5	1.9-4.5 Brown w/ some yellow/orange mottling. Fine sand, some clay + gravel. More fines w/ depth	X		
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

DRILLING LOG FOR GP7

Project Name ACSF

Site Location Rochester, NY

Date Started/Finished 11/12/01

Drilling Company SJB

Driller's Name Frank Mimulers, M Matthies

Geologist's Name S. Reynolds Smith

Geologist's Signature [signature]

Rig Type (s) Geoprobe

Drilling Method (s) Geoprobe

Bit Size (s) ______ Auger Size (s) ______

Auger/Split Spoon Refusal 4.7'

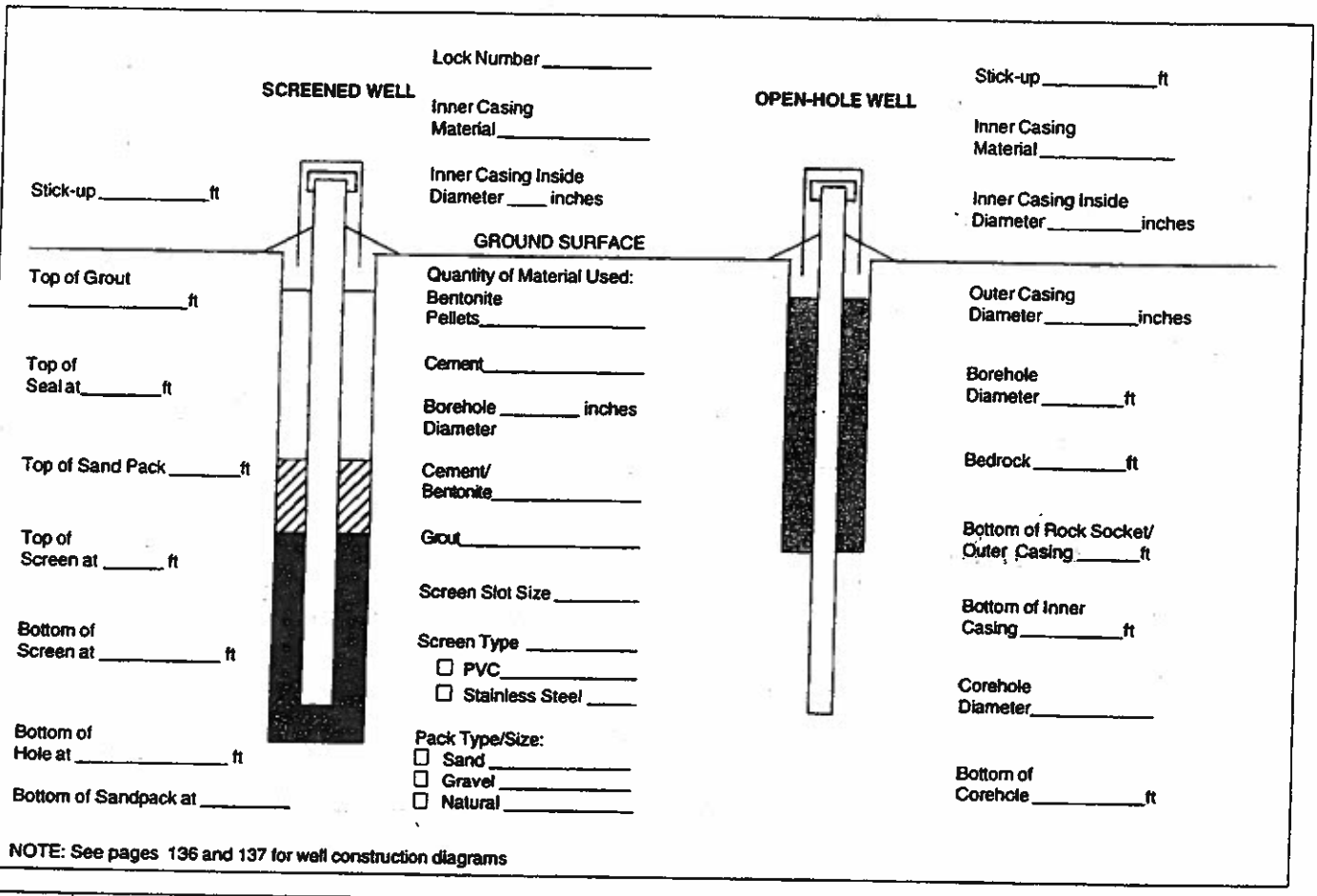
Total Depth of Borehole Is 4.7'

Total Depth of Corehole Is ______

Water Level (TOIC)		
Date	Time	Level(Feet)

Well Location Sketch

Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery ft	RQD	Fracture Sketch	HNu/OVA (ppm)	Comments
									1 ppm ambient air	
1										
2	1			1630		3.3			Ø	
3										
4	2			1643		0.7			Ø	
5										no water Sample for VOCs 4-4.7 (16:47)
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-2 Dark brown sand w/some gravel, trace clay	⊘	○	○
2	2-2.5 Asphalt? Black soft tar-like	⊘	○	○
3	2.5-3.5 Brown fine loose sand, trace gravel	⊘	○	○
4	3.5-4.7 Fine light brown sand, trace fine gravel	○	○	○
5		○	○	○
6		○	○	○
7		○	○	○
8		○	○	○
9		○	○	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

DRILLING LOG FOR GPS

Project Name ACSF

Site Location Rochester, NY

Date Started/Finished 11/12/21

Drilling Company SJB

Driller's Name Frank Minnideus & M. Matthies

Geologist's Name S. Reynolds Smith

Geologist's Signature S. Reynolds Smith

Rig Type (s) Geoprobe

Drilling Method (s) Geoprobe

Bit Size (s) _____ Auger Size (s) _____

Auger/Split Spoon Refusal 4.9'

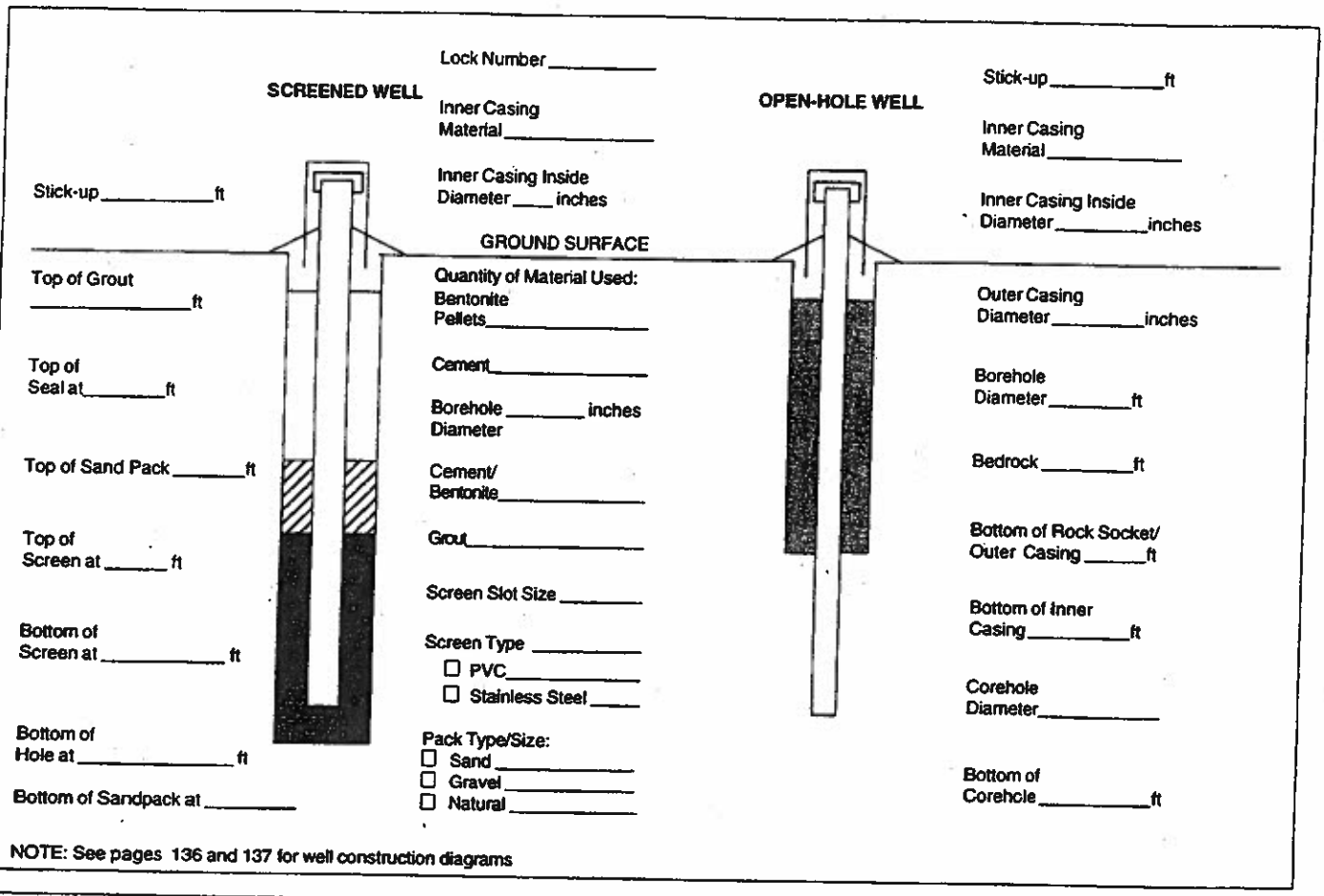
Total Depth of Borehole Is 4.9'

Total Depth of Corehole Is _____

Water Level (TOIC)		
Date	Time	Level (Feet)

Well Location Sketch

Depth (Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery ft	RQD	Fracture Sketch	HNu/OVA (ppm)	Comments
										ppm ↑ Downhole
1	1			1655		2.8				
2										
3									1@2-3'	
4	2					0.9			0	3 downhole
5										
6										4-4.9 (1712)
7										Sample for
8										VOCs, Metals etc
9										
10										
11										
12										
13										
14										
15										



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-0.2 Topsoil Dark brown organic rich, clayey sand	○	X	○
2	0.2-2.5 Brown fine sand w/ Coarse gravel	X	○	○
3	2.5-2.8 Fine brown to dark brown sand	X	○	○
4	4-4.9 Light brown fine sand	X	○	○
5		○	○	○
6		○	○	○
7		○	○	○
8		○	○	○
9		○	○	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

DRILLING LOG FOR GP 13

Project Name ALSF

Site Location Rochester, NY

Date Started/Finished 11/13/01

Drilling Company SJB

Driller's Name Frank Minnieus

Geologist's Name S. Reynolds Smith

Geologist's Signature S. Reynolds Smith

Rig Type (s) Geoprobe

Drilling Method (s) Geoprobe

Bit Size (s) _____ Auger Size (s) _____

Auger/Split Spoon Refusal 2.9'

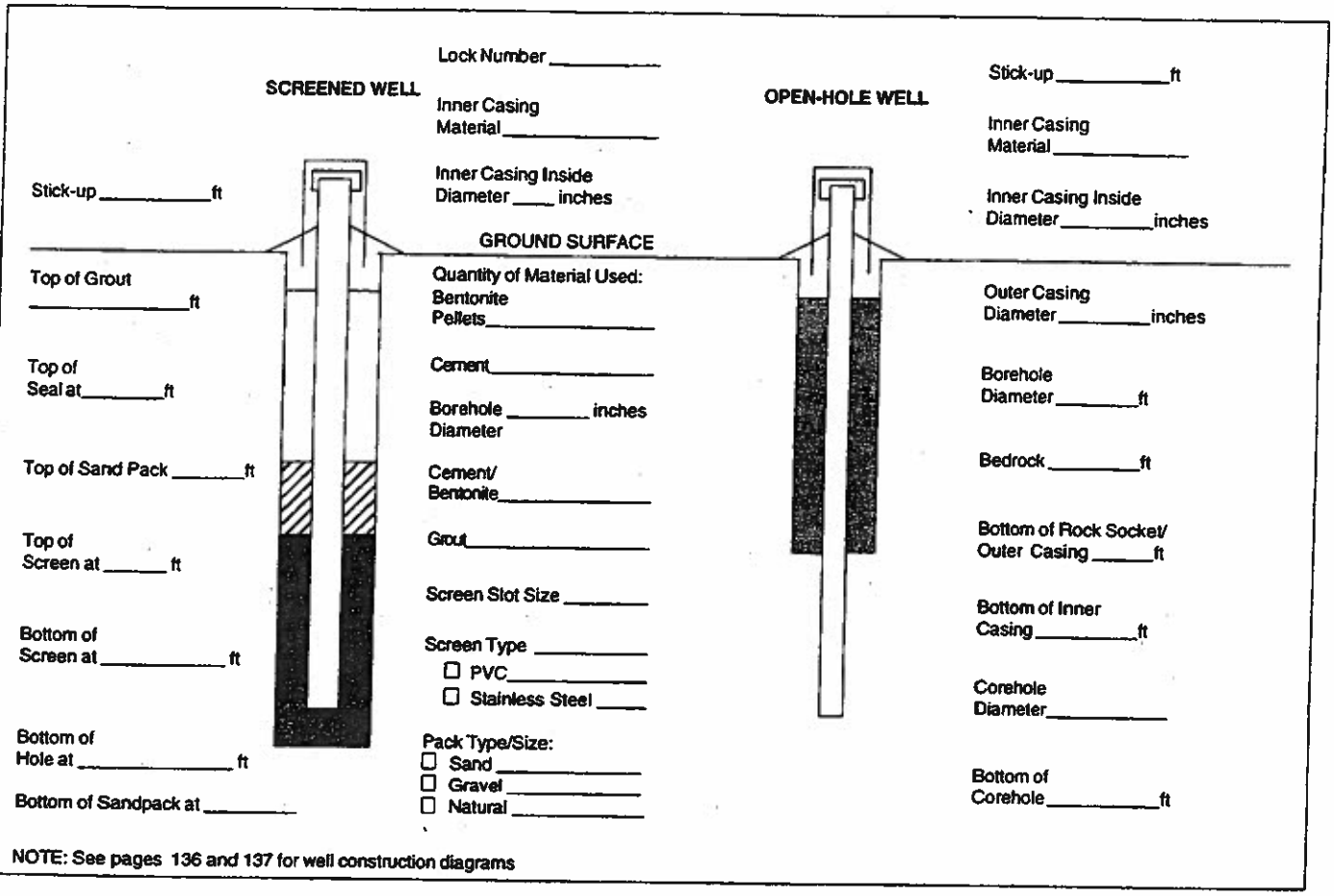
Total Depth of Borehole Is 2.9'

Total Depth of Corehole Is _____

Water Level (TOIC)		
Date	Time	Level(Feet)

Well Location Sketch

Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery ft	RQD	Fracture Sketch	HNu/OVA (ppm)	Comments
1	1			0942		2.0			0	0 Downhole sample for VOC (0-2') (1.5-2.0)
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

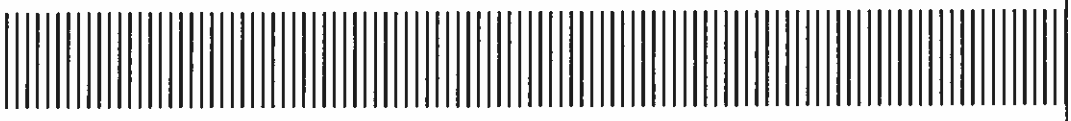


NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-0.9 Brown sand, trace clay, trace gravel, dry.	○	○	○
2	Top 0.35 organic rich	○	○	○
3	0.9-1.5 gravel, gray, coarse	○	○	○
4	1.5-2.0 Brown, fine sand, trace clay, dry-damp	○	○	○
5		○	○	○
6		○	○	○
7		○	○	○
8		○	○	○
9		○	○	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

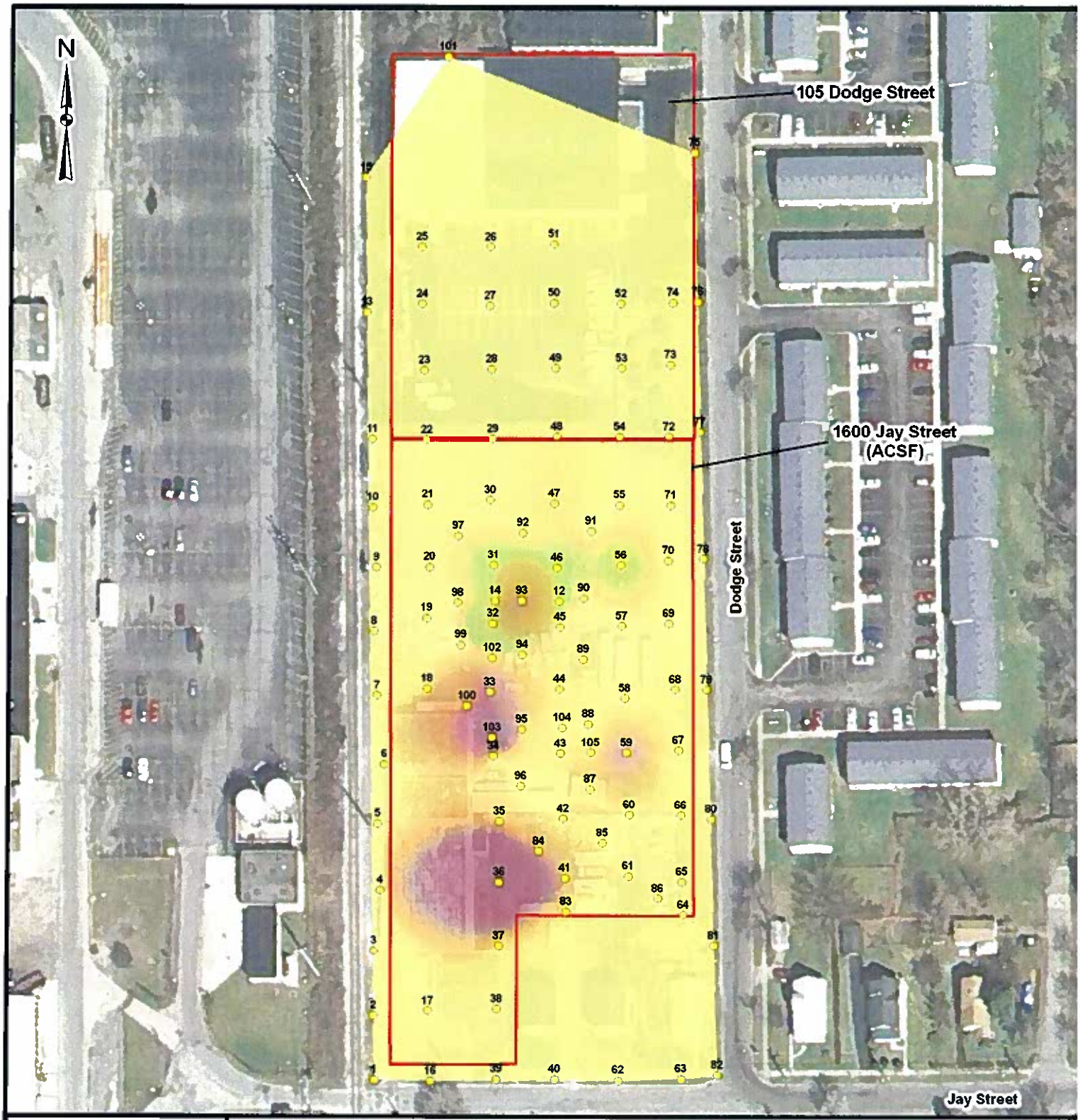
Abandoned Chemical Sales Facility
Rochester, New York

Work Plan
Appendix D



0266397

MALCOLM PIRNIE



Legend

Site Boundary

Passive Soil Gas Point

Vinyl Chloride (ng)

High : 1247.62

Low : 0

0 100 200 Feet

Source: EA, Science and Technology (2007), NYSGIS Clearinghouse (2007)

ABANDONED CHEMICAL SALES FACILITY SITE (8-28-105)
REMEDIAL INVESTIGATION REPORT
ROCHESTER, NEW YORK

FIGURE 3-3
PASSIVE GAS SURVEY RESULTS
(TOTAL CVOC)

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
SLG	CJS	SAB	SLG	AS SHOWN	MARCH 2011	14368.07	GIS/PROJECTS/ ACSF.MXD

Abandoned Chemical Sales Facility
Rochester, New York

Work Plan
Appendix E

0266397

MALCOLM PIRNIE

TABLE 3-1 GROUNDWATER ELEVATION DATA AUGUST 2010

Monitoring Well	Ground Surface Elevation (ft)	Elevation at Top of Casing (TOC) (ft)	Total Depth of Well (ft)	Depth to Water Level (ft) (August 2010)	GW_Elev (ft) (August 2010)
MW-01	534.62	536.66	18.88	9.72	526.94
MW-02	534.68	536.84	19.35	10.22	526.62
MW-03	533.83	533.51	19.88	8.35	525.16
MW-05	534.47	534.02	19.41	7.84	526.18
MW-06	534.62	534.31	19.38	7.78	526.53
MW-06I	534.41	533.83	34.44	12.57	521.26
MW-07	535.69	535.10	17.61	8.09	527.01
MW-08	532.07	531.64	19.39	6.43	525.21
MW-08I	531.90	531.40	35.14	13.29	518.11
MW-09	534.64	534.41	19.71	12.92	521.49
MW-10	535.50	535.50	27.41	18.60	516.90
MW-10I	535.48	535.13	40.67	18.54	516.59
MW-11	536.26	535.98	18.94	11.17	524.81
MW-12	537.49	536.68	18.54	10.36	526.32
MW-13	533.55	533.55	30.06	12.30	521.25
MW-14	535.90	535.70	30.37	14.87	520.83
MW-15	534.21	534.01	34.45	13.48	520.53
MW-1	527.99	527.99	16.56	5.12	522.87
MW-202	533.88	533.45	13.73	5.29	528.16
MW-515	531.26	530.73	30.94	8.22	522.51
MW-516	533.83	533.40	13.63	5.28	528.12
MW-517	533.87	533.44	30.65	9.90	523.54
MW-518	535.50	535.19	18.30	16.41	518.78
MW-519	535.37	535.05	33.50	13.29	521.76
MW-521	537.73	537.37	29.78	14.86	522.51
MW-523	533.40	533.04	19.76	13.48	519.56
MW-525	534.85	536.47	33.53	18.09	518.38
PZ-401-2	530.30	530.30	12.41	5.16	525.14
PZ-401-5	533.62	533.33	11.98	5.31	528.02
PZ-402-3	530.00	530.00	12.76	5.83	524.17
DB-309-2	536.30	538.31	39.79	20.15	518.16

Legend

Site Boundary

Soil Boring Location

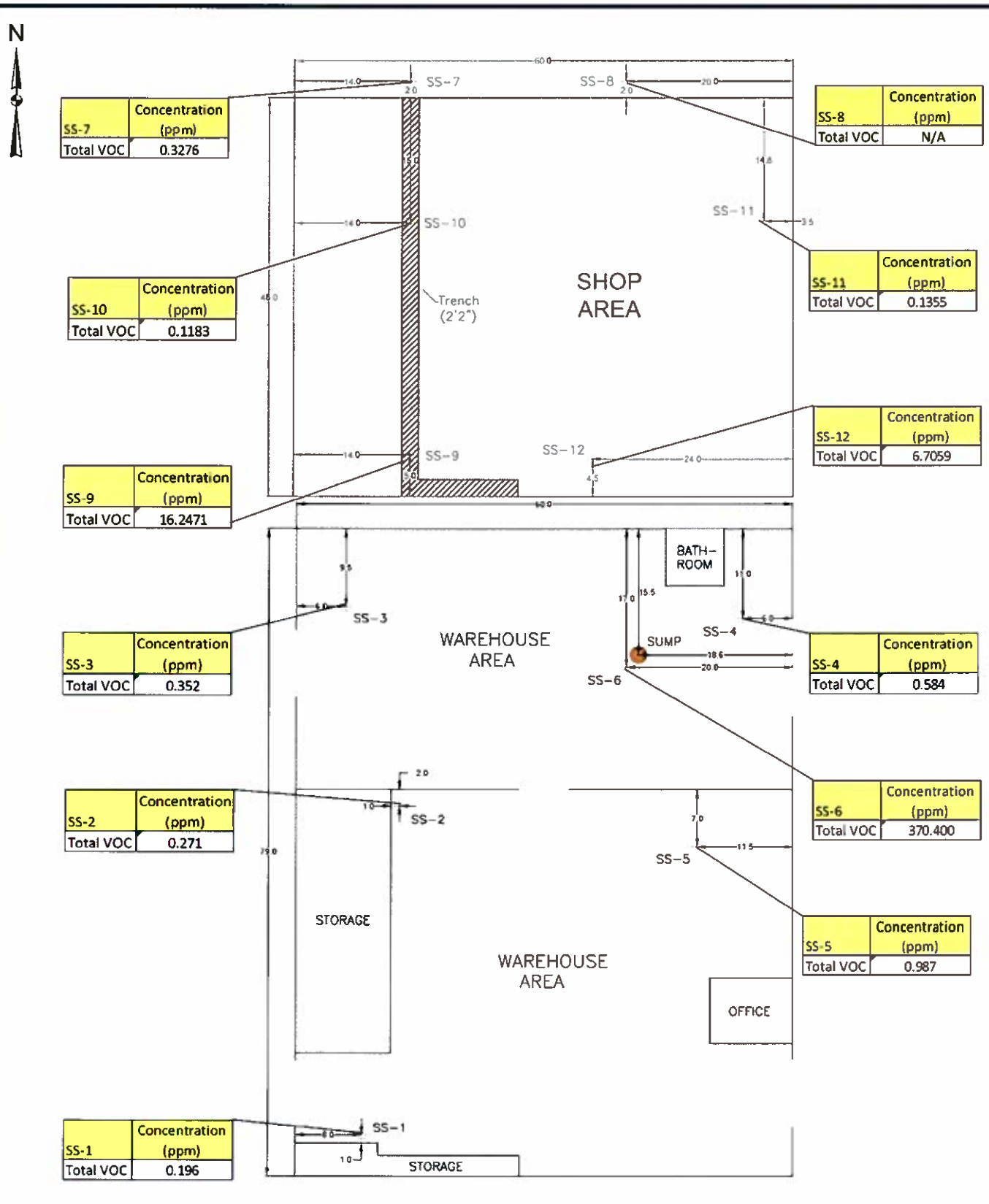
0 100 200 Feet

Source: EA, Science and Technology (2007), NYSGIS Clearinghouse (2007)

ABANDONED CHEMICAL SALES FACILITY SITE (8-28-105)
REMEDIAL INVESTIGATION (DRAFT)
ROCHESTER, NEW YORK

FIGURE 2-2
SUBSURFACE SOIL BORING LOCATIONS (JANUARY 2007)

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
SLG	SAB	SAB	SLG	AS SHOWN	MARCH 2011	14368.07	GIS/PROJECTS/ FIGURE2_2.MXD



Legend

Sub-Slab Soil Boring Location

ABANDONED CHEMICAL SALES FACILITY SITE (8-28-105)
RI/FS (DRAFT)
ROCHESTER, NEW YORK

FIGURE 3-5
SUB-SLAB SOIL SAMPLING RESULTS
(DECEMBER 2009)

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
SLG	SAB	SAB	SLG	NOT TO SCALE	MARCH 2011	14368.07	G:\Projects\State&Local\NYSDEC\D004438 - Inv Des\1436807 ACSF\GIS\Projects

TABLE 3-2 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL ANALYTICAL DATA - JANUARY 2007

Parameter List USEPA Method 8260B	Location ID	SB01		SB03		SB04		SB05		SB07		SB09		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (mg/kg)
	Sample ID	8-28-105-SB01		8-28-105-SB03		8-28-105-SB04 (D)		8-28-105-SB05		8-28-105-SB07		8-28-105-SB09		
	Lab ID	F0067-01A		F0067-03A		F0067-04A		F0067-05A		F0067-06A		F0067-07A		
	Sample Type	Soil		Soil		Soil		Soil		Soil		Soil		
	Sample Date	1/16/07		1/16/07		1/16/07		1/16/07		1/16/07		1/16/07		
	Sample Depth	6.5		5.5-6		6		6		6.5		6		
Acetone	mg/kg		U		U		UJ		UJ		U		U	0.05
Bromofluorobenzene	mg/kg													---
2- Butanone	mg/kg		U		U		U		U		U		U	0.12
sec- Butylbenezene	mg/kg		U		U		U		U		U		U	11
n- Butylbenzene	mg/kg		U		U		U		U		U		U	12
Dibromofluoromethane	mg/kg													---
1,4- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.8
1,2- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.1
1,1- Dichloroethane	mg/kg		U		U		U		U		U		U	0.27
cis-1,2- Dichloroethene	mg/kg		U	0.0049	J		U		U		U		U	0.25
trans-1,2- Dichloroethene	mg/kg		U		U		U		U		U		U	0.19
Ethylbenzene	mg/kg		U		U		U		U		U		U	1
Hexachlorobutadiene	mg/kg		U		U		U		U		U		U	---
Isoproplybenzene	mg/kg		U		U		U		U		U		U	---
4- Isoproplytoulene	mg/kg		U		U		U		U		U		U	---
Methylene Chloride	mg/kg		U		U		U		U		U		U	0.05
Naphthalene	mg/kg		U		U		U		U		U		U	12
n- Proplybenzene	mg/kg		U		U		U		U		U		U	3.9
Tetrachloroethene	mg/kg		U		U	0.00039		0.049		0.0082			U	1.3
1,1,1- Trichloroethane	mg/kg		U		U		U		U		U		U	0.68
Trichloroethene	mg/kg		U		U		U		U		U		U	0.47
1,2,4- Trimethylbenzene	mg/kg		U		U		U	0.0026	UJ		U		U	3.6
1,3,5- Trimethylbenzene	mg/kg		U		U		U		U		U		U	8.4
o- Xylene	mg/kg		U		U		U		U		U		U	---
m,p- Xylenes	mg/kg	0.0026	J		U	0.0028	J		U		U	0.0042	J	---
Xylenes (total)	mg/kg	0.0026	J		U	0.0028	J		U		U	0.0042	J	0.26

NOTE: USEPA = United States Environmental Protection Agency
ID = Identification
NYCRR = New York Codes of Rules and Regulations.
mg/kg = milligrams per kilogram (ppm)
U = The analyte was analyzed for, but was not detected above the sample reporting limit.
J = Reported value is an estimate.
--- =

Analytical data results provided by Mitkem Corporation. Data Validation completed by Environmental Data Validation Inc.
Only parameters that had at least one detection from the data set are shown.
Bolded values indicate that the analyte was detected above the NYCRR Part 375 Soil Cleanup Objective - Unrestricted Use.

TABLE 3-2 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL ANALYTICAL DATA - JANUARY 2007

Parameter List USEPA Method 8260B	Location ID	SB10		SB11		SB12		SB13		SB14		SB15		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (ppm)
	Sample ID	8-28-105-SB10		8-28-105-SB11		8-28-105-SB12		8-28-105-SB13		8-28-105-SB14		8-28-105-SB15		
	Lab ID	F0067-08A		F0067-09A		F0067-10A		F0067-11A		F0067-12A		F0067-13A		
	Sample Type	Soil		Soil		Soil		Soil		Soil		Soil		
	Sample Date	1/16/07		1/16/07		1/16/07		1/16/07		1/16/07		1/16/07		
	Sample Depth	6		6		6		6.5		6		5.5		
Acetone	mg/kg		U		U		U		U	0.012		0.0073	J	0.05
Bromofluorobenzene	mg/kg													---
2- Butanone	mg/kg		U		U		U		U		U		U	0.12
sec- Butylbenezene	mg/kg		U		U		U		U		U		U	11
n- Butylbenzene	mg/kg		U		U		U		U		U		U	12
Dibromofluoromethane	mg/kg													---
1,4- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.8
1,2- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.1
1,1- Dichloroethane	mg/kg		U		U		U		U		U		U	0.27
cis-1,2- Dichloroethene	mg/kg		U		U		U		U		U		U	0.25
trans-1,2- Dichloroethene	mg/kg		U		U		U		U		U		U	0.19
Ethylbenzene	mg/kg		U		U		U		U		U		U	1
Hexachlorobutadiene	mg/kg		U		U		U		U		U		U	---
Isoproplybenzene	mg/kg		U		U		U		U		U		U	---
4- Isoproplytoulene	mg/kg		U		U		U		U		U		U	---
Methylene Chloride	mg/kg		U		U		U		U		U		U	0.05
Naphthalene	mg/kg		U		U		U		U		U		U	12
n- Proplybenzene	mg/kg		U		U		U		U		U		U	3.9
Tetrachloroethene	mg/kg		U		U		U		U		U		U	1.3
1,1,1- Trichloroethane	mg/kg		U		U		U		U		U		U	0.68
Trichloroethene	mg/kg		UJ		UJ		UJ		U		U		U	0.47
1,2,4- Trimethylbenzene	mg/kg		U		U		U		U		U	0.0051	UJ	3.6
1,3,5- Trimethylbenzene	mg/kg		U		U		U		U		U		U	8.4
o- Xylene	mg/kg	0.003	J		U	0.0057	J		U		U		U	---
m,p- Xylenes	mg/kg		U		U	0.0042	J	0.0027	J	0.0036	J		U	---
Xylenes (total)	mg/kg	0.003	J		U	0.0057	J	0.0027	J	0.0036	J		U	0.26

TABLE 3-2 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL ANALYTICAL DATA - JANUARY 2007

Parameter List USEPA Method 8260B	Location ID	SB16		SB17		SB18		SB19		SB20		SB21		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (ppm)
	Sample ID	8-28-105-SB16 (D)		8-28-105-SB17		8-28-105-SB18		8-28-105-SB19		8-28-105-SB20		8-28-105-SB21		
	Lab ID	F0067-14A		F0067-15A		F0067-16A		F0067-17A		F0067-18A		F0067-19A		
	Sample Type	Soil		Soil		Soil		Soil		Soil		Soil		
	Sample Date	1/16/07		1/16/07		1/16/07		1/16/07		1/16/07		1/16/07		
	Sample Depth	7		6.5		7		6		6.5		6		
Acetone	mg/kg	0.029	UJ	0.012	J		UJ	0.0064		0.02	J		U	0.05
Bromofluorobenzene	mg/kg		U		U		U		U		U		U	---
2- Butanone	mg/kg		U		U		U		U		UJ		U	0.12
sec- Butylbenezene	mg/kg	1.5	J		U		U		U		UJ	0.0024	J	11
n- Butylbenzene	mg/kg	2.3			U		U		U		UJ		U	12
Dibromofluoromethane	mg/kg		U		U		U		U		U		U	---
1,4- Dichlorobenzene	mg/kg	0.023			U		U		U		UJ		U	1.8
1,2- Dichlorobenzene	mg/kg	0.078			U		U		U		UJ		U	1.1
1,1- Dichloroethane	mg/kg		U		U		U		U		UJ		U	0.27
cis-1,2- Dichloroethene	mg/kg		U		U		U		U		UJ		U	0.25
trans-1,2- Dichloroethene	mg/kg		U		U		U		U		UJ		U	0.19
Ethylbenzene	mg/kg	0.67	J	0.0092			U		U		UJ		U	1
Hexachlorobutadiene	mg/kg		U		U		U		U		U		U	---
Isoproplybenzene	mg/kg	0.8	J		U		U		U		UJ		U	---
4- Isoproplytoulene	mg/kg	2.5			U		U		U		UJ	0.0031		---
Methylene Chloride	mg/kg		U		U		U		U		U		U	0.05
Naphthalene	mg/kg	0.038	B		U		U		U		UJ		U	12
n- Proplybenzene	mg/kg	2.4			U		U		U		UJ	0.0053	J	3.9
Tetrachloroethene	mg/kg	0.022			U		U		U		UJ		U	1.3
1,1,1- Trichloroethane	mg/kg		U		U		U		U		UJ		U	0.68
Trichloroethene	mg/kg		U		U		U		U		UJ		U	0.47
1,2,4- Trimethylbenzene	mg/kg	57	J	0.0039	UJ		UJ		U	0.0047	UJ	0.073		3.6
1,3,5- Trimethylbenzene	mg/kg	16	J		U		U		U		UJ	0.017		8.4
o- Xylene	mg/kg	0.77	J		U		U		U	0.0038	J		U	---
m,p- Xylenes	mg/kg	2.8		0.054		0.0043	J		U	0.012	J	0.0073		---
Xylenes (total)	mg/kg	3.5		0.054		0.0043	J		U	0.016	J	0.0073		0.26

TABLE 3-2 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL ANALYTICAL DATA - JANUARY 2007

Parameter List USEPA Method 8260B	Location ID	SB22		SB23		SB24		SB25		SB26		SB27		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (ppm)
	Sample ID	8-28-105-SB22		8-28-105-SB23		8-28-105-SB24		8-28-105-SB25		8-28-105-SB26		8-28-105-SB27		
	Lab ID	F0068-02A		F0068-03A		F0068-04A		F0068-05A		F0068-06A		F0068-07A		
	Sample Type	Soil		Soil		Soil		Soil		Soil		Soil		
	Sample Date	1/17/07		1/17/07		1/17/07		1/17/07		1/17/07		1/17/07		
	Sample Depth	5.5		5.3		4.9		4		3.5		5		
Acetone	mg/kg	0.05	J		UJ		UJ		UJ		UJ	0.012	J	0.05
Bromofluorobenzene	mg/kg		U		U		U		U		U		U	---
2- Butanone	mg/kg		U		U		U		U		U		U	0.12
sec- Butylbenezene	mg/kg		U		U		U		U		U		U	11
n- Butylbenzene	mg/kg		U		U		U		U		U		U	12
Dibromofluoromethane	mg/kg		U		U		U		U		U		U	---
1,4- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.8
1,2- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.1
1,1- Dichloroethane	mg/kg		U		U		U		U		U		U	0.27
cis-1,2- Dichloroethene	mg/kg		U		U	0.012			U		U		U	0.25
trans-1,2- Dichloroethene	mg/kg		U		U		U		U		U		U	0.19
Ethylbenzene	mg/kg		U		U		U		U		U		U	1
Hexachlorobutadiene	mg/kg		U		U		U		U		U		U	---
Isoproplybenzene	mg/kg		U		U		U		U		U		U	---
4- Isoproplytoulene	mg/kg		U		U		U		U		U		U	---
Methylene Chloride	mg/kg		U		U		U		U		U		U	0.05
Naphthalene	mg/kg		U		U		U		U		U		U	12
n- Proplybenzene	mg/kg		U		U		U		U		U		U	3.9
Tetrachloroethene	mg/kg		U		U	0.14			U	0.0051	J		U	1.3
1,1,1- Trichloroethane	mg/kg		U		U		U		U		U		U	0.68
Trichloroethene	mg/kg		U		U	0.017			U	0.0027	J		U	0.47
1,2,4- Trimethylbenzene	mg/kg	0.0029	UJ		U		U		U		U		U	3.6
1,3,5- Trimethylbenzene	mg/kg		U		U		U		U		U		U	8.4
o- Xylene	mg/kg		U		U		U		U	0.0022	J		U	---
m,p- Xylenes	mg/kg		U	0.0028	J		U	0.0049	J	0.0081		0.0055	J	---
Xylenes (total)	mg/kg		U	0.0028	J		U	0.0049	J	0.01		0.0055	J	0.26

TABLE 3-2 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL ANALYTICAL DATA - JANUARY 2007

Parameter List USEPA Method 8260B	Location ID	SB28		SB30		SB31		SB31		SB32		SB33		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (ppm)
	Sample ID	8-28-105-SB28		8-28-105-SB30		8-28-105-SB31		8-28-105-SB31		8-28-105-SB32		8-28-105-SB33		
	Lab ID	F0068-08A		F0068-10A		F0068-11A		F0068-12A		F0068-13A		F0068-14A		
	Sample Type	Soil		Soil		Soil		Soil		Soil		Soil		
	Sample Date	1/17/07		1/17/07		1/17/07		1/17/07		1/17/07		1/17/07		
	Sample Depth	5		6		3		6		6		6		
Acetone	mg/kg		UJ		UJ		U		U		UJ	0.0096		0.05
Bromofluorobenzene	mg/kg		U		U		U		U		U		U	---
2- Butanone	mg/kg		U		U		U		U		U		U	0.12
sec- Butylbenezene	mg/kg		U		U		U		U		U		U	11
n- Butylbenzene	mg/kg		U		U		U		U		U		U	12
Dibromofluoromethane	mg/kg		U		U		U		U		U		U	---
1,4- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.8
1,2- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.1
1,1- Dichloroethane	mg/kg		U		U		U		U		U		U	0.27
cis-1,2- Dichloroethene	mg/kg		U		U	0.0034	J		U		U		U	0.25
trans-1,2- Dichloroethene	mg/kg		U		U		U		U		U		U	0.19
Ethylbenzene	mg/kg		U		U		U		U		U		U	1
Hexachlorobutadiene	mg/kg		U		U	0.36	J		U		U		U	---
Isoproplybenzene	mg/kg		U		U		U		U		U		U	---
4- Isoproplytoulene	mg/kg		U		U		U		U		U		U	---
Methylene Chloride	mg/kg		U		U		U		U		U		U	0.05
Naphthalene	mg/kg		U		U		U		U		U		U	12
n- Proplybenzene	mg/kg		U		U		U		U		U		U	3.9
Tetrachloroethene	mg/kg		U		U	5	E	0.25	D	0.0097			U	1.3
1,1,1- Trichloroethane	mg/kg		U		U		U		U		U		U	0.68
Trichloroethene	mg/kg		U		U	0.075			U		U		U	0.47
1,2,4- Trimethylbenzene	mg/kg		U		U		U		U		U		U	3.6
1,3,5- Trimethylbenzene	mg/kg		U		U		U		U		U		U	8.4
o- Xylene	mg/kg		U		U		U		U		U		U	---
m,p- Xylenes	mg/kg	0.0045	J		U	0.0047	J	0.025	J		U		U	---
Xylenes (total)	mg/kg	0.0045	J		U	0.0047	J	0.025	J		U		U	0.26

TABLE 3-2 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL ANALYTICAL DATA - JANUARY 2007

Parameter List USEPA Method 8260B	Location ID	SB34		SB35		SB36		SB37		SB38		SB39		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (ppm)
	Sample ID	8-28-105-SB34		8-28-105-SB35		8-28-105-SB36		8-28-105-SB37		8-28-105-SB38		8-28-105-SB39		
	Lab ID	F0068-15A		F0068-16A		F0068-17A		F0068-18A		F0068-19A		F0068-20A		
	Sample Type	Soil		Soil		Soil		Soil		Soil		Soil		
	Sample Date	1/17/07		1/17/07		1/17/07		1/17/07		1/17/07		1/17/07		
	Sample Depth	8.5		7.5		6		6		6		6		
Acetone	mg/kg		UJ		UJ		U		U		U		U	0.05
Bromofluorobenzene	mg/kg		U		U		U		U		U		U	---
2- Butanone	mg/kg		U		U		U		U		U		U	0.12
sec- Butylbenezene	mg/kg		U		U		U		U		U		U	11
n- Butylbenzene	mg/kg		U		U		U		U		U		U	12
Dibromofluoromethane	mg/kg		U		U		U		U		U		U	---
1,4- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.8
1,2- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.1
1,1- Dichloroethane	mg/kg		U		U		U		U		U		U	0.27
cis-1,2- Dichloroethene	mg/kg	0.026		0.0059		0.85		0.079			U		U	0.25
trans-1,2- Dichloroethene	mg/kg		U		U	0.027	J		UJ		U		U	0.19
Ethylbenzene	mg/kg		U		U		U		U		U		U	1
Hexachlorobutadiene	mg/kg		U		U		U		U		U		U	---
Isoproplybenzene	mg/kg		U		U		U		U		U		U	---
4- Isoproplytoulene	mg/kg		U		U		U		U		U		U	---
Methylene Chloride	mg/kg		U		U		U		U		U		U	0.05
Naphthalene	mg/kg		U		U		U		U		U		U	12
n- Proplybenzene	mg/kg		U		U		U		U		U		U	3.9
Tetrachloroethene	mg/kg	0.023		0.0033	J	0.23		0.0062	J		U		U	1.3
1,1,1- Trichloroethane	mg/kg		U		U	0.095		0.0065	J		U		U	0.68
Trichloroethene	mg/kg	0.023			U	0.37		0.05			U		U	0.47
1,2,4- Trimethylbenzene	mg/kg		U		U		U	0.0094	J		U		U	3.6
1,3,5- Trimethylbenzene	mg/kg		U		U		U	0.0024	J		U		U	8.4
o- Xylene	mg/kg		U		U		U		U		U		U	---
m,p- Xylenes	mg/kg	0.004	J	0.0053	J		U	0.0041	J	0.0061	J		U	---
Xylenes (total)	mg/kg	0.004		0.0053	J		U	0.0041	J	0.0061	J		U	0.26

TABLE 3-2 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL ANALYTICAL DATA - JANUARY 2007

Parameter List USEPA Method 8260B	Location ID	SB40		SB41		SB42		SB43		SB44		SB45		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (ppm)
	Sample ID	8-28-105-SB40		8-28-105-SB41		8-28-105-SB42		8-28-105-SB43		8-28-105-SB44		8-28-105-SB45		
	Lab ID	F0069-01A		F0069-02A		F0069-03A		F0069-04A		F0069-05A		F0069-06A		
	Sample Type	Soil		Soil		Soil		Soil		Soil		Soil		
	Sample Date	1/17/07		1/17/07		1/17/07		1/17/07		1/17/07		1/17/07		
	Sample Depth	4		3 5		3 5		3.5		4		4		
Acetone	mg/kg	0.024			U	0.04		0.034			U	0.014		0.05
Bromofluorobenzene	mg/kg		U		U		U		U		U		U	---
2- Butanone	mg/kg		U		U		U		U		U		U	0.12
sec- Butylbenezene	mg/kg		U		U		U		U		U		U	11
n- Butylbenzene	mg/kg		U		U		U		U		U		U	12
Dibromofluoromethane	mg/kg		U		U		U		U		U		U	---
1,4- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.8
1,2- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1 1
1,1- Dichloroethane	mg/kg		U		U		U		U		U		U	0.27
cis-1,2- Dichloroethene	mg/kg		U		U		U		U		U		U	0.25
trans-1,2- Dichloroethene	mg/kg		U		U		UJ		U		U		U	0.19
Ethylbenzene	mg/kg		U		U		U		U		U		U	1
Hexachlorobutadiene	mg/kg		U		U		U		U		U		U	---
Isoproplybenzene	mg/kg		U		U		U		U		U		U	---
4- Isoproplytoulene	mg/kg		U		U		U		U		U		U	---
Methylene Chloride	mg/kg		U		U		U		U		U		U	0.05
Naphthalene	mg/kg		U		U		U		U		U		U	12
n- Proplybenzene	mg/kg		U		U		U		U		U		U	3.9
Tetrachloroethene	mg/kg		U		U		U		U		U		U	1.3
1,1,1- Trichloroethane	mg/kg		U		U		U		U		U		U	0.68
Trichloroethene	mg/kg		U		U		U		U		U	0.0022	J	0.47
1,2,4- Trimethylbenzene	mg/kg		U		U	0.0085	J		U		U		U	3.6
1,3,5- Trimethylbenzene	mg/kg		U		U	0.0021	J		U		U		U	8.4
o- Xylene	mg/kg		U		U	0.0023	J		U	0.0036	J		U	---
m,p- Xylenes	mg/kg	0.0052	J	0.0053	J	0.0072		0.007		0.011		0 0065		---
Xylenes (total)	mg/kg	0.0052	J	0.0053	J	0.0095		0.007		0.014		0.0065		0.26

TABLE 3-2 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL ANALYTICAL DATA - JANUARY 2007

Parameter List USEPA Method 8260B	Location ID	SB46		SB47		SB48		SB49		SB50		SB51		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (ppm)
	Sample ID	8-28-105-SB46		8-28-105-SB47		8-28-105-SB-48		8-28-105-SB49		8-28-105-SB50		8-28-105-SB51		
	Lab ID	F0069-07A		F0069-08A		F0069-09A		F0069-10A		F0069-11A		F0069-12A		
	Sample Type	Soil		Soil		Soil		Soil		Soil		Soil		
	Sample Date	1/17/07		1/17/07		1/17/07		1/17/07		1/17/07		1/17/07		
	Sample Depth	3.5		3.5		3.5		3.5		3.5		3.25		
Acetone	mg/kg	0.028		**0.054**		**0.068**		0.043		0.032		0.018		0.05
Bromofluorobenzene	mg/kg		U		U		U		U		U		U	---
2- Butanone	mg/kg		U		U	0.015		0.01			U		U	0.12
sec- Butylbenezene	mg/kg		U		U		U		U		U		U	11
n- Butylbenzene	mg/kg		U		U		U		U		U		U	12
Dibromofluoromethane	mg/kg		U		U		U		U		U		U	---
1,4- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.8
1,2- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.1
1,1- Dichloroethane	mg/kg	0.0086			U	0.0026	J		U		U		U	0.27
cis-1,2- Dichloroethene	mg/kg		U		U	0.0058	J		U		U		U	0.25
trans-1,2- Dichloroethene	mg/kg		U		UJ		U		U		U		U	0.19
Ethylbenzene	mg/kg		U		U	0.0026	J		U	0.0057	J		U	1
Hexachlorobutadiene	mg/kg		U		U		U		U		U		U	---
Isoproplybenzene	mg/kg		U		U		U		U		U		U	---
4- Isoproplytoulene	mg/kg		U		U		U		U		U		U	---
Methylene Chloride	mg/kg		U		U		U		U		U		U	0.05
Naphthalene	mg/kg		U		U		U		U		U		U	12
n- Proplybenzene	mg/kg		U		U		U		U		U		U	3.9
Tetrachloroethene	mg/kg		U		U		U		U		U		U	1.3
1,1,1- Trichloroethane	mg/kg		U		U		U		U		U		U	0.68
Trichloroethene	mg/kg	0.0035	J		U		U		U		U		U	0.47
1,2,4- Trimethylbenzene	mg/kg		U	0.0065	J		U		U		U		U	3.6
1,3,5- Trimethylbenzene	mg/kg		U	0.0014	J		U		U		U		U	8.4
o- Xylene	mg/kg	0.0026	J	0.0015	J	0.0043	J		U		U		U	---
m,p- Xylenes	mg/kg	0.0058	J	0.0049	J	0.013		0.0072		0.0059	J	0.0065	J	---
Xylenes (total)	mg/kg	0.0083		0.0064	J	0.017		0.0072		0.0059	J	0.0065	J	0.26

TABLE 3-2 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL ANALYTICAL DATA - JANUARY 2007

Parameter List USEPA Method 8260B	Location ID	SB52		SB53		SB54		SB55		DUP01		DUP02		6 NYCRR Part 375 Soil Cleanup Objectives - Unrestricted Use (ppm)
	Sample ID	8-28-105-SB52		8-28-105-SB-53		8-28-105-SB54		8-28-105-SB55 (D)		8-28-105-DUP01		8-28-105-DUP02		
	Lab ID	F0069-13A		F0069-14A		F0069-15A		F0069-16A		F0067-20A		F0069-17A		
	Sample Type	Soil		Soil		Soil		Soil		Soil		Soil		
	Sample Date	1/17/07		1/17/07		1/17/07		1/17/07		1/16/07		1/17/07		
	Sample Depth	3.25		5		6		6.5		N/A		N/A		
Acetone	mg/kg		U		U		U	0.0091			UJ		U	0.05
Bromofluorobenzene	mg/kg		U		U		U	0.052			U		U	---
2- Butanone	mg/kg		U		U		U		U		U		U	0.12
sec- Butylbenezene	mg/kg		U		U		U	1.1	J		U		U	11
n- Butylbenzene	mg/kg		UJ		UJ		UJ	2	J		U		U	12
Dibromofluoromethane	mg/kg		U		U		U	0.053			U		U	---
1,4- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.8
1,2- Dichlorobenzene	mg/kg		U		U		U		U		U		U	1.1
1,1- Dichloroethane	mg/kg		U		U		U		U		U		U	0.27
cis-1,2- Dichloroethene	mg/kg		U		U		U		U	0.012			U	0.25
trans-1,2- Dichloroethene	mg/kg		U		U		U		U		U		UJ	0.19
Ethylbenzene	mg/kg		U		U		U	0.0063			U		U	1
Hexachlorobutadiene	mg/kg		UJ		UJ		UJ	0.52	JB		U		U	---
Isoproplybenzene	mg/kg		U		U		U	0.29	E		U		U	---
4- Isoproplytoulene	mg/kg		U		U		U	1.9	J		U		U	---
Methylene Chloride	mg/kg		U		U		U	0.0012	J		U		U	0.05
Naphthalene	mg/kg		UJ		UJ		UJ	0.013	B		U		U	12
n- Proplybenzene	mg/kg		U		U		U	2.3	J		U		U	3.9
Tetrachloroethene	mg/kg		U		U		U	0.0016	J		U	0.11		1.3
1,1,1- Trichloroethane	mg/kg		U		U	0.0044	J		U		U		U	0.68
Trichloroethene	mg/kg		U		U	0.0085			U		U		U	0.47
1,2,4- Trimethylbenzene	mg/kg		U		U		U	54			UJ	0.0062	J	3.6
1,3,5- Trimethylbenzene	mg/kg		U		U		U	13			U	0.0014	J	8.4
o- Xylene	mg/kg		U		U		U	0.31	E		U		U	---
m,p- Xylenes	mg/kg	0.0038	J	0.0043	J		U	0.037		0.0038	J		U	---
Xylenes (total)	mg/kg	0.0038	J	0.0043	J		U	0.34		0.0038	J		U	0.26

TABLE 3-2 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL ANALYTICAL DATA - JANUARY 2007

Parameter List USEPA Method 8260B	Location ID	RB01		RB02	
	Sample ID	8-28-105-RB01		8-28-105-RB02	
	Lab ID	F0068-01A		F0069-19A	
	Sample Type	Water		Water	
	Sample Date	1/16/07		1/17/07	
	Sample Depth	N/A		N/A	
Acetone	ug/L		U		U
Bromofluorobenzene	ug/L		U		U
2- Butanone	ug/L		U		U
sec- Butylbenezene	ug/L		U		U
n- Butylbenzene	ug/L		U		U
Dibromofluoromethane	ug/L		U		U
1,4- Dichlorobenzene	ug/L		U		U
1,2- Dichlorobenzene	ug/L		U		U
1,1- Dichloroethane	ug/L		U		U
cis-1,2- Dichloroethene	ug/L		U		U
trans-1,2- Dichloroethene	ug/L		U		U
Ethylbenzene	ug/L		U		U
Hexachlorobutadiene	ug/L		U		U
Isoproplybenzene	ug/L		U		U
4- Isoproplytoulene	ug/L		U		U
Methylene Chloride	ug/L	20		25	
Naphthalene	ug/L		U		U
n- Proplybenzene	ug/L		U		U
Tetrachloroethene	ug/L		U		U
1,1,1- Trichloroethane	ug/L		U		U
Trichloroethene	ug/L		U		U
1,2,4- Trimethylbenzene	ug/L		U		U
1,3,5- Trimethylbenzene	ug/L		U		U
o- Xylene	ug/L		U		U
m,p- Xylenes	ug/L		U		U
Xylenes (total)	ug/L		U		U

TABLE 3-3 DETECTED VOLATILE ORGANIC COMPOUNDS SUBSURFACE SOIL ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	8-28-105-SS-1		8-28-105-SS-2		8-28-105-SS-3		8-28-105-SS-4		8-28-105-SS-4		NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives Unrestricted Use (ppm)
	Lab ID	H2600-16		H2600-05		H2600-17		H2600-14		H2600-15		
	Sample Type	Soil		Soil		Soil		Soil		Soil		
	Sample Date	12/15/2009		12/15/2009		12/15/2009		12/15/2009		12/15/2009		
	Sample Depth	4-5'		7-8'		4-6'		2-4'		4-5'		
1,1,1-Trichloroethane	ppm	(<0.0053)	U	(<0.0057)	U	0.0054		(<0.0052)	U	(<0.0061)	U	0.68
1,1,2,2-Tetrachloroethane	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
1,1,2-Trichloroethane	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
1,1-Dichloroethane	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	0.27
1,1-Dichloroethene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	0.33
1,2,4-Trimethylbenzene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	3.6
1,2-Dichlorobenzene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	1.1
1,2-Dichloroethane	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	0.02
1,3,5-Trimethylbenzene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	8.4
1,4-Dichlorobenzene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	1.8
2-Butanone	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
4-Isopropyltoluene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
4-Methyl-2-pentanone	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
Acetone	ppm	(<0.0053)	U	**0.15**		0.037		(<0.0052)	U	0.0058	J	0.05
Benzene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	0.06
Chlorobenzene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	1.1
Chloroethane	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
Chloroform	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	0.37
cis-1,2-Dichloroethene	ppm	0.0092		0.0034	J	0.012		0.0043	J	0.0039	J	0.25
Ethylbenzene	ppm	(<0.0053)	U	0.02		(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	1
Isopropylbenzene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
m,p-Xylene	ppm	(<0.0053)	U	0.0025	J	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
Methylene chloride	ppm	(<0.0053)	U	0.0032	J	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	0.05
Naphthalene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
n-Butylbenzene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	12
n-Propylbenzene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	3.9
o-Xylene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
Styrene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	—
Tetrachloroethene	ppm	0.0075		(<0.0057)	U	0.033		0.014		0.015		0.47
Toluene	ppm	0.0019	J	0.0014	J	0.0021	J	(<0.0052)	U	0.0038	J	0.7
trans-1,2-Dichloroethene	ppm	(<0.0053)	U	(<0.0057)	U	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	0.19
Trichloroethene	ppm	0.01		(<0.0057)	U	0.041		0.018		0.025		0.47
Vinyl chloride	ppm	(<0.0053)	U	(<0.0057)	U	(<0.001)	U	(<0.0052)	U	(<0.0061)	U	0.02
Xylene (Total)	ppm	(<0.0053)	U	0.0025	J	(<0.0052)	U	(<0.0052)	U	(<0.0061)	U	0.26
Total VOCs	ppm	0.0268		0.183		0.1305		0.0363		0.0535		

NOTE:
USEPA = United States Environmental Protection Agency
ID = Identification
NYSDEC = New York State Department of Environmental Conservation
NYCRR = New York Code of Rules and Regulations
ppm = Parts per million
U = Non-detect, detection below the method detection limit
— =
J = Reported value is an estimate.
VOC = Volatile Organic Compound
Data provided by Mitkem. Only analytes that were detected in at least one sample are shown.
Data validation completed by Environmental Data Validations, Inc
Concentration values in bold indicate that analyte was detected above the NYSDEC Soil Cleanup Objective
Duplicate sample collected at SS-06

TABLE 3-3 DETECTED VOLATILE ORGANIC COMPOUNDS SUBSURFACE SOIL ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	8-28-105-SS-5		8-28-105-SS-6		8-28-105-SS-6		8-28-105-SS-6		8-28-105-SS-6		NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives Unrestricted Use (ppm)
	Lab ID	H2600-13		H2600-12		H2600-09		H2600-11		H2600-08		
	Sample Type	Soil		Soil		Soil		Soil		Soil		
	Sample Date	12/15/2009		12/15/2009		12/15/2009		12/15/2009		12/15/2009		
	Sample Depth	6-7'		4-2'		2-4'		4-6'		6-8'		
1,1,1-Trichloroethane	ppm	(<0.0063)	U	0.0025	J	(<0.0066)	U	0.0022	J	4.9		0.68
1,1,2,2-Tetrachloroethane	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.0087		---
1,1,2-Trichloroethane	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.0079		---
1,1-Dichloroethane	ppm	0.17		(<0.0065)	U	(<0.0066)	U	0.0011	J	(<3.7)	UD	0.27
1,1-Dichloroethene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.085		0.33
1,2,4-Trimethylbenzene	ppm	(<0.0063)	U	0.0075		0.0032	J	0.0041	J	0.047		3.6
1,2-Dichlorobenzene	ppm	(<0.0063)	U	0.0025	J	0.0014	J	0.0013	J	0.0064		1.1
1,2-Dichloroethane	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.0076		0.02
1,3,5-Trimethylbenzene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.013		8.4
1,4-Dichlorobenzene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.0019		1.8
2-Butanone	ppm	(<0.0063)	U	7.1	D	1.6	JD	9.1	D	12		---
4-Isopropyltoluene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.0029		---
4-Methyl-2-pentanone	ppm	(<0.0063)	U	(<3.0)	UD	0.11		(<3.1)	UD	1.6	JD	---
Acetone	ppm	0.0093		**61**	D	**25**	D	**60**	D	62		0.05
Benzene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.0057		0.06
Chlorobenzene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	(<0.0057)	U	1.1
Chloroethane	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	(<0.0057)	U	---
Chloroform	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.0052	J	0.37
cis-1,2-Dichloroethene	ppm	0.042		(<3.0)	UD	0.0058	J	**37**		56	D	0.25
Ethylbenzene	ppm	0.0048	J	**6.3**	J	(<0.0066)	U	**10**		6.4		1
Isopropylbenzene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.023		---
m,p-Xylene	ppm	0.15		0.054		0.013		0.078		41		---
Methylene chloride	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	0.0019	J	0.011		0.05
Naphthalene	ppm	(<0.0063)	U	0.0056	J	0.0036	J	0.0017	J	0.0094		---
n-Butylbenzene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.0036	J	12
n-Propylbenzene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.013		3.9
o-Xylene	ppm	0.0062	J	0.039		0.0095		0.042		10		---
Styrene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.035		---
Tetrachloroethene	ppm	(<0.0063)	U	0.023		0.004	J	0.022		0.18		0.47
Toluene	ppm	0.1		0.035		0.0092		0.1		120		0.7
trans-1,2-Dichloroethene	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	0.031		0.19
Trichloroethene	ppm	(<0.0063)	U	0.013		0.0037	J	0.014		0.12		0.47
Vinyl chloride	ppm	(<0.0063)	U	(<0.0065)	U	(<0.0066)	U	(<0.0046)	U	(<0.0057)	U	0.02
Xylene (Total)	ppm	0.15		0.092		0.022		0.12		51		0.26
Total VOCs	ppm	0.6323		74.6804		26.7854		116.4883		365.5173		

NOTE: D = Dilution

TABLE 3-3 DETECTED VOLATILE ORGANIC COMPOUNDS SUBSURFACE SOIL ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	8-28-105-SS-7		8-28-105-SS-9		8-28-105-SS-10		8-28-105-SS-11		8-28-105-SS-12		NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives Unrestricted Use (ppm)
	Lab ID	H2600-06		H2600-10		H2600-01		H2600-02		H2600-01		
	Sample Type	Soil		Soil		Soil		Soil		Soil		
	Sample Date	12/16/2009		12/16/2009		12/16/2009		12/16/2009		12/16/2009		
	Sample Depth	2-4'		4-5'		2-4'		6-8'		5-6'		
1,1,1-Trichloroethane	ppm	0.13		0.028		0 0051	J	0.0034	J	0.0025	J	0.68
1,1,2,2-Tetrachloroethane	ppm	(<0.0056)	U	(<0.0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	---
1,1,2-Trichloroethane	ppm	(<0.0056)	U	(<0.0052)	U	(<0 0063)	U	(<0.0066)	U	(<0.0049)	U	---
1,1-Dichloroethane	ppm	0.021		0.08		0.0031	J	0.003	J	0.0023	J	0.27
1,1-Dichloroethene	ppm	0.0073		0.0025	J	(<0 0063)	U	(<0.0066)	U	(<0.0049)	U	0.33
1,2,4-Trimethylbenzene	ppm	(<0.0056)	U	(<0.0052)	U	(<0 0063)	U	(<0.0066)	U	(<0.0049)	U	3.6
1,2-Dichlorobenzene	ppm	(<0.0056)	U	(<0.0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	1.1
1,2-Dichloroethane	ppm	(<0.0056)	U	(<0.0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	0.02
1,3,5-Trimethylbenzene	ppm	(<0.0056)	U	(<0.0052)	U	(<0 0063)	U	(<0.0066)	U	(<0.0049)	U	8.4
1,4-Dichlorobenzene	ppm	(<0 0056)	U	(<0 0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	1.8
2-Butanone	ppm	(<0 0056)	U	1.8	J	(<0.0063)	U	(<0.0066)	U	1		---
4-Isopropyltoluene	ppm	(<0 0056)	U	(<0 0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	---
4-Methyl-2-pentanone	ppm	(<0 0056)	U	0.0061		(<0.0063)	U	(<0.0066)	U	0.06		---
Acetone	ppm	0.027		14		0.046		0.013		5.5	D	0.05
Benzene	ppm	(<0 0056)	U	(<0.0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	0.06
Chlorobenzene	ppm	(<0 0056)	U	(<0 0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	1.1
Chloroethane	ppm	(<0.0056)	U	0.0038	J	0.0076		(<0.0066)	U	(<0.0049)	U	---
Chloroform	ppm	(<0.0056)	U	(<0.0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	0.37
cis-1,2-Dichloroethene	ppm	0.034		(<3.9)	UD	0.048		0.047		0.027		0.25
Ethylbenzene	ppm	(<0.0056)	U	0.0038	J	(<0.0063)	U	(<0.0066)	U	0.0014	J	1
Isopropylbenzene	ppm	(<0.0056)	U	(<0.0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	---
m,p-Xylene	ppm	0.0036	J	0.018		(<0.0063)	U	(<0.0066)	U	0.012		---
Methylene chloride	ppm	0.0023	J	0.0016	J	0.0016	J	0.0022	J	0.0012	J	0.05
Naphthalene	ppm	(<0.0056)	U	(<0.0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	---
n-Butylbenzene	ppm	(<0.0056)	U	(<0.0052)	U	(<0.0063)	U	(<0.0066)	U	(<0 0049)	U	12
n-Propylbenzene	ppm	(<0.0056)	U	(<0.0052)	U	(<0 0063)	U	(<0.0066)	U	(<0 0049)	U	3.9
o-Xylene	ppm	(<0.0056)	U	0.0068		(<0 0063)	U	(<0.0066)	U	0.0023	J	---
Styrene	ppm	(<0.0056)	U	(<0.0052)	U	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	---
Tetrachloroethene	ppm	0.0098		0.023		(<0.0063)	U	0.014		0.0072		0.47
Toluene	ppm	0.066		0.15		0.0069		0.0049	J	0.05		0.7
trans-1,2-Dichloroethene	ppm	(<0.0056)	U	0.0021	J	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	0.19
Trichloroethene	ppm	0.023		0.096		(<0.0063)	U	0.048		0.026		0.47
Vinyl chloride	ppm	(<0.0056)	U	0.0014	J	(<0.0063)	U	(<0.0066)	U	(<0.0049)	U	0.02
Xylene (Total)	ppm	0.0036	J	0.024		(<0.0063)	U	(<0.0066)	U	0.014		0.26
Total VOCs	ppm	0.3276		16.2471		0.1183		0.1355		6.7059		

TABLE 3-3 DETECTED VOLATILE ORGANIC COMPOUNDS SUBSURFACE SOIL ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	8-28-105-SUMP1		8-28-105-SS-DUPLICATE		NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives Unrestricted Use (ppm)
	Lab ID	H2600-04		H2600-07		
	Sample Type	Soil		Soil		
	Sample Date	12/15/2009				
	Sample Depth	2-4'				
1,1,1-Trichloroethane	ppm	**9.5**		**1.1**	JD	0.68
1,1,2,2-Tetrachloroethane	ppm	(<9.1)	U	0.026	U	---
1,1,2-Trichloroethane	ppm	(<9.1)	U	(<.026)	U	---
1,1-Dichloroethane	ppm	(<9.1)	U	0.13		0.27
1,1-Dichloroethene	ppm	(<9.1)	U	0.089		0.33
1,2,4-Trimethylbenzene	ppm	(<9.1)	U	0.14		3.6
1,2-Dichlorobenzene	ppm	(<9.1)	U	0.028		1.1
1,2-Dichloroethane	ppm	(<9.1)	U	0.0098		0.02
1,3,5-Trimethylbenzene	ppm	(<9.1)	U	0.036		8.4
1,4-Dichlorobenzene	ppm	(<9.1)	U	0.0084		1.8
2-Butanone	ppm	(<9.1)	U	8.8	D	---
4-Isopropyltoluene	ppm	(<9.1)	U	(<.026)	U	---
4-Methyl-2-pentanone	ppm	(<9.1)	U	0.97	JD	---
Acetone	ppm	(<9.1)	U	**62**	D	0.05
Benzene	ppm	(<9.1)	U	(<.026)	U	0.06
Chlorobenzene	ppm	(<9.1)	U	0.0068	J	1.1
Chloroethane	ppm	(<9.1)	U	(<.026)	U	---
Chloroform	ppm	(<9.1)	U	(<.026)	U	0.37
cis-1,2-Dichloroethene	ppm	**40**		**9.8**	D	0.25
Ethylbenzene	ppm	(<9.1)	U	**2.8**	D	1
Isopropylbenzene	ppm	(<9.1)	U	0.066		---
m,p-Xylene	ppm	96		21	D	---
Methylene chloride	ppm	(<9.1)	U	0.025	J	0.05
Naphthalene	ppm	(<9.1)	U	0.031		---
n-Butylbenzene	ppm	(<9.1)	U	0.017	J	12
n-Propylbenzene	ppm	(<9.1)	U	0.038		3.9
o-Xylene	ppm	(<9.1)	U	5.2	D	---
Styrene	ppm	(<9.1)	U	(<.026)	U	---
Tetrachloroethene	ppm	**170**		**2.6**	D	1.3
Toluene	ppm	**240**		**44**	D	0.7
trans-1,2-Dichloroethene	ppm	(<9.1)	U	(<.026)	U	0.19
Trichloroethene	ppm	**150**		0.2		0.47
Vinyl chloride	ppm	(<9.1)	U	(<.026)	U	0.02
Xylene (Total)	ppm	**96**		**26**	D	0.26
Total VOCs	ppm	801.5		185.121		

TABLE 3-4 DETECTED VOLATILE ORGANIC COMPOUNDS SUBSURFACE SOIL TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8260B	Sample ID	TP-1		TP-1		TP-2		TP-5		TP-7		TP-DUPLICATE		NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives Unrestricted Use (ppm)
	Lab ID	J0894-01		J0894-02		J0894-03		J0894-04		J0894-05		J0894-07		
	Sample Type	Soil		Soil		Soil		Soil		Soil		Soil		
	Sample Date	4/26/2010		4/26/2010		4/26/2010		4/26/2010		4/27/2010		4/26/2010		
	Sample Depth	1-3'		2-6'		1-5'		1-4'		3-5'				
1,1,2,2-Tetrachloroethane	ppm	0.0021	U	(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	(<0.0059)	U	---
1,2,4-Trimethylbenzene	ppm	0.0027	J	1		**31**	J	(<0.0056)	U	(<0.0064)	U	**6.1**	D	3.6
1,3,5-Trimethylbenzene	ppm	0.0026	J	0.3		7.6		(<0.0056)	U	(<0.0064)	U	1.4	D	8.4
2-Chlorotoluene	ppm	0.0039	J	(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	(<0.0059)	U	---
4-Isopropyltoluene	ppm	(<0.0064)	U	0.086	J	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	0.063		---
Acetone	ppm	0.0073	J	(<0.290)	R	(<1.7)	R	0.006	J	(<0.0064)	R	0.014	J	0.05
Chlorobenzene	ppm	0.0029	J	(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	(<0.0059)	U	1.1
Ethylbenzene	ppm	**5.5**	D	(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	(<0.0059)	U	1
Isopropylbenzene	ppm	0.019		(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	0.036		---
m,p-Xylene	ppm	23	D	(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	0.0043	J	---
Naphthalene	ppm	0.0068		0.12	J	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	(<0.0059)	U	---
n-Butylbenzene	ppm	(<0.0064)	U	0.074	J	1.6	J	(<0.0056)	U	(<0.0064)	U	0.052	J	12
n-Propylbenzene	ppm	0.006	J	0.067	J	1.3	J	(<0.0056)	U	(<0.0064)	U	0.13	J	3.9
o-Xylene	ppm	4.4	D	(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	0.014		---
sec-Butylbenzene	ppm	(<0.0064)	U	(<0.290)	U	0.9	J	(<0.0056)	U	(<0.0064)	U	0.035		11
Tetrachloroethene	ppm	0.017	D	(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	(<0.0059)	U	0.47
Toluene	ppm	**0.76**	D	(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	(<0.0059)	U	0.7
Trichloroethene	ppm	0.0024	J	(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	(<0.0059)	U	0.47
Xylene (Total)	ppm	**28**	D	(<0.290)	U	(<1.7)	U	(<0.0056)	U	(<0.0064)	U	0.018	B	0.26
Total VOCs	ppm	61.73		1.71		42.4		0.006		0		7.87		

NOTE:
USEPA = United States Enivronmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
NYCRR = New York Code of Rules and Regulations
ppm = Parts per million
U = Non-detect, detection below the method detection limit
--- =
J = Reported value is an estimate.
D = Dilution
Data provided by Mitkem. Only analytes that were detected in at least one sample are shown.
Data validation completed by Environmental Data Validations, Inc.
Concentration values in **bold** indicate that analyte was detecetd above the NYSDEC Soil Cleanup Objective.
Duplicate sample collected at TP-2 (1-5').

TABLE 3-4 DETECTED SEMIVOLATILE ORGANIC COMPOUNDS SUBSURFACE SOIL TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 8270	Sample ID	TP-1		TP-1		TP-5		TP-DUPLICATE2		NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives Unrestricted Use (ppm)
	Lab ID	J0894-01		J0894-02		J0894-04		J0894-07		
	Sample Type	Soil		Soil		Soil		Soil		
	Sample Date	4/26/2010		4/26/2010		4/26/2010		4/26/2010		
	Sample Depth	1-3'		2-6'		1-4'				
2-Methylnaphthalene	ppm	0.09	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	---
Acenaphthylene	ppm	0.042	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	100
Anthracene	ppm	0.26	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	100
Benzo (a) anthracene	ppm	0.42		(<0.400)	U	(<0.380)	U	(<0.380)	U	1
Benzo (b) fluoranthene	ppm	0.41	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	1
Benzo (g,h,i) perylene	ppm	0.32	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	100
Benzo (k) fluoranthene	ppm	0.34	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	0.8
Bis (2-ethylhexyl) phthalate	ppm	0.49	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	---
Chrysene	ppm	0.45	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	1
Dibenzo (a,h) anthracene	ppm	0.064	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	0.33
Dibenzofuran	ppm	0.14	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	---
Fluoranthene	ppm	1	J	(<0.400)	U	(<0.380)	U	0.042	J	100
Fluorene	ppm	0.2	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	30
Indeno (1,2,3-cd) pyrene	ppm	0.3	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	0.5
Naphthalene	ppm	0.12	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	12
Phenanthrene	ppm	1.1	J	(<0.400)	U	(<0.380)	U	(<0.380)	U	100
Pyrene	ppm	1.1	J	(<0.400)	U	(<0.380)	U	0.045	J	100
Total SVOCs	ppm	6.846		0		0		0.087		

TABLE 3-4 DETECTED METALS SUBSURFACE SOIL TEST PIT ANALYTICAL DATA

Parameter List USEPA Method 6010	Sample ID	TP-1		TP-1		TP-5		TP-DUPLICATE2		NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives Unrestricted Use (ppm)
	Lab ID	J0894-01		J0894-02		J0894-04		J0894-07		
	Sample Type	Soil		Soil		Soil		Soil		
	Sample Date	4/26/2010		4/26/2010		4/26/2010		4/26/2010		
	Sample Depth	1-3'		2-6'		1-4'				
Aluminum	ppm	6,450	J	6,740	J	5,480	J	5,110	J	---
Antimony	ppm	0.18	UJ	0.14	UJ	0.18	UJ	0.17	UJ	---
Arsenic	ppm	4.4		3.9		4.2		3		13
Barium	ppm	40.6	J	58.7	J	44.1	J	40.3	J	350
Beryllium	ppm	0.36	J	0.59	J	0.42	J	0.32	J	7.2
Cadmium	ppm	0.16	J	0.23		0.13	J	0.11	J	2.5
Calcium	ppm	54,700		2,160		30,200		40,900		---
Chromium	ppm	6.3	J	10.7	J	6.7	J	5.8	J	30
Cobalt	ppm	5.7	J	4	J	3.7	J	3.4	J	---
Copper	ppm	19		7.2		9.7		8.8		50
Iron	ppm	12,700	J	25,200	J	14,300	J	10,800	J	---
Lead	ppm	25.8	J	8.3	J	7.7	J	5.8	J	63
Magnesium	ppm	8,490	J	1,690	J	11,700	J	11,500	J	---
Manganese	ppm	575	J	89.8	J	294	J	336	J	1,600
Mercury	ppm	0.076		0.043	J	0.043		0.0056	U	0.18
Nickel	ppm	11.6	J	8.3	J	7.1	J	6.8	J	30
Potassium	ppm	1,200	J	357	J	305	J	303	J	---
Selenium	ppm	1.3	J	0.61	U	1.3	J	1.1	J	3.9
Silver	ppm	0.081	U	0.062	U	0.077	U	0.075	U	2
Sodium	ppm	92.6	J	43.2	J	101	J	107	J	---
Thallium	ppm	0.29	J	0.19	U	0.23	U	0.23	U	---
Vanadium	ppm	12.9	J	37.6	J	18.7	J	13.8	J	---
Zinc	ppm	40.2	J	20.2	J	17.2	J	15.3	J	109

TABLE 3-5 DETECTED VOLATILE ORGANIC COMPOUNDS SOIL VAPOR ANALYTICAL DATA - FEBRUARY 2008

Parameter List USEPA Method TO-15	Location ID	SV-01		SV-02		SV-03		SV-04	
	Sample ID	8-28-105-SV01		8-28-105-SV02		8-28-105-SV03		8-28-105-SV04	
	Lab ID	08BO6746		08BO6747		08BO6748		08BO6749	
	Sample Type	Soil Vapor		Soil Vapor		Soil Vapor		Soil Vapor	
	Sample Date	2/26/2008		2/26/2008		2/26/2008		2/26/2008	
	Sample Depth	11.5 - 12 ft bgs		11.5 - 12 ft bgs		9.5 - 10 ft bgs		9.5 - 10 ft bgs	
Acetone	µg/m3	82.0		6.10		14.0		8.0	
Benzene	µg/m3	1.20		0.80		1.10			U
Bromodichloromethane	µg/m3	2.90		0.68			U	3.60	
2- Butanone	µg/m3	8.10		2.10		2.20		3.30	
Carbon Disulfide	µg/m3	1.60			U		U		U
Carbon Tetrachlorde	µg/m3	1.30			U		U	1	
Chloroethane	µg/m3	160		1.80		0.55		2.10	
Chloroform	µg/m3	19.0		5.10		3.20		19	
Cyclohexane	µg/m3	1.0			U		U		U
Dichlorodifluoromethane (CFC-12)	µg/m3	2.50		2.30		2.40		2.30	
1,1- Dichloroethane	µg/m3	3,100		94 0		8.80		51.0	
1,1- Dichloroethene	µg/m3	100		2.60		0.86		4.90	
cis-1,2- Dichloroethene	µg/m3	4,800		220		86.0		580	
trans-1,2- Dichloroethene	µg/m3	17.0		0.69			U	1.10	
Ethanol	µg/m3	10.0			U		U		U
Ethyl Acetate	µg/m3		U		U		U		U
4- Ethyl Toluene	µg/m3	0.67			U		U		U
Ethylbenzene	µg/m3	3.20			U	0.49			U
Hexane	µg/m3	1.30		0.60		0.75		0.42	
2- Hexanone	µg/m3		U		U		U	0.55	
Isopropyl Alcohol	µg/m3	16.0		6.50		7.30		14.0	
Methyl Tert Butyl Ether (MTBE)	µg/m3		U		U		U		U
4- Methyl-2-Pentanone	µg/m3		R		R		R		R
Methylene Chloride	µg/m3		U		U		U		U
N-Heptane	µg/m3	0.70			U		U		U
Tetrachloroethene	µg/m3	21.0			U		U		
Tetrahydrofuran	µg/m3	9.50			U		U		
Toluene	µg/m3	23.0		1.60		2.30		1.30	
1,1,1- Trichloroethene	µg/m3	1,700		37.0		21.0		140	
Trichloroethene	µg/m3	190		22.0		5.40		35.0	
Trichlorofluoromethane (CFC-11)	µg/m3	1.10		1.10		1.10		1.20	
Trichlorotrifluoroethane	µg/m3	6.80		0.81			U		U
1,2,4- Trimethylbenzene	µg/m3	2.90			U	0.52			U
1,3,5- Trimethylbenzene	µg/m3	1.10			U	0.50	U		U
Vinyl Chloride	µg/m3	110		9.20			U	0.90	
o- Xylenes	µg/m3	3.30			U	0.56			U
m/p- Xylenes	µg/m3	10.0		0.99		1.50			U

NOTE: USEPA = United States Environmental Protection Agency
ft bgs = feet below ground surface.
µg/m3 = micrograms per cubic meter
U = The analyte was analyzed for, but was not detected above the sample reporting limit.
R = Analytical data was rejected.
Analytical data results provided by Con-Test Laboratories. Data Validation completed by Environmental Data Validation, Inc.

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Job. No. 1436807	Client: NYSDEC		Location: ACSF
Drilling Method:	0-5' 6.25 ID HSA / 5-6.5' Roller Bit / 6.5-20.3' HQ Core		Well Number: MW-06
Sampling Method:			Sheet 1 of 1

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Water Lev.	DTW =	BOW =	(from top of PVC)	Drilling Start	Drilling Finish
Time				5/22/2007	5/24/2007
Date					

Surface Conditions: Grass
Weather: Sunny
Temperature: 75°

Blow Counts (140-lb)	Feet Drvn/Ft Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
				0		0-5' Brown-black sandy silt, weathered odor, moist, loose non-cohesive, very rocky (golfball-baseball size cobbles)
				1		
				2		
				3		Perched water at 3'
				4		
				5		Top of bedrock at 5'
				6		6.75' Small fracture
				7		7.25' Small fracture
				▼		7.5' Fracture / Water @ 7.81 on 5/29/07
				8		
				9		
				10		10.5' Small fracture
				11		
				12		12' Small fracture
				13		
				14		14.25' Small fracture 14.5' Small fracture
				15		15' Small fracture
				16		16.5' Fracture
				17		
				18		
				19		19.5' Fracture
				20		5-20' Gray dolostone
				21		
				22		
				23		
				24		
				25		
				26		
				27		
				28		

Well Specifications:

Diam. of riser:	2"	Screen Interval:	10-20'	Sand pack:	8-20'	Grout:	N/A
BOH:	20.3'	Riser Interval:	.5-10'	Bentonite:	5-8'	Cover:	Flush

Driller Information

Logged by:	Kris Charney	Date:	5/22-24/2007
Drilling Contractor:	Aztech Technologies	Driller:	Chris DiNovo

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Job. No. 1436807	Client: NYSDEC		Location: ACSF
Drilling Method:	0-5' 6.25 ID HSA / 5-6.5' Roller Bit / 6.5-35' HQ Core		Well Number: MW-06I
Sampling Method:			Sheet 1 of 2
Coordinates:			
Surface Elevation:			Drilling
Casing Below Surface:	Water Lev. DTW = BOW = (from top of PVC)		Start: 5/22/2007 Finish: 5/24/2007
Reference Elevation:	Time		
Reference Description:	Date		

Surface Conditions: Grass
Weather: Sunny
Temperature: 75°

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
				0		0-5' Brown sandy silt, moist, loose non-cohesive, very rocky (golfball-baseball size cobbles)
				1		
				2		
				3		Perched water at 3'
				4		
				5		Top of bedrock at 5', weathered
				6		
				7		7' Small fracture / 7.25' Small fracture
						7.5' Small fracture / 7.75' Small fracture
				8		8' Small fracture / 8.25' Small fracture
						8.5' Small fracture
				9		9' Small fracture
						9.5' Small fracture
				10		10' Small fracture
						10.5' Small fracture
				11		
				12		
						12.5' Small fracture
				13▼		Water @ 13.07' on 5/29/07
						13.5' Small fracture
				14		14' Small fracture
						14.5' Small fracture
				15		
				16		
				17		
				18		
				19		19.25' Small fracture
				20		20' Small fracture
						20.5' Small fracture
				21		
						21.5' Small fracture
				22		
				23		
				24		
				25		25' Small fracture
				26		26' Small fracture
				27		
						27.5' Rock core becomes finer grained
				28		

Well Specifications:

Diam. of riser:	2"	Screen Interval:	25-35'	Sand pack:	23-35'	Grout:	N/A
BOH:	35.3'	Riser Interval:	.5-25'	Bentonite:	19-23'	Cover:	Flush

Driller Information

Logged by:	Kris Charney	Date:	5/22-24/2007
Drilling Contractor:	Aztech Technologies	Driller:	Chris DiNovo

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location
1436807	NYSDEC	ACSF
Drilling Method:	0-5' 6.25 ID HSA / 5-6.5' Roller Bit / 6.5-35' HQ Core	Well Number: MW-06I
Sampling Method:		Sheet 2 of 2

Water Lev.	DTW =	BOW =	(from top of PVC)	Drilling Start	Drilling Finish
Time				5/22/2007	5/24/2007
Date					

Surface Conditions: Grass
Weather: Sunny
Temperature: 75°

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
				29		
				30		30' Small silt filled fracture
				31		
				32		31.5' Small silt filled fracture 32' Weathered petroleum odor / Small silt filled fracture 32.75' Small silt filled fracture
				33		
				34		33.5' Small silt filled fracture
				35		5-35' Gray dolostone
				36		
				37		
				38		
				39		
				40		
				41		
				42		
				43		
				44		
				45		
				46		
				47		
				48		
				49		
				50		
				51		
				52		
				53		
				54		
				55		
				56		
				57		

Well Specifications:

Diam. of riser:	2"	Screen Interval:	25-35'	Sand pack:	23-35'	Grout:	N/A
BOH:	35.3'	Riser Interval:	.5-25'	Bentonite:	19-23'	Cover:	Flush

Driller Information

Logged by:	Kris Charney	Date:	5/22-24/2007
Drilling Contractor:	Aztech Technologies	Driller:	Chris DiNovo

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location
1436807	NYSDEC	ACSF
Drilling Method:	0-5.5' 6.25 ID HSA / 5.5-7' Roller Bit / 7-19.5' HQ Core	Well Number: MW-11
Sampling Method:		Sheet 1 of 1

Water Lev.	DTW =	BOW =	(from top of PVC)	Drilling Start	Drilling Finish
Time				5/23/2007	5/30/2007
Date					

Surface Conditions: Gravel
Weather: Sunny
Temperature: 85°

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	
				0		0-2.5' Brown sandy silt, loose unconsolidated
				1		
				2		2.5' Large cobble (softball size)
				3		3' Moist
				4		
				5		5.5' Top of bedrock
				6		
				7		7.25' Small fracture / 7.3' Small fracture / 7.4' Small fracture
						7.5' Small fracture / 7.6' Small fracture / 7.75' Small fracture / 7.9' Small fracture
				8		8' Small fracture
				9		8.5' Small fracture / 8.75' Small fracture
						9' Loss of water / 9.25' Small fracture
				10		9.5' Small fracture / 9.75' Small fracture
						10.25' Small fracture
				11▼		10.75' Small fracture
						11' Small fracture / 11.25' Small fracture / Water @ 11.46' on 6/1/07
				12		11.5' Small fracture
				13		
				14		14' Small fracture / 14.25' Small fracture
						14.5' Small fracture / 14.75' Small fracture / Loss of water
				15		
				16		15.5' Small fracture
				17		17.25' Small fracture
				18		
				19		
						5.5-19.5' Gray dolostone
				20		
				21		
				22		
				23		
				24		
				25		
				26		
				27		
				28		

Well Specifications:

Diam. of riser:	2"	Screen Interval:	9.5-19.5'	Sand pack:	8.5-19.5'	Grout:	N/A
BOH:	19.5'	Riser Interval:	0-9.5'	Bentonite:	4.5-8.5'	Cover:	Flush

Driller Information

Logged by:	Kris Charney	Date:	5/23-30/2007
Drilling Contractor:	Aztech Technologies	Driller:	Chris DiNovo

EA Engineering, P.C.
EA Science and Technology

LOG OF SOIL BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Description:

Job. No.	Client:	Location
1436807	NYSDEC	ACSF
Drilling Method:	0-6' 6.25 ID HSA / 6-9' Roller Bit / 9-19.5' HQ Core	Well Number: MW-12
Sampling Method:		Sheet 1 of 1

Water Lev.	DTW =	BOW =	(from top of PVC)	Drilling Start	Drilling Finish
Time				5/23/2007	5/29/2007
Date					

Blow Counts (140-lb)	Feet Drvn/Ft. Recvrd	Well Diagram	PID (ppm) HNu	Depth in Feet	USCS Log	Surface Conditions: Gravel Weather: Sunny Temperature: 85°
				0		0-6' Brown sandy silt, loose unconsolidated, cobbles (golfball size)
				1		
				2		
				3		
				4		
				5		
				6		6' Top of bedrock
				7		
				8		
				9		9.25' Small fracture
						9.5' Small fracture / 9.75' Small fracture
				10▼		10' Small fracture / Water @ 10.17' on 5/31/07
						10.5' Small fracture / 10.75' Small fracture
				11		11' Small fracture / 11.25' Small fracture
						11.75' Small fracture
				12		12.25' Small fracture
				13		13' Small fracture / 13.25' Small fracture
						13.5' Small fracture
				14		
						14.5' Small fracture
				15		15' Small fracture
						15.75' Small fracture
				16		
				17		
				18		
				19		
						6-19.5' Gray dolostone
				20		
				21		
				22		
				23		
				24		
				25		
				26		
				27		
				28		

Well Specifications:

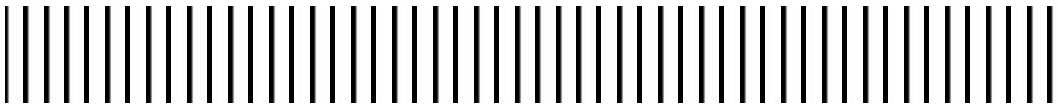
Diam. of riser:	2"	Screen Interval:	9.5-19.5'	Sand pack:	8.5-19.5'	Grout:	N/A
BOH:	19.5'	Riser Interval:	.5-9.5'	Bentonite:	4.5-8.5'	Cover:	Flush

Driller Information

Logged by:	Kris Charney	Date:	5/23-29/2007
Drilling Contractor:	Aztech Technologies	Driller:	Chris DiNovo

Abandoned Chemical Sales Facility
Rochester, New York

Work Plan
Appendix F



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Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m^3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m^3 or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Special Requirements for Indoor Work With Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under "Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures" except that in this instance "nearby/occupied structures" would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

SPEC 00002
Concrete

Table of Contents

SECTION X - Standard Specifications

SPEC 00002
Concrete

1) ***General***

1.1 Scope of Work

a) The Contractor shall furnish all labor, materials, equipment, and incidentals needed for the cast-in-place and/or precast concrete required by the Contract Documents and as herein specified.

1.2 Submittals

a) Cast-in-place concrete.

1) Name and location of batch plant.

2) Design mix.

3) Shop drawings indicating placement of all reinforcing inserts, location of joints, sealing of joints, etc.

4) Submittal on grating and frame.

b) Precast concrete

1) Name and location of precaster.

2) Submittals of precast units.

3) Certifications of design for loading.

4) Submittal on manhole frame and cover.

1.3 Quality Assurance

a) Codes and Standards

1) Comply with the provisions of the following codes and standards, except as otherwise shown or specified:

a) ACI 301 - "Specifications for Structural Concrete for Buildings."

b) ACI 318 - "Building Code Requirements for Reinforced Concrete."

c) CRSI - "Manual of Standard Practice."

d) ACI 305 - "Recommended Practice for Hot Weather Concreting."

2) Where provisions of the above codes and standards are in conflict with the building code in force for the project, the more stringent code shall apply.

2) *Products*

2.1 Cast-In-Place Concrete

a) Portland Cement - ASTM C 150, Type III.

b) Aggregates - ASTM C 33

1) Fine aggregates - clean, sharp, natural sand free of dune sand, bank run sand, manufactured sand, loam, clay, etc.

2) Coarse aggregate - clean processed natural limestone free of all foreign matter.

c) Water - clean, fresh, free of all oils, acids organics, etc.

d) Admixtures.

1) Air-Entraining - ASTM C 260.

2) Water-Reducing - ASTM C 494.

3) Floor sealer - Sonoglaze is manufactured by Sonneborn Building Products or similar product by Master Builders.

e) Concrete Qualifiers.

1) Concrete mix shall be DOT Class E.

2) Strength - 4,000 psi at twenty-eight (28) days with maximum water-cement ratio of 0.45.

3) Air content - 6 percent.

4) Slump limits - 3-4 inch.

f) Reinforcing

1) Bars - ASTM A615, Grade 40.

2) Welded Wire Fabric - ASTM A185.

g) Frame and Grating - (Reteculine)

1) The frames, gratings, and appurtenances shall be fabricated from steel conforming to ASTM A36.
2) All parts shall be galvanized according to the requirements of the NYSDOT 719-01 type 1.

3) Grating shall be provided with lock down bolt anchors.

h) Waterstops

1) Waterstops to be 6" PVC dumbbell style, made of virgin raw materials.

2) Waterstops shall be #747 as manufactured by Greenstreak, #8046 as manufactured by Vulcan Metal Products, Inc., or equal.

2.2 **Precast Concrete Units**

a) Precast concrete units shall be of sizes shown and built in accordance with ASTM standards C913-89. Units to be designated to withstand H-20 loading.

b) Manhole cover and frame shall conform to NYSDOT Standard 715-05, Class No. 30. Units shall be supplied with lock down device.

3) *Execution*

3.1 **Concrete Placement**

a) General - Place concrete in compliance with the practices and recommendations of ACI-304, and herein specified.

b) Deposit and consolidate concrete slabs in a continuous operation, within the limits of construction joints, until the placing of a panel or section is complete. In the event that the slab is placed in two sections, the sections shall have continuous waterstops.

c) Consolidate concrete during placing operations using mechanical vibrating equipment, so that concrete is thoroughly worked around reinforcing and other embedded items and into corners.

d) Bring slab surfaces to the correct level with a straight edge strike off. Use bull floats or darbies to smooth the surface, leaving it free of humps or hollows.

3.2 **Cold Weather Placing**

a) Protect all concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures.

b) When air temperature has fallen to or is expected to fall below 40E F, uniformly heat all water and aggregate before mixing, to obtain a mixture temperature of not less than 50E F and not more than 80E F at point of placement.

c) Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators.

3.3 **Monolithic Slab Finish**

a) Begin float finishing when surface water has disappeared or when concrete has stiffened sufficiently to permit the operation of a power-driven float. Check surface plane to a tolerance not to exceed 1/4 inch in 10 feet, with uniform slopes to drains.

b) Begin the final toweling when the surface produces a ringing sound as the trowel is moved over the surface.

3.4 **Concrete Curing and Protection**

a) Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

b) Weather permitting, keep placed concrete continuously moist for not less than 72 hours.

3.5 **Concrete Floor Sealer**

a) Concrete slab shall be fully cured, cleaned, and etched.

b) Apply sealer as recommended by manufacturer or as specified in the contract documents.

*** END OF SECTION ***

SPEC 00003
Minimum Requirements for Health and Safety

Table of Contents

SPEC 00003

MINIMUM REQUIREMENTS FOR HEALTH AND SAFETY

1. GENERAL

1.01 Description

A. The **CONTRACTOR** is solely responsible and liable for the health and safety of all on-site personnel and any off-site community potentially impacted by the remediation.

B. This section describes the minimum health and safety requirements for this project including the requirements for the development of a written Health and Safety Plan (HASP). All on-site workers must comply with the requirements of the HASP. The **CONTRACTOR's** HASP must comply with all applicable federal and state regulations protecting human health and the environment from the hazards posed by activities during this site remediation. The HASP is a required deliverable for this project. The HASP will be reviewed by the **ENGINEER**. The **CONTRACTOR** will resubmit the HASP, addressing all review comments from the **ENGINEER**. The **CONTRACTOR** shall not initiate on-site work in contaminated areas until an acceptable HASP addressing all comments has been developed.

C. Consistent disregard for the provision of these health and safety specifications shall be deemed just and sufficient cause for immediate stoppage of work and/or termination of the Contract or any Subcontract without compromise or prejudice to the rights of the **DEPARTMENT** or the **ENGINEER**.

D. Any discrepancies between this HASP and the specifications (or OSHA requirements) shall be resolved in favor of the more stringent requirements as determined by the **ENGINEER**.

1.02 Basis

A. The Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (20 CFR 1910 and 1926) and subsequent additions and/or modifications, the New York State Labor Law Section 876 (Right-to-Know Law), the Standard Operating Safety Guidelines by the United States Environmental Protection Agency (EPA), Office of Emergency and Remedial Response and the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (NIOSH, OSHA, USCG, and EPA) provide the basis for the safety and health program. Additional specifications within this section are in addition to OSHA regulations and reflect the positions of both the EPA and the National Institute for Occupation Safety and Health (NIOSH) regarding procedures required to ensure safe operations at abandoned hazardous waste disposal sites.

B. The safety and health of the public and project personnel and the protection of the environment will take precedence over cost and schedule considerations for all project work. Any additional costs will be considered only after the cause for suspension of operations is addressed and work is resumed. The **ENGINEER's** on-site representative and the **CONTRACTOR's** Superintendent will be kept appraised, by the Safety Officer, of conditions which may adversely affect the safety and health of project personnel and the community. The **ENGINEER** may stop work for health and safety reasons. If work is suspended for health and/or safety reasons, it shall not resume until approval is obtained from the **ENGINEER**. The cost of work stoppage due to health and safety is the responsibility of the **CONTRACTOR** under this Contract.

1.03 Health and Safety Definitions

A. The following definitions shall apply to the work of this Contract:

1. Project Personnel: Project personnel include the **ENGINEER**, the **ENGINEER's** On-site Representatives, **CONTRACTOR**, Subcontractors, and Federal and State Representatives, working or having official business at the Project Site.

2. Authorized Visitor: Authorized visitors who work for the State of New York shall receive approval to enter the site from the **DEPARTMENT**. The Safety Officer has primary responsibility on determining who is qualified and may enter the site. The Site Safety Officer will only allow authorized visitors with written proof that they have been medically certified and trained in accordance with 29 CFR 1910.120 to enter the contamination reduction zone and/or exclusion area.

3. Health and Safety Coordinator (HSC): The HSC shall be a Certified Industrial Hygienist (CIH) or Certified Safety Professional (CSP) retained by the **CONTRACTOR**. The HSC will be responsible for the development and implementation of the HASP.

4. Safety Officer (SO): The SO will be the **CONTRACTOR's** on-site person who will be responsible for the day-to-day implementation and enforcement of the HASP.

5. Health and Safety Technicians (HST): The HST(s) will be the **CONTRACTOR's** on-site personnel who will assist the SO in the implementations of the HASP, in particular, with air monitoring in active work areas and maintenance of safety equipment.

6. Medical Consultant (MC): The MC is a physician retained by the **CONTRACTOR** who will be responsible for conducting physical exams as specified under the Medical Monitoring Programs in this section.

7. Project Site: The area designated on the Site Sketch, which includes the Contractor Work Area.

8. Contractor Work Area: An area of the project site including the Support Zone, access road, staging area, and Exclusion Zone.

9. Contractor Support Zone: An area of the Contractor Work Area outside the Exclusion Zone, accessible for deliveries and visitors. No persons, vehicles, or equipment may enter these areas from the Exclusion Zone without having gone through specified decontamination procedures in the adjacent Contamination Reduction Zone.

10. Staging Areas: Areas within the Exclusion Zone for the temporary staging of contaminated soil and debris.

11. Exclusion Zone: The innermost area within the Contractor Work Area that encloses the area of contamination. Protective clothing and breathing apparatus as specified in the health and safety requirements and in the **CONTRACTOR's** approved HASP must be worn.

12. Contamination Reduction Zone: An area at the Exit Point of the Exclusion Zone through which all personnel, vehicles, and equipment must enter and exit. All decontamination of vehicles and equipment and removal of personal protective clothing and breathing apparatus must take place at the boundary between the Exclusion Zone and the Contamination Reduction Zone.

13. **ENGINEER's** on-site representative: The **ENGINEER's** representative assigned responsibility and authority by the **ENGINEER** for day-to-day field surveillance duties.

14. Work: Work includes all labor, materials, and other items that are shown, described, or implied in the Contract and includes all extra and additional work and material that may be ordered by the **ENGINEER**.

15. Monitoring: The use of direct reading field instrumentation to provide information regarding the levels of gases and/or vapor, which are present during remedial action. Monitoring shall be conducted to evaluate employee exposures to toxic materials and hazardous conditions.

1.04 Responsibilities

A. The **ENGINEER** will be responsible for the following:

1. Reviewing the HASP for the acceptability for its personnel and the impact on the site and human health.

2. Reviewing modifications to the HASP.

B. The **CONTRACTOR** will be responsible for the following:

C. The **CONTRACTOR** will perform all work required by the Contract Documents in a safe and environmentally acceptable manner. The **CONTRACTOR** will provide for the safety of all project personnel and the community for the duration of the Contract.

D. The **CONTRACTOR** shall:

1. Employ an SO who shall be assigned full-time responsibility for all tasks herein described under this HASP. In the event the SO cannot meet his responsibilities, the **CONTRACTOR** shall be responsible for obtaining the services of an "alternate" SO meeting the minimum requirements and qualifications contained herein. No work will proceed on this project in the absence of an approved SO.

2. Ensure that all project personnel have obtained the required physical examination prior to and at the termination of work covered by the contract.

3. Be responsible for the pre-job indoctrination of all project personnel with regard to the HASP and other safety requirements to be observed during work, including but not limited to (a) potential hazards, (b) personal hygiene principles, (c) personal protection equipment, (d) respiratory protection equipment usage and fit testing, and (e) emergency procedures dealing with fire and medical situations.

4. Be responsible for the implementation of this HASP, and the Emergency Contingency and Response Plan.

5. Provide and ensure that all project personnel are properly clothed and equipped and that all equipment is kept clean and properly maintained in accordance with the manufacturer's recommendations or replaced as necessary.

6. Alert appropriate emergency services before starting any hazardous work and provide a copy of the Emergency Contingency Plan to the respective emergency services.

7. Have sole and complete responsibility of safety conditions for the project, including safety of all persons (including employees).

8. Be responsible for protecting the project personnel and the general public from hazards due to the exposure, handling, and transport of contaminated materials. Barricades, lanterns, roped-off areas, and proper signs shall be furnished in sufficient amounts and locations to safeguard the project personnel and public at all times.

9. Ensure all OSHA health and safety requirements are met.

10. Maintain a chronological log of all persons entering the project site. It will include organization, date, and time of entry and exit. Each person must sign in and out.

1.05 Health and Safety Plan

A. The HASP is a deliverable product of this project. The **ENGINEER** will review and comment on the **CONTRACTOR's** HASP. Agreed upon responses to all comments will be incorporated into the final copy of the HASP. The HASP shall govern all work performed for this contract. The HASP shall address, at a minimum, the following items in accordance with 29 CFR 1910.120(I)(2):

1. Health and Safety Organization.

2. Site Description and Hazard Assessment.

3. Training.

4. Medical Surveillance.

5. Work Areas.

6. Standard Operating Safety Procedures and Engineering Controls.

7. Personal Protective Equipment (PPE).

8. Personnel Hygiene and Decontamination.

9. Equipment Decontamination.

10. Air Monitoring.

11. Emergency Equipment/First Aid Requirements.

12. Emergency Response and Contingency Plan.

13. Confined-Space Entry Procedures.

14. Spill Containment Plan.

15. Heat & Cold Stress.

16. Record Keeping.

17. Community Protection Plan.

B. The following sections will describe the requirements of each of the above-listed elements of the HASP.

1.06 Health and Safety Organization

A. The **CONTRACTOR** shall list in the HASP a safety organization with specific names and responsibilities. At a minimum, the **CONTRACTOR** shall provide the services of a Health and Safety Coordinator, SO, Health and Safety Technician, and a Medical Consultant.

B. Health and Safety Coordinator: The **CONTRACTOR** must retain the services of a Health and Safety Coordinator (HSC). The HSC must be an American Board of Industrial Hygiene (ABIH) Certified Industrial Hygienist (CIH) or a Certified Safety Professional (CSP). The HSC must have a minimum of two years experience in hazardous waste site remediations or related industries and have a working knowledge of federal and state occupational health and safety regulations. The HSC must be familiar with air monitoring techniques and the development of health and safety programs for personnel working in potentially toxic atmospheres.

In addition to meeting the above requirements the HSC will have the following responsibilities:

1. Responsibility for the overall development and implementation of the HASP.

2. Responsibility for the initial training of on-site workers with respect to the contents of the HASP.

3. Availability during normal business hours for consultation by the Safety Officer.

4. Availability to assist the Safety Officer in follow-up training and if changes in site conditions occur.

C. Safety Officer: The designated SO must have, at a minimum, two years of experience in the remediation of hazardous waste sites or related field experience. The SO must have formal training in health and safety and be conversant with federal and state regulations governing occupational health and safety. The SO must be certified in CPR and first aid and have experience and training in the implementation of personal protection and air monitoring programs. The SO must have "hands-on" experience with the operation and maintenance of real-time air monitoring equipment. The SO must be thoroughly knowledgeable of the operation and maintenance of air-purifying respirators (APR) and supplied-air respirators (SAR) including SCBA and airline respirators.

In addition to meeting the above qualifications, the SO will be responsible for the following minimum requirements:

1. Responsibility for the implementation, enforcement, and monitoring of the health and safety plan.

2. Responsibility for the pre-construction indoctrination and periodic training of all on-site personnel with regard to this safety plan and other safety requirements to be observed during construction, including:

   a. Potential hazards.

   b. Personal hygiene principles.

   c. PPE.

   d. Respiratory protection equipment usage and fit testing.

   e. Emergency procedures dealing with fire and medical situations.

   f. Conduct daily update meetings in regard to health and safety.

3. Responsibility for alerting the **ENGINEER's** on-site representative prior to the **CONTRACTOR** starting any particular hazardous work.

4. Responsibility for informing project personnel of the New York State Labor Law Section 876 (Right-to-Know Law).

5. Responsibility for the maintenance of separation of Exclusion Zone (Dirty) from the Support Zone (Clean) areas as described hereafter.

D. Health and Safety Technicians: The Health and Safety Technician (HST) must have one year of hazardous waste site or related experience and be knowledgeable of applicable occupational health and safety regulations. The HST must be certified in CPR and first aid. The HST will be under direct supervision of the SO during on-site work. The HST must be familiar with the operations, maintenance and calibration of monitoring equipment used in this remediation. An HST will be assigned to each work crew or task in potentially hazardous areas.

E. Medical Consultant: The **CONTRACTOR** is required to retain a Medical Consultant (MC) who is a physician, certified in occupational medicine. The physician shall have experience in the occupational health area and shall be familiar with potential site hazards of remedial action projects. The MC will also be available to provide annual physicals and to provide additional medical evaluations of personnel when necessary.

1.07 Site Description and Hazard Assessment

A. The **CONTRACTOR** shall perform a hazard assessment to provide information to assist in selection of PPE and establish air monitoring guidelines to protect on-site personnel, the environment, and the public. The **CONTRACTOR** shall provide a general description of the site, its location, past history, previous environmental sampling results, and general background on the conditions present at the site.

1. Chemical Hazards: A qualitative evaluation of chemical hazards shall be based on the following:

   - Nature of potential contaminants;
   - Location of potential contaminants at the project site;
   - Potential for exposure during site activities; and
   - Effects of potential contaminants on human health.

2. Biological Hazards: A qualitative evaluation of biological hazards consisting of the elements listed for chemical hazards.

3. Physical Hazards: The **CONTRACTOR** shall assess the potential for physical hazards affecting personnel during the performance of on-site work.

B. The **CONTRACTOR** shall develop a hazard assessment for each site task and operation established in the HASP.

1.08 Training

A. OSHA Training

1. The **CONTRACTOR** is responsible to ensure that all project personnel have been trained in accordance with OSHA 1910.120 regulations.

2. The **CONTRACTOR** shall ensure that all employees are informed of the potential hazards of toxic chemicals to the unborn child and of the risks associated with working at the project site.

3. The **CONTRACTOR** shall be responsible for, and guarantee that, personnel not successfully completing the required training are not permitted to enter the project site to perform work.

B. Safety Meetings

1. The SO will conduct daily safety meetings for each working shift that will be mandatory for all project personnel. The meetings will provide refresher courses for existing equipment and protocols, and will examine new site conditions as they are encountered.

2. Additional safety meetings will be held on an as-required basis.

C. Should any unforeseen or site-specific safety-related factor, hazard, or condition become evident during the performance of work at this site, the **CONTRACTOR** will bring such to the attention of the SO in writing as quickly as possible for resolution. In the interim, the **CONTRACTOR** will take prudent action to establish and maintain safe working conditions and to safeguard employees, the public, and the environment.

1.09 Medical Surveillance

A. The **CONTRACTOR** shall utilize the services of a Physician to provide the minimum medical examinations and surveillance specified herein. The name of the Physician and evidence of examination of all **CONTRACTOR** and Subcontractor on-site personnel shall be kept by the SO.

B. **CONTRACTOR** and Subcontractor project personnel involved in this project shall be provided with medical surveillance prior to onset of work. Immediately at the conclusion of this project, and at any time there is suspected excessive exposure to substances that would be medically detectable, all project personnel will be medically monitored. The costs for these medical exams, including state field representatives, (four maximum) are to be borne by the **CONTRACTOR**.

C. Physical examinations are required for:

1. Any and all personnel entering hazardous or transition zones or performing work that required respiratory protection.

2. All **CONTRACTOR** personnel on site who are dedicated or may be used for emergency response purposes in the Exclusion Zone.

3. **CONTRACTOR** supervisors entering hazardous or transition zones, or on site for more than 16 hours during the length of the contract.

D. Physical examinations are not required for people making periodic deliveries provided they do not enter hazardous or transition zones.

E. In accordance with good medical practice, the examining Physician or other appropriate representative of the Physician shall discuss the results of such medical examination with the individual examined. Such discussion shall include an explanation of any medical condition that the Physician believes required further evaluation or treatment and any medical condition which the Physician believes would be adversely affected by such individual's employment at the project site. A written report of such examination shall be transmitted to the individual's private physician upon written request by the individual.

F. The examining Physician or Physician group shall notify the SO in writing that the individual has received a medical examination and shall advise the SO as to any specific limitations upon such individual's ability to work at the project site that were identified as a result of the examination. Appropriate action shall be taken in light of the advice given pursuant to this subparagraph.

G. The physical examination shall also include but not be limited to the following minimum requirements:

1. Complete blood profile;

2. Blood chemistry to include: chloride, CO_2, potassium, sodium, BUN, glucose, globulin, total protein, albumin, calcium, cholesterol, alkaline phosphatase, triglycerides, uric acid, creatinine, total bilirubin, phosphorous, lactic dehydrogenase, SGPT, SGOT;

3. Urine analysis;

4. "Hands on" physical examination to include a complete evaluation of all organ systems including any follow-up appointments deemed necessary in the clinical judgement of the examining physician to monitor any chronic conditions or abnormalities;

5. Electrocardiogram;

6. Chest X-ray (if recommended by examining physician in accordance with good medical practice);

7. Pulmonary function;

8. Audiometry - To be performed by a certified technician, audiologist, or physician. The range of 500 to 8,000 hertz should be assessed.

9. Vision screening - Use a battery (TITMUS) instrument to screen the individual's ability to see test targets well at 13 to 16 inches and at 20 feet. Tests should include an assessment of muscle balance, eye coordination, depth perception, peripheral vision, color discrimination, and tonometry.

10. Tetanus booster shot (if no inoculation has been received within the last five years); and

11. Complete medical history.

1.10 Site Control

A. Security

1. Security shall be provided and maintained by the **CONTRACTOR**.

2. The **CONTRACTOR** shall contact law enforcement officials, emergency medical care units, local fire departments and utility emergency teams to ascertain the type of response required in any emergency situation and to coordinate the responses of the various units. A standard operating procedure describing security force response to foreseeable contingencies shall be developed. The **CONTRACTOR** shall also prepare and update a list of emergency points of contact, telephone numbers, radio frequencies, and call signs to ensure dependable responses.

3. Security personnel shall record their presence while patrolling the site using a watchman's clock. The Tapes or punch cards shall be delivered to the **ENGINEER** once a week.

4. Security identification, specific to the project site, shall be provided by the **CONTRACTOR** for all project personnel entering the project site. The **CONTRACTOR** shall be responsible for and ensure that such identification shall be worn by each individual, visible at all times, while the individual is on the site. Vehicular access to the site, other than to designated parking areas, shall be restricted to authorized vehicles only.

5. Use of on-site designated parking areas shall be restricted to vehicles of the **ENGINEER**, **ENGINEER's** on-site representative, **CONTRACTOR**, subcontractor, and service personnel assigned to the site and actually on duty but may also be used on short-term basis for authorized visitors.

6. The **CONTRACTOR** shall be responsible for maintaining a log of security incidents and visitor access granted.

7. The **CONTRACTOR** shall require all personnel having access to the project site to sign-in and sign-out, and shall keep a record of all site access.

8. All approved visitors to the site shall be briefed by the SO on safety and security, provided with temporary identification and safety equipment, and escorted throughout their visit.

9. Site visitors shall not be permitted to enter the hazardous work zone unless approved by the **DEPARTMENT** with appropriate site access agreement.

10. Project sites shall be posted, "Warning Hazardous Work Area, Do Not Enter Unless Authorized," and access restricted by the use of a snow fence or equal at a minimum. Warning signs shall be posted at a minimum of every 500 feet.

B. Site Control

1. The **CONTRACTOR** shall provide the following site control procedures as a minimum:

   - A site map;
   - A map showing site work zones;
   - The use of a "buddy system"; and
   - Standard operating procedures or safe work practices.

C. Work Areas

1. The **CONTRACTOR** will clearly lay out and identify work areas in the field and will limit equipment, operations and personnel in the areas as defined below:

   a. Exclusion Zone (EZ) - This will include all areas where potential environmental monitoring has shown or it is suspected that a potential hazard may exist to workers. The level of PPE required in these areas will be determined by the SO after air monitoring and on-site inspection has been conducted. The area will be clearly delineated from the decontamination area. As work within the hazardous zone proceeds, the delineating boundary will be relocated as necessary to prevent the accidental contamination of nearby people and equipment. The Exclusion Zone will be delineated by fencing (e.g., chain link, snow fencing, or orange plastic fencing).

   b. Contamination Reduction Zone - This zone will occur at the interface of "Hazardous" and "Clean" areas and will provide for the transfer of equipment and materials from the Support Zone to the Exclusion Zone, the decontamination of personnel and clothing prior to entering the "Clean" area, and for the physical segregation of the "Clean" and "Hazardous" areas. This area will contain all required emergency equipment, etc. This area will be clearly delineated by fencing (e.g., chain link, snow fencing, or orange plastic fencing). It shall also delineate an area that although not contaminated at a particular time may become so at a later date.

   c. Support Zone - This area is the remainder of the work site and project site. The Support Zone will be clearly delineated and procedures implemented to prevent active or passive contamination from the work site. The function of the Support Zone includes:

      1. An entry area for personnel, material and equipment to the Exclusion Zone of site operations through the Contamination Reduction Zone;

      2. An exit for decontamination personnel, materials and equipment from the "Decontamination" area of site operations;

      3. The housing of site special services; and

      4. A storage area for clean, safety, and work equipment.

1.11 Standard Operating Safety Procedures (SOSP), Engineering Controls

A. General SOSP

1. The **CONTRACTOR** will ensure that all safety equipment and protective clothing is kept clean and well maintained.

2. All prescription eyeglasses in use on this project will be safety glasses and will be compatible with respirators. No contact lenses shall be allowed on site.

3. All disposable or reusable gloves worn on the site will be approved by the SO.

4. During periods of prolonged respirator usage in contaminated areas, respirator filters will be changed upon breakthrough. Respirator filters will always be changed daily.

5. Footwear used on site will be covered by rubber overboots or booties when entering or working in the Exclusion Zone area or Contamination Reduction Zone. Boots or booties will be washed with water and detergents to remove dirt and contaminated sediment before leaving the Exclusion Zone or Contamination Reduction Zone.

6. All PPE used on site will be decontaminated or disposed of at the end of the work day. The SO will be responsible for ensuring decontamination of PPE before reuse.

7. All respirators will be individually assigned and not interchanged between workers without cleaning and sanitizing.

8. **CONTRACTOR**, subcontractor and service personnel unable to pass a fit test as a result of facial hair or facial configuration shall not enter or work in an area that requires respiratory protection.

9. The **CONTRACTOR** will ensure that all project personnel shall have vision or corrected vision to at least 20/40 in one eye.

10. On-site personnel found to be disregarding any provision of this plan will, at the request of the SO, be barred from the project.

11. Used disposable outerwear such as coveralls, gloves, and boots shall not be reused. Used disposable outerwear will be removed upon leaving the hazardous work zone and will be placed inside disposable containers provided for that purpose. These containers will be stored at the site at the designated staging area and the **CONTRACTOR** will be responsible for proper disposal of these materials at the completion of the project. This cost shall be borne by the **CONTRACTOR**.

12. Protective coveralls that become torn or badly soiled will be replaced immediately.

13. Eating, drinking, chewing gum or tobacco, smoking, etc., will be prohibited in the hazardous work zones and neutral zones.

14. All personnel will thoroughly cleanse their hands, face, and forearms and other exposed areas prior to eating, smoking or drinking.

15. Workers who have worked in a hazardous work zone will shower at the completion of the work day.

16. All personnel will wash their hands, face, and forearms before using toilet facilities.

17. No alcohol, firearms or drugs (without prescriptions) will be allowed on site at any time.

18. All personnel who are on medication should report it to the SO who will make a determination whether or not the individual will be allowed to work and in what capacity. The SO may require a letter from the individual's personal physician stating what limitations (if any) the medication may impose on the individual.

B. Engineering Controls - Air Emissions

1. The **CONTRACTOR** shall provide all equipment and personnel necessary to monitor and control air emissions.

1.12 Personal Protective Equipment

A. General

1. The **CONTRACTOR** shall provide all project personnel with the necessary safety equipment and protective clothing, taking into consideration the chemical wastes at the site. The **CONTRACTOR** shall supply the **ENGINEER's** on-site personnel (average two people for the project duration) with PPE as specified. The **ENGINEER** will require specific manufacturers and styles of PPE, which are detailed in the Safety Equipment Specifications portion of this section. At a minimum, the **CONTRACTOR** shall supply
<u>all</u> project personnel with the following:

   a. Two (2) sets of cotton work clothing to include underwear, socks, work shirts, and work pants. Leather steel-toed work boots, and such other clothing and outer garments as required by weather conditions (e.g., insulated coveralls and winter jacket);

   b. Sufficient disposable coveralls;

   c. One pair splash goggles;

   d. Chemical-resistant outer and inner gloves;

   e. Rubber overshoes (to be washed daily);

   f. Hard hat;

   g. One full-face mask with appropriate canisters. The **ENGINEER** and the **DEPARTMENT** will supply their own full-face mask. The **CONTRACTOR** will supply the appropriate canisters to all on-site project personnel including the **ENGINEER** and the **DEPARTMENT**. The **CONTRACTOR** shall supply MSA canisters; and

   h. For all project personnel involved with Level B protection, a positive-pressure SCBA or in-line air. A 5-minute escape bottle must be included with the in-line air apparatus.

B. Levels of Protection

1. It is planned that Levels C and D PPE will be required in this remediation. Although Levels A and B are not planned, site conditions may be encountered that

require their use. The following sections described the requirements of each level of protection.

a. Level A Protection

1. PPE:

a. Supplied-air respirator approved by the Mine Safety and Health Administration (MSHA) and NIOSH. Respirators may be:

- Positive-pressure SCBA; or
- Positive-pressure airline respirator (with escape bottle for Immediately Dangerous to Life and Health [IDLH] or potential for IDLH atmosphere).

b. Fully encapsulating chemical-resistant suit.

c. Coveralls.

d. Cotton long underwear.*

e. Gloves (inner), chemical-resistant.

f. Boots, chemical-resistant, steel toe and shank. (Depending on suit construction, worn over or under suit boot.)

g. Hard hat (under suit).*

h. Disposal gloves and boot covers (worn over fully encapsulating suit).

i. Cooling unit.*

j. Two-way radio communications (inherently safe).*

* Optional

2. Criteria for Selection:

Meeting any of these criteria warrants use of Level A protection:

a. The chemical substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on:

- Measures (or potential for) high concentration of atmospheric vapors, gases, or particulates, or

- Site operations and work functions involves high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials highly toxic to the skin.

b. Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible.

c. Operations must be conducted in confined, poorly ventilated areas until the absence of substances requiring Level A protection is determined.

d. Direct readings on field Flame Ionization Detectors (FID) or Photoionization Detectors (PID) and similar instruments indicate high levels of unidentified vapors and gases in the air.

3. Guidance on Selection:

a. Fully encapsulating suits are primarily designed to provide a gas- or vapor-tight barrier between the wearer and atmospheric contaminants. Therefore, Level A is generally worn when high concentrations of airborne substances could severely effect the skin. Since Level A requires the use of SCBA, the eyes and respiratory system are also more protected.

Until air surveillance data become available to assist in the selection of the appropriate level of protection, the use of Level A may have to be based on indirect evidence of the potential for atmospheric contamination or other means of skin contact with severe skin affecting substances.

Conditions that may require Level A protection include:

- Confined spaces: Enclosed, confined, or poorly ventilated areas are conducive to the buildup of toxic vapors, gases, or particulates. (Explosive or oxygen-deficient atmospheres are also more probable in confined spaces). Confined-space entry does not automatically warrant wearing Level A protection, but should serve as a cue to carefully consider and to justify a lower level of protection.

- Suspected/known highly toxic substances: Various substances that are highly toxic, especially skin absorption, for example, fuming corrosives, cyanide compounds, concentrated pesticides, Department of Transportation

Poison "A" materials, suspected carcinogens, and infectious substances may be known or suspected to be involved. Field instruments may not be available to detect or quantify air concentrations of these materials. Until these substances are identified and concentrations measured, maximum protection may be necessary.

- Visible emissions: Visible air emissions from leaking containers or railroad/vehicular tank cars, as well as smoke from chemical fires and others, indicate high potential for concentrations of substances that could be extreme respiratory or skin hazards.

- Job Functions: Initial site entries are generally walk-throughs, in which instruments and visual observations are used to make a preliminary evaluation of the hazards.

In initial site entries, Level A should be worn when:

- There is a probability for exposure to high concentrations of vapors, gases, or particulates; and

- Substances are known or suspected of being extremely toxic directly to the skin or by being absorbed.

Subsequent entries are to conduct the many activities needed to reduce the environmental impact of the incident. Levels of protection for later operations are based not only on data obtained from the initial and subsequent environmental monitoring, but also on the probability of contamination and ease of decontamination.

Examples of situations where Level A has been worn are:

- Excavating of soil to sample buried drums suspected of containing high concentrations of dioxin;

- Entering a cloud of chlorine to repair a valve broken in a railroad accident;

- Handling and moving drums known to contain oleum; and

- Responding to accidents involving cyanide, arsenic, and undiluted pesticides.

b. The fully encapsulating suit provides the highest degree of protection to skin, eyes, and respiratory system if the suit material resists chemicals during the time the suit is worn. While Level A provides maximum protection, all suit material may be rapidly permeated and degraded by certain chemicals from extremely high air concentrations, splashes, or immersion of boots or gloves in concentrated liquids or sludges. These limitations should be recognized when specifying the type of fully encapsulating suit. Whenever possible, the suit material should be matched with the substance it is used to protect against.

b. Level B Protection

1. PPE:

a.. Positive-pressure SCBA (MSHA/NIOSH approved); or

b. Positive-pressure air line respirator (with escape bottle for IDLH or potential for IDLH atmosphere) MSHA/NIOSH approved;

c. Chemical-resistant clothing (overalls and long-sleeved jacket; coveralls or hooded, one- or two-piece chemical-splash suit; disposable chemical-resistant, one-piece suits);

d. Cotton long underwear;*

e. Coveralls;

f. Gloves (outer), chemical-resistant;

g. Gloves (inner), chemical-resistant;

h. Boots (inner), leather work shoe with steel toe and shank;

I. Boots (outer), chemical-resistant, (disposable);

j. Hard hat (face shield*);

k. 2-way radio communication;* and

l. Taping between suit and gloves, and suit and boots.

*Optional

2. Criteria for Selection:

Any one of the following conditions warrants use of Level B Protection:

a. The type and atmospheric concentration of toxic substances have been identified and require a high level of respiratory protection, but less skin protection than Level A. These atmospheres would:

- Have IDLH concentrations; or
- Exceed limits of protection afforded by an air-purifying mask; or
- Contain substances for which air-purifying canisters do not exist or have low removal efficiency; or
- Contain substances requiring air-supplied equipment, but substances and/or concentrations do not represent a serious skin hazard.

b. The atmosphere contains less than 19.5% oxygen.

c. Site operations make it highly unlikely that the work being done will generate high concentrations of vapors, gases or particulates, or splashes of material that will affect the skin of personal wearing Level B protection.

d. Working in confined spaces.

e. Total atmospheric concentrations, sustained in the breathing zone, of unidentified vapors or gases range from 5 ppm above background to 500 ppm above background as measured by direct reading instruments such as the FID or PID or similar instruments, but vapors and gases are not suspected of containing high levels of chemicals toxic to skin.

3. Guidance on Selection Criteria:

Level B equipment provides a reasonable degree of protection against splashes and to lower air contaminant concentrations, but a somewhat lower level of protection to skin than Level A. The chemical-resistant clothing required in Level B is available in a wide variety of styles, materials, construction detail, permeability, etc. Taping joints between the gloves, boots and suit, and between hood and respirator reduces the possibility for splash and vapor or gas penetration. These factors all affect the degree of protection afforded. Therefore, the SO should select the most effective chemical-resistant clothing based on the known or anticipated hazards and/or job function. (It is anticipated that Level B protection will not be required under this contract.)

Level B does provide a high level of protection to the respiratory tract. Generally, if SCBA is required, Level B clothing rather than a fully encapsulating suit (Level A) is selected based on needing less protection against known or anticipated substances affecting the skin. Level B skin protection is selected by:

a. Comparing the concentrations of known or identified substances in air with skin toxicity data;

b. Determining the presence of substances that are destructive to or readily absorbed through the skin by liquid splashes, unexpected high levels of gases, vapor or particulates, or other means of direct contact; and

c. Assessing the effect of the substance (at its measured air concentrations or splash potential) on the small area of the head and neck left unprotected by chemical-resistant clothing.

For initial site entry at an open site, Level B protection should protect site personnel, providing the conditions described in selecting Level A are known or judged to be absent.

c. Level C Protection

1. PPE

a.. Full-face, air-purifying, cartridge- or canister-equipped respirator (MSHA/NIOSH approved) with cartridges appropriate for the respiratory hazards;

b. Chemical-resistant clothing (coveralls, hooded, one-piece or two-piece chemical splash suit; chemical-resistant hood and apron; disposable chemical-resistant coveralls);

c. Coveralls;

d. Cotton long underwear;*

e. Gloves (outer), chemical-resistant;

f. Gloves (inner), chemical-resistant;

g. Boots (inner), leather work shoes with steel toe and shank;

h. Boots (outer), chemical-resistant (disposable);*

i. Hard hat (face shield);*

j. Escape SCBA of at least 5-minute duration;

k. 2-way radio communications (inherently safe);* and

l. Taping between suit and boots, and suit and gloves.

* Optional

2. Criteria for Selection

Meeting all of these criteria permits use of Level C protection:

a. Measured air concentrations of identified substances will be reduced by the respirator to, at or below, the substance's Threshold Limit Value (TLV) or appropriate occupational exposure limit and the concentration is within the service limit of the canister.

b. Atmospheric contaminant concentrations do not exceed IDLH levels.

c. Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect the small area of the skin left unprotected by chemical-resistant clothing.

d. Job functions do not require SCBA.

e. Total readings register between background and 5 ppm above background as measured by instruments such as the FID or PID.

f. Oxygen concentrations are not less than 19.5% by volume.

g. Air will be monitored continuously.

3. Guidance on Selection Criteria

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 air-purifying devices. The air-purifying device must be a full-face mask (MSHA/NIOSH approved) equipped with a cartridge suspended from the chin or on a harness. Cartridges must be able to remove the substances encountered.

A full-face, air-purifying mask can be used only if:

a. Oxygen content of the atmosphere is at least 19.5% by volume;

b. Substance(s) is identified and its concentrations(s) measured;

c. Substance(s) has adequate warning properties;

d. Individual passes a qualitative fit-test for the mask; and

e. Appropriate cartridge is used, and its service limits concentration is not exceeded.

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 (Level C). Continual surveillance using direct-reading instruments and air sampling is needed to detect any changes in air quality necessitating a higher level of respiratory protection. Total unidentified vapor/gas concentrations exceeding 5 ppm above background require Level B.

d. Level D Protection

1. PPE:

a. Coveralls, chemical resistant;

b. Gloves (outer), chemical resistant;

c. Gloves (inner), chemical resistant;*

d. Boots (inner), leather work shoes with steel toe and shank;

e. Boots (outer), chemical resistant (disposable);*

f. Hard hat;

g. Face shield;*

h. Safety glasses with side shields or chemical splash goggles;* and

i. Taping between suit and boots, and suit and gloves.

* Optional

2. Criteria for Selection:

a. No atmospheric contaminant is present.

b. Direct reading instruments do not indicate any readings above background.

c. Job functions have been determined not to require respirator protection.

3. Guidance on Selection Criteria:

Level D protection is distinguished from Level C protection in the requirement for respiratory protection. Level D is used for non-intrusive activities or intrusive activities with continuous air monitoring. It can be worn only in areas where there is no possibility of contact with contamination.

e. Anticipated Levels of Protection

1. It is anticipated that most of the work shall be performed in Level D. A respirator shall be immediately available in the event that air monitoring indicates an upgrade to Level C is required. The determination of the proper level of protection for each task shall be the responsibility of the **CONTRACTOR**. These task specific levels of protection shall be stated in the **CONTRACTOR's** HASP.

C. Safety Equipment Specifications

Note: Prior to purchasing any equipment or supplies required by this HASP, the **CONTRACTOR** shall notify the **ENGINEER** of the type, model and manufacturer/supplier of that particular safety equipment he is proposing to use or purchase for use on this project. The specifications for PPE that the **CONTRACTOR** is to supply to the **ENGINEER** and which differ from the minimum requirements shown below are provided at the end of this section.

D. Self-Contained Breathing Apparatus

1. The **CONTRACTOR** shall provide positive-pressure SCBA for possible upgrades in respiratory protection. The **CONTRACTOR** shall further supply all the SCBA for all field personnel for the duration of normal work activities. The units must be a MSHA/NIOSH-approved pressure-demand type with a 30-minute service life, manufactured/supplied by Scott, MSA, or other appropriate manufacturers. The **CONTRACTOR** shall inspect and maintain respirators in accordance with OSHA regulations (29 CFR 1910.13-4) and as recommended by the manufacturer.

E. Disposable Coveralls

1. The **CONTRACTOR** shall provide, as necessary, protective coveralls for all project personnel each day with extra sets provided for authorized visitors. The coveralls shall be of the disposable type made of Tyvek or equivalent material, and shall be manufactured/supplied by Durafab, Koppler, or other appropriate manufacturers. To protect project personnel from exposure to liquids, splash-resistant suits (Saranex suits, from appropriate manufacturers) shall be provided. Ripped suits will be immediately replaced after all necessary decontamination has been completed to the satisfaction of the SO.

F. Hard Hat

1. The **CONTRACTOR** shall provide and maintain one hard hat per person on site (authorized visitors included). The hard hats shall comply with OSHA Health and Safety Standards (29 CFR 1910.135).

G. Face Shields

1. The **CONTRACTOR** shall provide and maintain one face shield per person on site. The face shields shall be of the full face type meeting OSHA Health and Safety Standards (29 CFR 1910.133) and shall have brackets for mounting on hard hats. Hard hats and face shields shall be from the same manufacturer to ensure proper fit and shall be manufactured/supplied by Bullard, Norton, or other appropriate manufacturers.

H. Work Clothing

1. The **CONTRACTOR** shall provide a minimum of two sets of work clothing per personnel to allow for changing if contaminated. The work clothing shall include a minimum of underwear, socks, work shirts, work pants, and other clothing as weather conditions dictate. All work clothes shall be put on clean, before entering the site and shall not be kept in same lockers as the workers street clothes. All project personnel shall shower and change to street clothing prior to leaving the site. All contaminated work clothing shall be laundered on site with wash water drained to the decontamination water holding tank.

I. Escape-Type Respirator

1. The **CONTRACTOR** shall provide and maintain one self-contained breathing escape-type respirator per person working on site. The small self-contained device shall be capable of providing oxygen to the worker while protecting an escaping worker from toxic gases. The respirator shall be made by Scott, MSA, or other appropriate manufacturer. The **CONTRACTOR** shall inspect and ensure all devices are in working order before issuing to personnel. Employees must be trained to use equipment prior to being allowed to work on site and carry the escape-type respirator with them. An escape-type respirator must be provided if positive-pressure SCBA are not part of the ensemble worn by each person on site.

J. Full Face Organic Vapor Respirator

1. The **CONTRACTOR** shall provide and maintain a dedicated air-purifying organic vapor respirator per person working in hazardous work and neutral work zones. The respirator shall be of the full-face canister type with cartridges appropriate for the respiratory hazards. Respirators and cartridges shall be MSHA/NIOSH approved, manufactured/supplied by MSA, Scott, or other appropriate manufacturers. The **CONTRACTOR** shall inspect and maintain respirators and canisters in accordance with OSHA regulations (29 CFR 1910.134) and in accordance with manufacturer's instructions. The **CONTRACTOR** shall ensure
that proper fit testing training and medical surveillance of respirator users is in accordance with OSHA regulations (29 CFR 1910.134).

K. Gloves (outer)

1. The **CONTRACTOR** shall supply a minimum of one pair of gloves per workman in areas where skin contact with hazardous material is possible. Work gloves shall consist of nitrile (NCR) or Neoprene material. Other gloves may be selected if required based on the potential chemical present. Cotton liners will be provided by the **CONTRACTOR**
during cold weather.

L. Gloves (inner)

1. The **CONTRACTOR** shall supply Latex or equivalent surgical gloves to be worn inside the outer gloves.

M. Boots (inner)

1. The **CONTRACTOR** shall supply one pair of safety shoes or boots per workman and shall be of the safety-toe type meeting the requirements of 29 CFR 1910.136.

N. Boots (outer)

1. The **CONTRACTOR** shall provide and maintain one pair of overshoes for the on-site person entering a hazardous work area. The overshoes shall be constructed of rubber and shall be 12 inches high minimum.

PERSONAL PROTECTIVE EQUIPMENT SPECIFICATIONS				
Description	**Manufacturer**	**Model Number**	**Size**	**Comments**
Tyvek coveralls	Kappler/Abanda	1427/1428	xl/lg	NA
Saranex coveralls	Kappler/Abanda	77427/77428/77434	xl/lg	NA
Sijal acid suit	Chemtex Bata	91522-G	xl/lg	NA
Surgical gloves	Best	7005	xl/lg	NA
Neoprene gloves	Edmont	8-354	xl/lg	NA
Nitrile gloves	Granet	1711	10	NA
Butyl gloves	North	B-161	10	NA
Viton gloves	North	F-124	10/11	NA
Long gauntlet neoprene	Edmont	19-938	xl	NA
Cotton work gloves	North	Grip-N/K511M	men's	or equal
Latex booties	Rainfair	1250-Y	xl	NA
PAPR pesticide cartridges	Racal	AP-3	NA	NA
PAPR asbestos cartridges	Racal	SP-3	NA	NA
APR organic cartridges	MSA	GMC-H	NA	NA
APR asbestos cartridges	MSA	Type H	NA	NA
APR pesticide cartridges	MSA	GMP	NA	NA

1.13 Personnel Hygiene and Decontamination

A. On-Site Hygiene Facility

1. The **CONTRACTOR** shall provide a hygiene facility on site. The hygiene facility shall include the following:

   - Adequate lighting and heat;
   - Shower facilities for project personnel;
   - Laundry facilities for washing work clothes and towels;
   - Areas for changing into and out of work clothing. Work clothing should be stored separately from street clothing;
   - Clean and "dirty" locker facilities; and

- Storage area for work clothing, etc.

a. Portable "Boot Wash" Decontamination Equipment

1. The **CONTRACTOR** shall provide a portable decontamination station, commonly referred to as a "Boot Wash" facility for each hazardous work zone requiring decontamination for project personnel. These facilities shall be constructed to contain spent wash water, contain a reservoir of clean wash water, a power supply to operate a pump for the wash water, a separate entrance and exit to the decontamination platform, with the equipment being mobile, allowing easy transport from one hazardous work zone to the next. All such wash water shall be disposed of at the dewatering facility. An appropriate detergent such as trisodium phosphate shall be used.

b. Personnel Decontamination

1. The **CONTRACTOR** shall provide full decontamination facilities at all hazardous zones. Decontamination facilities must be described in detail in the HASP.

c. Disposal of Spent Clothing and Material

1. Contaminated clothing, used respirator cartridges and other disposable items will be put into drums/containers for transport and proper disposal in accordance with TSCA and RCRA requirements.

2. Containers/55-gallon capacity drums shall conform to the requirements of 40 CFR Part 178 for Transportation of Hazardous Materials. The containers/drums containing excavated and other hazardous material shall be transported by the **CONTRACTOR** to the staging area.

3. The **CONTRACTOR** is responsible for the proper container packaging, labeling, transporting, and disposal.

1.14 Equipment Decontamination

A. General

1. All equipment and material used in this project shall be thoroughly washed down in accordance with established federal and state procedures before it is removed from the project. With the exception of the excavated materials, all other contaminated debris, clothing, etc. that cannot be decontaminated shall be disposed at the **CONTRACTOR's** expense by a method permitted by appropriate regulatory agencies. The cost for this element of work shall be incorporated in the lump sum bid for mobilization/demobilization the unit prices bid for disposal of decontamination liquids or as otherwise directed on this project. All vehicles and equipment used in the "Dirty Area" will be decontaminated to the satisfaction of the SO in the decontamination area on site prior to leaving the project. The **CONTRACTOR** will certify, in writing, that each piece of equipment has been decontaminated prior to removal from the site.

2. Decontamination shall take place within the designated equipment and materials decontamination area. The decontamination shall consist of degreasing (if required), followed by high-pressure, hot-water cleaning, supplemented by detergents as appropriate. Wash units shall be portable, high-pressure with a self-contained water storage tank and pressurizing system (as required). Each unit shall be capable of heating wash waters to 180 degrees Fahrenheit and providing a nozzle pressure of 150 psi.

3. Personnel engaged in vehicle decontamination will wear protective clothing and equipment as determined in the HASP. If the **CONTRACTOR** cannot or does not satisfactorily decontaminate his tools or equipment at the completion of the project, the **CONTRACTOR** will dispose of any equipment which cannot be decontaminated satisfactorily and will bear the cost of such tools and equipment and its disposal without any liability to the **ENGINEER**. At the completion of the project the **CONTRACTOR** shall completely decontaminate and clean the decontamination area.

B. Decontamination Station

1. The **CONTRACTOR** shall construct a decontamination station as described. The decontamination station shall be located in the Contamination Reduction Zone and shall be used to clean all vehicles leaving the Exclusion Zone prior to entering the Support Zone or leaving the site.

2. Each decontamination pad will be equipped with a drain system and holding tank on a properly graded area that has no deleterious material. The **CONTRACTOR** shall obtain and analyze one soil sample at the area where the decontamination pad is to be built and one soil sample after the pad has been dismantled, as directed by the Engineer. The cost associated with the samples shall be included in the cost of providing health and safety at the site.

3. Shop drawings of the decontamination pad shall be submitted to the **ENGINEER** for approval.

4. The **CONTRACTOR** shall be responsible for the provision of an adequately equipped decontamination pad which shall meet the following requirements:

   a. Adequate dimensions to contain wash water and debris from the largest sized vehicles to be utilized in this contract. All vehicles and construction equipment leaving a contaminated zone shall be decontaminated.

   b. Perimeter to be curbed and provided with splash guards.

   c. 40 mil impervious HDPE membrane is required to prevent seepage into the ground.

   d. Sumps, pumping facilities, and temporary storage facilities to be adequate for anticipated use.

   e. Temporary storage facility may be mobile tankers or suitable fixed tanks. Fixed tanks shall be located within secondary containment areas capable of containing 100% of the tank capacity, or 110% of the largest tank where the secondary containment area holds more than one tank. The secondary containment area shall have a permeability of not more than 1.0×10^{-7} cm/sec.

   f. The decontamination pad is to be located at the exit of each contaminated zone such that previously non-contaminated areas are not contaminated during

remedial activities. This may require the construction and use of multiple decontamination pads.

g. The **CONTRACTOR** shall place a minimum of six (6) inches of sand under the decontamination pad.

h. There shall be side wall panels, six (6) feet high minimum on two sides to prevent over spray.

C. The **CONTRACTOR** shall clean the decontamination pad after daily use. No contamination shall be left behind. The **CONTRACTOR** will be required to dismantle, remove and properly dispose of the pad at their own expense.

1.15 Air Monitoring Program

A. General

1. The **CONTRACTOR** shall develop, as part of the HASP, an air monitoring program (AMP). The purpose of the AMP is to determine that the proper level of personnel protective equipment is used, to document that the level of worker protection is adequate, and to assess the migration of contaminants to off-site receptors as a result of site work.

2. The **CONTRACTOR** shall supply all personnel, equipment, facilities, and supplies to develop and implement the air monitoring program described in this section. Equipment shall include at a minimum real-time aerosol monitors, depending on work activities and environmental conditions.

3. The **CONTRACTOR's** AMP shall include both real-time and documentation air monitoring (personal and area sampling as needed). The purpose of real-time monitoring will be to determine if an upgrade (or downgrade) of PPE is required while performing on-site work and to implement engineering controls, protocols, or emergency procedures if **CONTRACTOR**-established action levels are encountered.

4. The **CONTRACTOR** shall also use documentation monitoring to ensure that adequate PPE is being used and to determine if engineering controls are mitigating the migration of contamination to off-site receptors. Documentation monitoring shall include the collection and analysis of samples for total nuisance dust.

5. To protect the public in the neighboring residential neighborhood, the **CONTRACTOR** must include in the AMP provisions for suspending work and implementing engineering controls based upon detectable odors, as well as upon instrument monitoring results.

6. During the progress of active remedial work, the **CONTRACTOR** will monitor the quality of the air in and around each active hazardous operation with real-time instrumentation prior to personnel entering these areas. Sampling at the hazardous work site will be conducted on a continuous basis. Any departures from general background will be reported to the SO prior to entering the area. The SO will determine when and if operations should be shut down.

7. Air monitoring (both real time and documentation monitoring) shall be conducted by a minimum of one dedicated person with communication to the foreman whenever intrusive activities (such as excavation, tank removal, and soil treatment) are performed in an exclusion zone. After completion of intrusive activities involving contaminated materials and removal of the exclusion zone, air monitoring may be discontinued.

8. Air monitoring equipment will be operated by personnel trained in the use of the specific equipment provided and will be under the control of the SO. A log of the location, time, type and value of each reading and/or sampling will be maintained. Copies of log sheets will be provided on a daily basis to the **ENGINEER's** on-site representative.

B. Action Levels

1. 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.

a. 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.

b. 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.

c. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

d. All 15-minute readings must be recorded and be available for State (DEPARTMENT and New York State Department of Health (NYSDOH)) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

2. 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.

a. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) 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 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

b. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 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 mcg/m3 of the upwind level and in preventing visible dust migration.

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

C. Real-Time Monitoring

1. The **CONTRACTOR** shall submit a written copy of the real time air monitoring results for each Workday, by 10:00 a.m. the following Workday, which shall include an appropriately scaled map of the Work area depicting sample locations, wind direction and other pertinent meteorological data: date; time; analytical results; applicable standards and engineering controls implemented (if necessary).

2. Real-time monitoring shall be conducted using the following equipment:

3. Organic vapor photoionizers shall be Photovac TIP, total organic vapor analyzer as manufactured by Photovac International, 739B Park Avenue, Huntington, New York 11743 or equal. The **CONTRACTOR** shall provide one Photovac TIP for each and every hazardous work zone operation.

4. Particulate monitoring must be performed using real-time particulate monitors (MiniRam Model MIEPDM-3, or equal) and shall monitor particulate matter in the range of 0-10 microns diameter (PM_{10}) with the following minimum performance standards:

Object to be measured: Dust, Mists, Aerosols
Measurement Ranges: 0.001 to 400 mg/m^3 (1 to 400,000 µg/m^3)
Precision (2-sigma) at constant temperature:
+/- 10 µg/m^3 for one second averaging; +/- 1.5 µg/m^3 for sixty second averaging
Accuracy:
+/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 µm, g= 2.5, as aerosolized)
Resolution: 0.1% of reading or 1 µg/m^3, whichever is larger
Particle Size Range of Maximum Response: 0.1-10 µ
Total Number of Data Points in Memory: 10,000
Logged Data:
Each Data Point: average concentration, time/date, and data point number
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.

Alarm Averaging Time (user selectable):
real-time (1-60 seconds) or STEL (15 minutes)

Operating Time: 48 hours (fully charged NiMH battery); continuously with charger

Operating Temperature: -10 to 50°C (14 to 122°F)

Automatic alarms are suggested.

5. Particulate levels will be monitored and integrated over a period not to exceed 15 minutes. Consequently, instrumentation shall require necessary averaging hardware to accomplish this task. A monitor such as the personal DataRAM, manufactured by Monitoring Instruments for the Environment, Inc., or equivalent, can be used as a real time particulate screening tool. Although the instrument's design does not allow it to make a sharp differentiation of particulates at the PM_{10} standard, the instrument could be used in the passive mode without a pump to provide readings in the 0.1 to 10µ range in the immediate vicinity of construction activities.

6. Monitor the air, using the same equipment, for 10-15 minutes upwind of the work site to establish background level. The background level shall be established before the start of each shift every day. In the event that downwind particulates are detected at levels in excess of 150 ug/m^3 or 2.5 times the established background level at the work site, re-measure the background concentrations upwind of the work zone using the same equipment. If the measured particulate level at the work zone is 100 ug/m^3 above background, monitor the downwind site perimeter and implement additional dust controls in the work zone. Continue to take hourly measurements of the upwind background concentrations and compare such concentrations with the particulate level at the work zone, until the downwind level at the work zone is less than 100 ug/m^3 above the upwind level. If at any time the measured particulate level at the work zone is more than 150 ug/m^3 over background concentration, the CONTRACTOR shall immediately suspend work at the site, promptly notify the Safety Officer, and implement suitable corrective action or engineering controls before work resumes.

7. Real-time monitoring will be conducted at any excavation of contaminated soil or sediments. Real-time monitoring will also be conducted at perimeter locations including an upwind (background) and three downwind locations. A background reading will be established daily at the beginning of the work shift. If the wind direction changes during the course of the day, a new background reading will be made. Downwind readings at the perimeter will be made when **CONTRACTOR** action levels have been exceeded at the excavation face or at a minimum of twice a day.

8. If action levels are exceeded at the perimeter location for fugitive dust, work must be suspended and engineering controls must be implemented to bring concentrations back down to acceptable levels.

9. Construction activities generate dust which could potentially transport contaminants off site. There may be situations when visible dust is being generated and leaving the site and the monitoring equipment does not measure PM_{10} at or above the action level. Therefore, if dust is observed leaving the working site, additional dust suppression techniques must be employed by the **CONTRACTOR**.

D. Documentation Monitoring

1. Documentation monitoring will be conducted at the perimeter at a minimum of four locations (one upwind and three downwind) for total dust. Documentation monitoring will be conducted only during excavation, consolidation, staging, removal, or decontamination activities (i.e., intrusive activities).

   a. Collect total nuisance dust using PVC collection filter and personnel sampling pump and analyze gravimetrically according to NIOSH 89-127 Method 0500.

   b. Documentation samples will be collected at established perimeter locations. The four locations will be chosen according to site activities and expected wind direction.

   c. The perimeter locations will be established and marked with high visibility paint or flagging at approximately equidistant points around the site. Samples will be collected at a height of 6 feet above ground surface.

   d. Documentation samples will be collected continuously, during the normal work hours when activities are occurring on site. At the end of the week, one days worth of sampling (i.e. three downwind locations and one upwind location) will be selected by the Engineer for analysis by the Contractor.

   e. The documentation samples will be collected over an eight (8) hour work period.

   f.. In addition to perimeter monitoring, personnel documentation samples will be collected on site once a week. On-site samples will be collected by choosing "high risk" workers to wear appropriate collection media for pesticides, metals, and particulate. "High risk" workers are those who are most likely to encounter contamination on a particular task. At a minimum, two high risk workers will be chosen to wear collection media for a particular day each week and the media will be analyzed with the documentation air monitoring samples.

   g. The **CONTRACTOR** shall submit a written copy of the documentation air monitoring results within 7 days of sampling, which shall include an appropriately scaled map of the Work area depicting sample locations, wind direction and other pertinent meteorological data: date; time; analytical results; applicable standards and engineering controls implemented (if necessary).

   h. The documentation sampling submitted shall also identify the "high risk" workers chosen to wear appropriate collection media for contaminants; date media was worn; task involved; analytical results and applicable standards.

   i. Payment for air monitoring will not be approved until the above submittals have been received and approved by the **ENGINEER**.

E. Community Air Monitoring

1. 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 DEPARTMENT/NYSDOH staff.

a. **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.

b. **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 Final DER-10 Page 205 of 226 Technical Guidance for Site Investigation and Remediation May 2010 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.

1.16 Emergency Equipment and First Aid Requirements

A. Communications

1. The **CONTRACTOR** shall provide telephone communication at the site field office. Emergency numbers, such as police, sheriff, fire, ambulance, hospital, poison control, DEPARTMENT, EPA, NYSDOH, and utilities, applicable to this site shall be prominently posted near the telephone.

2. The **CONTRACTOR** shall establish a signaling system for emergency purposes.

B. Emergency Shower and Emergency Eye Wash

1. The **CONTRACTOR** shall supply and maintain one portable eyewash/body wash facility per active hazardous work zone. The facility shall have a minimum water capacity of 10 gallons and shall conform to OSHA regulations 29 CFR 1910.151. The portable eyewash/body wash facility shall be manufactured/ supplied by Direct Safety Company, Lab Safety Supply Company, or other appropriate suppliers.

C. Fire Extinguishers

1. The **CONTRACTOR** shall supply and maintain at least one fire extinguisher in the **CONTRACTOR's** office and one at each hazardous work zone. The fire extinguisher shall be a 20-pound Class ABC dry fire extinguisher with UL-approval per OSHA Safety and Health Training Standards 29 CFR 1910.157. The fire extinguisher shall be manufactured/supplied by Direct Safety Company, Lab Safety Supply Company, or other appropriate suppliers.

D. First Aid Kit

1. The **CONTRACTOR** shall supply and locate in his project office and at each and every hazardous work zone one 24-unit (minimum size) "industrial" or "Contractor" first aid kit, required by OSHA requirements 29 CFR 1910.151. The first aid kit shall be manufactured/supplied by Norton, Scott, or other appropriate suppliers.

E. Emergency Inventory

1. In addition to those items specified elsewhere, the SO will maintain the following inventory of equipment and protective clothing for use at the site in the event of emergencies.

   a. Washable coveralls;

   b. Gloves (outer);

   c. Gloves (inner);

   d. SCBA;

   e. Escape SCBA (authorized visitor use);

   f. Face shields;

   g. Safety glasses;

   h. Respirators and appropriate cartridges;

   i. Disposable coveralls;

   j. Chemical-resistant boots and latex boot covers;

   k. Hard hats;

   l. Bottled breathing air; and

   m. Rain suits.

1.17 Emergency Responses/contingency Plan and Procedures

A. Daily Work

1. During the progress of work, the **CONTRACTOR** will monitor the quality of the air in and around each active hazardous operation prior to personnel entering these areas. Sampling shall be conducted on a continuous basis. Based on the air monitoring data, the proper level of protection will be chosen by the SO.

B. Emergency Vehicle Access

1. In the event that emergency services vehicles (police, fire, ambulance) need access to a location which is blocked by the working crew operations, those operations (equipment, materials, etc.) will be immediately moved to allow those vehicles access. Emergency crews will be briefed as to site conditions and hazards by the SO. All vehicles and personnel will be decontaminated prior to leaving the site.

2. The **CONTRACTOR** shall schedule a site briefing with the local Fire Department at the completion of mobilization to familiarize emergency response personnel with his operations and site layout.

C. Personal Injury Response Plan

1. In cases of personal injuries, the injured person or the crew personnel in charge will notify the SO. The SO will assess the seriousness of the injury, give first aid treatment if advisable, consult by telephone with a physician if necessary, and arrange for hospitalization if required. The SO will arrange for an ambulance if required.

2. If soiled clothing cannot be removed, the injured person will be wrapped in blankets for transportation to the hospital.

3. Personnel, including unauthorized personnel, having skin contact with chemically contaminated liquids or soils shall be flushed with water after any wet or soiled clothing has been removed.

4. These personnel should be observed by the SO to ascertain whether there are any symptoms resulting from the exposure. If there is any visible manifestation of exposure such as skin irritation, the project personnel will refer to a consulting physician to determine whether the symptoms were the result of a delayed or acute exposure, a secondary response to exposure such as skin infection, or occupational dermatitis. All episodes of obvious chemical contamination will be reviewed by the SO in order to determine whether changes are needed in work procedures.

D. Route to the Hospital

1. The **CONTRACTOR** shall post in conspicuous places in the Support Zone a map with written directions to the nearest hospital or emergency medical treatment facility.

E. Fire Service

1. The **CONTRACTOR** will make arrangements to take immediate fire fighting and fire protection measures with the local Fire Chief. If there is a fire, the crewmen or their person in charge will immediately call the SO. The SO will immediately call the fire personnel.

2. The air downwind from any fire or explosion will be monitored immediately in order to protect workers and the nearby community. If personal injuries result from any fire or explosion, the procedures outlined in the Personal Injury Response Plan are to be followed.

F. Master Telephone List

1. The attached master telephone list will be completed and prominently posted at the field office. The list will have telephone numbers of all project personnel, emergency services including hospital, fire, police, and utilities. In addition, two copies with telephone numbers are to be given to the **DEPARTMENT** for emergency reference purposes.

Emergency Service		Telephone Number
Fire Department		911
Police Department		911
Ambulance		911
Hospital/Emergency Care Facility		To be determined
Poison Control Center		(800) 336-6997
Chemical Emergency Advice (CHEMTREC)		(800) 424-9300
NYSDEC Albany Office	Work Hours	To be determined
	After Hours	To be determined
NYSDEC Regional Office	Work Hours	To be determined
County Dept. of Health		To be determined
New York State Dept. of Health - Albany		To be determined
New York State Dept. of Health - Regional		To be determined

1.18 Heat Stress Monitoring

A. Site personnel who wear protective clothing allow body heat to be accumulated with an elevation of the body temperature. Heat cramps, heat exhaustion, and heat stroke can be experienced, which, if not remedied, can threaten life or health. Therefore, an American Red Cross Standard First Aid book or equivalent will be maintained on site at all times so that the SO and site personnel will be able to recognize symptoms of heat emergencies and be capable of controlling the problem.

B. When protective clothing is worn, especially Levels A and B, the suggested guidelines for ambient temperature and maximum wearing time per excursion are:

Ambient Temperature (°F)	Maximum Wearing Time Per Excursion (Minutes)
Above 90	15
85 to 90	30
80 to 85	60
70 to 80	90
60 to 70	120
50 to 60	180

C. One method of measuring the effectiveness of employees' rest-recovery regime is by monitoring the heart rate. The "Brouha guideline" is one such method:

- During a 3-minute period, count the pulse rate for the last 30 seconds of the first minute, the last 30 seconds of the second minute, and the last 30 seconds of the third minute.
- Double the count.

D. If the recovery pulse rate during the last 30 seconds of the first minute is at 110 beats/minute or less and the deceleration between the first, second, and third minutes is at least 10 beats/minute, the work-recovery regime is acceptable. If the employee's rate is above that specified, a longer rest period is required, accompanied by an increased intake of fluids.

E. In the case of heat cramps or heat exhaustion, "Gatorade" or its equivalent is suggested as part of the treatment regime. The reason for this type of liquid refreshment is that such beverages will return much-needed electrolytes to the system. Without these electrolytes, body systems cannot function properly, thereby increasing the represented health hazard.

F. This liquid refreshment will be stored in a cooler at the edge of the decontamination zone in plastic squeeze bottles. The plastic bottles will be marked with individual's names. Disposable cups with lids and straws may be used in place of the squeeze bottles. Prior to drinking within the decontamination zone, the project personnel shall follow the following decontamination procedures:

1. Personnel shall wash and rinse their outer gloves and remove them.

2. Personnel shall remove their hard hats and respirators and place on table.

3. Personnel shall remove their inner gloves and place them on table.

4. Personnel shall wash and rinse their face and hands.

5. Personnel shall carefully remove their personal bottle or cup from the cooler to ensure that their outer clothes do not touch any bottles, cups, etc.

6. The used bottle or cups will not be returned to the cooler, but will be placed in a receptacle or container to be cleaned or disposed of.

7. Personnel shall replace their respirators, hard hats, gloves and tape gloves prior to re-entering the hazardous zone.

G. When personnel are working in situations where the ambient temperatures and humidity are high--and especially in situations where protection Levels A, B, and C are required--the SO must:

- Assure that all employees drink plenty of fluids ("Gatorade" or its equivalent);

- Assure that frequent breaks are scheduled so overheating does not occur; and

- Revise work schedules, when necessary, to take advantage of the cooler parts of the day (i.e., 5:00 a.m. to 1:00 p.m., and 6:00 p.m. to nightfall).

1.19 Cold Stress

A. Whole-body protection shall be provided to all site personnel that have prolonged exposure to cold air. The right kind of protective clothing shall be provided to site personnel to prevent cold stress. The following dry clothing shall be provided by the **CONTRACTOR** as deemed necessary by the SO:

- Appropriate underclothing (wool or other);

- Outer coats that repel wind and moisture;

- Face, head, and ear coverings;

- Extra pair of socks;

- Insulated safety boots; and

- Glove liners (wool) or wind- and water-repellant gloves.

B. The SO will use the equivalent chill temperature when determining the combined cooling effect of wind and low temperatures on exposed skin or when determining clothing insulation requirements.

C. Site personnel working continuously in the cold are required to warm themselves on a regular basis in the on-site hygiene facility. Warm, sweet drinks will also be provided to site personnel to prevent dehydration. The SO shall follow the work practices and recommendations for cold stress threshold limit values as stated by the 1991-1992 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices by the American Conference of Governmental Industrial Hygienists or equivalent cold stress prevention methods.

1.20 Logs, Reports and Record Keeping

A. Security Log

1. A daily log of security incidents and visitors granted access to the site will be maintained, as well as a log of all personnel entering and exiting the site.

2. All approved visitors to the site will be briefed by the SO on safety and security, provided with temporary identification and safety equipment, and escorted throughout their visit. Site visitors will not be permitted to enter a hazardous work zone.

3. Project site shall be posted, "Warning: Hazardous Work Area, Do Not Enter Unless Authorized," and access restricted by the use of a snow fence.

B. Safety Log

1. The **CONTRACTOR's** SO will maintain a bound safety logbook. The log will include all health and safety matters on site and include, but not be limited to, the following information:

- Date and weather conditions on site;
- A description of the proposed work for the day;
- Times when site personnel arrive and depart;
- Air monitoring data;
- Heat and/or cold stress monitoring;
- Decontamination procedures;
- Type and calibration of air sampling/monitoring equipment used;
- Safety meeting summaries; and
- Accidents.

C. Emergency Or Accident Report

1. Any emergency or accident will be reported immediately to the SO. The **ENGINEER** will also be notified. The **CONTRACTOR** will submit a written report immediately, but no later than 24 hours of its concurrence. The report will include, but not be limited to, the nature of the problem, time, location, areas affected, manner and methods used to control the emergency, sampling and/or monitoring data, impact, if any, to the surrounding community, and corrective actions the **CONTRACTOR** will institute to minimize future occurrences. All spills will be treated as emergencies.

D. Daily Work Report

1. The **CONTRACTOR** shall maintain a daily work report that summarizes the following:

    - Work performed,
    - Level of protection,
    - Air monitoring results,
    - Safety-related problems, and
    - Corrective actions implemented.

1.21 Posting Regulations

A. The **CONTRACTOR** will post signs at the perimeter of the Exclusion Zone that state "Warning, Hazardous Work Area, Do Not Enter Unless Authorized." In addition, a notice directing visitors to sign in will be posted at the project site. Also, the **CONTRACTOR** will post a sign stating that any questions about the site should be directed to the New York State Department of Environmental Conservation.

B. Safety regulations and safety reminders will be posted at conspicuous locations throughout the project area. The following safety regulations and safety reminders are at a minimum to be posted around the job site:

SAFETY REGULATIONS

(To be Posted for Project Personnel)

The main safety emphasis is on preventing personal **contact** with gases, soils, sludge and water. Towards that end, the following rules have been established.

Regulations

A. Eating, drinking and smoking on the site is PROHIBITED except in specifically designated areas.

B. All project personnel on the site must wear clean or new gloves daily.

C. If you get wet to the skin, you must wash the affected area with soap and water immediately. If clothes in touch with the skin are wet, these must be changed.

D. You must wash your hands and face before eating, drinking or smoking.

E. Observe regulations on washing and removing boots before entering the dressing room or a clean area and showering before going home.

Recommendations

A. Do not smoke on site with dirty hands; better yet, do not smoke.

B. Check for any personal habit which could get soil or water into your body.

   Examples: food off your fingers, wiping your face or nose with a dirty hand or running a dirty hand through your hair.

C. Check that any regularly worn clothing is clean. Examples include dirty watchbands, neck chains and a dirty liner on your safety helmet. Safety practices with poisonous chemicals can be summed up with a few words:

   Don't breathe in chemical odors and don't touch the water, soil, and sludge.

   If you do get dirty or wet, clean up as soon as possible.

SAFETY REMINDER FOR TOXIC CHEMICALS

(Post for Project Personnel)

Chemicals can't cause problems unless you breathe them, eat them, or put them on your skin.

Chemicals in Gases, Soils, Sludge, and Water

Don't let them go into your mouth, nose, or stay on your skin.

Use common personal hygiene.

A. Don't eat or drink on the site.

B. No smoking in the area of work.

C. Wear protective clothing.

D. Glove liners must be **clean**.

E. Wash your hands whenever practical. Wash before eating, drinking, or smoking.

F. Don't carry chemicals home to your family. (For example, on clothing, mud in the car, dirty hands.)

G. Follow strictly the HASP.

1.22 Community Protection Plan

A. General

1. Develop, as part of this HASP, a Community Protection Plan (CPP). The CPP shall outline those steps to be implemented to protect the health and safety of surrounding human population and the environment.

B. Air Monitoring

1. As part of the Air Monitoring Program, use real-time monitoring and documentation sampling as described in the Subpart "Air Monitoring Program" of this section to determine if off-site emission, as a result of site work, poses a threat to the surrounding community.

2. Provide real-time air monitoring for volatile compounds and particulate levels as the perimeter of the work area as necessary. Include the following:

    a. Volatile organic compounds must be monitored at the downwind perimeter of the work area on a continuous basis. If total organic vapor levels exceed 5 ppm above background, work activities shall be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings shall be recorded and be available for State (DEC & DOH) personnel to review.

    b. Particulates shall be continuously monitored at the 4 documentation sampling stations for a total of 4 dust monitors. If the downwind particulate level is 150 ug/m^3 greater than the upwind particulate level, dust suppression techniques shall be employed. All readings shall be recorded and be available for State (DEC & DOH) personnel to review.

C. Vapor Emission Response Plan

1. If the ambient air concentration of organic vapors exceed 5 ppm above background at the perimter of the work area, activities shall be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities may resume. If the organic vapor levels are greater than 5 ppm over background but less than 225 ppm over background at the perimeter of the work area, activities may resume provided the organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

2. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities shall be shutdown. When work shutdown occurs, downwind air monitoring as directed by the SO shall be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

D. Major Vapor Emission

1. If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities shall be halted.

2. If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, the air quality shall be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

3. If efforts to abate the emission source are unsuccessful and if organic vapor levels are approaching 5 ppm above background and persist for more than 30 minutes in the 20 Foot Zone, the Major Vapor Emission Response Plan shall automatically be placed into effect.

4. However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background levels.

E. Major Vapor Emission Response Plan

1. Upon activation, the following shall be undertaken:

   a. All Emergency Response Contracts as listed in the Subpart titled "Emergency Response and Contingency Plan" paragraph titled "Telephone List."

   b. The local police authorities shall immediately be contacted by the SO and advised of the situation. Coordinate with local officials to arrange for notification and evacuation of the surrounding community.

   c. Frequent air monitoring shall be conducted at 30 minutes intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring say be halted or modified by the SO.

2. The Air Monitoring Program shall include real-time air monitoring and shall be conducted at the perimeter of the site. Particulates should be continuously monitored upwind, downwind and within the Exclusion Zone at temporary particulate monitoring stations. If the downwind particulate level is more than 2.5 times greater than the upwind particulate level and greater than 150 ug/m^3, then dust suppression techniques shall be employed. This is a general action level. A site-specific action level shall be developed based on available analytical data. All readings shall be recorded and be available for ENGINEER, DEPARTMENT, and NYSDOH personnel to review.

3. Coordinate with local officials to arrange for notification and evacuation of the surrounding community in the event that off-site emissions pose a threat.

F. Odor

1. Foam active work areas to reduce odors if odor complaints are received from nearby residences during site activities. Odor masking agents or other odor control methods may be used subject to **ENGINEER's** review. Continue odor suppression during each day that odor complaints are received.

G. Off-Site Spill Response

1. Produce as part of the HASP a Spill Response Plan, also coordinated with local officials, in case of an off-site spill of either liquid or solid wastes. The plan shall include transportation routes and times, as well as the minimum requirements set forth in the Subpart titled "On-Site Spill Containment Plan." The driver shall be supplied with Material Safety Data Sheets (MSDSs), a 24-hour emergency phone number, and instructions for reporting emergencies to local agencies and the project site.

1.23 Confined Space Work

A. Evaluate the work areas and determine if there are any permit-required confined spaces. If the **CONTRACTOR** determines that personnel will not need to enter a permit-required confined space, appropriate measures to prevent personnel from entering such shall be taken. If the **CONTRACTOR** determines that personnel will need to enter a permit-required confined space, develop and implement a written permit-required confined space program.

B. The written program shall comply with 29 CFR 1910.146 and shall include the following:

1. Implement methods to prevent unauthorized entry;
2. Identify and evaluate the hazards of permit-required confined spaces before personnel entry;
3. Develop and implement procedures for safe permit-required confined space entry;
4. Provide the appropriate equipment to evaluate permit-required confined spaces;
5. Evaluate permit-required confined spaces when entry operations are conducted;
6. Provide at least one attendant outside the permit-required confined space which will be entered;
7. Designate the personnel who will have active roles in entry operations;
8. Develop and implement procedures for obtaining rescue and emergency services;
9. Develop and implement a system for the preparation, issuance, use, and collection of entry permits;
10. Develop and implement procedures to coordinate entry operations when personnel from more than one employer are working;
11. Develop and implement procedures for concluding the entry;
12. Review and revise entry operations if measures may not protect personnel; and
13. Review the permit-required confined space program to ensure personnel are protected from the hazards present.

C. Copes of the permit-required confined space program and employee training certificates shall be included with the HASP.

2. PRODUCTS

Not Used.

3. EXECUTION

Not Used.

*** END OF SECTION ***

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+ + END OF TABLE OF CONTENTS + +

SECTION 01 35 43.13

ENVIRONMENTAL PROCEDURES FOR HAZARDOUS MATERIALS

PART 1 – GENERAL

1.1 DESCRIPTION

A. CONTRACTOR shall develop, implement, and maintain a Hazardous Materials management program (HMMP) throughout the Project, in accordance with Laws and Regulations.
   1. Hazardous Materials Brought to Site by Contractor: Transport, handle, store, label, use, and dispose of in accordance with this Section, and Laws and Regulations.
   2. Hazardous Material Generated by Contractor:
      a. Hazardous Material shall be properly handled, stored, labeled, transported and disposed of by CONTRACTOR in accordance with Laws and Regulations, and this Section.
      b. If CONTRACTOR will generate or has generated Hazardous Material at the Site, obtain a United States Environmental Protection Agency (EPA) identification number listing CONTRACTOR's name and address of the Site as generator of the Hazardous Material. Obtain identification number from state environmental agency or similar authority having jurisdiction at the Site. Submit identification number within time frame specified in Article 1.3 of this Section.
      c. CONTRACTOR shall be responsible for identifying, analysis of, profiling, transporting, and disposing of Hazardous Material generated by CONTRACTOR.
   3. Fines or civil penalties levied against DEPARTMENT for violations committed at the Site by CONTRACTOR, and costs to DEPARTMENT (if any) associated with cleanup of Hazardous Materials shall be paid by CONTRACTOR.

B. Enforcement of Laws and Regulations:
   1. Interests of DEPARTMENT are that accidental spills and emissions, Site contamination, and injury of personnel at the Site are avoided.
   2. When DEPARTMENT is aware of suspected violations, DEPARTMENT will notify CONTRACTOR, and authorities having jurisdiction if DEPARTMENT reasonably concludes that doing so is required by Laws or Regulations.

1.2 DEFINITIONS

A. The following terms are defined for this Section and supplement the terms defined in the General Conditions:
   1. Hazardous Material: Material, whether solid, semi-solid, liquid, or gas, that, if not stored or used properly, may cause harm or injury to persons through inhalation, ingestion, absorption or injection, or that may negatively impact the environment through use or discharge of the material on the ground, in water (including groundwater), or to the air. Hazardous Material includes, but is not limited to, chemicals, Asbestos, Hazardous Waste, PCBs, Petroleum, Radioactive Material, and which is or becomes listed, regulated, or addressed pursuant to [a] the Comprehensive Environmental Response, Compensation and Liability Act, 42 United States Code (USC) §§9601 et seq. ("CERCLA"); [b] the Hazardous Materials Transportation Act, 49 USC §§1801 et seq.; [c] the Resource Conservation and Recovery Act, 42 USC §§6901 et seq. ("RCRA"); [d] the Toxic Substances Control Act, 15 USC §§2601 et seq.; [e] the Clean Water Act, 33 USC §§1251 et seq.; [f] the Clean Air Act, 42 USC §§7401 et seq.; and [g] any other Law or Regulation regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Laws and Regulations applying to the Work under this Section include:
   1. Code of Federal Regulations (CFR), Title 29, Part 1910, Occupational Safety and Health Standards.
   2. CFR, Title 29, Part 1926, Safety and Health Regulations for Construction.
   3. CFR Title 40, Protection of Environment.
   4. CFR, Title 49, Transportation.
   5. Occupational health and safety requirements of state labor department or similar entity; environmental Laws and Regulations of state environmental agency, Laws and Regulations of state department of transportation.
   6. New York State Department of Environmental Conservation.

1.4 SUBMITTALS

A. Informational Submittals: Submit the following to the entity(ies) specified for each:
   1. Hazardous Materials (including Chemicals) Proposed for Use at the Site: Submit current (dated within the past two years) material safety data sheets (MSDS) in accordance with 29 CFR 1910.1200 (OSHA Hazard Communication Standard), manufacturer, Supplier (if different than manufacturer), container size(s) and number of containers proposed to be at the Site, minimum and maximum volume of material intended to be stored at the Site, and description of process or procedures in which Hazardous Material will be used. Furnish information in sufficient time to obtain DEPARTMENT's acceptance no later than least three days before bringing Hazardous Material to

the Site. Submit to ENGINEER and DEPARTMENT's environmental representative.

2. Hazardous Material Generated at the Site: Submit for each Hazardous Material generated at the Site identification number, analysis results, and number and size of storage containers at the Site. Furnish information not less three days of CONTRACTOR's receipt of analytical results. Submit to ENGINEER and DEPARTMENT's environmental representative.
3. Permits: Copies of permits for storing, handling, using, transporting, and disposing of Hazardous Materials, obtained from authorities having jurisdiction. Submit to DEPARTMENT's environmental representative and ENGINEER.
4. Other Documents required for the HMMP: Submit to DEPARTMENT's environmental representative requested documents within three days of CONTRACTOR's receipt of request. HMMP documents may include emergency/spill response plan, communication plan, and other documents.
5. Qualifications Statements:
    a. Contractor's Safety Representative: Submit qualifications of proposed safety representative, including summary of experience, training received, and valid certifications applicable to the Project.

1.5 HAZARDOUS MATERIALS MANAGEMENT

A. Obtain DEPARTMENT's environmental representative's acceptance before bringing each Hazardous Material to the Site.

B. Communication Plan: CONTRACTOR shall develop a Hazardous Materials communication plan. At minimum, maintain at the Site two notebooks containing: 1) Inventory of Hazardous Materials (including all chemicals); and, 2) Current (dated within the past two years) material safety data sheets (MSDS) for all materials being used to accomplish the Work, whether or not defined as Hazardous Material in this Section. Keep one notebook in CONTRACTOR's field office at the Site; keep second notebook at location acceptable by DEPARTMENT's environmental representative. Keep notebooks up-to-date as materials are brought to and removed from the Site.

C. Emergency/Spill Response Plan: Develop, implement, and maintain an emergency/spill response plan, for each Hazardous Material or each class/group of Hazardous Materials as applicable. At minimum, response plan shall include the following:
    1. Description of equipment available at the Site to contain or respond to emergency related to or spill of the material.
    2. Procedures for notifying, and contact information for: authorities having jurisdiction, emergency responders, DEPARTMENT, ENGINEER, the public as applicable, and other entities as required.
    3. Response coordination procedures between CONTRACTOR, DEPARTMENT, and others as appropriate.

4. Site plan showing proposed location of Hazardous Materials storage area and location of spill containment/response equipment, and location of storm water drainage inlets and drainage routes.
5. Description of Hazardous Material handling and spill response training provided to CONTRACTOR's and Subcontractors' employees, in accordance with 29 CFR 1926.21(b) and other Laws and Regulations..

D. Storage of Hazardous Materials and Non-Hazardous Materials:
   1. Hazardous Materials containers shall bear applicable hazard diamond(s).
   2. Container Labeling:
      a. Properly label each container of consumable materials, whether or not classified as Hazardous Materials under this Section.
      b. Stencil CONTRACTOR's name and, as applicable, Subcontractor's name, on each vessel containing Hazardous Material and, for non-Hazardous Materials, on each container over five-gallon capacity. Containers shall bear securely-attached label clearly identifying contents. Label containers that are filled from larger containers.
      c. If DEPARTMENT becomes aware of unlabeled containers at the Site, DEPARTMENT's environmental representative will notify CONTRACTOR. Properly label container(s) within one hour of receipt of notification or remove container from the Site.
   3. To greatest extent possible, store Hazardous Materials off-Site until required for use in the Work.

E. Hazardous Materials Storage Area:
   1. Maintain designated storage area for Hazardous Materials that includes secondary containment. Storage area shall include barriers to prevent vehicles from colliding with storage containers, and shall include protection from environmental factors such as weather.
   2. Provide signage in accordance with Laws and Regulations, clearly identifying the Hazardous Materials storage area.

F. CONTRACTOR's safety representative shall meet at least monthly with DEPARTMENT's environmental representative to review CONTRACTOR's HMMP documents, procedures, and inspect storage areas and the Site in general, to verify compliance with this Section.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01 41 26

STORMWATER POLLUTION PREVENTION PLAN AND PERMIT

PART 1 – GENERAL

1.1 DESCRIPTION

A. CONTRACTOR shall comply with the Project's State Pollutant Discharge Elimination System (SPDES) General Construction Permit for New York. CONTRACTOR is responsible for providing necessary materials and taking appropriate measures to comply with requirements of the permit and minimize pollutants in storm water runoff from the Site.

B. Documents: The following are part of the Work included under this Section:
   1. Storm Water Pollution Prevention Plan (SWPPP): Prepared by CONTRACTOR and filed with authority having jurisdiction over storm water discharges during construction.
   2. Sediment and Erosion Control Permit: Prepared by CONTRACTOR and filed with the authority having jurisdiction over sediment and erosion control during construction.
   3. SWPPP Revisions: Prepared by CONTRACTOR and submitted to ENGINEER. At minimum, CONTRACTOR shall file a SWPPP Revision prior to starting Work at the Site, and as required by authorities having jurisdiction. SWPPP Revision shall include CONTRACTOR's proposed temporary means for storm water control during all phases of the Work and include plans for storm water conveyance and retention, as applicable. Coordinate with excavation plan submittals required in Division 31 of the Specifications. Should CONTRACTOR propose deviations to the SWPPP included in the Contract Documents, or if Project-specific modifications of the SWPPP are required to conform to field conditions, CONTRACTOR shall provide additional SWPPP Revisions as necessary, in accordance with requirements of authorities having jurisdiction and applicable permits. SWPPP Revisions shall use the SWPPP Revision form included in this Section, with supporting documents attached as required, or forms provided by authorities having jurisdiction.
   4. Storm Water Certification Statement: To be provided by CONTRACTOR to ENGINEER on the form included with this Section, or on a form provided by authority having jurisdiction. Do not perform Work at the Site until the Storm Water Certification has been submitted to ENGINEER.
   5. Notice of Intent (NOI): Prepared by CONTRACTOR and submitted to authorities having jurisdiction following ENGINEER's receipt and acceptance of CONTRACTOR's SWPPP Revision and preliminary Progress Schedule. NOI will be filed with authorities having jurisdiction within ten days of ENGINEER's acceptance of CONTRACTOR's SWPPP Revision and

preliminary Progress Schedule. Do not perform Work at Site until NOI is submitted to authorities having jurisdiction.

6. Storm Water Inspection Report: Prepared by ENGINEER's Resident Project Representative (RPR) using the form included with this Section, or a form provided by authority having jurisdiction. Storm water inspection reports will be filed in a log book kept at the Site by ENGINEER. Copy of each report will be furnished to CONTRACTOR upon request. Storm water inspection report will be completed for each of the following:
    a. Pre-construction: After placement of storm water management measures, including sediment and erosion controls, and other temporary facilities, prior to starting other Work at the Site.
    b. During the Work: Every seven days until Notice of Termination is completed. When the Site is stabilized relative to storm water, erosion, and discharge of sediment, inspection frequency during temporary shutdowns and seasonal shutdowns is once per month until Notice of Termination is completed.
    c. Final: Final inspection report will be prepared prior to completion of Notice of Termination.
7. Notice of Termination (NOT): Prepared by CONTRACTOR on the form included with storm water permit and provided to ENGINEER for review. CONTRACTOR shall submit the NOT to authority having jurisdiction. Submit the NOT following completion of all Work that may result in pollution in storm water discharges, including landscaping Work. Final Payment will not be made until the NOT is filed with authority having jurisdiction.

C. Prevent discharge of sediment to and erosion from the Site to surface waters, drainage routes, public streets and rights-of-way, and private property, including dewatering operations. Prevent trash and demolition and construction debris from leaving the Site via storm water runoff. Provide berms, dikes, and other acceptable methods of directing storm water around work areas to drainage routes. Prior to starting the Work associated with such discharge, construction-related discharges to publicly owned conveyance or treatment systems shall be approved by Department of system to which the discharge will be directed.

D. Do not cause or contribute to a violation of water quality standards, Laws, or Regulations. Notify ENGINEER of revisions to the SWPPP necessary to protect receiving water quality and comply with applicable permits. Provide and implement measures to control pollutants in storm water runoff from the Site to prevent:
    1. Turbidity increases that will cause a substantial visible contrast to natural conditions.
    2. Increase in suspended, colloidal, and settleable solids that would cause sediment deposition or impair receiving water quality and use.
    3. Presence of residue from oil and floating substances, visible oil, and globules of grease.

E. CONTRACTOR shall pay civil penalties and other costs incurred by DEPARTMENT, including additional engineering, RPR, and inspection services, associated with non-complying with applicable permits related to storm water discharges associated with construction activity and sediment and erosion controls associated with the Work.

F. Contract Price includes all material, labor, and other permits and incidental costs related to:
   1. Preparing SWPPP Revisions and other documents that are CONTRACTOR's responsibility, in accordance with this Section.
   2. Installing and maintaining structural and non-structural items used in complying with the SWPPP and its revisions.
   3. Clean-up, disposal, and repairs following wet weather events or spills caused by CONTRACTOR.
   4. Implementing and maintaining "best management practices", as defined in applicable permits and Laws or Regulations, to comply with requirements that govern storm water discharges at the Site.
   5. Inspections of storm water, sediment, and erosion controls as specified.

G. Coordinate requirements of this Section with requirements for earthwork, erosion control, and landscaping in the Contract Documents, applicable permit requirements, and Laws and Regulations.

H. Implement SWPPP controls and practices prior to starting other Work at the Site. Each contractor and subcontractor identified in the SWPPP and SWPPP Revisions shall sign a copy of the storm water certification statement.

1.2 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with Laws and Regulations relative to environmental protection and restoration, including:
   1. Storm water permit applicable to the Work and Site.
   2. State and local erosion and sediment control guidelines and requirements,
   3. State and local storm water regulations and guidance.

1.3 SUBMITTALS

A. Informational Submittals: Submit the following:
   1. Submit the following, in accordance with Article 1.1 and Article 1.4 of this Section; for Projects involving Work at multiple Sites, submit each of the following for each Site, as applicable:
      a. SWPPP Revisions.
      b. Storm Water Certification Statement.
      d. Notice of Termination

2. Approval to Discharge to Publicly-owned Treatment Works: For storm water discharges associated with construction activity that are discharged to a publicly owned conveyance or treatment system, prior to commencing discharges, submit system Department's written approval for such discharges.
3. Storm Water Site Plan Updates: Within three days after each storm water inspection, submit updated storm water site plan.

1.4 SWPPP REVISIONS

A. CONTRACTOR shall prepare a SWPPP Revision in accordance with the Project's storm water permit when:
   1. There is a significant change in design, construction, operation, or maintenance of the Project that significantly affects the potential of discharging pollutants to Waters of the United States, and has not otherwise been addressed in the SWPPP.
   2. SWPPP proves to be ineffective relative to:
      a. eliminating or significantly minimizing pollutants from sources identified in the SWPPP required by this permit, or
      b. achieving general objectives of controlling pollutants in storm water discharges from permitted construction activity.
   3. Prepare and submit SWPPP Revision identifying contractors and subcontractor responsible for implementing part of the SWPPP.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 INSPECTIONS AND REPAIRS

A. Perform Site inspections and assessments as required in applicable storm water permit and this Section. Inspections and assessments shall be done by CONTRACTOR's site superintendent or project manager, together with ENGINEER's RPR.

B. Inspections:
   1. During the Work, Site inspections shall be performed:
      a. After SWPPP controls are provided and prior to starting other Work at the Site.
      b. During the Work: Every seven days until Notice of Termination is completed. When the Site is stabilized relative to storm water, erosion, and discharge of sediment, inspection required frequency during temporary shutdowns and seasonal shutdowns is once per month until Notice of Termination is completed
      c. Prior to CONTRACTOR submitting the Notice of Termination.

2. During each inspection, verify sediment control practices and record approximate degree of sediment accumulation as percentage of acceptable sediment storage volume; inspect erosion and sediment control practices and record maintenance performed; observe and record deficiencies relative to implementation of the SWPPP. RPR or ENGINEER will complete Storm Water Inspection Reports and CONTRACTOR shall record and submit the following.
    a. Storm Water Site Plan: On a copy of the Site plan included in the Contract Documents or other map of the Site acceptable to ENGINEER, indicate extent of all disturbed areas and drainage pathways. Indicate areas expected to undergo initial disturbance or significant site work within the next fourteen days.
    b. Indicate on storm water site plan areas of Site that have undergone temporary or permanent stabilization.
    c. Indicate on storm water site plan all disturbed areas that have not undergone active site Work during the previous fourteen days.

C. Maintain at the Site a copy of storm water site plans from storm water inspection submit each storm water map to ENGINEER and RPR. RPR will maintain at the Site a log book with a copy of each Storm Water Inspection Reports.

D. Cooperate with representatives of authorities having jurisdiction during periodic visits to Site, and promptly provide information requested by authorities having jurisdiction.

E. Complete repairs to SWPPP controls in accordance with applicable requirements and to satisfaction of ENGINEER within two calendar days of each inspection.

3.2 ATTACHMENTS

A. The documents listed below, following the "End of Section" designation, are part of this Specification Section. Notice of Intent (NOI) form, Co-permittee Agreement form, and Notice of Termination (NOT) form are included with storm water permit.
    1. Storm Water Inspection Report form (two pages).
    2. Storm Water Permit Certification form (one page).
    3. SWPPP Revision Form (one page).

+ + END OF SECTION + +

STORM WATER INSPECTION REPORT

Department:
Site:
Project:
Contractor:

Date of Inspection:_____
Day of Week:

S	M	T	W	T	F	S

Sheet No. _____ **of** _____ **Sheets**

If pertinent to the Operation	
Weather	
Temperature	

This inspection and maintenance form is to be used when the Work is subject to a Storm Water General Permit for Construction Activity. Inspections must be performed at least once every seven calendar days; for sites that are stabilized and temporarily shut down inspections may be reduced to once per month. Each erosion and sediment control measure installed on the Site is to be inspected and the Contractor must complete all required maintenance within two calendar days from the date of inspection.

Reason for this inspection:
- ÿ Pre-construction Site assessment
- ÿ Seven calendar day inspection
- ÿ Monthly inspection (when Site is stabilized and shut down)
- ÿ Post-construction inspection prior to Notice of Termination

Key for erosion and sediment control measures to be inspected: [Use the following designations in the table below] (1) mulch, (2) seed and mulch, (3) check dams, (4) haybale/strawbales, (5) silt fence, (6) sediment trap, (7) turbidity curtains, (8) pipe slope drains, (9) drainage structure inlet protection, (10) rolled erosion control products, (11) soil stabilizers, (12) construction entrances, (13) pipe inlet/outlet protection, (14) water diversion structures, (15) sedimentation basins, (16) cofferdams, (17) Other _____.

ID	Location	Disturbance		Measure		Remarks (Evaluate integrity of measure, describe evidence of erosion)	Approximate Sediment Accumulation (% of Depth)	Maintenance Required? (Y or N) (If Yes, Describe Below)
		Existing? (Y or N)	Next 14 Days? (Y or N)	Code #	Temp or Perm? (T, P or NA)			
1								
2								
3								
4								
5								
6								
7								
8								

ID	Location	Disturbance		Measure		Remarks (Evaluate integrity of measure, describe evidence of erosion	Approximate Sediment Accumulation (% of Depth)	Maintenance Required? (Y or N) (If Yes, Describe Below)
		Existing? (Y or N)	**Next 14 Days?** (Y or N)	**Code #**	**Temp/Perm or N/A?** (T, P or NA)			
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

DESCRIPTION OF REQUIRED MAINTENANCE AND ANY EXISTING DEFICIENCIES IN THE SWPPP: Specify for each location using row ID number.

I certify under penalty of Law that this document and all attachments were prepared under my direction or supervision in accordance with a system to ensure that qualified personnel property gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein may be punishable by Law.

Signature: _____ Prepared: _____ Copy to Contractor: _____
Resident Project Representative (Date) (Date)

Qualified Professional Name Malcolm Pirnie, Inc.
(w/Firm Name, if Consultant)

STORM WATER PERMIT CERTIFICATION

Contract Number:_____ Project:_____

Department:_____

_____

Each Contractor and Subcontractor identified in the Storm Water Pollution Prevention Plan (SWPPP) must certify that they understand the permit conditions and their responsibilities. Every Contractor and Subcontractor performing an activity that involves soil disturbance shall sign this certification and submit it to the Engineer prior to performing the Work. This certification shall be signed by an owner, principal, president, secretary, or treasurer of the firm.

> I certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP for the construction Site identified in such SWPPP as a condition of authorization to discharge storm water. I also understand that my firm and its employees and Subcontractors shall comply with the terms and conditions of Department's general permit for storm water discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards, Laws, or Regulations.

Firm: _____

Address: _____

City:_____ State_____ Zip_____

_____ _____ _____

Name (Print) Signature Date

_____

Title

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REVISION

Date of Inspection: _____

Department:
Site:
Project:
Contractor:

Sheet No. _____ **of** _____ **Sheets**

This form shall be used when revisions to the current Storm Water Pollution Prevention Plan (SWPPP) are required by the Storm Water General Permit for Construction Activity or the Contract Documents.

Reason for the Revision(s): Revisions were requested by State: ÿ Yes ÿ No

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Describe the Revision(s) to the SWPPP: _____

_____
_____
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I certify under penalty of Law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein may be punishable by Law.

Signature: _____ Prepared: _____ (Date) Submitted: _____ (Date)

Copy to: ÿ Engineer ÿ Contractor _____

SECTION 01 45 29.13

TESTING LABORATORY SERVICES FURNISHED BY CONTRACTOR

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall employ and pay for services of independent testing laboratory to perform specified services.
   2. Inspection, sampling, and testing shall be as specified in the Specifications including but not limited to:
      a. Section 31 23 05, Excavation and Fill.
      b. Section 02 51 41, Off-Site Transportation and Disposal.
      c. Other tests in the Contract Documents that are not specifically assigned to others.
   3. CONTRACTOR shall pay for:
      a. Tests not specifically indicated in the Contract Documents as being OWNER's responsibility.
      b. Tests made for CONTRACTOR's convenience.
      c. Repeat tests required because of CONTRACTOR's negligence or defective Work, and retesting after failure of test for the same item to comply with the Contract Documents.
   4. Testing laboratory is not authorized to approve or accept any portion of the Work or defective Work; rescind, alter, or augment requirements of Contract Documents; and perform duties of CONTRACTOR.

1.2 REFERENCES

A. Standards referenced in this Section are:
   1. ASTM E329, Specification for Agencies Engaged in Construction Inspection and/or Testing.
   2. ISO/IEC 17025, General Requirements for the Competence of Testing and Calibration Laboratories.
   3. NIST SRM, Standard Reference Materials.

1.3 QUALITY ASSURANCE

A. Qualifications:
   1. Testing Laboratory:
      a. Comply with applicable requirements of ASTM E329.
      b. Testing laboratory shall be licensed to operate in the same state as the Site. Where applicable, laboratory shall be certified by the authority having jurisdiction for the types of testing required.

c. Testing equipment used by laboratory shall be calibrated at maximum intervals of twelve months by devices of accuracy traceable to one of the following: NIST SRM, ISO/IEC 17025, certified by state or local bureau of weights and measures, or values of natural physical constants generally accepted in the engineering and scientific community.

1.4 SUBMITTALS

A. Informational Submittals: Submit the following:
   1. Quality Control Submittals and Test Reports: Testing laboratory shall promptly submit to CONTRACTOR results of testing and inspections, including:
      a. Date issued.
      b. Project title, number, and name of the Site.
      c. Testing laboratory name and address.
      d. Name and signature of inspector or person obtaining samples.
      e. Date of inspection or sampling.
      f. Record of temperature and weather.
      g. Date of test.
      h. Identification of material or product tested, and associated Specification Section.
      i. Location in the Project.
      j. Type of inspection or test.
      k. Results of tests and observations regarding compliance with the Contract Documents.
   2. Qualifications Statements:
      a. Testing Laboratory:
         1) Qualifications statement indicating experience and facilities for tests required under the Contract Documents.
         2) Copy of report of inspection of facilities during most recent NIST inspection tour. Include memorandum of remedies of deficiencies reported during inspection.
         3) Copy of certificate of calibration for each instrument or measuring device proposed for use, by accredited calibration agency.

1.5 TESTING LABORATORY DUTIES

A. Testing laboratory shall:
   1. Cooperate with CONTRACTOR and provide qualified personnel promptly on notice.
   2. Perform required inspections, sampling, and testing of materials and methods of construction; comply with applicable reference standards and the Contract Documents; and ascertain compliance with requirements of the Contract Documents.
   3. Promptly notify ENGINEER and CONTRACTOR of irregularities or deficiencies in the Work that are observed during performance of services.
   4. Promptly submit to CONTRACTOR copies of reports of inspections and tests.
   5. Perform additional tests and services, as required by CONTRACTOR.

1.6 CONTRACTOR'S RESPONSIBILITIES

A. CONTRACTOR shall:
   1. Cooperate with testing laboratory personnel.
   2. Provide to testing laboratory preliminary representative samples of materials and products to be tested, in required quantities.
   3. Promptly submit to ENGINEER copies of results of tests and inspections received from testing laboratory.
   4. Provide to laboratory the preliminary design mix proposed for concrete and other material mixes to be tested by testing laboratory.
   5. Provide labor and facilities:
      a. For access to the Work to be tested, and where required, to Suppliers' operations.
      b. For obtaining and handling samples at the Site.
      c. For facilitating inspections and tests.
      d. For testing laboratory's exclusive use for storing and curing of test samples.
      e. Forms for preparing concrete test beams and cylinders.
   6. Notify laboratory and ENGINEER sufficiently in advance of operations to allow assignment of personnel and scheduling of tests.
   7. Arrange with laboratory and pay for additional services, sampling, and testing required for CONTRACTOR's convenience.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01 55 13

ACCESS ROADS AND PARKING AREAS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide temporary construction roads, walks, parking areas, and appurtenances required during the Project for use by CONTRACTOR, other contractors employed on the Project, DEPARTMENT's, and emergency vehicles.
   2. Temporary roads and parking areas shall be designed and maintained by CONTRACTOR and shall be fully passable to vehicles in all weather conditions.

B. Use of Existing Access Roads:
   1. CONTRACTOR is allowed to use existing roads.
   2. Prevent interference with traffic on existing roads and parking areas. At all times, keep access roads and entrances serving the Site clear and available to Owner, Site employees, emergency vehicles, and other contractors. Do not use access roads or Site entrances for parking or storage of materials or equipment unless approved by the ENGINEER.
   3. CONTRACTOR shall indemnify and hold harmless DEPARTMENT and ENGINEER from expenses caused by CONTRACTOR's operations over existing roads and parking areas.
   4. Schedule deliveries to minimize use of driveways and Site entrances.

1.2 SITE ACCESS

A. Site Access:
   1. CONTRACTOR access to the Site shall be via entrances shown on Figures and as described in the Work Plan.

1.3 CONTRACTOR PARKING

A. CONTRACTOR employee vehicles shall park on east side of the Site building.

B. Park construction vehicles and equipment in work areas off of permanent roads and parking areas, in areas of the Site designated for CONTRACTOR staging.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Materials for temporary roads and parking areas shall comply with the Contract Documents.

B. Traffic controls shall comply with requirements of authorities having jurisdiction.

PART 3 – EXECUTION

3.1 TEMPORARY ROADS AND PARKING AREAS

A. Temporary Roads and Parking in Areas Different from Permanent Pavement:
   1. Provide temporary roads and parking areas adequate to support and withstand traffic loads during the Project. Locate temporary roads and parking areas as shown.
   2. Provide reasonably level, graded, well-drained subgrade of satisfactory soil material, compacted to at least 95 percent of maximum dry density in the upper six inches.
   3. Where required to support loads and provide separation between subgrade and subbase materials, provide geotextile or geogrid as required.
   4. Provide crushed stone or gravel subbase material a minimum of six inches thick, roller-compacted to level, smooth, dense surface. Subbase for temporary roads and areas traveled by construction vehicles shall be adequate for loads and traffic served.

B. Temporary Roads and Parking in Same Areas as Permanent Pavement:
   1. Provide temporary roads and parking areas adequate to support and withstand traffic and construction loads during the Project. Locate temporary roads and parking areas in same location as permanent roads and parking areas. Extend temporary roads and parking areas, within construction limits indicated, as required for construction operations.
   2. Coordinate elevations of temporary roads and parking areas with permanent roads and parking areas.
   3. Prepare subgrade, subbase, and base for temporary roads and parking areas in accordance with Contract Documents requirements for permanent roads. Where required by subgrade conditions and construction loads and traffic, provide geotextile or geogrid, as required, on compacted subgrade for subbase support and separation of subbase and subgrade materials.
   4. Re-condition granular subbase of temporary roads and parking, including removing and properly disposing of granular material that has become intermixed with soil, re-grading, proof rolling, compacting, and testing.

3.2 TRAFFIC CONTROLS

A. Traffic Controls:
   1. Provide temporary traffic controls at intersections of temporary roads, including intersections with other temporary roads, intersections with public roads, and intersections with permanent access roads at the Site.
   2. Provide warning signs on permanent roads and drives, and provide "STOP" signs for traffic on temporary roads where required and at entrances to permanent pavement.
   3. Comply with requirements of authorities having jurisdiction.

3.3 MAINTENANCE OF ROADS

A. General:
   1. Maintain temporary roads and parking to continuously provide at the Site access for construction vehicles and trucks, DEPARTMENT vehicles, deliveries for DEPARTMENT, emergency vehicles, and parking areas for DEPARTMENT's personnel.
   2. Public roads shall be passable at all times unless a road closure is allowed in writing by authority having jurisdiction.
   3. When granular material of temporary roads and parking without hard surfacing become intermixed with soil or when temporary roads otherwise create a nuisance, remove intermixed granular-and-soil material and replace with clean aggregate as required.
   4. Provide snow and ice removal for temporary roads and parking areas.

B. Cleaning and Dust Control:
   1. Cleaning: Clean paved surfaces over which construction vehicles travel. Perform cleaning minimum of two times per week or more frequently as directed by ENGINEER, by mechanical sweeping. Clean the following surfaces:
      a. Roads within limits of the Project.
      b. Permanent roads at the Site, between the Site entrance and the work areas, between the Site entrance and construction parking and staging areas.
      c. Public roads that require sweeping and cleaning due to construction operations.
   2. Dust Control:
      a. Control dust resulting from construction activities to prevent nuisances at the Site and in nearby areas.
      b. Apply water or use other methods subject to ENGINEER's acceptance that will minimize airborne dust. Do not use water when water will cause hazardous or objectionable conditions such as ice, mud, ponds, and pollution.
      c. Provide dust control that is non-polluting and does not contribute to tracking-out of dirt and dust onto pavement. Re-apply dust control treatment as required.

C. Protection of Underground Facilities: Provide temporary, heavy-duty steel roadway plates to protect existing manholes, handholes, valve boxes, vaults, and other Underground Facilities near to or visible at the ground surface.

3.4 REMOVALS AND RESTORATION

A. Removals:
   1. Remove temporary roads, walks, and parking areas that are not intended for, or acceptable for, integration into permanent pavement. Return areas of temporary roads, walks, and parking to pre-construction condition unless otherwise required by the Contract Documents. Remove temporary gates, fencing, and traffic controls associated with temporary roads and parking areas.
   2. Where areas of temporary roads and parking will be permanently landscaped, remove pavement, aggregate, soil and other material that does not comply with the Contract Documents regarding fill, subsoil, and landscaping. Remove and properly dispose of materials contaminated with oil, bitumen, and other petrochemical compounds, and other substances that might impair growth of plants and lawns.

B. Restoration:
   1. Repair or replace paving, curbs, gutters, and sidewalks affected by temporary roads and parking, and restore to required conditions in accordance with authorities having jurisdiction.
   2. Restore to pre-construction conditions existing roads, walks, and parking areas damaged by CONTRACTOR, subject to approval of the owner of affected roads, walks, and parking areas.

+ + END OF SECTION + +

SECTION 02 41 00

DEMOLITION

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified and required for demolition, removal, and disposal Work.
   2. The Work under this Section includes, but is not necessarily limited to:
      a. Demolition and removal of existing materials and equipment as shown or indicated on the Figures. The Work includes demolition of structural concrete and similar existing facilities.
      b. Remove from slabs, foundations, walls, and footings that are to be demolished all utilities and appurtenances embedded in such construction.
   3. Demolitions and removals specified under other Sections shall comply with requirements of this Section.
   4. Perform demolition Work within areas shown or indicated.
   5. Pay all costs associated with transporting and, as applicable, disposing of materials and equipment resulting from demolition.

B. Coordination:
   1. Review procedures under this and other Sections and coordinate the Work that will be performed with or before demolition and removals.

C. Related Sections:
   1. Section 02 51 41, Off-Site Transportation and Disposal

1.2 QUALITY ASSURANCE

A. Qualifications:
   1. Structural Removals: Entity and personnel performing removals shall be legally qualified to perform construction and demolition work in the jurisdiction where the Site is located.
   2. Plumbing Removals: Entity and personnel performing plumbing removals shall be plumber legally qualified to perform plumbing construction and plumbing work in the jurisdiction where the Site is located.

B. Regulatory Requirements:
   1. Demolition, removal, and disposal Work shall be in accordance with 29 CFR 1926.850 through 29 CFR 1926.860 (Subpart T - Demolition), and all other Laws and Regulations.

2. Comply with requirements of authorities having jurisdiction.

1.3 SUBMITTALS

A. Informational Submittals: Submit the following:
   1. Procedure Submittals:
      a. Demolition and Removal Plan: Not less than ten days prior to starting demolition Work, submit acceptable plan for demolition and removal Work, including:
         1) Plan for coordinating shut-offs, capping, temporary services, and continuing utility services.
         2) Other proposed procedures as applicable.
         3) Equipment proposed for use in demolition operations.
         4) Recycling/disposal facility(ies) proposed, including facility owner, facility name, location, and processes. Include copy of appropriate permits and licenses, and compliance status.
         5) Planned demolition operating sequences.
         6) Detailed schedule of demolition Work in accordance with the accepted Process Schedule.
   2. Qualifications Statements:
      a. Name and qualifications of entity performing demolitions, including copy of licenses required by authorities having jurisdiction.
      b. Name and qualifications of entity performing plumbing removals, including copy of licenses required by authorities having jurisdiction.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 PREPARATION

A. Notification:
   1. At least 48 hours prior to commencing demolition or removal, notify ENGINEER in writing of planned start of demolition Work. Do not start removals without permission of ENGINEER.

B. Protection of Surrounding Areas and Facilities:
   1. Perform demolition and removal Work in manner that prevents damage and injury to property, structures, occupants, the public, and facilities. Do not interfere with use of, and free and safe access to and from, structures and properties.
   2. Closing or obstructing of roads, drives, sidewalks, and passageways adjacent to the Work is not allowed unless indicated otherwise in the Contract Documents. Conduct the Work with minimum interference to vehicular and pedestrian traffic.
   3. Provide temporary barriers, lighting, sidewalk sheds, and other necessary protection.

4. Repair damage to facilities that are to remain.

C. Existing Utilities:
   1. Should uncharted or incorrectly charted Underground Facilities be encountered, cooperate with utility owners in keeping adjacent services and facilities in operation.
   2. Sanitary Sewer: Before proceeding with demolition, locate all sewer lines and service laterals in the excavation area.
   3. Shutdown of utility services shall be coordinated by CONTRACTOR, assisted by OWNER as required relative to contacting utility owners.

D. Remediation:
   1. Not Used.

3.2 DEMOLITION – GENERAL

A. Locate construction equipment used for demolition Work and remove demolished materials and equipment to avoid imposing excessive loading on supporting and adjacent walls, floors, framing, facilities, and Underground Facilities.

B. Pollution Controls:
   1. Use water sprinkling, temporary enclosures, and other suitable methods to limit emissions of dust and dirt to lowest practical level.
   2. Do not use water when water may create hazardous or objectionable conditions such as icing, flooding, or pollution.
   3. Clean adjacent structures, facilities, properties, and improvements of dust, dirt, and debris caused by demolition Work.

C. Explosives:
   1. Do not bring explosives to the Site.

D. Building or Structure Demolition:
   1. Demolish concrete and masonry in small sections.
   2. Do not remove foundations or slabs-on-grade unless otherwise shown or indicated as being removed.

3.3 STRUCTURAL REMOVALS

A. Remove structures to lines and grades shown or indicated, unless otherwise directed by ENGINEER. Where limits are not shown or indicated, limits shall be four inches outside item to be installed. Removals beyond limits shown or indicated shall be at CONTRACTOR's expense and such excess removals shall be reconstructed to satisfaction of ENGINEER without additional cost to OWNER.

B. Recycling and Reuse of Demolition Materials:
   1. All concrete, brick, tile, masonry, roofing materials, reinforcing steel, structural metals, miscellaneous metals, plaster, wire mesh, and other items contained in

or upon building or structure to be demolished shall be removed, transported, and disposed of away from the Site, unless otherwise approved by ENGINEER.

2. Do not use demolished materials as fill or backfill adjacent to structures, in pipeline trenches, or as subbase under structures or pavement.

C. After removing concrete and masonry walls or portions thereof, slabs, and similar construction that ties in to the Work or to existing construction, neatly repair the junction point to leave exposed only finished edges and finished surfaces.

D. Where parts of existing structures are to remain in service following demolition, remove the portions shown or indicated for removal, repair damage, and leave the building or structure in proper condition for the intended use.

1. Remove concrete and masonry to the lines shown or indicated by sawing, drilling, chipping, and other suitable methods. Leave the resulting surfaces true and even, with sharp, straight corners that will result in neat joints with new construction and be satisfactory for the purpose intended.
2. Do not damage reinforcing bars beyond the area of concrete and masonry removal. Do not saw-cut beyond the area to be removed.
3. Reinforcing bars that are exposed at surfaces of removed concrete and masonry that will not be covered with new concrete or masonry shall be removed to 1.5 inches below the final surface. Repair the resulting hole, with repair mortar for concrete and grout for masonry, to be flush with the surface.
4. Where existing reinforcing bars are shown or indicated to extend into new construction, remove existing concrete so that reinforcing bars are clean and undamaged.

E. Where equipment or material anchored to concrete or masonry are removed and anchors are not to be re-used, remove the anchors to not less than 1.5 inches beneath surface of concrete or masonry member. Repair the resulting hole, using repair mortar for concrete and grout for masonry, to be flush with the surface. Alternately, when the anchor is stainless steel, the anchor may be cut flush with the surface of the concrete or masonry, when so approved by ENGINEER.

3.4 MECHANICAL REMOVALS

A. Mechanical demolition and removal Work includes dismantling and removing existing piping, ductwork, pumps, equipment, tanks, and appurtenances as shown, indicated, and required for completion of the Work. Mechanical removals include cutting and capping as required.

B. Demolition and Removals of Piping, Ductwork, and Similar Items:

1. Purge piping and tanks (as applicable) of chemicals or fuel (as applicable) and make safe for removal and capping. Remove to the extent shown or indicated existing process, water, waste and vent, chemical, gas, fuel, and other piping. Remove piping to the nearest solid piping support, and provide caps on ends of remaining piping. Where piping to be demolished passes through existing walls to remain, cut off and cap pipe on each side of the wall.

2. Caps, Closures, Blind Flanges, and Plugs:
    a. Provide closure pieces, such as blind flanges and caps, where shown or required to complete the Work.
    b. Where used in this Section, the term "cap" means the appropriate type closure for the piping or ductwork being closed, including caps, blind flanges, and other closures.
    c. Caps shall be compatible with the piping or ductwork to which the cap is attached, fluid-tight and gastight, and appropriate for the fluid or gas conveyed in the pipe or duct.
    d. Unless otherwise shown or indicated, caps shall be mechanically fastened, fused, or welded to pipe or duct. Plug piping with means other than specified in this Section only when so shown or indicated in the Contractor Documents or when allowed by ENGINEER.
3. When Underground Facilities are altered or removed, properly cut and cap piping left in place, unless otherwise shown or indicated.
4. Remove waste and vent piping, and ductwork to extent shown and cap as required. Where demolished vent piping, stacks, and ductwork passes through existing roofing, patch the roof with the same or similar materials. Completed patch shall be watertight and comply with roofing manufacturer's recommendations.
5. Modifications to potable water piping and other plumbing and heating system work shall comply with Laws and Regulations. All portions of potable water system that have been modified or opened shall be hydrostatically tested and disinfected in accordance with the Contract Documents, and Laws and Regulations. Hydrostatically test other, normally-pressurized, plumbing piping and heating piping.

C. Equipment Demolition and Removals:
    1. Not Used

3.5 ELECTRICAL REMOVALS

A. Not Used.

3.6 DISPOSAL OF DEMOLITION DEBRIS

A. Remove from the Site all debris, waste, rubbish, and material resulting from demolition operations and equipment used in demolition Work. Comply with Section 02 51 41, Off-Site Transportation and Disposal.

B. Transportation and Disposal:
    1. Non-hazardous Material: Properly transport and dispose of non-hazardous demolition debris at appropriate landfill or other suitable location, in accordance with Laws and Regulations. Non-hazardous material does not contain Asbestos, PCBs, Petroleum, Hazardous Waste, Radioactive Material, or other material designated as hazardous in Laws and Regulations.

2. Hazardous Material: When handling and disposal of hazardous materials is included in the Work, properly transport and dispose of hazardous materials in accordance with the Contract Documents and Laws and Regulations.

C. Submit to ENGINEER information required in this Section on proposed facility(ies) where demolition material will be recycled. Upon request, ENGINEER or OWNER, shall be allowed to visit recycling facility(ies) to verify adequacy and compliance status. During such visits, recycling facility operator shall cooperate and assist ENGINEER and OWNER.

+ + END OF SECTION + +

SECTION 02 51 41

OFF-SITE TRANSPORTATION AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes procedures to transport and dispose all items specified for off-site disposal.

B. Contractor generated hazardous waste shall be confined to contamination reduction or exclusion zones until transported off-site for proper disposal.

C. Remedial work which generates hazardous waste from inactive hazardous waste disposal sites (defined at 27-1301 of the Environmental Conservation Law) are not subject to the special assessment "tax" because of the exemption found at 27- 0923 (3) (c) of the Environmental Conservation Law. The contractor remains responsible for paying any local and county taxes which might be applicable to the disposal of wastes from the demolition work.

1.2 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
   1. Code of Federal Regulations (CFR)
      a. 40 CFR 262 Standards Applicable to Generators of Hazardous Waste
      b. 49 CFR 172 Tables, Hazardous Material Communication Requirements, and Emergency Response Information Requirements
   2. Codes, Rules, and Regulations of the State of New York (NYCRR)
      a. 6 NYCRR Part 364 Waste Transportation Permits
      b. 6 NYCRR Part 372 Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities

1.3 SUBMITTALS

A. Transportation Plan:
   1. Submit six copies of a detailed Transportation Plan to the ENGINEER**.**
   2. The Transportation Plan must be approved before materials are transported off site.

B. Records:
   1. Written acceptance of waste profile from TDSF.
   2. Hazardous Waste Manifests
   3. Decontamination Certificates
   4. Submit written confirmation from TSDF of acceptance of waste.

5. Profile sampling results.
6. Manifests after permanent disposal
7. Certificates of disposal for non-hazardous waste.
8. Signed bills of lading for salvaged or recycled materials.

1.4 PERMITS AND REGULATIONS

A. Comply with all municipal, county, state, and federal regulations regarding transportation of hazardous and non-hazardous materials. These include:
   1. Trucks used for transportation of material for disposal off site shall be permitted pursuant to 6 NYCRR Part 364**.**
   2. Vehicle operator possession of a commercial driver's license with hazardous materials endorsement (if applicable).
   3. Registration of vehicle as a hazardous waste carrier (if applicable).
   4. Utilization of shipping papers or hazardous waste manifest (40 CFR 262 and 6 NYCRR Part 372).
   5. Proper marking and placarding of vehicles in accordance with 49 CFR
   6. Placement of emergency response procedures and emergency telephone numbers in vehicle, and operator familiarity with emergency response procedures.
   7. Compliance with load, height, and weight regulations.

1.5 DISPOSAL FACILITIES

A. Facilities must have valid Federal/state permits appropriate for the waste being disposed of. Permits must be valid during the entire project period.

B. Facilities must be in good legal standing with no significant violations, corrective actions, or other environmental conditions that could affect satisfactory operation.

C. The disposal facility must comply with policies adopted by the DEPARTMENT with respect to off-site disposal of waste.

D. Prior to shipment of hazardous wastes off the site, the CONTRACTOR shall confirm by written communication from the designated TSDF that it is authorized, has the capacity, and will provide or assure that the ultimate disposal method is followed for the particular hazardous waste on the manifest.

E. RCRA Wastes:
   1. The facility must have an RCRA Permit or RCRA Interim Status for RCRA wastes.
   2. The facility must not have any significant RCRA violations or other environmental conditions that could affect its satisfactory operation.
      a. Significant violations include Class 1 RCRA violations as defined in EPA’s RCRA Enforcement Response Policy dated December 1984, including but not limited to groundwater, closure, post closure, and financial violations.
      b. Other environmental conditions include those conditions affecting the

satisfactory operation of the facility and violations of state and/or federal laws other than RCRA.

c. Under limited circumstances, EPA Administrator may allow disposal of hazardous substances at a RCRA facility having significant RCRA violations or other environmental conditions affecting satisfactory operation, providing that the facility owner or operator has entered into a consent order or decree to correct the problems, and disposal only occurs within the facility at a new or existing unit that is in compliance with RCRA requirements.

3. Landfill disposal must be in a unit meeting applicable RCRA minimum technical requirements.
   a. Current RCRA minimum technical requirements for land disposal include the use of a double liner system.
   b. Under limited circumstances (low waste toxicity, mobility, and persistence), EPA may approve the use of a single-lined land disposal unit for RCRA wastes where use of such a unit adequately protects public health and the environment.

F. TSCA Wastes:
   1. The facility must have a current TSCA permit
   2. The facility must not have any significant violations, corrective actions, or other environmental conditions that could affect its satisfactory operation.

G. Non-hazardous Wastes:
   1. The facility must have a state permit, if applicable.
   2. The facility must be permitted in good standing with applicable agency regulatory requirements.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Equipment supplied shall be in good repair and good working condition.

B. Haul trucks that have visible oil or hydraulic fluid leaks will not be allowed on site.

C. Clean up oil or hydraulic fluid spills.

2.2 TRANSPORTATION

A. Submit a Transportation Plan which includes:
   1. Type, condition, and average daily number of vehicles to be used.
   2. Travel routes and time restrictions.
   3. Decontamination methods for vehicles, equipment, and containers.
   4. Emergency response plan.
   5. A list of all shippers and their federal and state transporter ID numbers.

6. A list of proposed disposal facilities including name, address, telephone number, contact name, and Federal/state permit numbers.

PART 3 - EXECUTION

3.1 VEHICLE LOADING AND DECONTAMINATION

A. General:
   1. The CONTRACTOR shall provide all equipment, personnel, and facilities necessary to load waste materials in accordance with the regulatory requirements listed herein, and in accordance with the regulations of those states through which the CONTRACTOR plans to transport materials.
   2. Vehicle operators shall be trained in conformance with federal and state regulations for waste haulers (hazardous, special, and non-hazardous).
   3. All vehicles hauling waste materials from the exclusion zone shall be decontaminated in the contamination reduction zone prior to leaving the site.
   4. A written decontamination certification shall be provided to the ENGINEER for each shipment stating that:
      a. No soil from the exclusion zone or the contamination reduction zone adheres to the vehicle (including tires and undercarriage).
      b. The vehicles are not leaking materials or dripping liquids in any amount.
      c. Any waste materials, debris, and contaminated materials are covered with a tarpaulin, or are otherwise completely enclosed so as not to cause or permit discharge from the vehicle during transport.

3.2 MEASUREMENT

A. The transport vehicle shall be weighed on a certified scale at the disposal facility to determine the amount of material being removed from the site.

B. A printed ticket with the time, date, and net weight of material being transported for disposal shall be obtained and submitted to the ENGINEER.

C. Measured gross weight of the vehicle or calculated net weight of material outside the certified capacity of the scale will not be accepted by the ENGINEER and the CONTRACTOR shall not be reimbursed for the associated costs of material disposal above the certified capacity of scale.

3.3 MANIFESTING

A. Complete all required manifest forms and bill of lading forms for the DEPARTMENT for proper transportation and disposal of all materials. The DEPARTMENT will provide a generator identification number if required.

B. Comply with 40 CFR 262 in completion and submittal of the Hazardous Waste Manifests. The Hazardous Waste Manifests for the transportation and disposal of waste removed from the site shall include all information in accordance with 49 CFR 172.101.

C. Notify the ENGINEER in writing a minimum of two weeks prior to the date(s) the manifests are ready to be signed.

D. The ENGINEER will sign the special waste or hazardous waste manifest for the DEPARTMENT, which is the generator.

E. Place on the manifest all information and data required by both the waste generator and transporter. The CONTRACTOR'S hazardous waste specialist shall accompany each prepared manifest with written certification that the manifest has been filled out in compliance with accordance with all EPA, DOT, and state regulations.

F. Provide the ENGINEER with two fully executed copies of each shipment manifested prior to shipping wastes off site.

G. The CONTRACTOR is responsible for proper distribution of manifests and bills of lading.

3.4 TRANSPORTATION

A. Prior to shipment of hazardous wastes off the project area, the CONTRACTOR shall confirm by written communication from the designated transporter(s) that they are authorized to deliver the manifested waste to the designated TSDF or SWMF.

B. The CONTRACTOR shall be responsible for obtaining permits and authorizations necessary to use the selected shipping routes. Comply with restrictions imposed by local governmental agencies regarding use of the routes.

C. Materials shall be transported only at the times and by the routes indicated in the approved Transportation Plan, unless written permission is received from the ENGINEER to do otherwise.

3.5 SAMPLING

A. Perform all sampling and analyses required by the disposal facility at no additional cost to the DEPARTMENT.

B. Provide copies of the results to the ENGINEER**.**

3.6 REPORTING

A. Manifests:
   1. After the waste has been permanently disposed of, the Hazardous Waste Manifests shall be completed in accordance with 6 NYCRR Part 372 and submitted by the CONTRACTOR to the ENGINEER with a copy to be forwarded to the DEPARTMENT.
   2. In accordance with 40 CFR 262.42, generator shall contact the transporter and TSD facility to determine the status of the HTW if the manifest is not returned

to the generator within 35 days of the date waste was accepted by the initial transporter.

3. The generator shall file an exception report with EPA and NYSDEC if he has not received a completed copy of the manifest from the designated TSD facility with 45 days of the date the waste was accepted by the original transporter.
4. The CONTRACTOR shall be responsible for providing the generator with the information needed to complete the exception report.

B. Certificates of Disposal
   1. Provide Certificates of Disposal for all wastes shipped off site.
   2. The Certificates of Disposal shall be submitted to the ENGINEER within 180 days of the shipment of wastes off site.

C. Bill of Lading
   1. Items and materials that have been recycled or salvaged shall only require a signed bill of lading or receipt of materials and quantity received.

+ + END OF SECTION + +

SECTION 31 05 19

GEOSYNTHETICS FOR EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment, and services required to provide and place geosynthetics as shown and specified.

B. Related Sections:
   1. Section XI-31 23 05, Excavation and Fill.

1.2 REFERENCES

A. Standards referenced in this Section are listed below:
   1. American Society for Testing and Materials, (ASTM):
      a. ASTM D 1117, Test Methods for Non-Woven Fabrics.
      b. ASTM D 3776, Test Methods for Mass per Unit Area (Weight) of Woven Fabric.
      c. ASTM D 5034, Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. Geotextile manufacturer shall be a specialist in the manufacture of geotextile cushion fabric, and have produced and successfully installed a minimum of five million square feet.

1.4 SUBMITTALS

A. Action Submittals: Submit the following:
   1. Product Data:
      a. Submit geotextile manufacturer's data, specifications, installation instructions and dimensions.

B. Informational Submittals: Submit the following:
   1. Certificates:
      a. Submit an affidavit certifying that the filter fabric furnished complies with all requirements specified herein.
      b. No fabric shall be shipped until the affidavit is submitted to the ENGINEER.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Each roll of geotextile delivered to the Site shall be labeled by the manufacturer identifying the manufacturer's name, product identification, lot number, roll number and roll dimensions.

B. All rolls and packages shall be inspected by CONTRACTOR upon delivery to the Site. CONTRACTOR shall notify ENGINEER if any loss or damage exists to geotextile filter fabric. Replace loss and repair damage to new condition, in accordance with manufacturer's instructions.

C. Geotextile shall be protected from ultraviolet light exposure, precipitation or other inundation, mud, dirt, dust, puncture, cutting or any other damaging or deleterious conditions. Geotextile rolls shall be shipped and stored in relatively opaque and watertight wrappings.

PART 2 - PRODUCTS

2.1 GEOTEXTILE STABILIZATION FABRIC

A. Stabilization geotextile shall be a woven pervious sheet composed of polymeric yarn or fiber manufactured by:
   1. Propex Geosynthetics, Geotex 315ST.
   2. Or equal.

B. Stabilization geotextile shall comply with the following minimum average certifiable roll values:

Property	Test Method	Value	Test Frequency
1. Grab Tensile Strength	ASTM D4632	315 lbs	1/30 rolls
2. Grab Elongation	ASTM D4632	15%	1/30 rolls
3. Mullen Burst	ASTM D3786	675 lbs	1/30 rolls
4. Puncture Strength	ASTM D4833	150 lbs	1/30 rolls
5. Trapezoid Tear Strength	ASTM D4533	120 lbs	1/30 rolls
6. Apparent Opening Size	ASTM D4751	40 sieve	1/30 rolls

C. Stabilization geotextile shall be installed in locations shown on Contract Drawings.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR shall examine the conditions under which the Work is to be installed and notify the ENGINEER, in writing, of conditions detrimental to the

proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION - GENERAL

A. All geotextiles shall be weighted with sandbags or the equivalent when required. Such sandbags shall be installed during placement and shall remain until replaced with cover material or geomembrane.

B. CONTRACTOR shall take any necessary precautions to prevent damage to underlying layers during placement of the geotextile.

C. During placement of geotextiles, care shall be taken not to entrap in the geotextile stone, excessive dust, or moisture that could damage the geomembrane, generate clogging, or hamper subsequent seaming.

D. Geotextiles shall not be exposed to precipitation prior to being installed, and shall not be exposed to direct sunlight for more than 15 days.

E. Geotextiles shall be overlapped 12-inches.

3.3 GEOTEXTILE REPAIR

A. Any holes or tears in the fabric shall be repaired as follows:
   1. On slopes: A fabric patch shall be sewn into place using a double sewn lock stitch (1/4-inch to 3/4-inch apart and no closer than 1-inch from any edge). Should any tear exceed ten percent of the width of the roll, that roll shall be removed from the slope and replaced.
   2. Non-slopes: A fabric patch shall be spot-seamed in place with a minimum of 24-inches of overlap in all directions.

3.4 PLACEMENT OF COVER MATERIALS

A. CONTRACTOR shall place all cover materials in such a manner to ensure the geotextile is not damaged; minimal slippage of the geotextile on underlying layers; and no excess tensile stresses in the geotextile.

+ + END OF SECTION + +

SECTION 31 23 05

EXCAVATION AND FILL

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals required to perform all excavating, filling, and grading, and disposing of earth materials as shown, specified, and required for construction of structures, Underground Facilities, roads, and other facilities required to complete the Work.
   2. Preparation of subgrade for slabs and pavements is included under this Section.
   3. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof.

1.2 REFERENCES

A. Standards referenced in this Section are:
   1. ACI 522R, Pervious Concrete.
   2. ANSI/AISC 360, Specification for Structural Steel for Buildings.
   3. ASTM C29/C29M, Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate.
   4. ASTM C33/C33M, Specification for Concrete Aggregates.
   5. ASTM C94/C94M, Specification for Ready-Mixed Concrete.
   6. ASTM C138/C138M, Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
   7. ASTM C172, Practice for Sampling Freshly Mixed Concrete.
   8. ASTM C150/C150M, Specification for Portland Cement.
   9. ASTM C595/C595M, Specification for Blended Hydraulic Cements.
   10. ASTM C618, Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
   11. ASTM C989, Specification for Slag Cement for Use in Concrete and Mortars.
   12. ASTM D422, Test Method for Particle-Size Analysis of Soils.
   13. ASTM D448, Classification for Sizes of Aggregate for Road and Bridge Construction.
   14. ASTM D698, Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 (600 kN-m/m^3)).
   15. ASTM D1556, Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

16. ASTM D1557, Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
17. ASTM D2216, Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
18. ASTM D4253, Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
19. ASTM D4254, Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
20. ASTM D4318, Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
21. ASTM D4832, Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
22. ASTM D6023, Test Method for Density (Unit Weight), Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low-Strength Material (CLSM).
23. ASTM D6103, Test Method for Flow Consistency of Controlled Low Strength Material (CLSM).
24. ASTM D6938, Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
25. ASTM E329, Specification for Agencies Engaged in Construction Inspection and/or Testing.

1.3 TERMINOLOGY

A. The following words or terms are not defined but, when used in this Section, have the following meaning:
   1. "Subgrade" is the uppermost surface of native soil material unmoved from cuts; the bottom of excavation.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Professional Engineer:
      a. Engage a registered professional engineer legally qualified to practice in the same jurisdiction as the Site and experienced in providing engineering services of the kind indicated.
      b. Responsibilities include but are not necessarily limited to:
         1) Reviewing system performance and requirements shown or indicated in the Contract Documents.
         2) Preparing written requests for clarifications or interpretations of performance and requirements for submittal to ENGINEER by CONTRACTOR.
         3) Preparing or supervising the preparation of design calculations and related submittals verifying compliance of the system with the requirements of the Contract Documents.
         4) Signing and sealing all calculations, drawings, and submittals prepared by professional engineer.
         5) Certifying that:

a) it has performed the design of the system in accordance with the performance requirements stated in the Contract Documents, and
b) the said design conforms to Laws and Regulations, and to the prevailing standards of practice.

2. CONTRACTOR's Testing Laboratory:
   a. Retain the services of independent testing laboratory to perform testing and determine compliance with the Contract Documents of the materials specified in this Section.
   b. Do not employ the same laboratory hired by OWNER for field quality control testing under the field quality control Article of this Section.
   c. Testing laboratory shall comply with ASTM E329 and requirements of Section XI-01 45 29.13, Testing Laboratory Services Furnished by Contractor.
   d. Testing laboratory shall be experienced in the types of testing required.
   e. Selection of testing laboratory is subject to ENGINEER's acceptance.

B. Quality Assurance Testing:
   1. Quality assurance testing is in addition to field quality control testing required under Part 3 of this Section.
   2. Materials used in the Work may require testing and retesting, as directed by ENGINEER, during the Project. Allow free access to material stockpiles and facilities at all times. Tests not specifically indicated to be performed at OWNER's expense, including retesting of rejected materials and installed Work, shall be performed at CONTRACTOR's expense.
   3. CONTRACTOR's Testing Laboratory Scope:
      a. Collect samples and perform testing of proposed fill materials in the laboratory and in the field to demonstrate compliance of the Work with the Contract Documents.
      b. Testing laboratory shall perform testing required to obtain data for selecting moisture content for placing and compacting fill materials.
      c. Submit to ENGINEER and CONTRACTOR written report results of each test.
   4. Required Quality Assurance Material Testing by CONTRACTOR's Testing Laboratory:
      a. Gradation in accordance with ASTM D422. Perform one test for every 1,000 cubic yards of each of the following types of material incorporated into the Work: select fill, general fill, subbase material, drainage fill, and pipe bedding material.
      b. Atterberg limits in accordance with ASTM D4318. Perform one test for every 1,000 cubic yards of the following types of materials incorporated into the Work: general fill, and pipe bedding material.
      c. Moisture/density relations in accordance with ASTM D698, ASTM D1557, ASTM D4253, or ASTM D4254, as applicable. Perform one test for every 5,000 cubic yards of the following types of materials incorporated into the Work: select fill, general fill, subbase material, drainage fill, and pipe bedding material.

d. Moisture content of stockpiled or borrow material in accordance with ASTM D2216. Perform one test for every 1,000 cubic yards of the following types of material incorporated into the Work: select fill, general fill, subbase material, drainage fill, and pipe bedding material.

C. Regulatory Requirements:
1. Perform excavation work in compliance with requirements of authorities having jurisdiction and Laws and Regulations, including:
a. OSHA, 29 CFR Part 1926, Section .650 (Subpart P – Excavations).
2. Obtain required permits and approvals for excavation and fill Work, including work permits from right-of-way owners and permits from environmental authorities having jurisdiction over discharge of water from excavations.

1.5 SUBMITTALS

A. Action Submittals: Submit the following:
1. Shop Drawings:
a. Modifications to the Work proposed due to design of sheeting, shoring, bracing, cofferdams, and similar excavation supports.
2. Samples:
a. Submit Sample of each aggregate and soil material required under this Section. Deliver Samples to Resident Project Representative. Samples shall be of sufficient size to demonstrate the array of gradation and material types expected in the Work.

B. Informational Submittals: Submit the following:
1. Procedure Submittals:
a. Excavation Plan: Prior to starting excavation operations, submit written plan to demonstrate compliance with OSHA 29 CFR Part 1926.650. As a minimum, excavation plan shall include:
1) Name of CONTRACTOR's "competent person" in responsible charge of excavation and fill Work.
2) Excavation method(s) and additional items to be included in the Work.
3) Copies of "manufacturer's data" or other tabulated data if protective system(s) are designed on the basis of such data.
4) Copies of required permits and approvals, from authorities having jurisdiction and affected utility owners, for excavation methods proposed.
b. Proposed compaction procedure and compaction equipment proposed for use. Where different procedures or equipment will be used for compacting different types of material or at different locations at the Site, indicate where each procedure and equipment item will be used.
2. Excavation Support Plan and Related Information Prepared by CONTRACTOR's Professional Engineer:
a. CONTRACTOR and CONTRACTOR's professional engineer shall prepare the following for submittal:

1) Sheeting and bracing, or other protective system(s) required.
2) Dewatering system.
3) Underpinning.

b. Drawings and calculations shall be prepared by professional engineer qualified in the specialty involved. ENGINEER's review and acceptance of submittal does not imply approval by ENGINEER of the associated Work. CONTRACTOR shall be solely responsible for designing, installing, operating and maintaining the system(s) required to satisfactorily perform all necessary sheeting, bracing, protection, underpinning, and dewatering.

3. Delivery Tickets:
   a. Copy of delivery ticket for each load of aggregate and borrow material delivered to the Site. Each delivery ticket shall indicate project and contract by name and number, date, material type, department of transportation item number when applicable, and quantity delivered.
4. Quality Assurance Test Results Submittals:
   a. Submit results of quality assurance testing performed by in accordance with Paragraph 1.4.B of this Section, unless included as part of another submittal under this Section. Submit results for the following quality assurance testing:
      1) Tests on borrow fill material.
      2) Optimum moisture – maximum dry density curve for each type of fill material.
5. Field Quality Control Submittals:
   a. Submit results of testing and inspection performed in accordance with the field quality control Article in Part 3 of this Section, including:
      1) Field density testing.
6. Qualifications Statements:
   a. Professional engineer.
   b. Quality Assurance Testing laboratory. Submit name and qualifications of testing laboratory to be employed, and qualifications of testing laboratory's personnel that will perform quality assurance testing required in this Section.

1.6 SITE CONDITIONS

A. Subsurface Information: The Work Plan provides information available relative to subsurface conditions at the Site. Such information and data is not intended as a representation or warranty of continuity of conditions between soil borings or test pits, nor of groundwater levels at dates and times other than date and time when measured, nor that purpose of obtaining the information and data were appropriate for use by CONTRACTOR. OWNER will not be responsible for interpretations or conclusions drawn therefrom by CONTRACTOR.

B. Soil borings and other exploratory operations may be made by CONTRACTOR, at no additional cost to OWNER. Coordinate CONTRACTOR-performed test borings and other exploratory operations with OWNER and utility owners as appropriate. Perform such explorations without disrupting or otherwise adversely

affecting operations of OWNER or utility owners. Comply with Laws and Regulations relative to required notifications.

C. Existing Structures:
   1. The Contract Documents show or indicate certain structures and Underground Facilities adjacent to the Work. Such information was obtained from existing records and is not guaranteed to be correct or complete. CONTRACTOR shall explore ahead of the excavation to determine the exact location of all existing structures and Underground Facilities. Existing structures and Underground Facilities shall be supported and protected from damage by CONTRACTOR. Immediately repair and restore existing structures and Underground Facilities damaged by CONTRACTOR without additional cost to OWNER.
   2. Movement or operation of construction equipment over Underground Facilities shall be at CONTRACTOR's sole risk and only after CONTRACTOR has prepared and submitted to ENGINEER and utility owners (as applicable), and received acceptance therefrom, a plan describing CONTRACTOR's analysis of the loads to be imparted and CONTRACTOR's proposed measures to protect structures and Underground Facilities during the Project.
   3. Coordinate with utility owners for shut-off of services in active piping and conduits. When required by utility owner, OWNER will assist CONTRACTOR with utility owner notifications. Completely remove buried piping and conduits indicated for removal and not otherwise indicated as being abandoned or to remain in place.
   4. In general, service lines and laterals to individual houses and businesses are not shown; however, CONTRACTOR shall assume that a service exists for each utility owner to each house, business, and property.
   5. Do not interrupt existing utilities serving facilities occupied and used by OWNER or others, except when such interruption is indicated in the Contract Documents or when allowed in writing by ENGINEER after acceptable temporary utility services are provided by CONTRACTOR for the affected structure or property.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Select Fill – NYSDOT Type 2:
   1. Material shall be free of organic material, complying with the following:

Sieve Sizes (Square Openings)	Percentage by Weight Passing Sieve
2.0-inch	100
1.5-inch	100
1.0-inch	90 to 100
0.5	0 to 15
No. 200	Less than 1

B. General Fill:

1. General site fill shall be used in backfill areas where shown.

2. Material shall be clean, free of boulders, wood, muck, mud, frozen material, organic matter, or other deleterious materials.

3. Material shall be capable of being compacted as specified in this Section.

4. Material evaluations shall be performed by the CONTRACTOR on processed and stockpiled material to ascertain its acceptability as general site fill. The stockpiled material shall not be altered in any manner, including adding material to it or taking material from the stockpiles until the results from the material testing laboratory have been received.

5. Material shall be sampled and tested by the CONTRACTOR at the following frequency or whenever a change in material occurs or as directed by the ENGINEER.

Test	**Method**	**Frequency**
Particle Size Analysis of Soils	ASTM D422	1 per 1,000 cy
Moisture Density Relationship of Soils and Soil Aggregate Mixtures using 4.4 lb Hammer and 12-inch Drop (Standard Proctor)	ASTM D698	1 per 5,000 cy

6. The general site fill shall contain no objects larger than six (6) inches.
7. Material shall be free of: rock and gravel larger than three inches in any dimension.
8. Fill shall have a liquid limit not greater than 45, and plasticity index not greater than 25.

C. Gravel:

1. Material shall be naturally- or artificially-graded mixture of natural or crushed gravel, crushed stone, or natural or crushed sand, complying with the gradation requirements below. Crushed slag is unacceptable.

Sieve Sizes (Square Openings)	**Percentage by Weight Passing Sieve**
2-inch	100
1-inch	70 to 100
3/4-inch	50 to 90
No. 4	30 to 60
No. 30	9 to 33
No. 200	0 to 15

2.2 SOURCE QUALITY CONTROL

A. Perform quality assurance testing, including chemical analyses identified in the Work Plan, and submit results to ENGINEER, in accordance with the 'Quality Assurance" Article in Part 1 of this Section.

PART 3 – EXECUTION

3.1 INSPECTION

A. Provide ENGINEER with sufficient notice and with means to examine areas and conditions under which excavating, filling, and grading will be performed. ENGINEER will advise CONTRACTOR in writing when ENGINEER is aware of conditions that may be detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.2 TEST PITS

A. General:
   1. In advance of the construction, excavate, make observations and measurements, and fill test pits to determine conditions or location of the existing Underground Facilities and structures. Perform all work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, filling, and replacing pavement for test pits. CONTRACTOR shall be responsible for the definite location of each existing Underground Facility involved within the area of excavation for the Work. Exercise care during such location work to avoid damaging and disrupting the affected Underground Facility or structure. CONTRACTOR shall be responsible for repairing, at his expense, damage to Underground Facility or structure caused during the Work.

B. Payment for Test Pits:
   1. Separate payment will not be made for test pits made by CONTRACTOR.

3.3 PREPARATION

A. Use of Explosives:
   1. Use of explosives is not allowed.

B. Maintenance and Protection of Traffic:
   1. Keep all streets and traffic ways open for passage of traffic and pedestrians during the Project, unless otherwise approved by owner of the street, traffic way, or right-of-way, as applicable. Construction traffic shall access the Site only via entrance(s) indicated in Contract Drawings.
   2. When required to cross, obstruct, or temporarily close a street or traffic way, provide and maintain suitable bridges, detours, and other acceptable

temporary expedients to accommodate traffic. Closings of street or traffic way shall be for shortest time practical, and passage shall be restored immediately after completion of fill and temporary paving or bridging.

3. Give required advance notice to fire department, police department, and other emergency services as applicable of proposed construction operations.
4. Give reasonable notice to owners or tenants of private property who may be affected by construction operations. Give such notice not less than five days prior to construction that will affect the property.
5. Hydrants, valves, fire alarm boxes, postal boxes and delivery service boxes, and other facilities that may require access during construction shall be kept accessible for use.
6. Provide temporary signage, signals, barricades, flares, lights and other equipment, service, and personnel required to regulate and protect traffic and warn of hazards. Such Work shall comply with requirements of owner of right-of-way and authorities having jurisdiction at the Site. Remove temporary equipment and facilities when no longer required, and restore grounds to original or to specified conditions, as applicable.

3.4 DEWATERING

A. Dewatering – General:
   1. Provide and maintain adequate drainage and dewatering equipment to remove and dispose of all surface water and ground water entering excavations, or other parts of the Work and work areas. Keep each excavation dry during excavation, subgrade preparation, and continually thereafter.
   2. Keep all working areas at the Site free of surface water at all times. Provide temporary drainage ditches and temporary dikes, and provide required temporary pumping and other work necessary for diverting or removing rainfall and all other accumulations of surface water from excavations and fill areas. Perform diversion and removal of surface water in manner that prevents accumulation of water behind permanent or temporary structures and at any other locations in the construction area where such accumulations may be detrimental.
   3. Water used for working or processing, resulting from dewatering operations, or containing oils or sediments that will reduce the quality of the surface water or groundwater downstream of the point of discharge, shall not be directly discharged. Containerize and characterize all such waters prior to disposal.
   4. CONTRACTOR shall be responsible for condition of piping, conduits, and channels used for drainage and such piping, conduits, and channels shall be clean and free of sediment.
   5. Remove water from excavations as fast as water collects.

B. Temporary Dewatering System:
   1. CONTRACTOR shall design, provide, and operate dewatering system to include sufficient trenches, sumps, pumps, hose, piping, well points, deep wells, and similar facilities, necessary to depress and maintain groundwater

level two feet below the base of each excavation during all stages of construction operations.

2. Design and operate dewatering system to avoid settlement and damage to existing structures and Underground Facilities.
3. Groundwater table shall be lowered in advance of excavation for a sufficient period of time to allow dewatering of fine grain soils.
4. Maintain groundwater level at excavations two feet below lowest subgrade excavation until the structure has sufficient strength and weight to withstand horizontal and vertical soil and water pressures from natural groundwater.
5. Operate dewatering system continuously, 24 hours per day, seven days per week. Provide standby pumping facilities and personnel to maintain the continued effectiveness of the system. Do not discontinue dewatering operations without first obtaining ENGINEER's acceptance for such discontinuation.
6. If, in ENGINEER's opinion, the water levels are not being lowered or maintained as required, provide additional or alternate temporary dewatering devices as necessary, at no additional cost to OWNER.
7. Locate elements of temporary dewatering system to allow continuous dewatering operation without interfering with the Work to the extent practicable.
8. Where portions of dewatering system are located in the area of permanent construction, submit to and obtain ENGINEER's acceptance of details of proposed methods of constructing the Work at such location. Control of ground water shall continue until the permanent construction provides sufficient dead load to withstand hydrostatic uplift of the normal groundwater, until concrete has attained sufficient strength to withstand earth and hydrostatic loads, and until waterproofing Work is completed.
9. Perform pumping of water from excavations in a manner that prevents carrying away of unsolidified concrete materials, and that avoids damaging the subgrade.
10. Before discontinuing dewatering operations or permanently allowing rise of groundwater level, prepare computations to demonstrate that structures affected by the water level rise are protected by fill or other means to sustain uplift. Use a safety factor of 1.25 when preparing such calculations.

C. Disposal of Water Removed by Dewatering System:
   1. CONTRACTOR's dewatering system shall discharge to a suitable location acceptable to OWNER, in accordance with Laws and Regulations.
   2. Convey water from excavations in closed conduits. Do not use trench excavations as temporary drainage ditches.
   3. Dispose of water removed from excavations in a manner that does not endanger health and safety, property, the Work, and other portions of the Project.
   4. Dispose of water in manner that causes no inconvenience to OWNER, others involved in the Project, and adjacent and downstream properties.

3.5 EXCAVATION

A. Perform all excavation required to complete the Work as shown, specified, and required. Excavations shall include removing and handling of earth, sand, clay, gravel, hardpan, soft, weathered or decomposed rock, pavements, rubbish, and other materials within the excavation limits.

B. Excavation Protection:
   1. Provide excavation protection system(s) in accordance with Laws and Regulations to prevent injury to persons and property, including Underground Facilities.
   2. Excavation Less Than Five Feet Deep: Excavations in stable rock or in soil conditions where there is no potential for a cave-in may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.
   3. Excavations Greater Than Five Feet Deep: Excavations in stable rock may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.
   4. Provide and maintain excavation protection system(s) in accordance with submittals accepted by ENGINEER and required under Paragraph 1.5.B of this Section.

C. Maintain excavations in dry condition in accordance with “Dewatering” Article in Part 3 of this Section.

D. Elevations shown are approximate. ENGINEER may direct such minor changes in dimensions and elevations as may be required to secure a satisfactory footing.

E. When excavations are made below required grades without written order of ENGINEER, fill such excavations with compacted select fill material, as directed by ENGINEER, at CONTRACTOR’s expense.

F. Extend excavations sufficiently on each side of structures, footings, and similar construction to allow setting of forms, installation of shoring and bracing, and the safe sloping of banks, as necessary.

G. Subgrades – General:
   1. Not Used.

H. Proofrolling Subgrades:
   1. Not Used.

I. Pipe Trench Preparation:
   1. No Used.

J. Excavated Materials to be used as Fill:
   1. Not Used.

3.6 UNAUTHORIZED EXCAVATION

A. All excavations outside lines and grades shown or indicated and that are not approved by ENGINEER, together with removing and disposing of the associated material, shall be at CONTRACTOR's expense. Fill unauthorized excavations with properly-compacted select fill material at CONTRACTOR's expense.

3.7 EROSION AND SEDIMENT CONTROLS

A. Provide temporary erosion and sediment controls in accordance with Section 01 46 26, Stormwater Pollution Prevention Plan and Permit. When applicable, also comply with requirements of the erosion and sediment control plan approved by authorities having jurisdiction.

3.8 SHEETING, SHORING, AND BRACING

A. General:
   1. Design and provide sheeting, shoring, bracing, cofferdams, and similar excavation supports as shown, specified, and required for the Work.
   2. Clearances and types of temporary sheeting, shoring, bracing, and similar excavation supports, insofar as they may affect the finished character of the Work and the design of sheeting to be left in place, will be subject to the ENGINEER's approval; but CONTRACTOR is responsible for adequacy of all sheeting, shoring, bracing, cofferdams, and similar excavation supports.
   3. Materials:
      a. Previously-used materials shall be in good condition, and shall not be damaged or excessively pitted. All steel or wood sheeting designated to remain in place shall be new. New or used sheeting may be used for temporary sheeting, shoring, and bracing.
      b. All steel work for sheeting, shoring, bracing, cofferdams and other excavation supports, shall be in accordance with ANSI/AISC 360, except that field welding will be allowed.
      c. Provide permanent steel sheet piling or pressure-creosoted timber sheet piling where subsequent removal of sheet piling might allow lateral movement of soil under adjacent structures.
   4. As excavation progresses, carry down shoring, bracing, cofferdams, and similar excavation supports to required elevation at bottom of excavation.
   5. Comply with Laws and Regulations regarding sheeting, shoring, bracing, cofferdams, and similar excavation supports.
   6. Maintain sheeting, shoring, bracing, bracing, and other excavation supports in excavations regardless of time period excavations will be open.
   7. Unless otherwise shown, specified, or directed, remove materials used for temporary construction when the Work is completed. Perform such removal in manner not injurious to the structures and Underground Facility, their appearance, and adjacent construction.

B. Sheeting Left in Place:

1. Materials: Steel sheeting shown or indicated to be left in place shall consist of rolled sections of continuous interlocking type. Steel sheeting material designated to be left in place shall be new. Type and design of the sheeting and bracing shall comply with the above requirements for steel work for all sheeting and bracing.

2. Installation:
    a. Steel sheeting to be left in place shall be driven straight to lines and grades as shown, indicated, or directed. Piles shall penetrate into firm materials with secure interlocking throughout pile's entire length. Damaged piling having faulty alignment shall be pulled and replaced by new piling.
    b. Type of guide structure used and method of driving steel sheeting to be left in place shall be determined by CONTRACTOR's professional engineer. Jetting is not allowed.
3. Cut off at elevations shown, indicated, or directed by ENGINEER sheeting left in place and remove cut off pilings from the Site.
4. Clean wales, braces, and all other items to be embedded in the permanent structure, and ensure that concrete surrounding the embedded element is sound and free of air pockets and harmful inclusions. Provisions shall include the cutting of holes in the webs and flanges of wale and bracing members, and welding of steel diaphragm water stops perpendicular to the centerline of brace ends that are to be embedded.
5. Subsequent to removing the inside face forms, and when removal of bracing is allowed, cut back steel at least two inches inside the wall face and patch opening with concrete repair mortar in accordance with Section 03 30 00, Cast-in-Place Concrete. Concrete shall be thoroughly worked beneath wales and braces, around stiffeners, and at other place where voids may be formed.
6. Portions of sheeting or soldier piles and breast boards that are in contact with structure foundation concrete shall be left in place, together with wales and bracing members that are cast into foundation or superstructure concrete.

C. Removal of Sheeting and Bracing:
1. Remove sheeting and bracing from excavations, unless otherwise directed by ENGINEER in writing. Perform removal to avoid damaging the Work and adjacent construction. Removal shall be equal on both sides of excavation to ensure no unequal loads on structures and Underground Facilities.
2. Defer removal of sheeting and bracing, where removal may cause soil to come into contact with concrete, until the following conditions are satisfied:
    a. Concrete has cured for not less than seven days.
    b. Wall and floor framing, up to and including grade level floors, is in place.

3.9 TRENCH SHIELDS

A. Excavation of earth material below bottom of trench shield shall not exceed the limits established in Laws and Regulations.

B. When using a shield for installing piping:
   1. Portions of trench shield extending below the mid-diameter of an installed, rigid pipe, such as pre-stressed concrete pipe and other types of rigid pipe, shall be raised above the pipe's mid-diameter elevation prior to moving the shield along the trench for further construction.
   2. Bottom of shield shall not at any time extend below mid-diameter of installed pipe that is flexible or has flexing capability, such as steel, ductile iron, PVC, CPVC, polyethylene, and other pipe that has flexing capability.

C. When using a shield for installing structures, bottom of the shield shall not extend below the top of the bedding for the structures.

D. When removing the shield or moving the shield ahead, exercise extreme care to prevent moving piping, structures, and other Underground Facilities, and prevent disturbance of bedding material for piping, structures, and other Underground Facilities. When piping, structures, or Underground Facilities are disturbed, remove and reinstall the disturbed items in accordance with the Contract Documents.

3.10 FILL AND COMPACTION – GENERAL PROVISIONS

A. Provide and compact all fill required for the finished grades as shown and as specified in this Section.

B. Place fill in excavations as promptly as progress of the Work allows, but not until completing the following:
   1. ENGINEER's authorization after observation of construction below finish grade, including dampproofing, waterproofing, perimeter insulation, and similar Work.
   2. Inspection, testing, approval, and recording of locations of Underground Facilities.
   3. Removal of concrete formwork.
   4. Removal of shoring and bracing, and filling of voids with satisfactory materials.
   5. Removal of trash and debris.
   6. Permanent or temporary horizontal bracing is in place on horizontally-supported walls.
   7. Field testing of tanks, Underground Facilities including piping and conduits, and water-retaining structures.
   8. Placing of settlement plates.

C. Fill that includes organic materials or other unacceptable material shall be removed and replaced with approved fill material in accordance with the Contract Documents.

D. Placement – General:
   1. Place fill to the grades shown or indicated. Bring up evenly on all sides fill around structures and Underground Facilities.
   2. Fill areas shall be undercut and proof-rolled as directed by ENGINEER.
   3. Place fill materials at moisture content and density as specified in this Section and this Article's requirements on compaction density. Furnish and use equipment capable of adding measured amounts of water to the fill materials to bring fill materials to a condition within required moisture content range. Furnish and use equipment capable of discing, aerating, and mixing the fill materials to ensure reasonable uniformity of moisture content throughout the fill materials, and to reduce moisture content of borrow materials by air drying, when necessary. When subgrade or lift of fill materials requires moisture-conditioning before compaction, fill material shall be sufficiently mixed or worked on the subgrade to ensure uniform moisture content throughout the lift of material to be compacted. Materials at moisture content in excess of specified limit shall be dried by aeration or stockpiled for drying.
   4. Perform compaction with equipment suitable for the type of fill material placed. Select and use equipment capable of providing the minimum density required in the Contract Documents. Use light compaction equipment, with equipment gross weight not exceeding 7,000 pounds within horizontal distance of ten feet from the wall of completed, below-grade structures. Furnish and use equipment capable of compacting in restricted areas next to structures and around piping and Underground Facilities. Effectiveness of the equipment selected by CONTRACTOR shall be tested at start of compacted fill Work by constructing a small section of fill within the area where fill will be placed. If tests on the test section of fill indicate that required compaction is not obtained, do one or more of the following: increase the amount of coverages, decrease the lift thicknesses, or use different compactor equipment.
   5. Place fill materials in horizontal, loose lifts, not exceeding specified uncompacted thickness. Place fill in a manner ensuring uniform lift thickness after placing. Mechanically compact each lift, by not less than two complete coverages of the compactor. One coverage is defined as the conditions reached when all portions of the fill lift have been subjected to the direct contact of compactor's compacting surface. Compaction of fill materials by inundation with water is unacceptable.
   6. Do not place fill materials when standing water is present on surface of the area where fill will be placed. Do not compact fill when standing water is present on the fill to be compacted. Do not place or compact fill in a frozen condition or on top of frozen material. Fill containing organic materials or other unacceptable material previously described shall be removed and replaced prior to compaction.

7. If required densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly-functioning compaction equipment, CONTRACTOR shall perform all work required to provide the required densities. Such work shall include, at no additional cost to OWNER, complete removal of unacceptable fill areas and replacement and re-compaction until acceptable fill is provided.
8. Repair, at CONTRACTOR's expense, observed or measured settlement. Make repairs and replacements as required within 30 days after being so advised by ENGINEER.

E. Fill Against Concrete:
   1. Not Used.
F. Fill in Electrical Ductbank Trenches:
   1. Not Used
G. Fill in Pipe Trenches:
   1. Not Used.

H. Temporary Pavement:
   1. Not Used.

I. Subbase Placement:
   1. Provide subbase material where shown to the limits shown or indicated.
   2. Place subbase material in compacted lifts not exceeding depth of six inches each.

J. Drainage Fill Placement:
   1. Not Used.

K. Compaction Density Requirements:
   1. Compaction required for all types of fills shall be in accordance with Table 31 23 05-A of this Section. Moisten material or aerate the material as necessary to provide the moisture content that will facilitate obtaining the required compaction.

TABLE 31 23 05-A
REQUIRED MINIMUM DENSITY

Material	Percent Compaction (ASTM D698)	Uncompacted Lift (inches)
General Fill		
More than five feet below final grade	100	8
Less than five feet below final grade	95	8
Select Fill		
Below concrete slabs or mats	100	8
Below pavement and sidewalks	100	12
Behind concrete walls	95	8

Subbase Material		
Below pavement and sidewalks	100	12
All other locations	100	8
Pipe Bedding Material		
Below structures or pavement	100	8
All other locations	95	6
Drainage Fill	N/A	6

2. Fill shall be wetted and thoroughly mixed to achieve optimum moisture content plus-or-minus three percent, with the following exceptions:
   a. On-site clayey soils: Optimum to plus three percent.
3. Replace natural, undisturbed soils or compacted soil subsequently disturbed or removed by construction operations with materials compacted as indicated in Table 31 23 05-A of this Section.
4. Field quality control testing for density; to verify that specified density was obtained, will be performed during each day of compaction Work. Responsibility for field quality control testing is specified in the "Field Quality Control" Article in Part 3 of this Section.
5. When field quality control testing indicates unsatisfactory compaction, provide additional compaction necessary to obtain the specified compaction. Perform additional compaction Work at no additional cost to OWNER until specified compaction is obtained. Such work includes complete removal of unacceptable (as determined by ENGINEER) fill areas and replacement and re-compaction until acceptable fill is provided in accordance with the Contract Documents.

L. Replacement of Unacceptable Excavated Materials: In cases where over-excavation to replace unacceptable soil materials is required, backfill the excavation to required subgrade with select fill material and thoroughly compact in accordance with Table 31 23 05-A and the associated "Compaction Density Requirements" in this Article. Slope the sides of excavation in accordance with the maximum inclinations specified for each structure location.

3.11 GRADING

A. General:
   1. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.
   2. Smooth subgrade surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free of irregular surface changes, and shall comply with the following:

1. Grassed Areas or Areas Covered with Gravel, Stone, Wood Chips, or Other Special Cover: Finish areas to receive topsoil or special cover to within not more than one inch above or below the required subgrade elevations.
2. Sidewalks: Shape surface of areas under sidewalks to line, grade, and cross section, with finish surface not more than one inch above or below the required subgrade elevation.
3. Pavements: Shape surface of areas under pavement to line, grade, and cross section, with finish surface not more than 1/2-inch above or below the required subgrade elevation.

C. Grading Surface of Fill Under Concrete Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2-inch when tested with a ten foot straight edge.

D. Compaction:
1. After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.12 PAVEMENT SUBBASE COURSE

A. General:
1. Place subbase material, in layers of specified thickness, over ground surface to support pavement base course.
2. After completing filling and grading, shape and compact pavement subgrade to an even, firm foundation in accordance with this Section. Remove unsuitable subgrade materials, including soft materials, boulders, vegetation, and loose stones, and replace with compacted fill material as directed by ENGINEER.

B. Grade Control:
1. During construction, maintain lines and grades including crown and cross-slope of subbase course.

C. Placing of Pavement Subbase Course:
1. Place subbase course material on prepared subgrade in layers of uniform thickness, in accordance with indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placing operations.
2. Provide geotextile separation fabric over the prepared subgrade in accordance with Section XI-31 05 19, Geosynthetics for Earthwork.

3.15 DISPOSAL OF EXCAVATED MATERIALS

A. General:
1. CONTRACTOR shall haul away material removed from excavations and shall stockpile material as directed in the Work Plan.

2. Disposal of materials shall be in compliance with Laws and Regulations, at no additional cost to OWNER.

3.16 TEMPORARY BARRIERS

A. Provide temporary barrier surrounding excavations and excavation work areas to provide temporary protection to persons and property. Barrier shall have openings only at vehicular, equipment, and worker access points.

B. Minimum Material Requirements for Temporary Barriers:
   1. Temporary barrier shall not be less snow fence-type fencing, four feet high.
   2. Fence shall be constructed of vertical hardwood slats measuring not less than 1.5 inches by 1/4-inch interwoven with strands of horizontal wire, or shall be of equivalent plastic construction.
   3. Posts:
      a. Posts shall be steel, either "U"-, "Y"-, "T"-shaped, or channel section.
      b. Posts shall have a nominal weight of not less than 1/3-pound per linear foot, exclusive of the anchor.
      c. Posts shall have tapered anchors weighing not less than 0.67 pounds, each firmly attached by means of welding, riveting or clamping.
      d. Posts shall have corrugations, knobs, notches, or studs placed and constructed to engage a substantial number of fence line wire in the proper position.
      e. Provide each post with sufficient quantity of galvanized wire fasteners or clamps, of not less than 0.120-inch diameter, for attaching fence wire to post.

3.17 FIELD QUALITY CONTROL

A. Site Tests: CONTRACTOR shall employ a testing laboratory to perform field quality control testing:
   1. Testing Laboratory Scope:
      a. Perform field moisture content and density tests to ensure that the specified compaction of fill materials has been obtained.
      b. Tests of actual unconfined compressive strength or bearing tests on each stratum.
      c. Report results of each test to ENGINEER and CONTRACTOR.
   2. Required Material Tests:
      a. Compaction: Comply with ASTM D1556 and ASTM D6938, as applicable.
   3. Authority and Duties of Testing Laboratory:
      a. Technicians representing the testing laboratory shall inspect the materials in the field, perform testing, and report findings to ENGINEER and CONTRACTOR. When materials furnished or the Work performed does not comply with the Contract Documents, technician will direct attention of ENGINEER and CONTRACTOR to such failure.

b. Technician will not act as foreman or perform other duties for CONTRACTOR. Work will be checked as it progresses, but failure to detect defective Work or non-complying materials shall not in any way prevent later rejection when defect is discovered, nor shall it obligate ENGINEER for Substantial Completion or final acceptance. Technicians are not authorized to revoke, alter, relax, enlarge, or release requirements of the Contract Documents, or to approve or accept any portion of the Work.

4. Responsibilities and Duties of CONTRACTOR:
   a. Use of testing laboratory shall in no way relieve CONTRACTOR of the responsibility to provide materials and Work in full compliance with the Contract Documents.
   b. To facilitate testing laboratory, CONTRACTOR shall advise testing laboratory at least two days in advance of filling operations to allow for completion of field quality control testing and for assignment of personnel.
   c. It shall be CONTRACTOR's responsibility to accomplish the specified compaction for fill and other earthwork. CONTRACTOR shall control construction operations by confirmation tests to verify and confirm that CONTRACTOR has complied, and is complying at all times, with the Contract Documents relative to compaction, control.
   d. CONTRACTOR shall demonstrate adequacy of compaction equipment and procedures before exceeding one or more of the following quantities of earthwork. Each test location shall include tests for each layer, type, or class of fill to finish grade:
      1) 200 linear feet of trench fill.
      2) 10 cubic yards of select fill.
      3) 100 cubic yards of general fill.
      4) 50 cubic yards of subbase material.
5. Testing laboratory will inspect and indicate acceptable subgrades and fill layers before construction work is performed thereon. Testing of subgrades and fill layers shall be taken as follows:
   a. Trenches for Structures, and Underground Facilities (including buried ductbanks):
      1) In Open Fields: Two locations every 1,000 linear feet.
      2) Along Dirt or Gravel Roads or Off Traveled Right-of-Way: Two locations every 500 linear feet.
      3) Crossing Paved Roads: Two locations along each crossing.
      4) Under Pavement Cuts or Within Two Feet of Pavement Edges: One location every 400 linear feet.
   b. Footing Subgrade: For each stratum of soil on which footings will be placed, perform not less than one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to ENGINEER.
   c. For Select Fill: On 30-foot intervals on all sides of the structure for every compacted lift, but not less than one per lift on each side of the structure for structures less than 60 feet long on a side.

d. For General Fill: One per 1,000 square feet on every compacted lift.
e. Subbase Material: One per 1,000 square feet on every compacted lift.

6. Periodic compliance tests will be made by ENGINEER to verify that compaction is complying with the requirements specified, at no cost to CONTRACTOR. CONTRACTOR shall remove the overburden above the level at which ENGINEER wishes to test and shall fill and re-compact the excavation after testing is complete.
7. If testing laboratory reports or inspections indicate subgrade, fills, or bedding compaction below specified density, CONTRACTOR shall remove unacceptable materials as necessary and replace with specified materials and provide additional compaction at CONTRACTOR's expense until subgrades, bedding, and fill are acceptable. Costs for retesting of subgrade, fills, or bedding materials that did not originally comply with specified density shall be paid by CONTRACTOR.

+ + END OF SECTION + +

SECTION 32 92 00

LAWNS AND MEADOWS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, tools, equipment and incidentals as shown, specified and required to furnish and install all lawns and meadows.
   2. Extent of lawns and meadows is shown.
   3. Types of products required include the following:
      a. Topsoil.
      b. Lawn grass seed.
      c. Meadow grass seed mixture.
      d. Wildflower meadow seed mixture.
      e. Inorganic soil amendments.
      f. Organic soil amendments.
      g. Fertilizers.
      h. Mulches.
      i. Erosion-control materials.
      j. Accessories.

B. Coordination:
   1. Review installation procedures under other Sections and coordinate the installation of items that must be installed with, or before, lawns and meadows.

C. Related Sections:
   1. Section 31 23 05, Excavation and Fill.

1.2 REFERENCES

A. Standards referenced in this Section are listed below:
   1. Association of Official Analytic Chemists, (AOAC):
      a. Official Methods of Analysis of AOAC International.
   2. Association of Official Seed Analysts, (AOSA):
      a. Journal of Seed Technology; Rules for Testing Seeds.
   3. American Society of Agronomy, (ASA):
      a. Reference No. 1 - Methods of Soils Analysis, Soil Science Society of America, Incorporated.
   4. American Society for Testing and Materials, (ASTM):

a. ASTM B 221, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
b. ASTM C 602, Specification for Agricultural Liming Materials.
c. ASTM D 75, Practice for Sampling Aggregates.
d. ASTM D 422, Test Method for Particle Size Analysis of Soil.
e. ASTM D 977, Specification for Emulsified Asphalt.
f. ASTM D 2487, Practice for Classification of Soils for Engineering Purposes (United Soil Classification System).
g. ASTM D 5268, Specification for Topsoil Used for Landscape Purposes.
h. ASTM E 329, Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
i. ASTM E 548, Guide for General Criteria Used for Evaluating Laboratory Competence.

5. Turfgrass Producers International, (TPI):
   a. Guideline Specifications to Turfgrass Sodding.

1.3 DEFINITIONS

A. The term "finish grade" shall be used to describe the finished surface elevation of planting soil.

B. The term "manufactured topsoil" shall be used to describe soil produced off-Site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil acceptable as a component of loam.

C. The term "loam" shall be used to describe topsoil that has been mixed with additional organic and inorganic additives, as specified.

D. The term "percentage pure live seed" shall be defined as the percent (%) purity multiplied by percent (%) germination divided by 100 to equal the percent pure live seed (PLS) and shall be calculated for all seed lots using each seed lots own unique purity and germination test results. A PLS pound shall be defined as the bulk weight of seed required to equal one pound of 100 percent pure, germinated seed.

E. The term "subgrade" shall be used to describe the surface of subsoil remaining after completing excavation; or the top surface of a fill or backfill immediately beneath topsoil and which has not been tested for acceptable use as topsoil.

1.4 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Engage a single landscape installer skilled, trained and with successful and documented experience in the planting of lawns and meadows and with specific skill and successful experience in the installation of the types of materials required; and who agrees to employ only tradesmen with specific

skill and successful experience in this type of Work. Submit names and qualifications to ENGINEER along with the following information on a minimum of three successful projects:

a. Names and telephone numbers of owner, architects or engineers responsible for projects.
b. Approximate contract cost of the lawns and meadows.
c. Amount of area installed.

2. Installer's Site Supervisor: Require installer to maintain an experienced full-time landscape supervisor on-Site during the time of preparation for, and planting of, lawns and meadows. Supervisor shall have achieved landscape or horticultural certification acceptable to governing authorities having jurisdiction at the Site.
3. Ratio of laborers to certified landscape supervisors shall not exceed 12 to one. Certified landscape supervisor shall be on-Site throughout the day-to-day performance of the Work of this Section.
4. Application of herbicides, chemicals and insecticides shall be done by personnel licensed to perform such applications by governing authorities having jurisdiction at the Site and in accordance with each manufacturer's instructions provided on each product label.

B. Soil-Testing Laboratory Qualifications:
1. An independent laboratory, recognized by governing authorities having jurisdiction at the Site, with the experience and capability to conduct testing indicated and that specializes in types of soil tests to be performed.
2. To qualify for approval, an independent testing agency shall demonstrate to ENGINEER'S satisfaction, based on evaluation of criteria submitted by testing agency, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work, in accordance with ASTM E 329 and as documented according to ASTM E 548.

C. References: Comply with the applicable requirements referenced in Section XI-01 42 00, References.

D. Soil Analysis: Furnish report of soil analysis to ENGINEER, prepared by a qualified soil-testing laboratory, stating percentages of organic matter; mechanical gradation of sand, silt, and clay content in compliance with ASTM D 422; cation exchange capacity; sodium absorption ratio; deleterious materials content; pH; and mineral and plant-nutrient content of soil. Chemical analysis shall include tests for percentages of nitrate nitrogen, ammonium nitrogen, phosphorus, potassium, calcium, iron, manganese, copper, zinc, extractable aluminum, and total soluble salts:
1. Existing On-Site Soil:
a. Separate soil stockpiled and proposed for use as topsoil for lawns and meadows into 1000 cubic yard piles and label with a numbering system used to reference all soil samples and test results.
b. Obtain a one cubic foot representative sample for each 1000 cubic yards of soil stockpiled on-Site proposed for use as topsoil for lawns

and meadows, in compliance with ASTM D 75 and Appendixes, for securing samples from stockpiles.

c. Place samples taken from each stockpile, into separate clean, new and previously unused, containers and mix thoroughly. Maintain separation and legible labeling of each sample taken from each stockpile, throughout the process of mixing, drying and delivering to soil analysis laboratory. Label samples on outside of container.

d. Take one cup of soil from each container and allow to dry at room temperature. Once dry, place each one-cup sample in a separate, accurately labeled, new and previously unused one-cup sized plastic container, seal tightly and deliver to soil testing laboratory.

e. Report suitability of soil as a topsoil component for lawn and meadow plant growth. State recommended quantities of nitrogen, phosphorus, secondary and micronutrients, potash and soil amendments to be added to produce satisfactory topsoils. Include calculations, types of fertilizer and recommendations for application rates in either gallons or pounds per cubic foot of soil.

f. In addition, all on-Site soil that will be used as topsoil shall be provided with additional compost and peat moss amendments specified, whether or not testing indicates positive need for such amendments, for such material to be used as loam.

2. Manufactured Imported Topsoil:

a. Test each 1000 cubic yards of manufactured topsoil at the proposed source. In addition, after ENGINEER'S approval of manufactured topsoil based on results and recommendations of soil testing reports, test each 1000 cubic yards of manufactured topsoil that is delivered to the Site for conformance to results and recommended modifications of approved soil test reports. Manufactured topsoil that differs from proposed source material, after modification according to recommendations of soil test reports, shall be rejected for use in the Work.

b. Obtain a one cubic foot representative sample for each 1000 cubic yards of manufactured topsoil proposed for lawn and meadow Work, in compliance with ASTM D 75 and Appendixes, for securing samples from stockpiles.

c. Place samples taken from each stockpile into separate clean, new and previously unused, containers and mix thoroughly. Maintain separation and legible labeling of each sample, taken from each stockpile, throughout the process of mixing, drying and delivering to soil analysis laboratory. Label samples on outside of container.

d. Take one cup of topsoil from each container and allow to dry at room temperature. Once dry, place each one-cup sample in a separate, accurately labeled, new and previously unused one-cup sized plastic container, seal tightly and deliver to soil testing laboratory.

e. Report suitability of manufactured topsoil as a component for lawn and meadow plant growth. State recommended quantities of nitrogen, phosphorus, secondary and micronutrients, potash and soil

amendments to be added to produce satisfactory manufactured topsoil. Include calculations, types of fertilizer and recommendations for application rates in either gallons or pounds per cubic foot of manufactured topsoil.

f. Organic component of manufactured topsoil shall be obtained from compost and peat moss amendments specified, for such material to be used as loam.

E. Source Quality Control:

1. Analysis and Standards: Package all products with manufacturer's certified analysis performed in accordance with methods established by AOAC, wherever applicable, or as specified.
2. Provide manufactured imported topsoil from a commercial processing facility specializing in the manufacture of topsoil.
3. Seed that has been stored at temperatures, or under conditions not recommended by the seed supplier, or has become wet, moldy, or otherwise damaged, shall not be acceptable. The PLS for each seed lot shall be 75 percent, minimum.
4. Certify that all seed has been stored under conditions recommended by the seed supplier and has not been subjected to conditions damaging to PLS percentages.
5. Seed may be mixed by an approved method on-Site or at the seed supplier's facilities. If the seed is mixed on-Site, each variety shall be delivered in the original containers and shall bear the supplier's certified analysis. Where seed is mixed by the seed supplier, provide ENGINEER with the seed supplier's certified statement as to the composition of the mixture.

1.5 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:
   a. Schedule for lawn and meadow-planting showing anticipated planting dates for each type of Work.
2. Product Data:
   a. Manufacturer's product data, specifications and installation instructions for all required materials.
   b. Composition and analysis of commercial fertilizers and all purchase receipts showing the total quantity actually purchased for this Project.
   c. Proportions of each component contained in hydro seed mixture. Identify number of pounds of each component required for each 100 gallons of water. Include the number of square feet of lawn, grass meadow or wildflower meadow mixture that can be installed with each full tank of hydro seed mixture.
   d. PLS for each type of seed and each seed lot. Include bulk weight of seed required to equal one pound of 100 percent pure, germinated seed.

3. Samples:
    a. Submit 12-inch by 12-inch sheet of erosion control fabric with manufacturer's selections of standard biodegradable filler papers, and yarns.

B. Informational Submittals: Submit the following:
    1. Certificates:
        a. Certification of Grass and Wildflower Seed: For each grass-seed monostand and seed mixture, furnish seed supplier's certification stating the botanical and common name, and percentage by weight of each species and variety, and percentage of purity, germination and weed seed. Include the year of production and date of packaging. Certify that seed has been stored in compliance with all recommendations of the seed supplier.
        b. Certificates of inspection as may be required by governmental authorities to accompany shipments, and manufacturer's certified analysis for soil amendments and fertilizer materials. For standard products submit other data substantiating that materials comply with specified requirements.
    2. Test Reports: Submit the following:
        a. Soil analysis reports for existing soil and imported manufactured topsoil, as specified. Include recommendations for remediating existing soil into acceptable topsoil.
    3. Qualifications Data: Submit qualifications data for the following:
        a. Landscape installer.
        b. Landscape supervisor.
        c. Testing agency.
    4. Source Quality Control Submittals:
        a. Written statement providing the location from which manufactured topsoil is to be obtained and the names and addresses of the suppliers.

C. Closeout Submittals: Submit the following:
    1. Operations and Maintenance Data:
        a. Submit recommended procedures to be established by OWNER for the maintenance of lawns and meadows for one full year. Submit prior to expiration of required maintenance period.
    2. Warranty Documentation:
        a. Submit written warranty, signed by CONTRACTOR and landscape installer, as specified.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials:
    1. Do not deliver seed until Site conditions are ready for installation.
    2. Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery.

3. Deliver seed in undamaged, original containers, sealed by the supplier and indicating compliance with approved Shop Drawings.
4. Inspect lawn and meadow materials upon arrival at Site. Immediately and permanently remove unacceptable materials from Site.

B. Storage of Materials:
1. Store and cover materials to prevent deterioration. Remove packaged materials that become wet or show deterioration or water marks from the Site.
2. Seed that becomes wet, moldy or damaged during the time of storage on-Site or that has been damaged during transit is not acceptable.

1.7 PROJECT CONDITIONS

A. Environmental Requirements:
1. Proceed with and complete lawn and meadow planting as rapidly as portions of the Site become available, working within the seasonal limitations for each type of lawn, grass and wildflower planting required.
2. Proceed with planting only when current and forecasted weather conditions are favorable to successful planting and establishment of lawns and meadows:
   a. Do not spread seed when wind velocity exceeds five miles per hour.
   b. Do not plant when drought, or excessive moisture, or other unsatisfactory conditions prevail.
3. Herbicides, chemicals and insecticides shall not be used on areas bordering wetlands.

B. Scheduling:
1. Coordinate planting with specified extended service periods to provide required service from date of Substantial Completion. Plant during one of the following periods:
   a. Spring Planting: March 15 to June 1.
   b. Fall Planting: September 1 to October 30.
2. Do not begin lawn and meadow planting until water, acceptable for use and adequate in supply, is available on-Site and can be successfully transported to the areas of Work. Coordinate provision of adequate and acceptable water supply with Project Schedule.
3. Do not proceed with installation of loam until all subgrade utility services have been installed, are operating successfully and have been approved by ENGINEER.

C. Pre-installation Conference:
1. Prior to commencement of lawn and meadow planting and associated Work, CONTRACTOR shall schedule and meet at the Site with the landscape installer, the installers of other Work in and around lawn and meadow areas that follows the lawn and meadow Work, including fencing Work specified in Section XI-32 31 00, Fences; and ENGINEER and other representatives

directly concerned with performance of the Work. Review foreseeable methods and procedures related to the lawn and meadow Work, including the following:

a. Review Project requirements and the Contract Documents.
b. Review required submittals, both completed and yet to be completed.
c. Review availability of water and methods of delivery.
d. Review status of below-grade work and required access during lawn and meadow planting and establishment.
e. Review Project Schedule and availability of materials, tradesmen, equipment and facilities needed to make progress and avoid delays.
f. Review environmental conditions, other Project conditions, and procedures for coping with unfavorable conditions.
g. Review procedures required for protection of lawns and meadows during the remainder of the construction period.
h. Review required inspection, testing, and certifying procedures.

2. Record the discussions of the Pre-installation Conference and the decisions and agreements or disagreements reached, and furnish a copy of the record to each party attending.
3. Record all revisions or changes agreed upon, reasons therefor, and parties agreeing or disagreeing with them.
4. Reconvene the meeting at the earliest opportunity if additional information must be developed in order to conclude the subjects under consideration.

1.8 WARRANTY

A. General Warranty: The special warranties specified in this Article shall not deprive OWNER of other rights or remedies OWNER may otherwise have under the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by CONTRACTOR under the Contract Documents.

B. Special Warranties: Warranty lawns and meadows through the specified extended service period.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil:
1. All soil accepted as topsoil, whether obtained from on-Site or off-Site sources, shall comply with specified topsoil analysis.
2. Provide fertile, friable, natural loam, surface soil, capable of sustaining vigorous plant growth; free of any admixture of subsoil, clods of hard earth, plants or roots, sticks, stones larger than 1-inch in diameter, or other extraneous material harmful to plant growth, in compliance with ASTM D 5268. Provide topsoil with the following analysis:
a. 3/4-inch mesh: 100 percent passing.

b. No. 4-sieve: 90 to 100 percent passing.
c. No. 200-sieve: 0 to 10 percent passing.
d. Clay content of material passing No. 200-sieve not greater than 60 percent, as determined by hydrometer tests.
e. pH-adjusted with ferrous sulphate or ground limestone to provide pH 5.5 to pH 7.0 at time of installation of lawns, grass and meadow areas, unless particular species of grass or wildflower stand requires a different pH to meet its growing needs.
f. Electrical conductivity of a 1:2 soil-water suspension shall not exceed 1.0 milliohm per centimeter and with less than 200 parts per million of extractable aluminum.
g. Cation Exchange Capacity: 5, minimum.
h. Organic content not less than five percent, as determined by ignition loss of oven-dried samples passing No. 10-sieve (Muffle Furnace Temperature: 110 plus or minus five degrees C for eight hours).
i. Free of pests and pest larvae.

3. Topsoil Source: Reuse surface soil stockpiled on-Site, where possible. Verify suitability of stockpiled surface soil to produce topsoil, as specified. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth:
   a. Supplement acceptable on-Site soil with manufactured topsoil from off-Site sources, when quantities available on-Site are insufficient to complete the Work.

B. Lawn Grass Seed:
1. Lawn Grass Seed Mixture: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by AOSA. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, specified.
2. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 80 percent pure seed, and not more than 0.25 percent weed seed by weight:
   a. Full Sun: Kentucky Bluegrass (Poa pratensis), a minimum of three cultivars.
   b. Sun and Partial Shade: Proportioned by weight as follows:
      1) 50 percent Kentucky Bluegrass (Poa pratensis).
      2) 30 percent Chewings Red Fescue (Festuca rubra variety).
      3) 10 percent Perennial Ryegrass (Lolium perenne).
      4) 10 percent Redtop (Agrostis alba).
   c. Shade: Proportioned by weight as follows:
      1) 50 percent Chewings Red Fescue (Festuca rubra variety).
      2) 35 percent Rough Bluegrass (Poa trivialis).
      3) 15 percent Redtop (Agrostis alba).

C. Meadow Grass Seed:
1. Tall Grassy Meadow with Minor Forbs: Provide a mixture of fresh, clean, new-crop seed complying with the tolerance for purity and germination

established by AOSA. Provide seed of each species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed specified.

2. Seed Species: Seed of grass and forb species as follows, with not less than 95 percent germination, not less than 80 percent pure seed, and not more than 0.25 percent weed seed by weight:
   a. Full Sun: Proportioned by weight as follows:
      1) Ten percent Big Bluestem (Andropogon gerardii).
      2) Three percent Patridge Pea (Chamaecrista fasciculata).
      3) Ten percent Silky Wild Rye (Elymus villosus).
      4) Fifty percent Creeping Red Fescue (Festuca ruba).
      5) Five percent Deertongue (Panicum clandestinum).
      6) Five percent Switchgrass (Panicum virgatum).
      7) Five percent Foul Bluegrass (Poa palustris).
      8) Two percent Black-Eyed Susan (Rudbeckia hirta).
      9) Five percent Little Bluestem (Schizachyrium scoparium).
      10) Five percent Indiangrass (Sorghastrum nutans).

D. Wildflower Meadow Seed:
   1. Wildflower Meadow with Minor Grasses: Provide a mixture of fresh, clean, new-crop seed complying with the tolerance for purity and germination established by AOSA. Provide seed of each grass and forb species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed specified.
   2. Seed Species: Seed of grass and forb species as follows, with not less than 95 percent germination, not less than 80 percent pure seed, and not more than 0.25 percent weed seed by weight:
      a. Full Sun: Proportioned by weight as follows:
         1) 0.5 percent Eastern Columbine (Aquilegia canadensis).
         2) 1 percent Swamp Milkweed (Ascelpias incarnata).
         3) 1.5 percent Common Milkweed (Asclepias syriaca).
         4) 0.5 percent Butterflyweed (Asclepias tuberosa).
         5) 3 percent Smooth Aster (Aster laevis).
         6) 2 percent New England Aster (Aster novae-angliae).
         7) 1 percent Zig-Zag Aster (Aster prenanthoides).
         8) 10 percent Sideoats Grama (Bouteloua curtipendula).
         9) 2 percent Maryland Senna (Cassia marilandica).
         10) 5 percent Partridge Pea (Chamaecrista fasciculata).
         11) 1 percent Showy Tick Trefoil (Desmodium canadensis).
         12) 4 percent Purple Coneflower (Echinacea purpurea).
         13) 10 percent Silky Wild Rye (Elymus villosus).
         14) 2 percent Boneset (Eupatorium perfoliatum).
         15) 2 percent Ox-Eye Sunflower (Heliposis helianthoides).
         16) 1 percent Roundheaded Bush Clover (Lespedeza capitata).
         17) 2 percent Marsh Blazing Star (Liatris spicata).
         18) 0.5 percent Wild Bergamot (Monarda fistulosa).
         19) 10 percent Switchgrass (Panicum virgatum).

20) 1 percent Beard-Tongue (Penstemon digitalis).
21) 3 percent Black-Eyed Susan (Rudbeckia hirta).
22) 2 percent Grey-Headed Coneflower (Rudbeckia pinnata).
23) 1 percent Orange Coneflower (Rudbeckia speciosa).
24) 3 percent Brown-Eyed Susan (Rudbeckia triloba).
25) 13 percent Little Bluestem (Schizachyrium scoparium).
26) 12 percent Indiangrass (Sorghastrum nutans).
27) 1 percent Ohio Spiderwort (Tradescantia ohiensis).
28) 2 percent Blue Vervain (Verbena hastata).
29) 3 percent Wingstem (Verbesina alternifolia).

E. Inorganic Soil Amendments:
   1. Ground Oolitic Limestone: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:
      a. Class: Class T, with a minimum 99 percent passing through No. 8-sieve and a minimum 75 percent passing through No. 60-sieve.
   2. Iron Sulfate: Commercial-grade acidulant, recommended for use on acid-loving plants. Provide granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
   3. Perlite: Agricultural-grade, expanded pumice.
   4. Agricultural Gypsum: Commercial-grade and finely ground, containing a minimum of 90 percent calcium sulfate.
   5. Grit Aggregate: Commercial-grade filter sand consisting of hard, durable rounded grains of quartz or other rock that do not compact to a solid mass when wet, with a pH in the range required for topsoil. Provide clean, washed, natural or manufactured aggregate, free of toxic materials, salt and other chemical contamination.
   6. Diatomaceous Earth: Calcined, diatomaceous earth, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

I. Organic Soil Amendments:
   1. Compost: Well-composted, stable, weed-free organic matter, produced by the aerobic decomposition of organic residues; pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through a 1-inch screen; soluble salt content of 5 to 10 decisiemens/meter; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
      a. Organic Matter Content: 50 to 60 percent of dry weight.
      b. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
   2. Peat: Partially decomposed stems and leaves of several species of sphagnum moss; finely divided or granular texture. Supply shredded material, free from lumps, wood, roots, stones, decomposed collodial residue and other extraneous foreign matter, capable of passing through a 1/2-inch screen, which can easily be incorporated with the soil. Supply material, which has been conditioned in storage piles after excavation for at least six months,

including one freezing and thawing period. Supply peat humus with the following analysis:

a. Not less than 90 percent organic matter by weight on an ovendry basis.
b. pH range of 3.4 to 4.8.
c. Moisture content 35 percent at time of incorporation into soil.
d. Water absorbing ability 150 percent to 350 percent by weight.

3. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials:
   a. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with at least 0.15 pounds of ammonium nitrate or 0.25 pounds of ammonium sulfate per cubic foot of loose sawdust or ground bark.
4. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

J. Fertilizers:
1. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of four percent nitrogen and 20 percent phosphoric acid.
2. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
3. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   a. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports.
4. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   a. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

K. Mulches:
1. Straw Mulch: Provide air-dry, clean, mildew- and certified seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
2. Peat Mulch: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.
3. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch screen; soluble salt content of 5 to 10 decisiemens/meter; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
   a. Organic Matter Content: 50 to 60 percent of dry weight.

b. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

4. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
5. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.
6. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

L. Erosion-Control Materials:
1. Erosion-Control Blankets: 100 percent biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended 6-inches long steel wire staples.

M. Water: Acceptable for lawn and meadow application and containing no material harmful to plant growth and establishment.

2.2 LOAM MIXES

A. Follow recommendations of soil-testing laboratory for modifying on-Site soil and manufactured soil, for use as topsoil.

B. On-Site soil and manufactured soil that has been provided with all inorganic soil amendments and fertilizers recommended by soil-testing laboratory, and acceptable for use as topsoil, shall be mixed with an additional organic soil amendment mix in a ratio of two parts topsoil to one part organic soil amendment mix, by volume:
1. Prepare soil amendment mix by combining 40 percent compost, 40 percent peat moss, ten percent wood derivatives, five percent well-rotted manure and five percent grit aggregate, by volume.

C. Loam: Thoroughly blend topsoil with organic soil amendment mix and use as planting media for all lawn and meadow Work.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR shall examine the areas and conditions under which lawn and meadow Work is to be performed, and notify ENGINEER, in writing, of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

3.2 PREPARATION

A. Thoroughly blend and mix loam before spreading. Incorporate fertilizers, and ground limestone or acidulant, after spreading, as specified, and at rates recommended by soil-testing laboratory.

B. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations:
   1. Protect adjacent and adjoining areas from hydroseeding overspray.

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

D. Perform percolation tests on existing subgrade and placed fills prior to fine grading:
   1. Perform percolation testing of subgrades and placed fills to determine whether or not the subgrade will drain properly. Perform percolation tests in accordance with the following procedure:
      a. Dig a hole in the subgrade that is 4-inches in diameter and 12-inches deep.
      b. Fill the hole with water and wait for the water to completely drain from the hole.
      c. Immediately refill the hole with water and measure the rate of fall in the water level.
   2. In the event that water drains at a rate less than 1-inch in one hour, excavate soil to a minimum depth of 24-inches, and deeper, as necessary to break the compaction. Backfill, recompact and retest each area so prepared to confirm drainage rates exceed one inch in one hour.
   3. Perform minimum of one soil percolation test for every 10,000 square feet of lawn and meadow area.

E. Excavate or fill subgrade, as required, to bring subgrade to elevations shown. Maintain all angles of repose. Confirm that subgrade is at proper elevations and that no further earthwork is required to bring the subgrade to proper elevations. Provide subgrade elevations that slope parallel to finished grade and towards subsurface drains shown.

F. Remove all construction debris, trash, rubble and all extraneous materials from subgrade. In the event that fuels, oils, concrete washout or other material harmful to plant growth or germination have been spilled into the subgrade, excavate the subgrade sufficiently to remove all such harmful materials and fill with approved fill, compacted to the required subgrade compaction level.

3.3 FINE GRADING

A. Immediately prior to dumping and spreading loam, clean subgrade of all stones greater than 2-inches and all other extraneous matter. Remove all such material from Site. Notify ENGINEER that subgrade has been cleaned, and obtain approval prior to spreading loam.

B. Do not attempt to spread excessively wet, muddy or frozen loam. Do not spread loam more than five days before seeding or planting.

C. Spread loam to a depth of 6-inches but not less than required to meet finish grades after light rolling and natural settlement:
   1. Spread approximately one-half the thickness of required loam depth. After spreading loam, rototill, disk or harrow loam and subgrade to bring top 2-inches of subgrade upward into loam layer, so that there is a transitional layer between loam and subgrade.
   2. Spread remainder of loam to required finish grades.
   3. Compact each lift sufficiently to reduce settling, but not enough to prevent the movement of water and feeder roots through loam. After compaction spread loam should offer firm, even resistance when a soil sampling tube is inserted.
   4. Phase the placement of the final lift so that wheeled vehicles do not have to travel over areas where final lifts are already in-place.
   5. Spread and compact to a smooth, uniform surface plane, to within plus or minus 1/2-inch of finish elevations. Roll and rake and remove all ridges, and fill depressions, as required. Remove all stones larger than 1-inch in any dimension and all sticks, roots, trash and other extraneous matter.
   6. Perform percolation tests as for subgrades, except limit depth of holes to 2/3 the depth of loam layer.

D. Spread ground limestone or acidulant and fertilizer, as specified. Mix ground limestone with dry loam before spreading fertilizer and work lightly into the top 4-inches of loam by harrowing or tilling at least three days before applying commercial fertilizers.

E. Grade planting areas to smooth, even surface with loose, uniformly fine texture. Remove all stones and extraneous material in excess of 1-inch diameter. Roll, rake and remove ridges and fill depressions, as required to meet finish grades.

F. Moisten prepared areas before seeding, sodding, sprigging or plugging. Water thoroughly and allow surface moisture to dry before planting. Do not create a muddy loam condition.

G. Prior to seeding or planting, restore loam to specified condition, if eroded or otherwise disturbed.

3.4 CONVENTIONAL SEEDING

A. General: Maintain grade stakes until removal is mutually agreed upon by all parties concerned.

B. Rake or harrow all seedbeds immediately prior to seeding to produce a rough, grooved surface, no deeper than 1-inch. Seed only when seedbed is in a friable condition and not muddy or hard.

C. Sow seed using a spreader or seeding machine.

D. Distribute seed evenly over entire area by sowing equal quantity in two directions at right angles to each other.

E. Sow lawn grass seed mixture at the rate of not less than five-pounds for every 1000 square feet.

F. Sow meadow grass with minor forbs seed mixture at the rate of not less than 38 - pounds per acre.

G. Sow wildflower meadow with minor grasses seed mixture at the rate of not less than 19-pounds per acre.

H. Cultipacker, or approved similar equipment, may be used to cover the seed and to firm the seedbed in one operation. In areas inaccessible to cultipacker:
   1. Rake the seed lightly into top 1/8-inch of loam, roll in two directions with a water ballast roller, weighing not less than 100 pounds per linear foot.
   2. Take care during raking that seed is not raked from one spot to another.
   3. Protect seeded areas against erosion by spreading specified mulch after completion of seeding operations:
      a. Protect seeded areas against hot, dry weather or drying winds by applying peat moss mulch not more than 24 hours after completion of seeding operations. Presoak and scatter evenly to a depth of from 1/8-inch to 3/16-inches thick and roll to a smooth surface. Do not mound.
      b. Spread straw mulch to form a continuous loose blanket not less than 1-1/2-inch deep over seeded areas at the approximately rate of two tons-per acre:
         1) Anchor mulch by spraying with asphalt emulsion at the rate of ten to 13-gallons per 1000 square feet.
         2) Place mulch with equipment that will blow or eject, by means of a constant air stream, controlled quantities of the mulch and asphalt in a uniform pattern over the specified area. If the mulch is excessively cut or broken, take measures to reduce the cutting or breakage. Introduce the asphalt into the air stream by means of a spray arranged so that it will partially coat the mulch with a spotty

asphalt tack prior to the depositing of the mulch covering. Rate of application not less than 75-gallons per ton of mulch.

c. Protect seeded areas, with slopes exceeding one on six, by providing erosion-control fiber mesh and where slopes exceed one on four, by providing erosion-control blankets. Install erosion-control materials according to manufacturer's written instructions and as follows:
   1) Vertically down slope without stretching fabric.
   2) Install hold down staples three per square yard minimum in center of fabric or as required to hold and shape the fabric to the contours of the slope. Install hold down staples along edges and overlaps of fabric at 9 inches on centers minimum, or as required to hold and shape the fabric to the contours of the slope.
   3) Lap fabric 4-inches minimum and turn edges of fabric into 8-inch deep by 16-inch wide earth trench and fill trench with earth.

I. Using a uniform fine spray, thoroughly and evenly water seeded areas. Provide adequate water to moisten seedbed to a depth of 2-inches:
   1. Repeat this process when peat mulch color lightens. Maintain all seedbeds in a uniformly moist condition, conducive to seed germination and plant establishment, as specified.

J. Reseed areas that remain without mulch for longer than three days.

K. Take precautions to prevent damage or staining of construction or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.

L. Prevent foot or vehicular traffic, or the movement of equipment, over the mulched areas. Reseed areas damaged as a result of such activity.

3.5 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

B. Mix slurry with asphalt-emulsion tackifier.

C. Apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry application at a minimum rate of 500-pounds per acre dry weight, but not less than the rate required to obtain specified seed-sowing rate so that the seed comes into direct contact with loam.

D. Apply slurry cover coat of fiber mulch at a rate of 1000-pounds per acre.

3.9 RECONDITIONING EXISTING LAWNS AND MEADOWS

A. Recondition existing lawn and meadow damaged by CONTRACTOR'S operations, including areas used for storage of materials or equipment and areas damaged by movement of vehicles. Recondition existing lawns and meadow areas where minor regrading is required.

B. Recondition other existing lawn and meadow areas shown.

C. Provide fertilizer, seed or sod and soil amendments, as specified for new lawn and meadow, and as required to provide satisfactorily reconditioned lawns and meadows. Provide new loam as required to fill low spots and meet new finish grades.

D. Till stripped, bare, and compacted areas thoroughly to a depth of 12-inches.

E. Remove diseased or unsatisfactory lawn and meadow areas; do not bury into soil. Remove topsoil containing extraneous materials resulting from CONTRACTOR'S operations including oil drippings, stone, gravel and other construction materials.

F. In areas approved by ENGINEER, where substantial lawns and meadows remain (but are thin), mow, dethatch, core aerate and rake. Fill low spots, remove humps, cultivate soil, fertilize, and seed. Remove weeds before seeding or if extensive, apply selective chemical weed killers, as required. Apply a seedbed mulch, if required, to maintain moist condition.

G. Water newly planted areas and keep moist until new lawns and meadows are established, as specified.

3.10 ACCEPTANCE CRITERIA FOR LAWNS AND MEADOWS

A. Lawn and meadow Work will be considered acceptable when:
   1. Seeded Lawn: When a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 square feet and bare spots not exceeding 5-inches by 5-inches.
   2. Seeded Meadow: When a healthy, uniform, close stand of meadow grass and forbs has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 20 square feet and bare spots not exceeding 12-inches by 12-inches.

3.11 CLEANUP AND PROTECTION

A. Promptly remove soil and debris, created by lawn and meadow Work, from paved areas. Clean wheels of vehicles before leaving Site to avoid tracking soil and loam onto roads, walks, or other paved areas.

B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout extended service period and remove when service period ends. Treat, repair or replace damaged lawns and meadows.

C. Take all precautions to ensure that hydroseed slurry is only placed on the areas designated. Completely clean any overspray, on areas not designated to receive slurry.

3.12 INSPECTION AND ACCEPTANCE

A. Where lawns and meadows do not comply with specified acceptance criteria, reestablish lawns and meadows and continue extended service period until lawns and meadows comply with criteria for acceptance.

3.13 DEMONSTRATION

A. Engage installer's Site supervisor to train and instruct OWNER'S personnel in the proper maintenance of lawns and meadows and procedures to be performed throughout the year for proper care and maintenance of lawn and meadows:
   1. Include instructions and training on reconditioning established lawns and meadow and sources of lawn and meadow materials.
   2. Schedule training with OWNER, through ENGINEER, with at least seven days' advance notice.

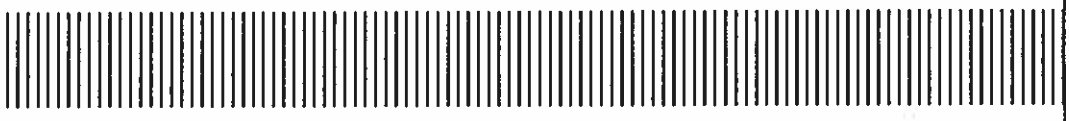
B. Review Operation and Maintenance information and be sure all instructions are clearly understood by OWNER'S personnel and are supplemented with additional information, clarifications and instructions, as required.

C. Provide minimum of two, nonconsecutive, full days on-Site training time during day shift normal working hours.

+ + END OF SECTION + +

Abandoned Chemical Sales Facility
Rochester, New York

Work Plan
Appendix G



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MALCOLM PIRNIE

Rec'd 12/27/95

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-3505

EARTH DAY 25 1995 ENVIRONMENTAL PARTNERS

Michael D. Zagata
Commissioner

MEMORANDUM

TO: Michael O'Toole, Director, Division of Hazardous Waste Remediation

FROM: N.G. Kaul, Director, Division of Water

SUBJECT: Generic Effluent Criteria for Surface Water Discharges

DATE: SEP 28 1995

This memo is to transmit a general authorization for short term, batch surface water discharges of pump test and containerized well development waters. Remedial investigations and designs have often required DOW to provide rapid turnaround times to develop short term surface water pump test and containerized well development water discharge criteria. The attached generic surface water effluent criteria and general conditions were developed by DOW staff to reduce delays in implementing these short term surface water discharges and to save staff time for both Divisions. Please have your staff pay particular attention to the footnotes listed at the end of the document.

The attached criteria are subject to the following conditions:

1. Discharges to surface waters within the New York City watershed are not authorized by the attached criteria. A full DOW review is required by these discharges.

2. The criteria do not contain discharge limitations for radioactive discharges. Limitations on discharges of radiation or radioactive isotopes are addressed under Part 380 Radiation Control Permits.

3. Alternate monitoring frequencies, discharge limitations (where appropriate) or inclusion of parameters not identified in the attachment will be considered; however, a complete review by DOW staff will be required.

4. The attached parameter list is extensive and DOW's intent is for monitoring to be conducted only for those parameters which are known or suspected to be present at the site. Monitoring of parameters not present is not required by these criteria.

The DOW does not have any regulatory authority over a discharge from State, PRP, Federal Superfund Sites without SPDES permits. DHWR will be responsible for ensuring compliance with the attached effluent criteria and approval of all engineering submissions. Footnote (11) requires identification of the DHWR contact person who will receive all effluent results, engineering submissions and modification requests. The Regional Water Engineer should be kept appraised of the status of each discharge and sent a copy of the effluent results for informational purposes.

Long term groundwater and surface water discharges are not addressed in the attached criteria or in the short term groundwater criteria sent in a previous memo. A complete review of these proposed discharge scenarios will still require full DOW review. The attached criteria may be used as a planning tool by your staff, consultants and PRPs determining the most feasible discharge option. All long term groundwater and surface water discharge requests and modifications of the short term discharge criteria should be directed to Mr. Angus Eaton, Chief, Chemical Systems Section, Bureau of Wastewater Facilities Design.

If you have any questions, please call Mr. Angus Eaton at 457-0625.

Attachment

cc: Regional Water Engineers
A. Eaton, DOW

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning with the start of each discharge event

and lasting until 7 days from start of discharge.

the discharges from the treatment facility to surface water shall be limited and monitored by the operator as specified below:

Outfall Number & Effluent Parameter	CAS No.	Discharge Limitations Daily Max.	Units	Minimum Monitoring Requirements: Measurement Frequency	Minimum Monitoring Requirements: Sample Type
Outfall 001 - Containerized Well Development Water and/or Pump Test Water:					
Flow	NA	Monitor	gpd	Continuous	Meter
pH(Range)	NA	6.5 to 8.5	SU	(1)	Grab
Oil and Grease	NA	15	mg/l	(1)	Grab
BOD, 5-day	NA	5	mg/l	(1)	Grab
Solids, Total Suspended	NA	10	mg/l	(1)	Grab
Solids, Total Dissolved	NA	200	mg/l	(1)	Grab
Turbidity	NA	5	NTUs	(1)	Grab
Acenaphthene	83-32-9	10	µg/l	(1)	Grab
Acenaphthylene	208-96-8	10	µg/l	(1)	Grab
Acetone	67-64-1	100.0[2]	µg/l	(1)	Grab
Acrylic acid	79-10-7	50	µg/l	(1)	Grab
Acrylonitrile	107-13-1	0.07	µg/l	(1)	Grab
Alachlor	15972-60-8	0.3	µg/l	(1)	Grab
Aldicarb	116-06-3	8.0[2]	µg/l	(1)	Grab
Methomyl	16752-77-5	40.0[2]	µg/l	(1)	Grab
Aldicarb sulfone	1646-88-4	2	µg/l	(1)	Grab
Aldicarb sulfoxide	1646-87-3	4	µg/l	(1)	Grab
Aldrin	309-00-2	0.020[2]	µg/l	(1)	Grab
Alkyl dimethyl benzyl ammonium chloride	68391-01-5	50	µg/l	(1)	Grab
Alkyl diphenyl oxide sulfonates[3]	NA	50	µg/l	(1)	Grab
Aluminum, Total	NA	100	µg/l	(1)	Grab
Ametryn	834-12-8	50	µg/l	(1)	Grab
Aminomethylene phosphonic acid salts[4]	NA	50	µg/l	(1)	Grab
Sum of Aminopyridines	NA	1.0	µg/l	(1)	Grab
Ammonia, Total (as NH_3)	7664-41-7	660	µg/l	(1)	Grab
Aniline	62-53-3	10.0[2]	µg/l	(1)	Grab
Anthracene	120-12-7	10	µg/l	(1)	Grab
Antimony, Total	NA	10.0[2]	µg/l	(1)	Grab
Arsenic, Total	NA	36	µg/l	(1)	Grab
Aryltriazoles[3]	NA	50	µg/l	(1)	Grab
Atrazine	1912-24-9	8.0[2]	µg/l	(1)	Grab
Azinphosmethyl	86-50-0	0.60[2]	µg/l	(1)	Grab
Azobenzene	103-33-3	0.5	µg/l	(1)	Grab
Barium, Total	NA	1,000	µg/l	(1)	Grab
Benz(a)anthracene	56-55-3	0.050[2]	µg/l	(1)	Grab

SEE PAGES 9 OF 10 AND 10 OF 10 FOR FOOTNOTES.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning with the start of each discharge event

and lasting until 7 days from start of discharge.

the discharges from the treatment facility to surface water shall be limited and monitored by the operator as specified below:

Outfall Number & Effluent Parameter	CAS No.	Discharge Limitations Daily Max.	Units	Minimum Monitoring Requirements: Measurement Frequency	Minimum Monitoring Requirements: Sample Type
Benzene	71-43-2	0.80[2]	µg/l	(1)	Grab
Benzidine	92-87-5	0.30[2]	µg/l	(1)	Grab
Benzisothiazole	271-61-4	50	µg/l	(1)	Grab
Benzo(a)anthracene	56-55-3	10	µg/l	(1)	Grab
Benzo(b)fluoranthene	205-99-2	0.070[2]	µg/l	(1)	Grab
Benzo(k)fluoranthene	207-08-9	0.020[2]	µg/l	(1)	Grab
Benzo(ghi)Perylene	191-24-2	10	µg/l	(1)	Grab
Benzo(a)pyrene	50-32-8	0.090[2]	µg/l	(1)	Grab
Beryllium, Total	NA	3	µg/l	(1)	Grab
Bis(2-chloroethyl)ether	111-44-4	1.0[2]	µg/l	(1)	Grab
Bis(2-ethylhexyl)phthalate	117-81-7	8.0[2]	µg/l	(1)	Grab
Boric acid, Borates & Metaborates[5]	NA	125	µg/l	(1)	Grab
Boron, Total	NA	1,000	µg/l	(1)	Grab
Bromide, Total	NA	2,000	µg/l	(1)	Grab
Bromobenzene	108-86-1	5	µg/l	(1)	Grab
Bromochloromethane	74-97-5	5	µg/l	(1)	Grab
Bromodichloromethane	75-27-4	10	µg/l	(1)	Grab
Bromoform	75-25-2	10	µg/l	(1)	Grab
Bromomethane	74-83-9	5	µg/l	(1)	Grab
Butoxyethoxyethanol	112-34-5	50	µg/l	(1)	Grab
Butoxypropanol	5131-66-8	50	µg/l	(1)	Grab
Butylate	2008-41-5	50	µg/l	(1)	Grab
n-Butylbenzene	104-51-8	5	µg/l	(1)	Grab
sec-Butylbenzene	135-98-8	5	µg/l	(1)	Grab
tert-Butylbenzene	98-06-6	5	µg/l	(1)	Grab
Butyl benzyl phthalate	85-68-7	50	µg/l	(1)	Grab
Butyl isopropyl phthalate	NA	50	µg/l	(1)	Grab
Cadmium, Total	NA	1.2	µg/l	(1)	Grab
Carbofuran	1563-66-2	10.0[2]	µg/l	(1)	Grab
Carbon tetrachloride	56-23-5	0.50[2]	µg/l	(1)	Grab
Carboxin	5234-68-4	50	µg/l	(1)	Grab
Chloramben[6]	NA	50	µg/l	(1)	Grab
Chlordane	57-74-9	0.060[2]	µg/l	(1)	Grab
Chloride	NA	250,000	µg/l	(1)	Grab
2,3,7,8-Tetrachlorodibenzo-p-dioxin	NA	0.0080[2]	µg/l	(1)	Grab
Chlorinated dibenzo-p-dioxins and Chlorinated dibenzofurans	NA	0.0080[2]	µg/l	(1)	Grab

SEE PAGES 9 OF 10 AND 10 OF 10 FOR FOOTNOTES.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning with the start of each discharge event

and lasting until 7 days from start of discharge.

the discharges from the treatment facility to surface water shall be limited and monitored by the operator as specified below:

Outfall Number & Effluent Parameter	CAS No.	Discharge Limitations Daily Max.	Units	Minimum Monitoring Requirements: Measurement Frequency	Minimum Monitoring Requirements: Sample Type
Chlorine, Total Residual	NA	100.0[2]	µg/l	(1)	Grab
Chlorobenzene	108-90-7	5	µg/l	(1)	Grab
4-Chlorobenzotrifluoride	98-56-6	5	µg/l	(1)	Grab
Chloroethane	75-00-3	5	µg/l	(1)	Grab
Chloroform	67-66-3	7	µg/l	(1)	Grab
2-Chloronaphthalene	91-58-7	10	µg/l	(1)	Grab
2-Chlorotoluene	95-49-8	5	µg/l	(1)	Grab
4-Chlorotoluene	106-43-4	5	µg/l	(1)	Grab
5-Chloro-o-toluidine	95-79-4	0.7	µg/l	(1)	Grab
Chromium, Total	NA	207	µg/l	(1)	Grab
Chromium, Hexavalent	NA	11	µg/l	(1)	Grab
Chrysene	218-01-0	0.60[2]	µg/l	(1)	Grab
Cobalt, Total	NA	5	µg/l	(1)	Grab
Copper, Dissolved	NA	Monitor	µg/l	(1)	Grab
Copper, Total	NA	24	µg/l	(1)	Grab
Cyanide, Amenable to Chlorination	NA	60.0[2]	µg/l	(1)	Grab
Dalapon[6]	NA	50	µg/l	(1)	Grab
4,4'-DDT	50-29-3	0.050[2]	µg/l	(1)	Grab
4,4'-DDD	72-54-8	0.040[2]	µg/l	(1)	Grab
4,4'-DDE	72-55-9	0.020[2]	µg/l	(1)	Grab
Sum of Demeton	NA	0.1	µg/l	(1)	Grab
Dechlorane Plus	13560-89-9	5	µg/l	(1)	Grab
Diazinon	333-41-5	0.7	µg/l	(1)	Grab
Dibenzo(a,h)Anthracene	53-70-3	10	µg/l	(1)	Grab
Dibromochloromethane	124-48-1	10	µg/l	(1)	Grab
1,2-Dibromo-3-chloropropane	96-12-8	0.2	µg/l	(1)	Grab
Dibromodichloromethane	594-18-3	5	µg/l	(1)	Grab
Dibromomethane	74-95-3	5	µg/l	(1)	Grab
2,2-Dibromo-3-nitrilopropionamide	10222-01-2	20	µg/l	(1)	Grab
Di-n-butyl phthalate	84-74-2	50	µg/l	(1)	Grab
1,2-Dichlorobenzene	95-50-1	see sum of Dichlorobenzenes			
1,4-Dichlorobenzene	106-46-7	see sum of Dichlorobenzenes			
1,3-Dichlorobenzene	541-73-1	see sum of Dichlorobenzenes			
Sum of Dichlorobenzenes	NA	5	µg/l	(1)	Grab
4-Dichlorobenzotrifluoride	328-84-7	5	µg/l	(1)	Grab
Dichlorodifluoromethane	75-71-8	5	µg/l	(1)	Grab
1,1-Dichloroethane	75-34-3	5	µg/l	(1)	Grab

SEE PAGES 9 OF 10 AND 10 OF 10 FOR FOOTNOTES.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning with the start of each discharge event

and lasting until 7 days from start of discharge.

the discharges from the treatment facility to surface water shall be limited and monitored by the operator as specified below:

Outfall Number & Effluent Parameter	CAS No.	Discharge Limitations Daily Max.	Units	Minimum Monitoring Requirements: Measurement Frequency	Minimum Monitoring Requirements: Sample Type
1,2-Dichloroethane	107-06-2	0.8	µg/l	(1)	Grab
cis-1,2-Dichloroethylene	156-59-2	5	µg/l	(1)	Grab
trans-1,2-Dichloroethylene	156-60-5	5	µg/l	(1)	Grab
1,1-Dichloroethylene	75-35-4	0.50[2]	µg/l	(1)	Grab
Dichlorofluoromethane	75-43-4	5	µg/l	(1)	Grab
2,4-Dichlorophenol	120-83-2	2.0[2]	µg/l	(1)	Grab
2,4-Dichlorophenoxyacetic acid	94-75-7	10	µg/l	(1)	Grab
1,2-Dichloropropane	78-87-5	0.5	µg/l	(1)	Grab
1,1-Dichloropropane	78-99-9	5	µg/l	(1)	Grab
,3-Dichloropropane	142-28-9	5	µg/l	(1)	Grab
2,2-Dichloropropane	594-20-7	5	µg/l	(1)	Grab
1,1-Dichloropropene	563-58-6	5	µg/l	(1)	Grab
cis-1,3-Dichloropropene	10061-01-5	5	µg/l	(1)	Grab
trans-1,3-Dichloropropene	10061-02-6	5	µg/l	(1)	Grab
2,3-Dichlorotoluene	32768-54-0	5	µg/l	(1)	Grab
2,4-Dichlorotoluene	95-73-8	5	µg/l	(1)	Grab
2,5-Dichlorotoluene	19398-61-9	5	µg/l	(1)	Grab
2,6-Dichlorotoluene	118-69-4	5	µg/l	(1)	Grab
3,4-Dichlorotoluene	95-75-0	5	µg/l	(1)	Grab
3,5-Dichlorotoluene	25186-47-4	5	µg/l	(1)	Grab
Dieldrin	60-57-1	0.0080[2]	µg/l	(1)	Grab
Di(2-ethylhexyl)adipate	103-23-1	50	µg/l	(1)	Grab
Diethyl phthalate	84-66-2	50	µg/l	(1)	Grab
N,N-Dimethyl aniline	121-69-7	1.0	µg/l	(1)	Grab
Dimethylformamide	68-12-2	50	µg/l	(1)	Grab
Dimethyl phthalate	131-11-3	50	µg/l	(1)	Grab
Dimethyl tetrachloroterephthalate	1861-32-1	50	µg/l	(1)	Grab
2,6-Dinitrotoluene	606-20-2	0.080[2]	µg/l	(1)	Grab
Di-n-octyl phthalate	117-84-0	50	µg/l	(1)	Grab
Diphenamid	957-51-7	50	µg/l	(1)	Grab
1,2-Diphenylhydrazine	122-66-7	0.05	µg/l	(1)	Grab
Diquat dibromide	85-00-7	20	µg/l	(1)	Grab
Dodecylguanidine acetate	2439-10-3	see sum of Dodecylguanidine acetate and Dodecylguanidine hydrochloride			
Dodecylguanidine hydrochloride	13590-97-1				
um of Dodecylguanidine acetate and dodecylguanidine hydrochloride	NA	50	µg/l	(1)	Grab
Dyphylline	479-18-5	50	µg/l	(1)	Grab

SEE PAGES 9 OF 10 AND 10 OF 10 FOR FOOTNOTES

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning with the start of each discharge event

and lasting until 7 days from start of discharge.

the discharges from the treatment facility to surface water shall be limited and monitored by the operator as specified below:

Outfall Number & Effluent Parameter	CAS No.	Discharge Limitations Daily Max.	Units	Minimum Monitoring Requirements: Measurement Frequency	Minimum Monitoring Requirements: Sample Type
Endosulfan	115-73-3	0.020[2]	µg/l	(1)	Grab
Endothall	145-73-3	50	µg/l	(1)	Grab
Endrin	72-20-8	0.020[2]	µg/l	(1)	Grab
Ethylbenzene	100-41-4	5	µg/l	(1)	Grab
Ethylene chlorohydrin	107-07-3	50	µg/l	(1)	Grab
Ethylene dibromide	106-93-4	0.05	µg/l	(1)	Grab
Ethylene glycol	107-21-1	50	µg/l	(1)	Grab
Ethylene oxide	75-21-8	0.05	µg/l	(1)	Grab
Fluometuron	2164-17-2	50	µg/l	(1)	Grab
Fluoranthene	206-44-0	10	µg/l	(1)	Grab
Fluorene	86-73-7	10	µg/l	(1)	Grab
Fluoride	NA	2000	µg/l	(1)	Grab
Glyphosate	1071-83-6	50	µg/l	(1)	Grab
Guaifenesin	93-14-1	50	µg/l	(1)	Grab
Heptachlor	76-44-8	0.010[2]	µg/l	(1)	Grab
Heptachlor epoxide	1024-74-3	0.30[2]	µg/l	(1)	Grab
Hexachlorobenzene	118-74-1	0.20[2]	µg/l	(1)	Grab
Hexachlorobutadiene	87-68-3	1.0[2]	µg/l	(1)	Grab
α-Hexachlorocyclohexane(α-BHC)	319-84-6	0.010[2]	µg/l	(1)	Grab
β-Hexachlorocyclohexane(β-BHC)	319-85-7	0.020[2]	µg/l	(1)	Grab
δ-Hexachlorocyclohexane(δ-BHC)	319-86-8	0.040[2]	µg/l	(1)	Grab
Γ-Hexachlorocyclohexane(Lindane)	58-89-9	0.020[2]	µg/l	(1)	Grab
Hexachlorocyclopentadiene	77-47-4	2.0[2]	µg/l	(1)	Grab
2-Hexanone	591-78-6	50	µg/l	(1)	Grab
Hexazinone	51235-04-2	50	µg/l	(1)	Grab
Hydrazine	302-01-2	5	µg/l	(1)	Grab
Hydrogen sulfide	7783-06-4	2.0	µg/l	(1)	Grab
Hydroquinone	123-31-9	2.2	µg/l	(1)	Grab
1-Hydroxyethylidene-1,1-diphosphonic acid	2809-21-4	50	µg/l	(1)	Grab
2-(2-Hydroxy-3,5-di-tert-pentylphenyl)benzotriazole	25973-55-1	50	µg/l	(1)	Grab
Indeno(1,2,3-cd)pyrene	193-39-5	0.20[2]	µg/l	(1)	Grab
Iron, Total	NA	300	µg/l	(1)	Grab
Isodecyl diphenyl phosphate	29761-21-5	1.7	µg/l	(1)	Grab
Isophorone	78-59-1	10	µg/l	(1)	Grab
Isopropylbenzene	98-82-8	5	µg/l	(1)	Grab

SEE PAGES 9 OF 10 AND 10 OF 10 FOR FOOTNOTES.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning with the start of each discharge event

and lasting until 7 days from start of discharge.

the discharges from the treatment facility to surface water shall be limited and monitored by the operator as specified below:

Outfall Number & Effluent Parameter	CAS No.	Discharge Limitations Daily Max.	Units	Minimum Monitoring Requirements: Measurement Frequency	Minimum Monitoring Requirements: Sample Type
4-Isopropyltoluene	99-87-6	5	µg/l	(1)	Grab
Total Isothiazolones	NA	1	µg/l	(1)	Grab
Lead, Total	NA	4.0[2]	µg/l	(1)	Grab
Magnesium, Total	NA	35,000	µg/l	(1)	Grab
Malathion	121-75-5	0.6[2]	µg/l	(1)	Grab
Manganese, Total	NA	300	µg/l	(1)	Grab
Mercaptobenzothiazole	149-30-4	50	µg/l	(1)	Grab
Mercury, Total	NA	0.8[2]	µg/l	(1)	Grab
Methacrylic acid	79-41-4	50	µg/l	(1)	Grab
Methoxychlor	72-43-5	0.4[2]	µg/l	(1)	Grab
(2-Methoxyethyl)benzene	4013-34-7	50	µg/l	(1)	Grab
(1-Methoxyethyl)benzene	3558-60-9	50	µg/l	(1)	Grab
Sum of Methybenz(a)anthracenes	NA	0.002	µg/l	(1)	Grab
Methyl chloride	74-87-3	5	µg/l	(1)	Grab
Methylene bisthiocyanate	6317-18-6	1.0	µg/l	(1)	Grab
Methylene chloride	75-09-2	5	µg/l	(1)	Grab
4-(1-Methylethoxy)-1-butanol	31600-69-8	50	µg/l	(1)	Grab
2-Methylethyl-1,3-dioxolane	126-39-6	50	µg/l	(1)	Grab
Methyl ethyl ketone	78-93-3	50	µg/l	(1)	Grab
2-Methylstyrene	611-15-4	5	µg/l	(1)	Grab
3-Methylstyrene	100-80-1	5	µg/l	(1)	Grab
Metribuzin	21087-64-9	50	µg/l	(1)	Grab
Mirex	2385-85-5	0.4[2]	µg/l	(1)	Grab
Naphthalene	91-20-3	10	µg/l	(1)	Grab
Niacinamide	98-92-0	500	µg/l	(1)	Grab
Nickel, Total	NA	96	µg/l	(1)	Grab
Nitrate (as N)	NA	10,000	µg/l	(1)	Grab
Nitrilotriacetic acid[7]	NA	3	µg/l	(1)	Grab
Nitrite	NA	20	µg/l	(1)	Grab
Nitrobenzene	98-95-3	5	µg/l	(1)	Grab
N-Nitrosodiphenylamine	86-30-6	10	µg/l	(1)	Grab
Oxamyl(Vydate)	23135-22-0	10	µg/l	(1)	Grab
Parathion	56-38-2	0.6[2]	µg/l	(1)	Grab
Methyl parathion	298-00-0	0.6[2]	µg/l	(1)	Grab
Pentachlorophenol	87-86-5	2[2]	µg/l	(1)	Grab
Phenanthrene	85-01-8	10	µg/l	(1)	Grab
Phenolic compounds (total phenols)[11]	NA	8.0[2]	µg/l	(1)	Grab

SEE PAGES 9 OF 10 AND 10 OF 10 FOR FOOTNOTES.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning with the start of each discharge event

and lasting until 7 days from start of discharge.

the discharges from the treatment facility to surface water shall be limited and monitored by the operator as specified below:

Outfall Number & Effluent Parameter	CAS No.	Discharge Limitations Daily Max.	Units	Minimum Monitoring Requirements: Measurement Frequency	Minimum Monitoring Requirements: Sample Type
Phenyl ether	101-84-8	10	µg/l	(1)	Grab
Phenylpropanolamine	14838-15-4	50	µg/l	(1)	Grab
cis-1-Phenyl-1-propene	766-90-5	5	µg/l	(1)	Grab
trans-1-Phenyl-1-propene	873-66-5	5	µg/l	(1)	Grab
3-Phenyl-1-propene	637-50-3	5	µg/l	(1)	Grab
Phosphorus	NA	20	µg/l	(1)	Grab
Picloram[6]	1918-02-1	50	µg/l	(1)	Grab
PCB-1016	12674-11-2	0.30[2,8]	µg/l	(1)	Grab
PCB-1221	11104-28-2	0.30[2,8]	µg/l	(1)	Grab
PCB-1232	11141-16-5	0.30[2,8]	µg/l	(1)	Grab
PCB-1242	53469-21-9	0.30[2,8]	µg/l	(1)	Grab
PCB-1248	12672-29-6	0.30[2,8]	µg/l	(1)	Grab
PCB-1254	11097-69-1	0.30[2,8]	µg/l	(1)	Grab
PCB-1260	11096-82-5	0.30[2,8]	µg/l	(1)	Grab
Prometon	1610-18-0	50	µg/l	(1)	Grab
Propham	122-42-9	50	µg/l	(1)	Grab
n-Propylbenzene	103-65-1	5	µg/l	(1)	Grab
Pyrene	129-00-0	10	µg/l	(1)	Grab
Pyridine	110-86-1	50	µg/l	(1)	Grab
Sum of Quaternary ammonium compounds	NA	10	µg/l	(1)	Grab
Selenium, Total	NA	4[2]	µg/l	(1)	Grab
Silver, Total	NA	200	µg/l	(1)	Grab
Simazine	122-34-9	8[2]	µg/l	(1)	Grab
Styrene	100-42-5	50	µg/l	(1)	Grab
Sulfate	NA	250,000	µg/l	(1)	Grab
Sulfides, Total	NA	50	µg/l	(1)	Grab
Sulfite	NA	200	µg/l	(1)	Grab
Tebuthiuron	34014-18-1	50	µg/l	(1)	Grab
Terbufos	13071-79-9	100.0[2]	µg/l	(1)	Grab
Sum of Tetrachlorobenzenes	12408-10-5	10	µg/l	(1)	Grab
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/l	(1)	Grab
1,1,2,2-Tetrachloroethane	79-34-5	0.2	µg/l	(1)	Grab
Tetrachloroethylene	127-18-4	0.7	µg/l	(1)	Grab
Tetrahydrofuran	109-99-9	50	µg/l	(1)	Grab
Thallium, Total	NA	4	µg/l	(1)	Grab
Theophylline	58-55-9	40	µg/l	(1)	Grab
Terbufos	13071-79-9	100.0[2]	µg/l	(1)	Grab

SEE PAGES 9 OF 10 AND 10 OF 10 FOR FOOTNOTES.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning with the start of each discharge event

and lasting until 7 days from start of discharge.

the discharges from the treatment facility to surface water shall be limited and monitored by the operator as specified below:

Outfall Number & Effluent Parameter	CAS No.	Discharge Limitations Daily Max.	Units	Minimum Monitoring Requirements: Measurement Frequency	Minimum Monitoring Requirements: Sample Type
Sum of Tetrachlorobenzenes	12408-10-5	10	µg/l	(1)	Grab
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/l	(1)	Grab
1,1,2,2-Tetrachloroethane	79-34-5	0.2	µg/l	(1)	Grab
Tetrachloroethylene	127-18-4	0.7	µg/l	(1)	Grab
Toluene	108-88-3	5	µg/l	(1)	Grab
o-Toluidine	95-53-4	10[2]	µg/l	(1)	Grab
Tolytriazole	29385-43-1	50	µg/l	(1)	Grab
Toxaphene	8001-35-2	1.0[2]	µg/l	(1)	Grab
1,2,4-Tribromobenzene	615-54-3	5	µg/l	(1)	Grab
Tributyltin oxide	56-35-9	50	µg/l	(1)	Grab
Sum of Trichlorobenzenes	12002-48-1	10	µg/l	(1)	Grab
1,1,1-Trichloroethane	71-55-6	5	µg/l	(1)	Grab
1,1,2-Trichloroethane	79-00-5	0.6	µg/l	(1)	Grab
Trichloroethylene	79-01-6	3	µg/l	(1)	Grab
Trichlorofluoromethane	75-69-4	5	µg/l	(1)	Grab
2,4,5-Trichloro-phenoxypropionic acid	93-72-1	10	µg/l	(1)	Grab
1,1,2-Trichloropropane	598-77-6	5	µg/l	(1)	Grab
1,2,3-Trichloropropane	96-18-4	5	µg/l	(1)	Grab
cis-1,2,3-Trichloropropene	13116-57-9	5	µg/l	(1)	Grab
trans-1,2,3-Trichloropropene	13116-58-0	5	µg/l	(1)	Grab
alpha,2,4-Trichlorotoluene	94-99-5	5	µg/l	(1)	Grab
alpha,2,6-Trichlorotoluene	2014-83-7	5	µg/l	(1)	Grab
alpha,3,4-Trichlorotoluene	102-47-6	5	µg/l	(1)	Grab
alpha,alpha,2-Trichlorotoluene	88-66-4	5	µg/l	(1)	Grab
alpha,alpha,4-Trichlorotoluene	13940-94-8	5	µg/l	(1)	Grab
2,3,4-Trichlorotoluene	7359-72-0	0.34	µg/l	(1)	Grab
2,3,5-Trichlorotoluene	56961-86-5	0.34	µg/l	(1)	Grab
2,3,6-Trichlorotoluene	2077-46-5	0.34	µg/l	(1)	Grab
2,4,5-Trichlorotoluene	6639-30-1	0.34	µg/l	(1)	Grab
2,4,6-Trichlorotoluene	23749-65-7	0.34	µg/l	(1)	Grab
1,1,1-Trichloro-2,2,2-trifluoroethane	354-58-5	5	µg/l	(1)	Grab
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5	µg/l	(1)	Grab
1,2,3-Trimethylbenzene	526-73-8	5	µg/l	(1)	Grab
1,2,4-Trimethylbenzene	95-63-6	5	µg/l	(1)	Grab
3,5-Trimethylbenzene	108-67-8	5	µg/l	(1)	Grab
,3,6-Trimethylpyridine	1462-84-6	50	µg/l	(1)	Grab

SEE PAGES 9 OF 10 AND 10 OF 10 FOR FOOTNOTES.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning with the start of each discharge event

and lasting until 7 days from start of discharge.

the discharges from the treatment facility to surface water shall be limited and monitored by the operator as specified below:

Outfall Number & Effluent Parameter	CAS No.	Discharge Limitations Daily Max.	Units	Minimum Monitoring Requirements: Measurement Frequency	Minimum Monitoring Requirements: Sample Type
2,4,6-Trimethylpyridine	108-75-8	50	µg/l	(1)	Grab
Triphenyl phosphate	115-86-6	4	µg/l	(1)	Grab
Vanadium, Total	NA	14	µg/l	(1)	Grab
Vinyl chloride	75-01-4	0.70[2]	µg/l	(1)	Grab
1,2-Xylene	95-47-6	5	µg/l	(1)	Grab
1,3-Xylene	108-38-2	5	µg/l	(1)	Grab
1,4-Xylene	106-42-3	5	µg/l	(1)	Grab
Zinc, Total	NA	166	µg/l	(1)	Grab

Footnotes:

(1) Samples must be collected prior to each discharge event. Discharge may not commence until the sample results show compliance with the above discharge limitations.

(2) Discharge limit is set at the Practical Quantitation Limit (PQL). Actual surface water effluent standard/limitation is below this limit.

(3) Limit applies to each isomer individually.

(4) Limit applies to each salt individually.

(5) Limit applies as boron equivalents to the sum of these substances.

(6) Limit includes forms that convert to the organic acid upon acidification to a pH of 2 or less; and esters of the organic acid.

(7) Includes related forms that convert to nitrilotriacetic acid upon acidification to a pH of 2.3 or less.

SEE PAGE 10 OF 10 FOR ADDITIONAL FOOTNOTES.

Footnotes (continued):

(8) a. The treatment plant operator must monitor this discharge for PCBs using USEPA laboratory method 608. The laboratory must make all reasonable attempts to achieve a Minimum Detection Level (MDL) of 0.065 µg/l.

b. 0.065 µg/l is the discharge goal. The treatment plant operator shall report all values above the MDL (0.065 µg/l per Aroclor). If the level of any Aroclor is above 0.065 µg/l, the treatment plant operator must evaluate the treatment system and identify the cause of the detectable level of PCBs in the discharge.

c. If the Department determines that effluent monitoring results above 0.065 µg/l can be prevented by implementation of additional measures as proposed by the treatment plant operator in footnote 10.b above, and approved by the Department, the treatment plant operator shall implement such additional measures.

(8) Only site generated pump test and containerized well development water are authorized for treatment and discharge.

(9) Samples and measurements, to comply with the monitoring requirements specified above, must be taken from the holding tank prior to discharge to _____.

(10) Discharge is not authorized until such time as an engineering submission showing the method of treatment and discharge is approved by the Department. The discharge rate may not exceed the effective treatment system capacity. All monitoring data, engineering submissions and modification requests must be submitted to the following DHWR contact person: _____.

(11) Total phenolics must be analyzed using EPA Methods 420.1 or 420.2.

(12) Discharge to a surface water body within the New York City Watershed is not authorized by these effluent criteria. Seperate review of any proposed discharge to a surface water within the New York City Watershed is required.

Abandoned Chemical Sales Facility
Rochester, New York

Work Plan
Appendix H

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MALCOLM PIRNIE

New York State Department of Environmental Conservation

*** Proceed to Guidance Document | Contact the Division of Environmental Remediation ***

This document is a facsimile of an original Technical and Administrative Guidance Memorandum (TAGM) issued by the New York State Department of Environmental Conservation, Division of Environmental Remediation (formerly the Division of Hazardous Waste Remediation). This facsimile was reformatted for the Internet but maintains as much as possible of the original document. Changes were made to headers, footnote locations, paging, etc. to facilitate Internet delivery. Unless otherwise noted, none of these changes revise the content of the original TAGM.

This document was developed to provide Department staff with guidance on how to ensure compliance with statutory and regulatory requirements, including case law interpretations, and to provide consistent treatment of similar situations. This document may also be used by the public to gain technical guidance and insight regarding how the department staff may analyze an issue and factors in their consideration of particular facts and circumstances. This guidance document is not a fixed rule under the State Administrative Procedure Act section 102(2)(a)(i). Furthermore, nothing set forth herein prevents staff from varying from this guidance as the specific facts and circumstances may dictate, provided staff's actions comply with applicable statutory and regulatory requirements. This document does not create any enforceable rights for the benefit of any party.

Many procedures used by the Division of Environmental Remediation are undergoing revision as a result of our continual efforts to improve program implementation. In many cases, previously issued guidance documents are no longer completely consistent with current practice, but are provided here in their original form until final revisions are issued. Users of the posted guidance documents are urged to contact the Division of Environmental Remediation.

TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM #4031

FUGITIVE DUST SUPPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

TO: Regional Hazardous Waste Remediation Engrs., Bur. Directors & Section Chiefs

FROM: Michael J. O'Toole, Jr., Director, Division of Hazardous Waste Remediation

SUBJECT: DIVISION TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM -- FUGITIVE DUST SUPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

DATE: Oct 27, 1989

Michael J. O'Toole, Jr. (signed)

1. Introduction

Fugitive dust suppression, particulate monitoring, and subsequent action levels for such must be used and applied consistently during remedial activities at hazardous waste sites. This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2. Background

Fugitive dust is particulate matter--a generic term for a broad class of chemically and physically diverse substances that exist as discrete particles, liquid droplets or solids, over a wide range of sizes--which becomes airborne and contributes to air quality as a nuisance and threat to human health and the environment.

On July 1, 1987, the United States Environmental Protection Agency (USEPA) revised the ambient air quality standard for particulates so as to reflect direct impact on human health by setting the standard for particulate matter less than ten microns in diameter (PM_{10}); this involves fugitive dust whether contaminated or not. Based upon an examination of air quality composition, respiratory tract deposition, and health effects, PM_{10} is considered conservative for the primary standard--that requisite to protect public health with an adequate margin of safety. The primary standards are 150 ug/m^3 over a 24-hour averaging time and 50 ug/m^3 over an annual averaging time. Both of these standards are to be averaged arithmetically.

There exists real-time monitoring equipment available to measure PM_{10} and capable of integrating over a period of six seconds to ten hours. Combined with an adequate fugitive dust suppression program, such equipment will aid in preventing the off-site migration of contaminated soil. It will also protect both on-site personnel from exposure to high levels of dust and the public around the site from any exposure to any dust. While specifically intended for the protection of on-site personnel as well as the public, this program is not meant to replace long-term monitoring which may be required given the contaminants inherent to the site and its air quality.

3. Guidance

A program for suppressing fugitive dust and monitoring particulate matter at hazardous waste sites can be developed without placing an undue burden on remedial activities while still being protective of health and environment. Since the responsibility for implementing this program ultimately will fall on the party performing the work, these procedures must be incorporated into appropriate work plans. The following fugitive dust suppression and particulate monitoring program will be employed at hazardous waste sites during construction and other activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Such activities shall also include the excavation, grading, or placement of clean fill, and control measures therefore should be considered.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM_{10}) with the following minimum performance standards:

   Object to be measured: Dust, Mists, Aerosols
   Size range: <0.1 to 10 microns
   Sensitivity: 0.001 mg/m^3
   Range: 0.001 to 10 mg/m^3
   Overall Accuracy: ±10% as compared to gravimetric analysis of stearic acid or reference dust

   Operating Conditions:
   Temperature: 0 to 40°C
   Humidity: 10 to 99% Relative Humidity

   Power: Battery operated with a minimum capacity of eight hours continuous operation

   Automatic alarms are suggested.

   Particulate levels will be monitored immediately downwind at the working site and integrated over a period not to exceed 15 minutes. Consequently, instrumentation

shall require necessary averaging hardware to accomplish this task; the P-5 Digital Dust Indicator as manufactured by MDA Scientific, Inc. or similar is appropriate.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the entity operating the equipment to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m^3 over the integrated period not to exceed 15 minutes. While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m^3, the upwind background level must be measured immediately using the same portable monitor. If the working site particulate measurement is greater than 100 ug/m^3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see Paragraph 7). Should the action level of 150 ug/m^3 be exceeded, the Division of Air Resources must be notified in writing within five working days; the notification shall include a description of the control measures implemented to prevent further exceedences.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM_{10} at or above the action level. Since this situation has the potential to migrate contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

    1. Applying water on haul roads.
    2. Wetting equipment and excavation faces.
    3. Spraying water on buckets during excavation and dumping.
    4. Hauling materials in properly tarped or watertight containers.
    5. Restricting vehicle speeds to 10 mph.
    6. Covering excavated areas and material after excavation activity ceases.
    7. Reducing the excavation size and/or number of excavations.

    Experience has shown that utilizing the above-mentioned dust suppression techniques, within reason as not to create excess water which would result in

unacceptable wet conditions, the chance of exceeding the 150 ug/m^3 action level at hazardous waste site remediations is remote. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. If the dust suppression techniques being utilized at the site do not lower particulates to an acceptable level (that is, below 150 ug/m^3 and no visible dust), work must be suspended until appropriate corrective measures are approved to remedy the situation. Also, the evaluation of weather conditions will be necessary for proper fugitive dust control--when extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended.

There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require appropriate toxics monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Abandoned Chemical Sales Facility
Rochester, New York

Work Plan
Appendix I

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MALCOLM PIRNIE

Contractor's Cost Quotation Form

New York State Department of Environmental Conservation

Project: ACSF Contaminated Soil Removal, NYS Site Number: 828105

UNIT PRICE ITEMS

Payment Item Number	*Description*	*Unit*	*Estimated Quantity*	*Unit Price*		*Total Amount ($)*
				Words	*Figures*	
UP-1	Provide Temporary Services	Day	31			
UP-2	Implement the Health and Safety Plan	Day	31			
UP-3	Sheeting	Vertical Square Foot	250			
UP-4	Initial Excavation	Cubic Yard	550			
UP-5	Supplemental Excavation	Cubic Yard	85			
UP-6	Load, Transport and Dispose Non-Hazardous Solid Waste	Ton	720			
UP-7	Load, Transport and Dispose Hazardous Solid Waste	Ton	240			
UP-8	Provide General Fill	Cubic Yard	485			

New York State Department of Environmental Conservation
Project: ACSF Contaminated Soil Removal, NYS Site Number: 828105
UNIT PRICE ITEMS

Payment Item Number	*Description*	*Unit*	*Estimated Quantity*	*Unit Price*		*Total Amount ($)*
				Words	*Figures*	
UP-9	Provide Stabilization Fabric	Square Foot	7000			
UP-10	Provide Gravel	Cubic Yard	100			
UP-11	Provide 9-inch Concrete Floor	Square Foot	875			
UP-12	Remove, Transport and Dispose or Treat and Discharge Liquids	Gallon	400			
UP-13	Provide Topsoil	Cubic Yard	25			
UP-14	Provide Select Fill NYSDOT Type 2	Cubic Yard	30			

New York State Department of Environmental Conservation
Project: ACSF Contaminated Soil Removal, NYS Site Number 828105
LUMP SUM ITEMS

Payment Item Number	***Description***	***Lump Sum Price***		***Total Amount ($)***
		Words	***Figures***	
LS-1	Mobilization			
LS-2	Provide Injection Points			
LS-3	Demolition of Concrete Floor			
LS-4	Demobilization			

GRAND TOTAL OF QUOTE _____ $_____
Words Figures

Legal Name of Person, Partnership or Corporation

By _____
Print Name

_____
Signature

Date _____