REPORT ON
***REVISED* INTERIM REMEDIAL MEASURE WORK PLAN**
SITE EXCAVATION AND GRADING
THE FORMER AMERICAN LINEN SUPPLY CO. FACILITY
BUFFALO, ERIE COUNTY, NEW YORK

by

Haley & Aldrich of New York
Rochester, New York

for

New York State Department of Environmental Conservation
Buffalo, New York

File No. 37319-050
18 September 2013

HALEY& ALDRICH

Haley & Aldrich of New York
200 Town Centre Drive
Suite 2
Rochester, NY 14623

Tel: 585.359.9000
Fax: 585.359.4650
HaleyAldrich.com

18 September 2013
File No. 37319-050

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, New York 14203-2915

Attention: Mr. Jaspal S. Walia, P.E.

Subject: *Revised* Interim Remedial Measure Work Plan
Site Excavation *and* Grading
The Former American Linen Supply Co. Facility
Buffalo, Erie County, New York
BCP Site #C915241

Dear Mr. Walia:

On behalf of AmeriPride Services Inc. ("AmeriPride"), Haley & Aldrich of New York ("Haley & Aldrich") is submitting herewith a *Revised* Interim Remedial Measure (IRM) Work Plan consisting of limited site excavations and site grading, at the above referenced site. This document is submitted in accordance with the Brownfield Cleanup Agreement (BCA) for Site #C915241 between the New York State Department of Environmental Conservation (NYSDEC) and AmeriPride.

This work plan has been developed in accordance with the NYSDEC (6 NYCRR) Part 375 Brownfield Cleanup Regulations dated December 2006, the "Technical Guidance for Site Investigation and Remediation" (DER-10 dated May 2010) and other relevant NYSDEC technical and administrative guidance. *The work plan has been revised per comments received from the NYSDEC in their letter dated 11 September 2013. Additions to the work plan based on that letter are shown in italics.*

If you have any questions or comments regarding this document, please do not hesitate to contact us.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK

Claire L. Mondello, CHMM
Project Manager

Mark N. Ramsdell, P.E., CHMM
Senior Engineer

Enclosures

G:\37319 (AmeriPride, 8 Lord Street, Buffalo)\050 - Soil Removal IRM Preparation\IRM Work Plan\2013_0918_Revised Soil Removal IRM Work Plan_F.docx

TABLE OF CONTENTS

LIST OF FIGURES

1. INTRODUCTION

1.1 Background

Remedial investigation (RI) and interim remedial measure (IRM) activities were conducted at the site between June 2011 and October 2012. These activities included building demolition; soil, groundwater, and soil vapor sampling; and limited impacted soil removal. These activities were summarized in a Draft Remedial Investigation and Interim Remedial Measure Completion Report (RI/IRM Report) dated 8 May 2013 and also in monthly progress reports. The Draft RI/IRM Report recommended additional interim remedial measures to remove to contaminants of concern (COCs), as described below, at concentrations exceeding the protection of groundwater soil cleanup objective (SCO), and eliminate exposure pathways to the remaining COCs in soil and groundwater at the site.

The NYSDEC provided comments to the Draft RI/IRM Report in a letter dated 17 June 2013. One of the NYSDEC's comments indicated that since IRMs have been recommended, it is difficult to determine if additional data collection will be necessary to complete the RI, or if the IRMs will satisfy the remedial goals for the site. AmeriPride responded to the NYSDEC's comments in a letter dated 16 August 2013 that indicated that the IRMs would be completed during the 4th Quarter of 2013. The IRMs are described herein. The IRMs have been designed to collect additional data, when warranted, to complete the RI, considering a Track 4 Cleanup goal with the provision of demarcation and one foot of clean cover material where it is required. Current site conditions are summarized below.

1.2 Current Site Conditions

The results of the remedial investigations conducted to date were used to develop a Conceptual Site Model (CSM) as follows. Overall, contaminants of concern (COCs) were detected at concentrations onsite in fill and native soil above NYSDEC protection of groundwater and/or commercial use soil cleanup objectives (SCOs), and in groundwater at concentrations exceeding groundwater standards and guidance criteria. Source areas of COCs were not encountered or otherwise identified; however, additional investigations do not appear to be warranted due to the amount of usable data obtained, which allowed for completion of a conceptual site model. Additional documentation data will be collected during the IRMs and the CSM will be updated as necessary.

The site soils generally consist of a layer of historic fill to ranging from 0.5 to 12 feet below ground surface below which are native soils (glaciolacustrine deposits and glacial till). Bedrock or drilling refusal was encountered between 14 and 23 feet below ground surface. The historic fill consists of well-graded gravel, sand, ash, slag, trace wood and brick, and some clay. The historic fill is found throughout the site, including below the asphalt in the former parking area, and in the area below what was the former building. A distinct ash layer (consisting of approximately 80% ash and slag) is present in the area of the former first floor building slab below a layer of unconsolidated clay fill material. Historic fill is not present in the footprint of the former basement.

COCs were identified based on multiple detections of any one of a broad suite of organic and inorganic substances that are related to the former site operations and are present at levels higher than the relevant standards, criteria, and guidelines (SCGs). The SCGs for the site include the Part 375 regulations for soil (specifically SCOs restricted for the protection of groundwater, commercial use, and industrial use), and the NYS Ambient Water Quality Standards and Guidance Values (class GA) specified in NYSDEC TOGS 1.1.1 for groundwater. The COCs identified for the site include:

- Target chlorinated volatile organic compounds (CVOCs), specifically tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), and vinyl chloride in soil, groundwater, and soil vapor.

- Polycyclic aromatic hydrocarbons (PAHs) and heavy metals (arsenic, copper, lead, and mercury) in historic fill.

Target CVOCs were detected in shallow fill above the protection of groundwater soil cleanup objectives (SCOs) near the former 1,500 gallon waste oil underground storage tank (UST) that is currently closed-in-place (PBS #9-013773) and on the southern side of the first floor slab near the former dry cleaning operations at test pit location TP-18. *In addition, Target CVOCs were detected above the protection of groundwater in relatively shallow native material (8-10 feet) at TP-16* (Figure 2).

Target CVOCs were also identified in groundwater at concentrations exceeding comparison criteria in two locations on the southern side of the site in and proximate to the former dry cleaning area. Groundwater was encountered from approximately 3.7 and 10.5 feet below ground surface and appears to be flowing slowly in a southerly direction. Target CVOC concentrations detected offsite in the adjacent rights-of-way were detected at or below the groundwater criteria and are indicative of natural attenuation, and the downgradient edge of groundwater impacts.

PAHs and metals were identified within historic fill located throughout the top 5 to 12 feet of the overburden in the former parking lot and first floor slab areas. It is anticipated that PAHs and metals are constituents of the fill materials, and not present as a result of former industrial operations. Historic fill is pervasive in the Buffalo area.

1.3 Purpose

Shallow fill and soils impacted with contaminants of concern (COCs) remain at the site in excess of regulatory criteria that could present an exposure risk to human health and the environment. As such, the RI/IRM report recommended that IRMs be conducted to address potential exposure risk. The IRMs recommended include limited additional soil and historic fill removal and waste oil UST removal. Conduct of these IRMs is intended to address the exposure risks *related to Target CVOC impacts*, *and further characterize the nature and extent of historic fill in the former slab-on-grade area*.

2. IRM WORK PLAN

2.1 General

The IRM work will be conducted with oversight by Haley & Aldrich personnel. All excavations will be screened visually and with a photoionization detector (PID) to facilitate soil/fill segregation for disposal, or analytical testing for potential onsite reuse. The management of excavated soil is further detailed in the IRM Soil & Groundwater Management Plan in Appendix A.

Community air monitoring will be conducted in accordance with the New York State Department of Health (NYSDOH) Community Air Monitoring Plan (CAMP) during excavation activities. A copy of the generic CAMP is included in Appendix B. Haley & Aldrich personnel will work under a Health & Safety Plan (HASP) included in Appendix C. The HASP will be provided to Contractors to be used to provide information and a template that will facilitate development of the Contractors' site specific HASPs.

2.2 Site Preparation

Prior to excavation work, the following activities will be conducted:

- The Contractor will obtain necessary permits from the City of Buffalo and others, as necessary.
- There are several piles of potentially impacted material (soil and concrete) remaining onsite from the building demolition activities. In addition drums of soil cuttings and water from RI activities are staged onsite. Those piles and drums will be characterized for waste disposal purposes and removed from the site. Refer to Appendix A for excavation and materials removal protocol.
- A crushed stone pad will be placed across the former basement area on the northwestern side of the former building to facilitate truck loading (Figure 2).

2.3 Removal of Sewer Vault

The sewer vault located on the southwestern side of the site (Figure 2) will be removed as follows:

- The sewer will be capped at Seneca Street.
- Sediment within the vault will be removed, and sampled in accordance with Appendix A for disposal purposes, and disposed properly offsite.
- The floor slab and two sidewalls of the vault will be removed completely. The sidewall parallel to the residential property to the west, and the sidewall parallel Seneca Street to the south will substantially remain in place. Those two walls will be cut to 18 inches below grade consistent with the former building basement walls and per the City of Buffalo code requirements. This procedure of cutting and leaving the remainder of the two walls in place is precautionary considering the proximity of the walls to residential property and Seneca Street, and the potential for soil sloughing and settlement upon complete removal.

- The footprint of the vault will be backfilled to grade per the IRM Soil & Groundwater Management Plan in Appendix A.

2.4 Removal of Former Waste Oil Underground Storage Tank

The closed-in-place 1,500 gallon waste oil UST and surrounding VOC-impacted soil will be removed as described below. Following removal, confirmation samples will be collected of the material remaining in place.

2.4.1 UST & Soil Removal

Soil and fill above and around the UST will be excavated, screened visually and with a PID, and stockpiled in accordance with the IRM Soil & Groundwater Management Plan in Appendix A. The UST will be removed by the Contractor, and the tank and its contents will be properly disposed.

Soil will be excavated as warranted based on the observed evidence of VOC-impact including results of visual, and PID screening, and on the discretion of Haley & Aldrich personnel until the practical limits are reached (e.g., maintaining a safe excavation without the use of shoring, preventing excessive management of groundwater infiltration or the edge of the property line has been reached).

The excavated material will be characterized and managed in accordance with the IRM Soil & Groundwater Management Plan in Appendix A.

2.4.2 UST Excavation Confirmation Sampling & Backfilling

Following excavation activities, five (5) discrete confirmation samples from the four sidewalls and base of the excavation will be collected and analyzed at an ELAP Certified laboratory for target analyte list (TAL) VOCs via EPA Method 8260. Subsequent activities will be dictated by the analytical results as follows:

- If the sample results indicate that VOCs were detected at concentrations below the protection of groundwater SCOs, the excavation is complete.

- If the sample results indicate that VOCs were detected at concentrations above the protection of groundwater SCOs, and the practical excavation limits have not been reached, additional material will be excavated and confirmation samples will be re-collected until one or more of the following conditions are met:
  a. The results are below the protection of groundwater SCOs.
  b. The excavation has reached a depth of 15 feet.
  c. The practical limits of the excavation have been reached (i.e., maintaining a safe excavation without the use of shoring or excessive management of groundwater infiltration or the edge of the property line has been reached).

Once the excavation is deemed complete, the excavation will be backfilled in accordance with the IRM Soil and Groundwater Management Plan in Appendix A.

2.5 Removal of Shallow Fill Soils Impacted with Chlorinated Volatile Organic Compounds

Two areas of shallow soil (TP-16 and TP-18) in the former dry cleaning area were identified to be impacted with PCE and cis-1,2-DCE above protection of groundwater SCOs. The impacted area appears to be less than 10 feet in depth. This area will be excavated as described below.

2.5.1 Soil Excavation

The Contractor will excavate soil from TP-16 and TP-18 (Figure 2). Excavated soil/fill will be stockpiled in approximately 500 ton piles for characterization and disposal per the IRM Soil and Groundwater Management Plan in Appendix A.

Vertically: The excavation will continue through the historic fill, until there is an absence of visual, and PID evidence of impact, the excavation reaches a depth of 15 feet below grade, or the practical limits of the excavation have been reached (i.e., maintaining a safe excavation without the use of shoring or without excessive management of groundwater infiltration or the edge of the property line has been reached).

Laterally: The excavation will continue until there is absence of visual, and or PID evidence and on the discretion of Haley & Aldrich or until the practical limits of the excavation as described above are reached.

2.5.2 Confirmation Sampling & Backfilling

Following excavation, discrete samples will be collected every 30 linear feet along the sidewalls of the excavations and every 1,000 square feet in the base of the excavations. At least one sample will be collected from each sidewall and the base. The samples will be analyzed at an ELAP Certified laboratory for target analyte list (TAL) VOCs via EPA Method 8260. Subsequent activities will be dictated by the analytical results as follows:

- If the sample results indicate that VOCs were detected at concentrations below the protection of groundwater SCOs, the excavation is complete.

- If the sample results indicate that VOCs were detected at concentrations above the protection of groundwater SCOs, and the practical excavation limits have not been reached, additional material will be excavated and confirmation samples will be re-collected until one or more of the following conditions are met:
  a. The results are below the protection of groundwater SCOs.
  b. The excavation has reached a depth of 15 feet.
  c. The practical limits of the excavation have been reached (i.e., maintaining a safe excavation without the use of shoring or excessive management of groundwater infiltration or the edge of the property line has been reached).

Once the excavation is deemed complete, the excavation will be backfilled to one foot below grade to accommodate the potential for the future placement of a demarcation layer and clean cover (Section 2.7 below) pending NYSDEC approval

2.6 Removal of Fill in Former Dry Cleaning Area to Grade

2.6.1 *Soil Removal*

Historic fill present beneath the former slab-on-grade area (Figure 2) will be excavated until the area is graded to a depth of one-foot or more below sidewalk elevation. This will accommodate the potential for the future placement of a demarcation layer and one foot of clean cover pending the analytical results of confirmation samples described below and the NYSDEC's approval. The excavated materials will be stockpiled and managed in accordance with the IRM Soil & Groundwater Management Plan in Appendix A.

2.6.2 *Confirmation Sampling*

Following fill removal, confirmation samples will be collected in a grid in the former slab-on-grade area as shown in the tentative sampling plan on Figure 3. The grid is based on the creation of 1,000 square foot cells. The number and location of the samples is approximate and subject to change based on field conditions and NYSDEC input. Surface samples of fill (approximately 0-1 feet below grade) will be collected from each grid location as follows:

- *One discrete soil sample will be collected from within each grid square from the location where soil PID screening result was the highest. The sample will be submitted to a laboratory and analyzed for Target CVOC compounds (PCE, TCE, cis-1,2-DCE, and vinyl chloride) via EPA Method 8260 to confirm that those compounds do not remain in that grid location above the protection of groundwater SCOs.*

  If the sample results indicate that VOCs were detected at concentrations above the protection of groundwater SCOs, additional material will be excavated and confirmation samples will be re-collected until one or more of the following conditions are met:
  a. *The results are below the protection of groundwater SCOs.*
  b. *The excavation has reached a depth of 15 feet.*
  c. *The practical limits of the excavation have been reached (i.e., maintaining a safe excavation without the use of shoring or excessive management of groundwater infiltration or the edge of the property line has been reached).*

- *One composite sample will be collected from selected grid squares (shown on Figure 3) and analyzed for fill-related constituents, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), Total Petroleum Hydrocarbons (TPH), and PPL Metals.*

3. POST-IRM GROUNDWATER SAMPLING

Following the IRM activities described in Section 2, groundwater sampling will be conducted to establish a baseline condition for future site management activities.

A round of site-wide groundwater sampling will occur from viable onsite and offsite wells to assess groundwater conditions. The well sampling will include sampling BR-13 and BR-14, which were installed by others on the western corner of the property and within the Seneca Street sidewalk just off the southern side of the property.

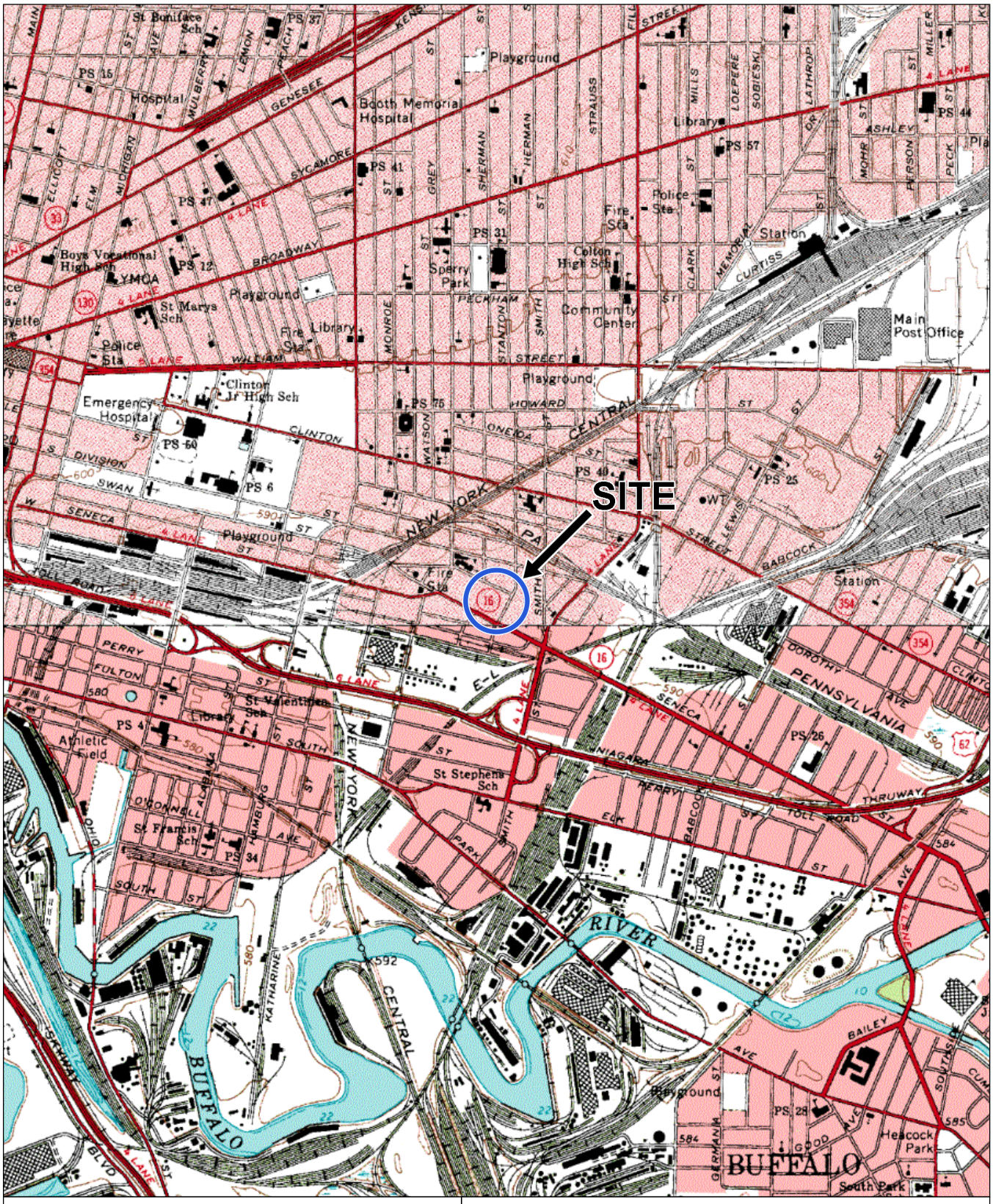
Prior to sampling, a round of static water levels will be collected to evaluate groundwater flow direction and each well will be evaluated for integrity. If deemed necessary, the wells will be developed at least one week prior to sampling to remove fines. The wells will be sampled using low-flow sampling methods using a bladder pump and flow-through cell in accordance with the procedures in the 31 May 2011 Remedial Investigation Work Plan. The samples will be analyzed for TCL VOCs via EPA Method 8260 and polycyclic aromatic hydrocarbons (PAHs) via EPA Method 8270.

4. PROFESSIONAL ENGINEER'S CERTIFICATION

I, Mark N. Ramsdell, P.E., certify that I am currently a New York State registered professional engineer ad defined in 6 NYCRR Part 375 and that this Interim Remedial Measure Work Plan was prepared in accordance with all applicable statues and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Mark N. Ramsdell, P.E.
Senior Engineer

9/18/13
Date



SITE COORDINATES: 42°52'33"N,78°50'48"W

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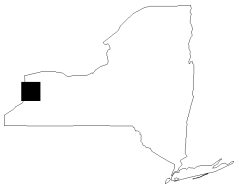


U.S.G.S. QUADRANGLE: BUFFALO NE, NY

HALEY & ALDRICH

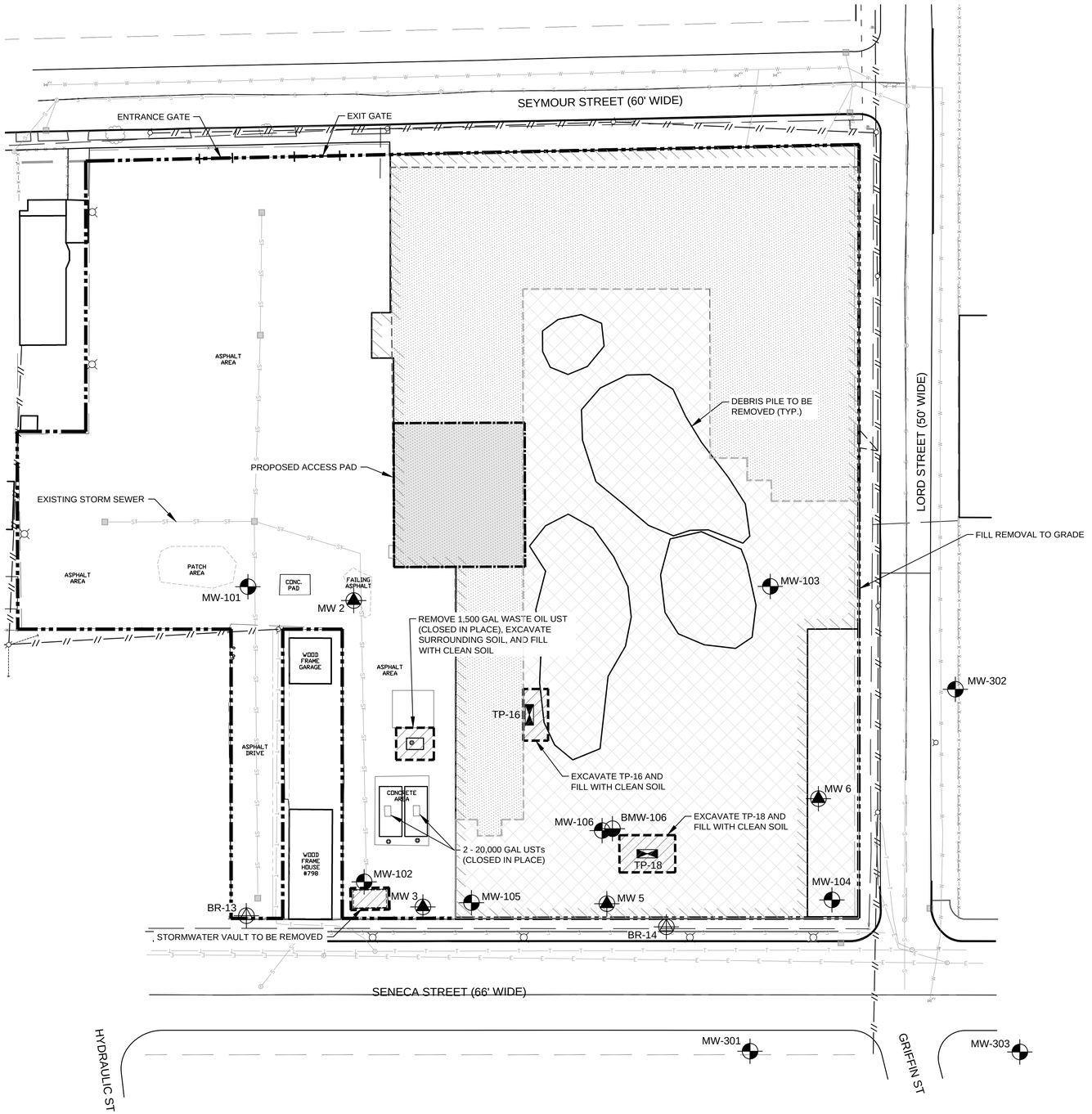
FORMER AMERICAN LINEN SUPPLY CO FACILITY
822 SENECA STREET
BUFFALO, NEW YORK

PROJECT LOCUS

SCALE: 1:24,000
SEPTEMBER 2013

FIGURE 1

37319-050 1.PDF



LEGEND:

- PROPERTY AND FENCE LINE
- FORMER BUILDING FOOTPRINT
- FORMER BASEMENT, PREVIOUSLY BACKFILLED TO GRADE
- AREA FOR EXCAVATION TO 1 FT BELOW FINAL GRADE AND FUTURE COVER PLACEMENT (FORMER SLAB-ON-GRADE AND LOADING DOCK)
- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE
- UNDERGROUND TELEPHONE LINE
- OVERHEAD TELEPHONE LINE
- ELECTRICAL LINE
- SURVEYED LOCATION OF BEDROCK MONITORING WELL INSTALLED IN 2012
- MW-103 SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2012
- MW-303 SURVEYED LOCATION OF OFF-SITE MONITORING WELL INSTALLED IN 2013
- SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY ENSR IN DECEMBER 2005
- SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY OTHERS FOR ADJACENT PROPERTY.

NOTES:

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, FORMER BUILDING FEATURES, AND FORMER BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP BASED ON ELECTRONIC CAD FILES TITLED "AMERICAN LINEN TOPO BNDY MAP.DWG" (1 DECEMBER 2010), "AMERICAN LINEN ENV SVY LORD ST BUFFALO" (7 DECEMBER 2012), AND "AMERICAN LINEN TOPO BNDY MAP" (1 DECEMBER 2010) FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK AND FROM ELECTRONIC IMAGES TITLED "BASEMENT PLAN SOIL BORING LOCATIONS" DATED 18 JANUARY 2007 AND IMAGE TITLED "SITE MAP SOIL BORING AND MONITORING WELL LOCATIONS" DATED 18 JANUARY 2007 FROM ENSR INTERNATIONAL.
3. MATERIAL TO BE HANDLED PER THE IRM SOIL AND GROUNDWATER MANAGEMENT PLAN.

N E S W

0 30 60 90 120
SCALE IN FEET

HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
822 SENECA STREET
BUFFALO, NEW YORK

PROPOSED INTERIM REMEDIAL MEASURE

SCALE: AS SHOWN
SEPTEMBER 2013

FIGURE 2

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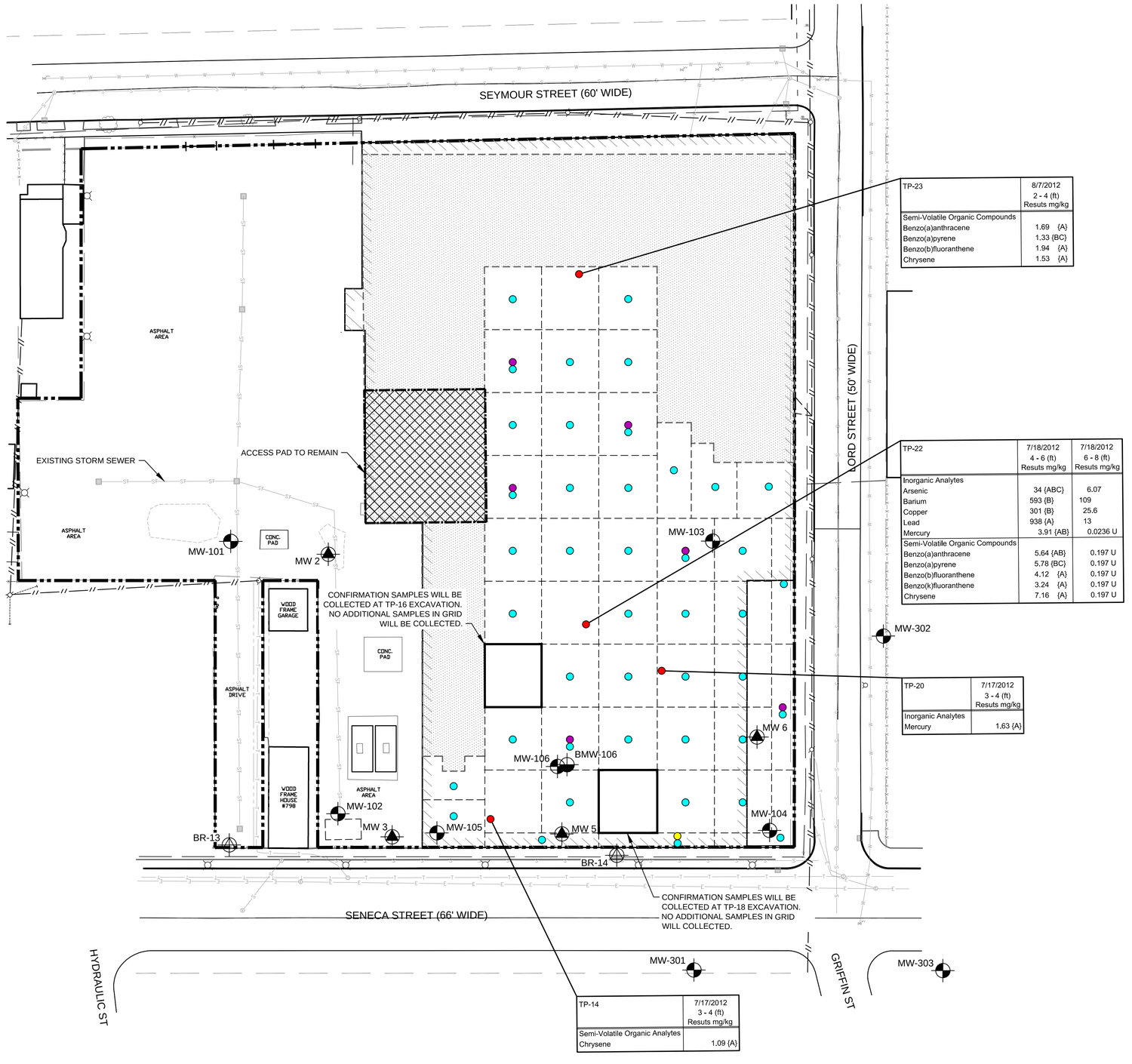


TP-23	8/7/2012 2 - 4 (ft) Resuts mg/kg
Semi-Volatile Organic Compounds	
Benzo(a)anthracene	1.69 {A}
Benzo(a)pyrene	1.33 {BC}
Benzo(b)fluoranthene	1.94 {A}
Chrysene	1.53 {A}

TP-22	7/18/2012 4 - 6 (ft) Resuts mg/kg	7/18/2012 6 - 8 (ft) Resuts mg/kg
Inorganic Analytes		
Arsenic	34 {ABC}	6.07
Barium	593 {B}	109
Copper	301 {B}	25.6
Lead	938 {A}	13
Mercury	3.91 {AB}	0.0236 U
Semi-Volatile Organic Compounds		
Benzo(a)anthracene	5.64 {AB}	0.197 U
Benzo(a)pyrene	5.78 {BC}	0.197 U
Benzo(b)fluoranthene	4.12 {A}	0.197 U
Benzo(k)fluoranthene	3.24 {A}	0.197 U
Chrysene	7.16 {A}	0.197 U

TP-20	7/17/2012 3 - 4 (ft) Resuts mg/kg
Inorganic Analytes	
Mercury	1.63 {A}

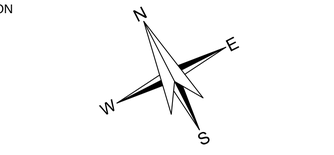
TP-14	7/17/2012 3 - 4 (ft) Resuts mg/kg
Semi-Volatile Organic Analytes	
Chrysene	1.09 {A}

LEGEND:

- PROPERTY AND FENCE LINE
- FORMER BUILDING FOOTPRINT
- FORMER BASEMENT (PREVIOUSLY BACKFILLED TO GRADE)
- CONFIRMATION SAMPLE AREA(S) DELINEATED BY DASHED GRIDLINES
- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE
- UNDERGROUND TELEPHONE LINE
- OVERHEAD TELEPHONE LINE
- ELECTRICAL LINE
- SURVEYED LOCATION OF BEDROCK MONITORING WELL INSTALLED IN 2012
- MW-103 SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2012
- MW-303 SURVEYED LOCATION OF OFF-SITE MONITORING WELL INSTALLED IN 2013
- SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY ENSR IN DECEMBER 2005
- SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY OTHERS FOR ADJACENT PROPERTY.
- RED DOT INDICATES A SAMPLE WAS COLLECTED DURING THE RI AND ONE OR MORE FILL CONSTITUENTS (SVOCs, METALS, AND/OR PCBs) WERE DETECTED ABOVE CRITERIA AS SHOWN. SAMPLE WILL SERVE AS CONFIRMATION SAMPLE IN GRIDS WHERE RED DOT IS PRESENT.
- YELLOW DOT INDICATES A SAMPLE WAS COLLECTED DURING THE RI AND FILL CONSTITUENTS (SVOCs, METALS, AND/OR PCBs) WERE NOT DETECTED ABOVE CRITERIA. SAMPLE WILL SERVE AS CONFIRMATION SAMPLE IN GRIDS WHERE YELLOW DOT IS PRESENT.
- BLUE DOT INDICATES DISCRETE VOC SCREENING AND CONFIRMATION SAMPLE TO BE COLLECTED FOLLOWING IRM EXCAVATION
- PURPLE DOT INDICATES COMPOSITE SAMPLE (PAHs, METALS, AND PCBs) TO BE COLLECTED FOR FILL CHARATERIZATION PURPOSES.

NOTES:

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, FORMER BUILDING FEATURES, AND FORMER BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP BASED ON ELECTRONIC CAD FILES TITLED "AMERICAN LINEN TOPO BNDY MAP.DWG" (1 DECEMBER 2010), "AMERICAN LINEN ENV SVY LORD ST BUFFALO" (7 DECEMBER 2012), AND "AMERICAN LINEN TOPO BNDY MAP" (1 DECEMBER 2010) FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK AND FROM ELECTRONIC IMAGES TITLED "BASEMENT PLAN SOIL BORING LOCATIONS" DATED 18 JANUARY 2007 AND IMAGE TITLED "SITE MAP SOIL BORING AND MONITORING WELL LOCATIONS" DATED 18 JANUARY 2007 FROM ENSR INTERNATIONAL.
3. FINAL GRADING CROWN TO BE INSTALLED AT WESTERN EDGE OF FORMER BUILDING FOOTPRINT TO PROVIDE NATURAL DRAINAGE TO THE NORTH, EAST, AND SOUTH.
4. SAMPLE LOCATIONS ARE APPROXIMATE AND SUBJECT TO CHANGE BASED ON FIELD OBSERVATIONS AND NYSDEC DISCRETION.
5. RESULTS SHOWN WITH AN IDENTIFIER {A, B, C} EXCEED THE FOLLOWING NYSDEC SOIL CLEANUP OBJECTIVES (SCOs):
   - {A} - GROUNDWATER PROTECTION
   - {B} - COMMERCIAL
   - {C} - INDUSTRIAL



HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
822 SENECA STREET
BUFFALO, NEW YORK

PROPOSED CONFIRMATION SAMPLING PLAN

SCALE: AS SHOWN
SEPTEMBER 2013

FIGURE 3

\\CLE\COMMON\PROJECTS\37319-AMERIPRIDE\050\CAD\37319-050-PROP-FINAL_GRADE.DWG

APPENDIX A

IRM Soil & Groundwater Management Plan

APPENDIX A

IRM SOIL & GROUNDWATER MANAGEMENT PLAN

I. Introduction

The following IRM Soil & Groundwater Management Plan provides guidance for managing excavations, soil, and groundwater at the Former American Linen Supply Co. Facility BCP site during the IRM scheduled to be completed during 4th Quarter 2013. The guidance herein is a companion to the Interim Remedial Measure Work Plan and complies with the criteria for a Track 4 – commercial use cleanup track. This guidance is based on the May 2010 DER-10 Technical Guidance for Site Investigation and Remediation.

The IRM work will be conducted with oversight by Haley & Aldrich personnel. All excavations will be screened visually and with a photoionization detector (PID) to facilitate soil/fill segregation for disposal, or analytical testing for potential onsite reuse. The management of excavated soil is further detailed in the IRM Soil & Groundwater Management Plan in Appendix A.

Community air monitoring will be conducted in accordance with the New York State Department of Health (NYSDOH) Community Air Monitoring Plan (CAMP) during excavation activities and until the cover system is in place. A copy of the generic CAMP is included in Appendix B. Haley & Aldrich personnel will work under a Health & Safety Plan (HASP) included in Appendix C. The HASP will be provided to Contractors to be used to provide information and a template that will facilitate development of the Contractors' site specific HASPs.

II. Stockpiling Methods

Soil will be placed in stockpiles based on visual, and PID characterization in either 300-400 cubic yard or 1,000 cubic yard piles depending on intended future disposition as described below:

a. *Non-Impacted Concrete* - Concrete free of coatings or otherwise not visually impacted by historic fill, sludge, or other contaminants may be reused onsite above or below the demarcation layer without further testing.

b. *Non-Impacted Clay Fill and Native Material* – Clay fill (present over the historic ash fill in former slab-on-grade area) and native material not visually impacted by historic ash fill or oily material, sludge, etc., may be stockpiled in 1,000 cubic yard piles for sampling and reuse.

c. *Impacted Materials and Historic Ash Fill* – Historic ash fill and materials otherwise impacted by historic ash fill, coatings, oily material, sludge, or volatile organic compounds (VOCs) will be stockpiled in 500 ton (300-400 cubic yard) piles and sampled for offsite disposal.

If sampling is required, the stockpiles will be sampled in accordance with Section III below.

III. Sampling Methods

Sample frequency and procedure will be done in accordance with the May 2012 Remedial Investigation Work Plan for materials proposed to be reused onsite, and the sampling plan approved by the NYSDEC on 27 September 2012 for materials proposed for offsite disposal. Sample results will be compared to the NYSDEC commercial use soil cleanup objectives (SCOs), protection of groundwater SCOs, EPA Maximum Concentrations of Contaminants for the Toxicity Characteristic (TCLP metals, only), and/or the TAGM 3028 contained-in thresholds (VOCs, only). The regulatory criteria are shown in the attached Table A-1. Sampling for reuse and disposal are described in the sections below.

a. *Sampling for Reuse Onsite (non-impacted materials)* –
    i. Non-impacted materials will be stockpiled in 1,000 cubic yard piles. For each 1,000 cubic yards of material proposed for reuse (other than non-impacted concrete, which does not require testing), the following will be collected:
        1. Two (2) discrete samples for TCL VOCs
        2. One (1) composite sample for TCL SVOCs, RCRA 8 Metals, PCBs, and Pesticides
    ii. If the samples meet the criteria for the lower of the commercial SCOs or the protection of groundwater SCOs, the soil maybe reused onsite as clean fill above a demarcation layer.
    iii. If the samples do not meet the commercial SCOs, but do meet the protection of groundwater SCOs, the soil may be reused onsite below the demarcation layer.
    iv. If the samples do not meet the protection of groundwater SCOs, it must be disposed offsite. Additional sampling may or may not be required to satisfy landfill requirements or to obtain TAGM 3028 contained-in approval (See Section III.b).

b. *Sampling for Disposal (impacted material and historic ash fill)* –
    i. Excavated impacted materials will be stockpiled in 500 ton (300-400 cubic yard) piles. For each stockpile, the following samples will be collected:
        1. Five (5) discrete samples for VOCs
        2. One (1) composite sample for TCLP Metals
    ii. The TCLP sample and one (1) VOC sample will be analyzed at the laboratory. The remaining (4) VOC samples will be held for further analysis for contained-in approval as necessary pending the results of the initial VOC analysis (See Section IV.b).
    iii. Note that additional sample parameters may be required by the receiving facility.

IV. Disposal Methods

The NYSDOH CAMP will be enacted during materials load out for disposal. Stockpiles will be disposed of offsite based on the analytical results from Section III above as follows:

a. If TCLP results indicate that the materials are characteristically hazardous and/or VOCs are detected above TAGM 3028 thresholds, dispose offsite as hazardous waste in accordance with disposal facility requirements.

b. If TCLP results indicate that the materials are characteristically non-hazardous, and VOC sampling indicated dry cleaning solvents detected but below TAGM 3028 thresholds, analyze the remaining four (4) VOC samples. If the VOC results indicate that VOCs are

below the TAGM 3028 thresholds, submit the results to the NYSDEC for TAGM 3028 contained-in approval and dispose offsite at a non-hazardous waste landfill once approved per disposal facility requirements. If the VOC results do not meet the TAGM 3028 thresholds, dispose at a hazardous waste landfill.

c. If TCLP results indicate that the materials are characteristically non-hazardous, and dry cleaning solvent related VOCs are not detected (i.e. the material is not a listed hazardous waste), dispose of offsite at a non-hazardous waste landfill in accordance with disposal facility requirements.

Disposal weight tickets, bills of lading/manifests will be collected by Haley & Aldrich field personnel for inclusion in the IRM completion report.

V. Excavation Dewatering

Water encountered in the excavation will be staged in tanks, tested, treated if necessary, and discharged to the City of Buffalo Sewer via a Temporary Discharge Permit procured by the Contractor.

VI. Backfill

Backfill may consist of the following materials described in the sections below based on their intended use.

a. *Clean Cover* – The following materials meeting the criteria for Clean Cover and may be used onsite above the demarcation layer.
   i. Onsite, non-impacted material (Section II.b above) tested in accordance with Section III.a above that meet lesser of the protection of groundwater or commercial use SCOs.
   ii. Gravel, rock, or stone, consisting of virgin material from a permitted mine or quarry.
   iii. Imported soil or cover, other than described in VI.a.ii above, that meets the testing requirements from the May 2010 DER-10 section 5.4(e)3.
   iv. Non-impacted concrete (Section II.a above) or recycled concrete or brick from a NYSDEC registered construction and demolition debris processing facility if the material conforms to the requirements of Section 304 of the New York State Department of Transportation *Standard Specifications Construction and Materials Volume 1 (2002)*.

b. *Materials below the demarcation layer or pavement* – Non-impacted material (Section II.b) that when tested in accordance with Section III.a above meet the protection of groundwater SCOs but may not meet the commercial use SCOs (e.g. elevated concentrations of metals) may be reused onsite below the demarcation layer or pavement layer.

TABLE A-1 -
APPLICABLE REGULATORY TESTING CRITERIA
FORMER AMERICAN LINEN SUPPLY CO. FACILITY
BUFFALO, NEW YORK
NYSDEC SITE # C915241

	Soil Cleanup/Reuse Criteria			Disposal Criteria for Potentially Hazardous Waste[4]	
	NYSDEC Soil Cleanup Objectives (Restricted Use)		Eastern United States Background Levels (mg/kg)	EPA Regulatory Level *(TCLP Metals, Only)* (mg/L)	TAGM 3028 *(VOCs, Only)* (mg/kg)
	Protection of Groundwater (mg/kg)	Commercial Use Criteria (mg/kg)			
Metals					
Arsenic	16 [2]	16 [2]	3-12	5	--
Barium	820	400	15-600	100	--
Beryllium	47	590	0-1.75	--	--
Cadmium	7.5	9.3	0.1-1	1	--
Chromium, hexavalent[1]	19	400	1.5-40	--	--
Chromium, trivalent[1]	--	1500	1.5-40	5	--
Copper	1720	270	1-50	--	--
Total Cyanide[1]	40	27	--	--	--
Lead	450	1000	200-500	5	--
Manganese	2000 [2]	10000	50-5000	--	--
Total Mercury	0.73	2.8	0.001-0.2	0.2	--
Nickel	130	310	0.5-25	--	--
Selenium	4 [2]	1500	0.1-3.9	1	--
Silver	8.3	1500	--	5	--
Zinc	2480	10000	9-50	--	--
Volatile Organic Compounds					
1,1,1-Trichloroethane	0.68	500	--	--	7000
1,1-Dichloroethane	0.27	240	--	--	8000
1,1-Dichloroethene	0.33	500	--	--	120
1,2-Dichlorobenzene	1.1	500	--	--	7000
1,2-Dichloroethane	0.02 [2]	30	--	--	7.7
cis-1,2-Dichloroethene	0.25	500	--	--	800
trans-1,2-Dichloroethene	0.19	500	--	--	2000
1,3-Dichlorobenzene	2.4	280	--	--	--
1,4-Dichlorobenzene	1.8	130	--	--	29
1,4-Dioxane	0.1 [3]	130	--	--	64
Acetone	0.05	500	--	--	8000
Benzene	0.06	44	--	--	24
Butylbenzene	12	500	--	--	--
Carbon tetrachloride	0.76	22	--	--	5.4
Chlorobenzene	1.1	500	--	--	2000
Chloroform	0.37	350	--	--	110
Ethylbenzene	1	390	--	--	6000
Hexachlorobenzene	3.2	6	--	--	0.41
Methyl ethyl ketone	0.12	500	--	--	4000
Methyl tert-butyl ether	0.93	500	--	--	--
Methylene Chloride	0.05	500	--	--	93
n-Propylbenzene	3.9	500	--	--	--
sec-Butylbenzene	11	500	--	--	--
tert-Butylbenzene	5.9	500	--	--	--
Tetrachloroethane	1.3	150	--	--	14
Toluene	0.7	500	--	--	20000
Trichloroethene	0.47	200	--	--	640
1,2,4-Trimethylbenzene	3.6	190	--	--	--
1,3,5-Trimethylbenzene	8.4	190	--	--	--
Vinyl Chloride	0.02	13	--	--	0.36
Xylene (mixed)	1.6	500	--	--	200000

TABLE A-1 -
APPLICABLE REGULATORY TESTING CRITERIA
FORMER AMERICAN LINEN SUPPLY CO. FACILITY
BUFFALO, NEW YORK
NYSDEC SITE # C915241

NOTES & ABBREVIATIONS:

-- = No Standard or Value

**The soil cleanup objectives herein are from the 6 NYCRR Part 375-6.8(b) dated 14 December 2006.

The EPA regulatory levels are from the Code of Federal Regulations Maximum Concentration of Contaminants for Toxisity Characteristics.

TAGM 3028 Action Leves are from the 30 November 1992 Memorandum 3028 regarding "Contained-In" Criteria for Environmental Media

1. The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of the contaminant is below the SCC
2. For consituants where the calculated SCO was lower than the rural soil background concentration determined by the Department and Department of Healt rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.
3. For constituents were the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.
4. Additional sampling criteria may be required by the receiving facility.

APPENDIX B

NYSDOH Community Air Monitoring Plan

New York State Department of Health
Generic Community Air Monitoring Plan

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

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

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

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (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 NYSDEC/NYSDOH staff.

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

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. 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.

- 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.

- 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.

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

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

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

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

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 20, 2000

P:\Bureau\Common\CommunityAirMonitoringPlan (CAMP)\GCAMPR1.DOC

APPENDIX C

Health & Safety Plan

HALEY & ALDRICH OF NEW YORK
SITE-SPECIFIC HEALTH & SAFETY PLAN

For

Former American Linen Supply Co. Facility

Interim Remedial Measure Work Plan

Project/File No. 37319-050

Prepared by: Claire L. Mondello Date: 08/21/2013

Revised by: Enter Revisor's Name Date: Enter Date

APPROVALS: The following signatures constitute approval of this Health & Safety Plan

Margaret B. Holt - Local H&S Coordinator — 8/22/13 Date

Date printed: 9/5/2013 at 8:56 AM

Note: This HASP has been developed for Haley & Aldrich purposes only and is not for use by others.

TABLE OF CONTENTS

1. PROJECT INFORMATION AND EMERGENCY RESOURCES

Project Name: Former American Linen Supply Co. Facility – IRM Work Plan	**H&A File No.: 37319-050**
Location: 822 Seneca Street, Buffalo, New York	
Client/Site Contact: Phone Number: Emergency Phone Number:	Mr. Randy Cook 612-676-8060 651-600-9348
General Contractor: **Superintendent:** Phone Number: Emergency Phone Number:	TBD TBD TBD TBD
H&A Project Manager: Phone Number: Emergency Phone Number:	Claire L. Mondello 585-321-4219 585-698-9052
Local Health & Safety Coordinator: Emergency Phone Number:	Margaret B. Holt 585-321-4214 585-721-2426
Nearest Hospital: Address: (see map on next page) Phone Number:	Buffalo General Hospital 100 High Street Buffalo, New York 14210 716-859-5600
Nearest Occ. Health Clinic: http://www.talispoint.com/liberty/ext/ Address: (see map on next page) Phone Number	Pulse Occupational Medicine 7616 Transit Road Buffalo, New York 14221 716-204-2273
Liberty Mutual Claim Policy	**WC2-Z11-254100-032**
Emergency Response Number:	**911**
Other Local Emergency Response Number:	911
Other Ambulance, Fire, Police, or Environmental Emergency Resources:	911

Work Scope:

This Site-Specific Health and Safety Plan addresses the health and safety practices and procedures that will be employed by all Haley & Aldrich employees participating in the site characterization of the Project Site. This plan is based on an assessment of the site-specific health and safety risks available to Haley & Aldrich and Haley & Aldrich's experience with other project sites. The scope of work for the Site Characterization includes:

Task #1: Excavation Monitoring & Sample Collection:

Haley & Aldrich personnel will oversee the removal soil and subsurface features (e.g. – underground storage tanks, sewer drains, etc.). Monitoring will include screening with a PID, logging daily field activities, conducting community air monitoring, and collecting samples for soil reuse and disposal.

Task #2: Site-Wide Groundwater Sampling

One round of site-wide groundwater sampling will occur at both onsite and offsite wells using low-flow sampling techniques. Static water levels will also be collected.

Task #3: Soil Vapor Sampling

Four soil vapor samples will be collected from installed soil vapor sampling points. Points will be installed using direct push drilling techniques.

Subcontractor(s) to be involved in on-site activities:

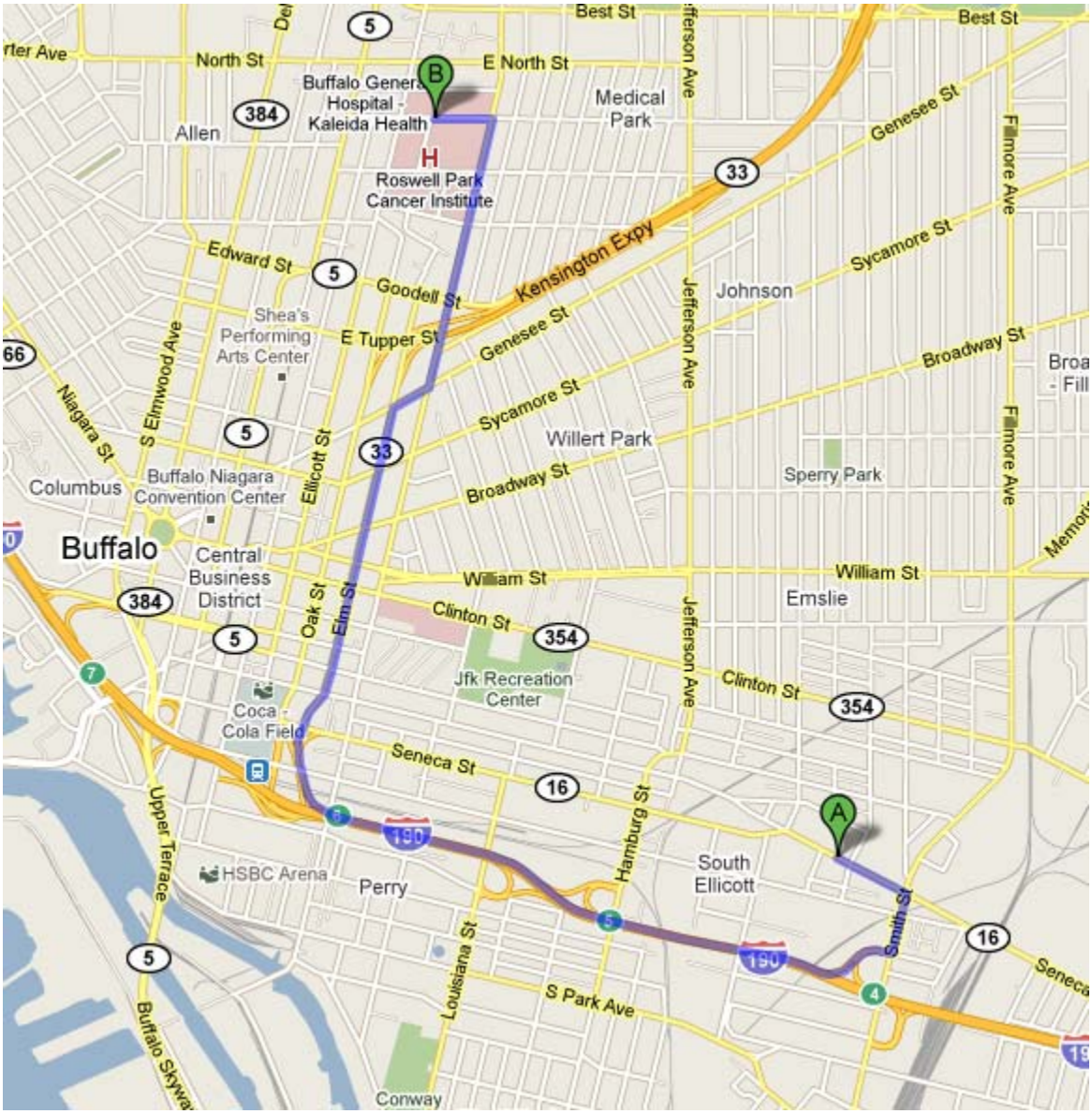
Firm Name	Work Activity
TBD	TBD
TBD	TBD

Projected Start Date: TBD

Projected Completion Date: TBD

Estimated Number of Days to Complete Field Work: 4-6 weeks

Directions to the Nearest Hospital:



822 Seneca St
Buffalo, NY 14210

1. Head **southeast** on **Seneca St** toward **Lord St**
0.2 mi
2. Take the 2nd right onto **Smith St**
0.1 mi
3. Turn right to merge onto **I-190 N** toward **Niagara Falls**
1.4 mi
4. Take exit **6** toward **Elm St**
0.2 mi
5. Slight right at **Carroll St/Center St/Elm St**
0.8 mi
6. Turn right at **Genesee St**
0.1 mi
7. Take the 1st left onto **Michigan Ave**
0.6 mi
8. Turn left at **High St**
0.1 mi

Kaleida Health-Buffalo General Division
100 High Street
Buffalo, NY 14203

2. SITE DESCRIPTION

Site Classification:

☐ Industrial	☐ Commercial	☑ Other Vacant

General Description:

The Site is located at 822 Seneca Street in the City of Buffalo, Erie County, New York. The Site is identified on the City of Buffalo tax maps as the parcel with section 122.27, block 1, lot 4, and is approximately 2.91 acres. The Site is located on the west side of Lord Street and bound to the north by Seymour Street and the south by Seneca Street, and is approximately one mile north of the Buffalo River.

AmeriPride Services, Inc. has owned this property since approximately 1978 (formerly as American Linen Supply Company), and since 2005, the Site has been unoccupied. The site was most recently used as an industrial dry cleaner/launderer. The parcel is currently developed with a vacant industrial building. The Site is located in an urban area of mixed industrial, commercial land use. The Site is currently zoned for light industrial use.

Background and Historic Site Usage:

According to a Phase I Environmental Site Assessment Report by C.T. Male Associates, P.C., dated December 2004, the Site building was first developed in 1910. Prior to 1910, the Site is indicated to have been occupied by residential and commercial properties. Between 1910 and 1978, the Site appeared to be used as a book binding and printing facility.

Coverall Service and Supply Co., (Coverall) a uniform cleaning facility, reportedly first occupied the Site in 1978. The facility was used for dry cleaning operations until 1985. Available records indicate that dry-cleaning with tetrachloroethylene (PCE) was conducted at the Site between 1978 and 1985; use and/or storage of PCE were not reported after 1985. The laundry operations occupied the first floor of the Site building as well as portions of the basement. Thorner Sydney Press occupied the second floor of the Site building as well as portions of the basement until 1997. According to a purchase agreement dated 1977, Thorner Sydney Press' lease agreement was initiated in 1965.

In April 2004, operations ceased at the Site building, and it has been vacant since.

Phase II investigations conducted in 2005 and 2006 by ENSR International and Remedial Investigations conducted by Haley & Aldrich between 2010 and 2013 indicate that the Site is currently impacted by chlorinated solvents in groundwater, soil, and soil vapor; and polycyclic aromatic hydrocarbons (PAHs) as part of historic urban fill.

Project Scope:

An IRM Work Plan has been developed as part of the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP).

The project scope includes:

1. Removal of subsurface features (sewer vault, former waste oil UST)
2. Removal of shallow fill soils impacted by chlorinated VOCs and disposal of impacted materials
3. Placement of a cover system
4. Groundwater sampling
5. Soil vapor sampling

Overview of Hazards:

Potential hazards include the following:

- Drilling Hazard
- Excavations (hazards from heavy equipment and falling)
- Extreme weather
- Heavy equipment
- Utilities
- Fumes & Dust
- Chemical hazards from onsite contamination
- Noise

Site Status: Indicate current activity status and describe operations at the site.

☐ Active	☑ Inactive
☐ Partially active	☐ Other

Site Plan:

Is a site plan or sketch available? ☑ Y ☐ N

Work Areas:

List/identify each specific work area(s) on the job site and indicate its location(s) on the site plan:

1. Former Waste Oil UST
2. Storm Sewer Vault
3. Former dry cleaning area/former slab-on-grade area
4. Former Parking Lot Area
5. Former Basement Area

3. PROJECT TASK BREAKDOWN

List and describe each distinct work task below.

Task No.	Detailed Task Description	Employee(s)	Work Date(s) or Duration
1	Excavation Monitoring & Sample Collection	2 H&A Employees (TBD)	4-6 weeks
2	Site-Wide Groundwater Sampling	2 H&A Employees (TBD)	1 week
3	Soil Vapor Sampling	2 H&A Employees (TBD)	3 days
4			

4. HAZARD ASSESSMENT

Material Safety Data Sheets (MSDS) of hazardous materials used during the execution of work shall be available on site. MSDSs are required for chemicals used to prepare samples, calibration gases, etc. MSDSs are not required for waste materials.

Chemical Hazards:

Does chemical analysis data indicate that the site is contaminated? ☑ Y ☐ N

Indicate the potential physical state of the hazardous materials at the site.

☑ Gas/Vapor	☐ Sludge
☑ Liquid	☑ Solid/Particulate

Indicate the anticipated or actual class of compounds at the site.

☐ Asbestos	☑ Inorganics
☐ BTEX	☐ Pesticides
☑ Chlorinated Solvents	☐ Petroleum products
☑ Heavy Metals	☑ Other PAHs

Impacted Environments:

Indicate media in which contamination is expected.

☑ Air	☑ Groundwater
☑ Soil	☐ Sediment
☐ Surface water	☐ Other Specify

Estimated concentrations:

Indicate medium of major chemicals expected to be encountered by onsite personnel.

Work Activity	Media	Chemical	Anticipated Concentration
Excavation Monitoring & Sample Collection	SO GW A	Chlorinated VOC PAHs & Metals Chlorinated VOCs VOCs	ND – 100 ppm ND – 1000 ppm ND – 5 ppm ND – 25,000 ug/m3
Groundwater Sampling	GW A	Chlorinated VOCs VOCs	ND – 5 ppm ND – 25,000 ug/m3
Soil Vapor Sampling	A	VOCs	ND – 25,000 ug/m3

(Media key: A = Air; GW = Groundwater; SW = Surface Water; SO = Soil; SE = Sediment)

Chemicals of Concern:

Trichloroethylene (TCE) is a colorless, nonflammable, non-corrosive liquid has a "sweet" odor characteristic of some chlorinated hydrocarbons.

The compound is incompatible with strong caustics, it reacts with aluminum when acidic, and it is incompatible with active metals - barium, lithium, sodium, magnesium, and titanium. Decomposition of TCE, due to contact with hot metal or ultraviolet radiation, forms products including chlorine gas, hydrogen chloride, and phosgene. Dichloroacetylene may be formed from the reaction of alkali with TCE.

The Cal-OSHA PEL for TCE is 25 PPM as an 8-hour TWA; an acceptable ceiling concentration of 300 PPM; and a STEL of 200 PPM. The OSHA PEL for TCE is 100 ppm as an 8-hour TWA; an acceptable ceiling concentration of 200 ppm; and an acceptable maximum peak ceiling of 300 ppm for no more than 5 minutes in any 2-hour period. The standard routes of entry in the body are through inhalation, percutaneous absorption, ingestion, skin and eye contact. The points of attack are the respiratory system, heart, liver, kidneys, central nervous system and skin.

Exposure to TCE vapor may cause irritation of the eyes, nose, and throat. The liquid, if splashed in the eyes, may cause burning irritation and damage. Repeated or prolonged shin contact with the liquid may cause dermatitis. Acute exposure to TCE depresses the central nervous system exhibiting such symptoms as headache, dizziness, vertigo, tremors, nausea and vomiting, irregular heart beat, sleepiness, fatigue, blurred vision, and intoxication similar to that of alcohol. Unconsciousness and death have been reported. Alcohol may make the symptoms of TCE overexposure worse. If alcohol has been consumed, the overexposed worker may become flushed. TCE addiction and peripheral neuropathy have been reported.

Tetrachloethylene (PCE)

Tetrachloroethylene (PCE) is a colorless, nonflammable liquid with a mild, chloroform-like odor.

PCE is incompatible with strong oxidizers and metals such as lithium, beryllium and barium, caustic soda, sodium hydroxide, and potash. Decomposition of PCE, due to fire, forms products including hydrogen chloride, and phosgene.

The OSHA PEL for PCE is 100 ppm as an 8-hour TWA; an acceptable ceiling concentration of 200 ppm; and an acceptable maximum peak ceiling of 300 ppm for no more than 5 minutes in any 3-hour period. The standard routes of entry in the body are through inhalation, percutaneous absorption, ingestion, skin and eye contact. The points of attack are the respiratory system, heart, liver, kidneys, central nervous system, eyes, and skin.

Symptoms that may occur as a result of exposure to PCE include irritation to the eyes, skin, nose, and throat; respiratory system distress; nausea; flushed face and neck; incoordination; headache; drowsiness; skin erythema; and liver damage.

1,1 and 1,2-Dichloroethylene (1,1-DCE; 1,2-DCE)

1,1 and 1,2-Dichloroethylene (1,1-DCE; 1,2-DCE) is a colorless, class IB flammable liquid with a slightly acrid, chloroform-like odor.

1,1 and 1,2-DCE is incompatible with strong oxidizers, strong alkalis, potassium hydroxide, and metals such as copper, and contains inhibitors to prevent polymerization.

The OSHA PEL for 1,2-DCE is 200 ppm as an 8-hour TWA. There is no OSHA PEL for 1,1-DCE. The 8-hour TWA for 1,1-DCE is 1.0 ppm. The standard routes of entry in the body are through inhalation, ingestion, skin and eye contact. The points of attack are the respiratory system, central nervous system, and eyes.

Symptoms that may occur as a result of exposure to 1,1 and 1,2-DCE include irritation to the eyes; respiratory system distress; central nervous system depression.

Vinyl Chloride (VC)

Vinyl Chloride (VC) is a colorless, liquid or flammable gas with a pleasant odor at high concentrations.

VC is incompatible with oxidizers, peroxides, and metals such as copper, aluminum, iron and steel. VC polymerizes in air, sunlight, or heat unless it is stabilized by inhibitors such as phenol. It attacks iron and steel in the presence of moisture.

The OSHA PEL for VC is 1 ppm as am 8-hour TWA, and an acceptable ceiling of 5 ppm in a 15 minute period. The standard routes of entry in the body are through inhalation, skin and eye contact. The points of attack are the respiratory system, central nervous system, liver, blood, and lymphatic system.

Symptoms that may occur as a result of exposure to VC include weakness and exhaustion; abdominal pain; gastrointestinal bleeding; enlarged liver; and pallor or cyanosis of the extremities. Liquid VC can cause frostbite. VC can also cause liver cancer.

PAHs

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

PAHs, as a group, are strongly hydrophobic, and therefore sorb to organic-based soil particles. Exposures to elevated levels of PAHs in the workplace could occur in coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.

Sorption of PAHs to soil and sediments increases with increasing organic carbon content and with increasing surface area of the sorbent particles. Lower molecular weight PAHs may also volatilize from soil. Due to this strong sorption to soil, PAHs do not tend to dissolve easily into and migrate with groundwater. Exposure from affected soil would tend to occur as a result of direct contact with affected soil or inhalation/ingestion of windborne affected soil.

Arsenic

The Occupational Safety and Health Administration has set limits of 10 microgram arsenic per cubic meter of workplace air (10 µg/m3) for 8 hour shifts and 40 hour work weeks. Several studies have shown that inorganic arsenic can increase the risk of lung cancer, skin cancer, bladder cancer, liver cancer, kidney cancer, and prostate cancer. The World Health Organization (WHO), the Department of Health and Human Services (DHHS), and the EPA have determined that inorganic arsenic is a human carcinogen.

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs. Ingesting high levels of inorganic arsenic can result in death. Lower levels of arsenic can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Lead

The Occupational Safety and Health Administration (OSHA) limits the concentration of lead in workroom air to 50 µg/cubic meter for an 8-hour workday. Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the immune system. The effects are the same whether it is breathed or swallowed. Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common after exposure to high levels of lead. In adults, lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect the memory. Lead may cause anemia, a disorder of the blood. It can cause abortion and damage the male reproductive system. The connection between these effects and exposure to low levels of lead is uncertain.

Mercury

Mercury vapor is highly toxic via this route. Causes severe respiratory tract damage. Symptoms include sore throat, coughing, pain, tightness in chest, breathing difficulties, shortness of breath, headache, muscle weakness, anorexia, gastrointestinal disturbance, ringing in the ear, liver changes, fever, bronchitis and pneumonitis. Can be absorbed through inhalation with symptoms similar to ingestion. May cause burning of the mouth and pharynx, abdominal pain, vomiting, corrosive ulceration, bloody diarrhea. May be followed by a rapid and weak pulse, shallow breathing, paleness, exhaustion, tremors and collapse. Delayed death may occur from renal failure. Gastrointestinal uptake of mercury is less than 5% but its ability to penetrate tissues presents some hazard. Initial symptoms may be thirst, possible abdominal discomfort. Causes irritation and burns to skin. Symptoms include redness and pain. May cause skin allergy and sensitization. Can be absorbed through the skin with symptoms to parallel ingestion. Causes irritation and burns to eyes. Symptoms include redness, pain, and blurred vision; may cause serious and permanent eye damage. Chronic exposure through any route can produce central nervous system damage. May cause muscle tremors, personality and behavior changes, memory loss, metallic taste, loosening of the teeth, digestive disorders, skin rashes, brain damage and kidney damage. Can cause skin allergies and accumulate in the body. Repeated skin contact can cause the skin to turn gray in color. A suspected reproductive hazard; may damage the developing fetus and decrease fertility in males and females. Persons with nervous disorders, or impaired kidney or respiratory function, or a history of allergies or a known sensitization to mercury may be more susceptible to the effects of the substance.

The OSHA Acceptable Ceiling Concentration for mercury and mercury compounds: 0.1 mg/m3 (TWA), skin contact is a parameter in determining exposure for mercury.

TABLE 1
OCCUPATIONAL EXPOSURE LIMITS (CONCENTRATIONS IN AIR)

(CIRCLE CONTAMINANTS OF CONCERN, WRITE ADDITIONAL CONTAMINANTS AND EXPOSURE ON LAST PAGE)

CHEMICAL	ROUTES OF EXPOSURE	IDLH	Ceiling	STEL	PEL	TLV	REL	PID (IP eV)	FID	ODOR THRES-HOLD	IRRITATION THRESHOLD	ODOR DESCRIPTION
VAPORS & GASES												
Acetone	R, I, C	2500	-	750 [ACGIH]	1000	500	250	9.69	60	13	-	fragrent, mint-like
Ammonia	R, I, C	300	-	35 [NOSH, ACGIH]	50	25	25	10.18**	-	0.5-2	10	Pungent suffocating odor
Benzene	R,A,I,C	Ca [500]	-	1 [NIOSH]; 2.5 [ACGIH]	1	0.5	0.1	9.24	150	4.68	-	Solvent, aromatic
Carbon tetrachloride (Tetrachloromethane)	R,A,I,C	Ca [200]	25 [instantaneous] 200 [5 min peak in any 4 hrs]	2 [NIOSH, 60-min]; 10 [ACGIH]	2	5	Ca	11.47**	10	50	-	Sweet, pungent, ether-like
Chlorobenzene	R,I,C	1000	-	-	75	10	-	9.07	200	0.68	-	Almond-like
Chloroform	R,I,C	Ca [500]	50 [OSHA]	2 [NIOSH, 60-min]	-	10	-	11.42**	65	50	-	Sweet, pleasant
o-Dichlorobenzene	R,A,I,C	200	50 [NIOSH, OSHA]	50 [ACGIH]	-	25	-	9.06	50	0.3	E 20-30	Pleasant, aromatic
p-Dichlorobenzene	R,A,I,C	Ca [150]	-	-	75	10	Ca	8.98	-	0.18	E 80-160	Distinct, aromatic, mothball-like
Dichlorodifluoromethane (Freon 12)	R,C	15000	-	-	1000	1000	1000	11.75**	15	-	-	Ether-like when at very high concs.
1,1-Dichloroethane	R,I,C	3000	-	-	100	100	100	11.06**	80	200	-	Distinct, chloroform-like
1,2-Dichloroethane (Ethylene dichloride)	R,I,A,C	Ca [50]	100 [OSHA]	2 ppm [NIOSH]; 200 ppm [OSHA, 5-min max peak in any 2 hours]	50	10	1	11.05**	80	88	-	Chloroform-like
1,1-Dichloroethylene (1,1-DCE, Vinylidene chloride)	R,A,I,C	Ca [ND]	-	-	-	5	Ca	10.00**	40	190	-	Chloroform-like
1,2-Dichloroethylene	R,I,C	1000	-	-	200	200	200	9.65	50	0.85	-	Bitter, chloroform-like
Ethanol	R,I,C	3300	-	-	1000	1000	1000	10.47**	25	10	-	Weak, ether-like, wine-like
Ethylbenzene	R,I,C	800	-	125 [NIOSH; ACGIH]	100	100	100	8.76	100	2.3	E 200	Aromatic
Ethylene Glycol	R,I,C	ND	50 [OSHA]; 100 mg/m^3 [ACGIH]	-	-	-	-	-	-	-	-	Odorless
Formaldehyde	I,C	Ca [20]	0.1 [NIOSH, 15-min]; 0.3 [ACGIH]	2	0.75	-	Ca [0.016]	10.88**	-	0.83	-	Pungent, suffocating
Gasoline	R,I,A,C	Ca [ND]	-	500 [OSHA; ACGIH]	300	300	-	-	-	-	E 0.5	Petroleum-like
n-Hexane	R,I,C	1100	-	-	500	50	50	10.18	70	130	E.T 1400-1500	Gasoline-like
Hydrogen Cyanide	R,A,I,C	50	4.7 [ACGIH; Skin]	4.7 [NIOSH - skin]	10 [skin]		-	-	-	0.58	-	Bitter almond
Hydrogen peroxide	R,I,C	75	-	-	1	1	1	10.54**	-	-	-	Sharp
Methanol	R,I,A,C	6000	-	250 [NIOSH; ACGIH; skin]	200	200 [skin]	200	10.84**	12	1000	-	Pungent
Methyl Ethyl Ketone Peroxide	R,I,C	ND	0.2 [NIOSH; ACGIH] 0.7 [OSHA]	-	-	-	-	-	-	-	-	Characteristic odor
Methyl Chloroform (1,1,1-TCA)	R,I,C	700	350 [NIOSH, 15-min]	450 [ACGIH]	350	350	Ca	11.00**	105	20-100	-	Chloroform-like
Methylene Chloride (Dichloromethane, Methylene dichloride)	R,I,A,C	Ca [2300]	-	125	25	50	Ca	11.32**	100	25-50	E 5000	Chloroform-like
Methyl Mercaptan	R,C	150	10 [OSHA] 0.5 [NIOSH, 15-min]	-	-	0.5	-	9.44	-	-	-	Garlic, rotten cabbage
MIBK (Hexone)	R,I,C	500	-	75 [NIOSH; ACGIH]	100	50	50	9.30	-	-	-	Pleasant
Naptha (coal tar)	R,I,C	1000	-	-	100	400	100	-	-	-	-	Aromatic
Naphthalene	R,A,I,C	250	-	15 [NIOSH; ACGIH]	10	10	10	8.12	-	0.3	E 15	Mothball-like
Octane	R,I,C	1000	385 [NIOSH, 15-min]	-	500	300	75	9.82	80	48	-	Gasoline-like
Pentachlorophenol	R,A,I,C	2.5 mg/m^3	-	-	0.5 mg/m^3 [skin]	0.5 mg/m^3 [skin]	0.5 mg/m^3 [skin]	-	-	-	-	Pungent when hot, benzene-like
Phenol	R,A,I,C	250	15.6 [NIOSH, 15-min]	-	5 [skin]	5 [skin]	5 [skin]	8.50	-	0.04	E.N.T. 68	Sweet, acrid
Propane	R,C	2100	-	-	1000	1000	1000	11.07**	80	1600	-	Odorless (commonly smells foul due to additive for odor detection)
Stoddard Solvent (Mineral Sprits)	R,CI,I	20000 mg/m^3	1800 mg/m^3 [NIOSH, 15-min]	-	500	100	350 mg/m^3	-	-	1	E 400	Kerosene-like
Styrene	R,I,A,C	700	200 [OSHA]	100 [NIOSH]; 600 [OSHA, 5-min max peak in any 3 hours]; 40 [ACGIH]	100	20	50	8.40	85	0.047	E 200-400	Sweet, floral
1,1,2,2-Tetrachloroethane	R,I,A,C	Ca [100]	-	-	5 [skin]	1 [skin]	1 [skin]	11.10**	100	1.5	-	Pungent, chloroform-like
Tetrachloroethylene (Perchloroethylene, Perc, PCE)	R,I,A,C	Ca [150]	200 [OSHA]	300 [OSHA, 5-min max peak in any 3-hours]; 100 [ACGIH]	100	25	Ca	9.32	70	4.68	N.T513-690	Chloroform-like
Toluene	R,A,I,C	500	300 [OSHA]	150 [NIOSH]; 500 [OSHA, 10-min max peak]	200	50	100	8.82	110	2.14	E300-400	Sweet, pungent, benzene-like
Trichloroethylene (TCE)	R,I,A,C	Ca [1000]	200 [OSHA]	300 [OSHA, 5-min max peak in any 2-hours]; 100 [ACGIH]	100	50	Ca	9.45	70	21.4	-	Chloroform-like
1,2,3-Trimethylbenzene	R,I,C	ND	-	-	-	-	25	8.48	-	-	-	Distinctive, aromatic
1,2,4-Trimethylbenzene	R,I,C	ND	-	-	-	-	25	8.27	-	-	-	Distinctive, aromatic
1,3,5-Trimethylbenzene	R,I,C	ND	-	-	-	-	25	8.39	-	-	-	Distinctive, aromatic
Turpentine	R,A,I,C	800	-	-	100	20	100	-	-	200	E.N 200	Pine-like
Vinyl Chloride	R,C	Ca [ND]	5 [OSHA, 15-min]	-	1	1	Ca	9.99	-	3000	-	Pleasant odor at high concs.
Xylenes	R,A,I,C	900	-	150 [NIOSH, ACGIH]	100	100	100	8.56 (m- and o-) 8.44 (p-)	111/116	1.1	E.N.T. 200	Aromatic

TABLE 1
OCCUPATIONAL EXPOSURE LIMITS (CONCENTRATIONS IN AIR)

(CIRCLE CONTAMINANTS OF CONCERN, WRITE ADDITIONAL CONTAMINANTS AND EXPOSURE ON LAST PAGE)

CHEMICAL	ROUTES OF EXPOSURE	IDLH	Ceiling	STEL	PEL	TLV	REL	PID (IP eV)	FID	ODOR THRES-HOLD	IRRITATION THRESHOLD	ODOR DESCRIPTION
DUSTS, MISTS, FUMES, AND MISCELLANEOUS COMPOUNDS												
Asbestos	R	Ca (ND)	-	-	0.1 fiber/cc	0.1 fiber/cc	0.1 fiber/cc	-	-	-	-	-
PCBs-42% Chlorine	R,A,I,C	Ca [5 mg/m^3]	-	-	1 mg/m^3 [skin]	1 mg/m^3 [skin]	0.001 mg/m^3	-	-	-	-	Mild, hydrocarbon
PCBs-54% Chlorine	R,A,I,C	Ca [5 mg/m^3]	-	-	0.5 mg/m^3 [skin]	0.5 mg/m^3 [skin]	0.001 mg/m^3	-	-	-	-	Mild, hydrocarbon
Aluminum - metal dust	R,C	ND	-	-	15 mg/m^3 (total); 5 mg/m^3 (respirable)	10 mg/m^3	10 mg/m^3 (total); 5 mg/m^3 (respirable)	-	-	-	-	-
Aluminum - soluble salts	R,I,C	ND	-	-	2 mg/m^3	2 mg/m^3	2 mg/m^3	-	-	-	-	-
Arsenic- inorganic	R,A,I,C	Ca [5 mg/m^3]	0.002 mg/m^3 [NIOSH, 15-min]	-	0.01 mg/m^3	0.01 mg/m^3	Ca	-	-	-	-	-
Barium:soluble compounds	R,I,C	50 mg/m^3	-	-	0.5 mg/m^3	0.5 mg/m^3	0.5 mg/m^3	-	-	-	-	-
Beryllium	R,C	Ca [4 mg/m^3]	0.005 mg/m^3 [OSHA]; 0.025 mg/m^3 [OSHA, 30-min max peak]; 0.0005 mg/m^3	0.01 mg/m^3 [ACGIH]	0.002 mg/m^3	0.002 mg/m^3	Ca	-	-	-	-	-
Cadmium dusts	R,I	Ca [9 mg/m^3]	-	-	0.005 mg/m^3	0.01 mg/m^3	Ca	-	-	-	-	-
Chromates (Cr(VI) Compounds) & Chromic Acid	R,I,C	Ca [15 mg/m^3]	0.1 mg/m^3 [OSHA]	-	0.001 mg/m^3	0.05 mg/m^3 [water soluble]; 0.01 mg/m^3 [insoluble]	Ca	-	-	-	-	-
Chromium (III) Compounds	R,I,C	25 mg/m^3	-	-	0.5 mg/m^3	0.5 mg/m^3	0.5 mg/m^3	-	-	-	-	-
Chromium Metal	R,I,C	250 mg/m^3	-	-	1 mg/m^3	0.5 mg/m^3	0.5 mg/m^3	-	-	-	-	-
Copper - dust & mist	R,I,C	100 mg/m^3	-	-	1 mg/m^3	1 mg/m^3	1 mg/m^3	-	-	-	-	-
Lead	R,I,C	100 mg/m^3	-	-	0.050 mg/m^3	0.05 mg/m^3	0.050 mg/m^3	-	-	-	-	-
Manganese (compounds and fume)	R,I	500 mg/m^3	5 mg/m^3 [OSHA]	3 mg/m^3 [NIOSH]	-	0.2 mg/m^3	1 mg/m^3	-	-	-	-	-
Mercury & Inorganic Mercury Compounds	R,I,A,C	10 mg/m^3	0.1 mg/m^3 [NIOSH, Skin]; 0.1 mg/m^3 [OSHA]	-	-	0.025 mg/m^3	0.05 mg/m^3 [skin]	-	-	-	-	-
Organo-Mercury Compounds	R,A,I,C	2 mg/m^3	0.04 mg/m^3 [OSHA]	0.03 mg/m^3 [NIOSH]	0.01 mg/m^3	0.01 mg/m^3 [alkyl]; 0.1 mg/m^3 [aryl]	0.01 mg/m^3	-	-	-	-	-
Nickel (metal and compounds)	R,I,C	Ca [10 mg/m^3]	-	-	1 mg/m^3	1.5 mg/m^3 [metal]; 1 mg/m^3 [soluble inorganic compounds]; 1 mg/m^3 [insoluble	0.015 mg/m^3	-	-	-	-	-
Particulate (Not otherwise regulated)	R, C	ND	-	-	15 mg/m^3 (total); 5 mg/m^3 (respirable)	10 mg/m^3 (inhalable); 3 mg/m^3 (respirable)	-	-	-	-	-	-
Portland cement	R,I,C	5000 mg/m^3	-	-	50 mppcf	10 mg/m^3	10 mg/m^3 (total); 5 mg/m^3 (respirable)	-	-	-	-	-
Selenium compounds	R,I,C	1 mg/m^3	-	-	0.2 mg/m^3	0.2 mg/m^3	0.2 mg/m^3	-	-	-	-	-
Silica, crystalline	R, C	Ca [25 mg/m^3 (cristobalite, tridymite); 50 mg/m^3 (quartz, tripoli)]	-	-	Dependent on silicon dioxide content of silica (see Appendix C of the NIOSH Pocket Guide to Chemical Hazards, 2005)	Dependent on minerology [see ACGIH 2005 TLVs and BEIs Handbook]	0.05 mg/m^3	-	-	-	-	-
Silver (metal and soluble compounds)	R,I,C	10 mg/m^3	-	-	0.01 mg/m^3	0.1 mg/m^3	0.01 mg/m^3	-	-	-	-	-
Thallium, soluble	R,A,I,C	15 mg/m^3	-	-	0.1 mg/m^3 [skin]	0.1 mg/m^3 [skin]	0.1 mg/m^3 [skin]	-	-	-	-	-
Tin (metal)	R,C	100 mg/m^3	-	-	2 mg/m^3	2	2 mg/m^3	-	-	-	-	-
Tin (organic compounds)	R,A,I,C	25 mg/m^3	-	-	0.1 mg/m^3	0.1 mg/m^3 [skin]	0.1 mg/m^3 [skin]	-	-	-	-	-
Zinc oxide dust & fume	R	500 mg/m^3	15 mg/m^3 [NIOSH, dust]	10 mg/m^3 [NIOSH; ACGIH; fume]	15 mg/m^3 (total dust); 5 mg/m^3 [respirable dust]; 5 mg/m^3 [fume]	2 mg/m^3 [respirable]	5 mg/m^3 (total dust); 5 mg/m^3 [fume]	-	-	-	-	-

NOTES & ABBREVIATIONS:

All units in parts per million (ppm) unless otherwise noted.
R = Respiratory (Inhalation)
I = Ingestion
A = Skin Absorption
C = Skin Contact
-: Not available
ND: Not detectable.
Ca = Carcinogen
** = Use 11.7 eV lamp
IP: Ionization potential
eV: Electrovolts

IDLH: Immediately dangerous to life and health
Ceiling: Highest allowable instantaneous
C = Skin and/or Eye Contact
STEL: Short-term exposure limit. Exposure period is 15 minutes unless otherwise indicated
PEL: OSHA Permissible Exposure Limit (legally-enforceable)
REL: NIOSH Recommended Exposure Limit
PID: Photoionization Detector
OSHA: United States Occupational Safety and Health Administration
NIOSH: National Institute of Occupational Safety and Health
TLV: ACGIH Threshold Limit Value
ACGIH: American Conference of Governmental Industrial Hygienists

Physical Hazards:

Indicate all hazards that may be present for each task. If any of these potential hazards are checked, it is the project manager's responsibility to determine how to eliminate/minimize the hazard to protect onsite personnel.

Copy and paste a checkmark "✓"into appropriate boxes.

Physical Hazard Checklist				
Potential Job Hazards	**Task 1**	**Task 2**	**Task 3**	**Task 4**
	Excavation	GW Mon.	SV Samp.	
Confined space entry*				
Underground utilities	✓		✓	
Overhead utilities	✓		✓	
Electrical hazards				
Excavations greater than 4' depth	✓			
Open excavation fall hazards	✓			
Heavy equipment	✓			
Drilling hazards			✓	
Noise (above 85 dBA)	✓			
Traffic concerns		✓		
Extreme weather conditions	✓	✓	✓	
Rough terrain for drilling equipment				
Buried drums				
Heavy lifting (more than 50 lbs)		✓	✓	
High risk fire hazard				
Poisonous insects or plants				
Water hazards				
Use of a boat				
Lockout/Tagout requirements				
Other: Chemical Exposure	✓	✓	✓	

***CONFINED SPACE ENTRY REQUIRES SPECIAL PROCEDURES, PERMITS AND TRAINING AND MUST BE APPROVED BY THE CORPORATE HEALTH & SAFETY MANAGER.**

Potential Activity Hazards and Hazard Controls:

Copy and paste a checkmark "✓" adjacent to potential activity hazards and relevant hazard controls.

POTENTIAL ACTIVITY HAZARDS

Abrasions and Cuts ✓
Access
Asphyxiation
Bacteria
Biological Hazards
Bloodborne Pathogens
Cave Ins
Chemical/Thermal Burns
Chemicals✓
Cold Stress✓
Compressed Gases
Confined Spaces
Congestion
Defective Equipment
Dermatitis
Dropping Materials/Tools to Lower Levels
Drowning or Flowing Water
Electrical Shock
Energized Equipment
Equipment Misuse ✓
Ergonomics
Excavations ✓
Explosions
Fatigue
Fire
Flammability
Flying debris ✓
Foreign Body in Eye ✓
Frostbite/Cold ✓
Fueling and Fuel Storage ✓
Fugitive Dust ✓
Fumes ✓
Generated Wastes ✓
Guards removed
Hazardous Materials ✓
Heat Stress (cramps, exhaustion, stroke)
Heavy Equipment Operation ✓
Heavy Equipment/Stability ✓
Heavy Lifting ✓
High crime area (violence)
High Winds
Hoists, Rigging, Slings, Cables
Housekeeping – Improper ✓
Illumination - Poor
Impact ✓
Inability to Maintain Communication
Inclement Weather ✓
Inclines
Insects/Reptiles
Mold
Moving Equipment, Conveyors or Vehicles ✓
Muddy Site Conditions
New Personnel
Noise ✓
Odor ✓
Overhead Utilities ✓
Overhead Work ✓
Overloaded Equipment
Oxygen deficiency
Pinch Points ✓
Poisonous Plants
Pressure
Pressurized Lines
Radiation
Repetitive Motion ✓
Rigging - Improper ✓
Sharp Objects ✓
Silicosis
Slips, Trips, and Falls ✓
Sprains and Strains ✓
Steam
Sunburn ✓
Surface Water Run-off
Toxicity ✓
Traffic
Underground Utilities ✓
Uneven Terrain
Unsafe Atmosphere
Vibration
Visibility - Poor
Visitors Known/Unknown ✓
VOC Emissions ✓
Weight ✓
Work at Depth
Work at Heights
Work over Water
Working on Ice

HAZARD CONTROLS

Air Monitoring ✓
Appropriate Clothing/Monitoring Of Weather ✓
Appropriate Labels/Signage ✓
Barricades/Fencing/Silt Fencing ✓
Buddy System - Attendant
Chock Blocks ✓
Confined Space Procedures
Decontamination Procedures✓
Derived Waste Management Plan
Drinking Water/Fluids
Dust Abatement Measures ✓
Emergency Action Plan Procedures
Equipment Inspection
Equipment Manuals/Training✓
Exclusion/Work Zones ✓
Exhaust Ventilation
Eye Protection ✓
Fall Protection
Fire Extinguisher ✓
Flotation Devices/Lifelines
Gloves ✓
Ground Fault Interrupter
Grounded Hydraulic Attachments
Grounded Equipment/Tanks
Hand Signal Communication
Hard Hat ✓
Hazardous/Flammable Material Storage
Hearing Protection ✓
High Visibility Safety Vest ✓
Hoses, Access to Water
Hotwork Procedures
Isolation of Energy Sources(Lockout/Tagout)
Machine/Equipment Guards
Manual Lifting Equipment
Police Detail
Proper Lifting Techniques ✓
Proper Tool for Job ✓
Proper Work Position/Tools
Protective Equipment ✓
Radio Communication
Respirator, (Specify Type)
Safety Harness /Lanyard/Scaffold
Security Escort
Sloping, Shoring, Trench Box
Spill Prevention Measures
Spill Kits
Stormwater Control
Traffic Controls
Procedures/Methods
Vehicle Inspection
Visitor Orientation Escort✓
Window Cleaning/Defrost

Safety Meetings

All H&A personnel visiting the site will be given an orientation safety meeting and are required to read and sign this HASP. Daily safety meetings will be conducted onsite and documented on a Health & Safety Tailgate Meeting Form.

Utility Locators and Underground Hazards

Prior to drilling or excavating, Haley & Aldrich staff members will ensure that permission has been gained from the property owner to access the property. Contact site facilities personnel to assist with location of underground utilities. Before marking any proposed exploration location, it is critical that all readily available information on underground utilities and structures be obtained. The estimated location of utility installations, such as gas, electric, fuel, steam, sewer, telephone, fiber optic, water, drainage or any other underground installation that may be expected to be encountered during drilling work, will be identified with the appropriate authority. Appropriate authorities include client representatives, utility companies, nonprofit organizations (e.g., "Dig-Safe), and others.

Heavy Equipment

Staff Members must be especially careful and alert when working with contractors who use heavy equipment, since equipment failure or breakage can lead to accidents and worker injury. Cranes and equipment for drilling, pile driving, test pitting and coring is of special concern. Should these devices fail during operation the likelihood of worker injury is high. Equipment of this nature should be visually inspected and checked for proper working order prior to the commencement of field work. Those that operate heavy equipment must meet all of the requirements to operate heavy equipment. Haley & Aldrich, Inc. staff members that supervise projects or are associated with such high risk projects that involve digging should use due diligence when working with a construction firm. Maintain visual contact with operators at all times and keep out of the strike zone whenever possible. Always approach heavy equipment with an awareness of the swing radius and traffic routes of each piece of equipment and never go beneath a hoisted load. High-visibility safety vests must be worn onsite at all times. Avoid fumes created by heavy equipment exhaust.

Noise Reduction

Site activities in proximity to heavy equipment often expose workers to excessive noise. It is anticipated that situations may arise when noise levels may exceed the OSHA Action Level of 85 dBA in an 8-hour time-weighted average (TWA). An example of this possibility is working in close proximity to the subcontractor during drilling activities onsite. If excessive noise levels occur, efforts will be made to control this by issuance of earplugs to all personnel and by implementing a system of hand signals understood by all.

Work Site Access & Controls (Standard Precautions)

The work area is restricted to authorized personnel. Clearly define the work area before beginning activities for the day. Caution tape and safety cones must be provided as necessary

for vehicular traffic concerns and to protect passers-by. Proper housekeeping is essential to avoid creating hazards to pedestrian and vehicular traffic. Excavations in progress will not be left unattended at any time. Running equipment will not be left unattended at any time. Test borings and test pits will be backfilled upon completion and the area restored. Drilling equipment will be secured above test borings during work stoppages and at the end of the workday.

Site Security

Site access will be restricted by a locked chain-link fence.

Weather Related Hazards

H&A employees and their subcontractors should be aware of potential health effects and/or physical hazards of working during inclement weather. Refer to OP1003-Cold Stress and OP1015-Heat Stress for discussion on weather hazards.

5. PROTECTIVE MEASURES

Personal Protective Equipment Requirements:

Copy and paste a checkmark "✓"into appropriate boxes.

Required PPE	Task 1	Task 2	Task 3	Task 4
	Excavation	GW Mon.	SV Samp.	
Hard hat	✓			
Safety glasses w/side shields	✓	✓	✓	
Steel-toe footwear	✓	✓	✓	
Hearing protection (plugs, muffs)	✓			
Tyvek ™ coveralls		✓		
PE-coated Tyvek™ coveralls				
Boots, chemical resistant	✓	✓		
Boot covers, disposable				
Leather work gloves	✓			
Inner gloves - Nitrile	✓	✓	✓	
Outer gloves - Enter material here				
Tape all wrist/ankle interfaces				
Half-face respirator*				
Full-face respirator*				
Organic vapor cartridges				
Acid gas cartridges				
Other cartridges: Enter type here				
P-100 (HEPA) filters				
Face shield				
Personal Flotation Device (PFD)				
High-Visibility Safety Vest	✓	✓	✓	
Other:				
Level of protection required [C or D]:	D	D	D	

* In the event of respirator use, H&A staff must be medically qualified, fit tested and clean shaven with no facial hair that will interfere with the seal.

The required PPE checked in any box above must be on site during the task being performed. Work shall not commence unless the required PPE is present.

Site Safety Equipment Requirements:

Check all items that are required to be on site.

Site Safety Equipment

☐ Fire Extinguisher	☑ First Aid Kit	☐ Flashlight
☐ Air horn/signaling device	☑ Cellular Phone	☐ Duct tape
☐ Ladder	☐ Barricade tape	☐ Drum dolly
☐ Two-way radio	☑ Safety cones	☐ Harness/Lanyard
☐ Other Specify		

The required equipment checked in any box above must be on site during the task being performed. Work shall not commence unless the equipment is present.

6. MONITORING PLAN AND EQUIPMENT

Is air/exposure monitoring required at this work site for personal protection? ☑ Y ☐ N

Is perimeter monitoring required for community protection? ☑ Y ☐ N

Monitoring/Screening Equipment Requirements:

Check all items that are required to be on site.

Required Monitoring/Screening Equipment

- ☑ Photo-Ionization Detector (PID) 10.2eV
- ☐ Photo-Ionization Detector (PID) 11.7eV
- ☐ Photovac Micro Tip (PID) 10.6eV
- ☐ Organic Vapor Monitor (FID)
- ☐ Photovac Gas Chromatagraph (GC)
- ☐ Combustible Gas Indicator (CGI) (LEL)
- ☐ Multiple Gas Detector LEL/O2/H2S/CO
- ☑ Dust Monitors (RAMs)
- ☐ Colorimetric tubes
- ☐ Other

The required equipment checked in any box above must be on site. Work shall not commence unless the equipment is present.

Standard Action Levels and Required Responses:

Exposure Guidelines for common contaminants are listed in Table 1 - Occupational Exposure Limits in the Chemical Hazards section above.

Requirements for PPE upgrades based on monitoring are in Table 2 - Monitoring Methods, Action Levels and Protective Measures following the Specific Monitoring Requirements section below.

Action levels for readings obtained with a multiple gas detector are listed below.

Instrument	Normal	Operating levels	Action levels – required responses
Oxygen Meter	20.9%	Between 19.5-23.5%	Below 19.5 %: leave area, requires supplied air Above 23.5%: leave area, fire hazard
CGI	0%	Less than 10%	Greater than 10%: fire/explosion hazard; cease work
Hydrogen Sulfide	0%	Less than 10 ppm.	Greater than 15 ppm (or 10 ppm for 8 hrs) requires supplied air respirator
Carbon Monoxide	0%	Less than 25 ppm	Greater than 200 ppm for 1 hour (or 25 ppm for 8 hrs) requires supplied air respirator

Standard Air Monitoring Plan (Volatiles):

- Prior to the beginning of work obtain background readings with the PID away from the site.
- Monitor the breathing zone when site soil is exposed (e.g., while drilling or excavating is occurring, etc.) with the PID.
- Monitoring should be conducted most frequently (e.g., every 15-30 minutes) when drilling or excavation first begins in a particular area and when soil is removed from the hole. After this, and if no exceedances of exposure limits are noted (see below), monitoring may be conducted less frequently (e.g., every 60 minutes).
- H&A general exposure limits will be used when a mixture of potentially volatile chemicals are suspected to be present in soil at the site.

In summary, if a reading of 10 ppm above background is detected with the PID for 5 minutes or longer, back away for a few minutes. Screen the air again after any vapors/gases have been given a chance to dissipate. If 10 ppm above background is still noted, evacuate the area and call the LHSC and PM for further guidance.

- Record monitoring data and PPE upgrades in field book or on Record of Field Monitoring form and maintain with project files.

- Air monitoring for exposure should be based on the frequency established under the Standard Air Monitoring Plan or under the Specific Monitoring Requirements. Record time, location and results of monitoring and actions taken based upon the readings.

Standard Dust Control Measures and Monitoring Plan:

Dust Control Measures:

It is anticipated that exposure to airborne dust can be mitigated during work operations as necessary to control dust emissions by means of limiting the area of exposed soils and through the use of water sprays. If dust emissions cannot be controlled by these standard measures, additional measures may be employed such as the use of a tackifier (if approved) to stabilize soil exposures or by covering exposed soil and stockpiles with tarpaulins, plastic sheeting or geotextile fabric. Otherwise cease work immediately and contact the Project Manager or the Local or Corporate Health & Safety Manager for assistance. It is not permissible for dust emissions to escape from the site and perimeter dust monitoring may be required to insure public safety.

Dust Monitoring:

Respirable Aerosol Monitors (RAM) can be used to monitor total dust levels in work zones and/or at the site perimeter. These instruments do not give specific readings of contaminant concentration (e.g. metals, asbestos, etc.). Depending upon the contaminants present, it may be mandatory for all workers to upgrade to level C protection using a half-face air-purifying respirator with HEPA (P-100) filters if dust levels cannot be adequately controlled during any of the on-site tasks. The H&A Site Safety Officer (SSO) will determine PPE upgrades based upon visual determination as necessary and the OSHA PEL for each known or suspected contaminant. The OSHA PEL/STEL for Respirable Nuisance Dust is 5 mg/m^3 (8 hour TWA).

Action levels for fugitive dust at the site perimeter are based upon the daily PM_{10} dust standard of 0.15 mg/m^3 in the National Ambient Air Quality Standard for Inhalable Dust (NAAQS).

Specific Monitoring Requirements:

VOC Monitoring:
Applicable tasks: # 1 and # 3
Frequency: Continuously in worker breathing space when soil is disturbed.
Description: In the event that soil excavation occurs, the soils will be screened using a PID (Mini Rae 2000) for the presence of volatiles

VOC Monitoring:
Applicable tasks: # 2 and # 3
Frequency: Continuously in worker breathing space during groundwater and soil vapor sampling.
Description: Air will be screened using a PID (Mini Rae 2000) for the presence of volatiles

Community Particulate and VOC Monitoring:
Applicable tasks: # 1 and # 3
Frequency: 1 reading every 15 minutes from each monitoring station.
Description: In accordance with NYSDOH generic CAMP guidance for both VOCs and particulates. Refer to the site-specific Community Air Monitoring Program

TABLE 2
Last Revised September 2002

MONITORING METHOD, ACTION LEVELS AND PROTECTIVE MEASURES

INSTRUMENT	HAZARD	ACTION LEVEL	ACTION RESPONSE
Respirable Dust Monitor	Total Particulates	> 5 mg/m^3	Upgrade to Level C Protection
OVA, HNU[2], Photovac Microtip	Total Organic Vapors	Background	Level D Protection
		10 ppm > background or lowest OSHA permissible exposure limit, whichever is lower, or as modified for this task. Sustained for >5 minutes in the breathing zone.	Upgrade to Level C - site evacuation may be necessary for specific compounds
		50 ppm over background, unless lower values required due to respirator protection factors	Cease work; upgrade to Level B[3] may be required
Explosimeter[4] (LEL)	Flammable/Explosive Atmosphere	<10% Scale Reading	Proceed with work
		10-15% Scale Reading	Monitor with extreme caution
		>15% Scale Reading	Evacuate site
0xygen Meter[5]	Oxygen-Deficient Atmosphere	19.5% - 23.5% 0_2	Normal - Continue work
		< 19.5% 0_2	Evacuate site; oxygen deficient
		> 23.5% 0_2	Evacuate site; fire hazard
Radiation Meter[6]	Ionizing Radiation	0.1 Millirem/Hour	If > 0.1, radiation sources may be present[7]
		> 1 Millirem/Hour	Evacuate site; radiation hazard
Drager Tubes	Vapors/Gases	Species Dependent > 1 ppm vinyl chloride > 1 ppm benzene > 1 ppm 1,1-DCE	Consult Table 1 or other resources for concentration toxicity/detection data. Upgrade to Level C if concentration of compounds exceed thresholds shown at left; May need to cease work if other levels exceeded - site specific
Gas Chromatograph (GC)	Organic Vapors	3 ppm total OV > background or > lowest specific OSHA permissible exposure limit, whichever is lower	On-site monitoring or tedlar bag sample collection for off-site/laboratory analysis

Notes:
1. Monitor breathing zone.
2. Can also be used to monitor some inorganic species.
3. Positive pressure demand self contained breathing apparatus
4. Lower explosive limit (LEL) scale is 0-100%. LEL for most gasses is 15%.
5. Normal atmospheric oxygen concentration at sea level is 20%
6. Background gamma radiation is ~0.01-0.02 millirems/hour.
7. Contact H&A Health and Safety staff immediately.

Calibration and Use of Equipment:

Calibrate all monitoring equipment in accordance with manufacturers requirements, H&A calibration (OP) standards and site specific requirements (e.g., at the beginning and end of each work day). Calibration of equipment shall be documented in the field notes or Daily Field Report (DFR). Documentation should include:

- Date/time
- Zero reading before calibration
- Concentration of calibration gas
- Reading obtained with calibration gas before adjusting span\
- Final reading obtained with calibration gas after adjusting span

7. DECONTAMINATION AND DISPOSAL METHODS

Personal Hygiene Safeguards:

The following minimum personal hygiene safeguards shall be adhered to:

- No smoking or tobacco products on any Hazwoper project.
- No eating or drinking in the exclusion zone.
- It is required that personnel present on site wash hands before eating, smoking, taking medication, chewing gum/tobacco, using the restroom, or applying cosmetics and before leaving the site for the day.
- It is recommended that personnel present on site shower or bathe at home at the end of each day of working on the site.

Standard Personal Decontamination Procedures:

Outer gloves and boots should be decontaminated periodically as necessary and at the end of the day. Brush off solids with a hard brush and clean with soap and water or other appropriate cleaner whenever possible. Remove inner gloves carefully by turning them inside out during removal. Wash hands and forearms frequently. It is good practice to wear work-designated clothing while on-site which can be removed as soon as possible. Non-disposable overalls and outer work clothing should be bagged onsite prior to laundering. If gross contamination is encountered on-site contact the Project Manager and LHSC to discuss proper decontamination procedures. The steps required for decontamination will depend upon the degree and type of contamination but will generally follow the sequence below.

1. Remove and wipe clean hard hat
2. Rinse boots and gloves of gross contamination
3. Scrub boots and gloves clean
4. Rinse boots and gloves
5. Remove outer boots
6. Remove outer gloves
7. Remove Tyvek coverall
8. Remove respirator, wipe clean and store
9. Remove inner gloves

Location of Decontamination Station:

N/A

Disposal of PPE:

PPE that is not grossly contaminated can be bagged and disposed in regular trash receptacles. PPE that is grossly contaminated must be bagged (sealed) and field personnel should communicate with the Project Manager to determine proper disposal.

Tools & Equipment Decontamination:

All decontamination should be conducted at the site and not at the office or lab.

Check all equipment and materials needed for decontamination of tools and other equipment.

☐ Acetone	☑ Distilled water	☐ Poly sheeting
☑ Alconox soap	☑ Drums for water	☐ Steam cleaner
☑ Brushes	☐ Hexane	☐ Tap water
☑ Disposal bags	☐ Methanol	☐ Washtubs
☑ 5 gallon pails	☑ Other Paper towels	

Standard Equipment Decontamination Procedures:

Air monitoring instrumentation and delicate instruments that are difficult to decontaminate or sensitive to water should be protected from contamination during use through the use of plastic sheeting. To the extent possible, efforts should be taken to limit the degree of contamination to hand tools and sampling equipment during use. Proper PPE must be worn while performing decontamination, including the wearing of chemical safety goggles and gloves. Storage or transport of decontamination solvents in squirt bottles is not permitted as they may discharge their contents upon ambient temperature change or leak if overturned. Standard equipment decontamination procedures are as follows. Any additional requirements are listed under Specific Equipment Decontamination Procedures below.

Pretreatment of heavily contaminated equipment may be conducted as necessary:

1. Remove gross contamination using a brush or wiping with a paper towel
2. Soak in a solution of Alconox and water (if possible)
3. Wipe off excess contamination with a paper towel
4. Clean with hexane or acetone and allow to dry

Standard decontamination procedure:

1. Wash using a solution of Alconox and water
2. Rinse with potable water
3. Rinse with methanol
4. Rinse with distilled water

Specific Equipment Decontamination Procedures:

1. Wash using a solution of Alconox and water
2. Rinse with potable water
3. Dispose of dedicated sampling equipment in drums

Standard Disposal Methods for Contaminated Materials:

Excess sample solids, decontamination materials, rags, brushes, poly sheeting, etc. that are determined to be free of contamination through field screening can usually be disposed into client-approved, on-site trash receptacles. Uncontaminated wash water may be discarded onto the ground surface away from surface water bodies in areas where infiltration can occur. Contaminated materials must be segregated into liquids or solids and drummed separately for off site disposal. Any additional requirements are listed under Specific Disposal Methods for Contaminated Materials below.

Specific Disposal Methods for Contaminated Materials:

If onsite trash receptacles are not available, excess sample solids, decontamination materials, rags, brushes, poly sheeting, etc. that are determined to be free of contamination through field screening will be disposed of in drums staged onsite for future disposal.

Disposal Methods for Contaminated Soils:

Contaminated soil cuttings and spoils must be drummed for disposal off-site unless otherwise specifically directed. Soil cuttings and spoils determined to be free of contamination through field screening can usually be returned to the boreholes or excavations from which they came. Any additional requirements are listed under Specific Disposal Methods for Contaminated Soils below.

Specific Disposal Methods for Contaminated Soils:

Large quantities of soils removed for excavation purposes will be staged on and beneath poly-sheeting prior to characterization and offsite disposal.

8. CONTINGENCY PLANNING

How H&A responds to an emergency depends on whether we are at an active facility or another other location. Many active facilities have very stringent requirements for the mitigation of emergencies. Therefore, the PM is responsible for identifying any specific requirements from the client contact.

As a rule of thumb, the following are H&A's basic responses to handling Emergencies. Typically, H&A does not mitigate emergencies. When Clients request or require specific functions such as First Aid/CPR trained personnel on site, we typically conform. Before any Project Manager or LHSC agrees to something more stringent, many issues should be considered such as training, safety, feasibility of an adequate response, insurance requirements, and much more.

Fire:

- Major Fires - Major fires will be mitigated by the local fire departments or by client's on-site fire/emergency response departments.
- Incipient Stage Fires -Incipient stage fires will be extinguished by on-site personnel using fire extinguishers. Only those who have received annual training may use an extinguisher.

Medical:

All H&A employee injuries and illnesses will be reported to the PM and to HP at hpinjuryreporting@haleyaldrich.com and documented using the Incident Reporting Form. This form is available on HANK.

- First Aid - First aid will be addressed using the on-site first aid kit. H&A employees are not required or expected to administer first aid/CPR to any H&A, Contractor, or Civilian personnel at any time and it is H&A's position that those who do are doing it on their behalf and not as a function of their job.
- Trauma - Based upon the nature of the injury, the injured party may be transported to the nearest hospital or emergency clinic by on-site personnel or by ambulance. First response to a trauma incident is to call 911 or facility security. H&A staff members are expected to assist in ancillary roles only such as directing ambulances to the scene. It is the discretion of the staff member on site whether an ambulance should be procured in remote locations where ambulance services will not be effective.

Hazardous Materials Spill:

- Small incidental spills (e.g. pint of motor oil) caused by H&A employees and/or by the contractor will be mitigated by the H&A staff member and/or the contractor.
- Large spills (e.g. large leak from heavy equipment fuel tank). The contractor is responsible for cleanup. In the event that it posses a serious human or environmental threat, the local Fire Department and/or client emergency response department will be contacted. Once emergency has been mitigated typically clean up will be provided by a vendor.

Rescue:

H&A employees will not enter any confined spaces for rescue purposes.

Weather Related Emergencies:

H&A employees and their subcontractors should be aware of potential health effects and/or physical hazards of working during inclement weather. If applicable, safeguards against the effects and hazards of heat stress, cold stress, frostbite, thunderstorms, and lightning, etc., should be included with the section pertaining to physical hazards in this HASP.

Evacuation Alarms:

Evacuation alarms and/or emergency information will be communicated among personnel on site through verbal communication.

Emergency Services:

Emergency services will be summoned via on-site or cellular phone.

Emergency Evacuation Plan:

The site evacuation plan is as follows:

1. Establish a designated meeting area to conduct a head count in the event of an emergency evacuation.
2. If the work area is not near an emergency exit, exit via the closest route and meet at the designated meeting area.
3. Notify emergency response personnel (fire, police and ambulance) of the number of missing or unaccounted for employees and their suspected location.
4. Administer first aid will in the meeting area as necessary.

Under no circumstances should any personnel re-enter the site area without the approval of the corporate H&S manager, the H&S coordinator, and the fire department official in charge.

9. HEALTH & SAFETY PLAN ACKNOWEDGMENT FORM

Note: Only H&A employees sign this page.

I hereby acknowledge receipt and briefing on this Health & Safety Plan prior to the start of on-site work and declare that I understand and agree to follow the provisions and procedures set forth herein while working on this site.

PRINTED NAME	SIGNATURE	DATE

10. PRE-JOB SAFETY CHECKLIST

The following checklist is designed to help Project Managers verify that all Health & Safety requirements are satisfied for projects involving site work and to aid in the preparation of the site-specific HASP.

Please initial and date the appropriate box once each requirement has been satisfied prior to commencement of site work.

#	Project H&S Requirements	Approval by PM or LHSC (initial each box or place NA)	Date Approved
1	Project site history has been researched and summarized, current site conditions have been determined and documentation of previous investigations, risk analyses and chemical data has been assembled and summarized.		
2	Project work scope has been outlined and potential chemical and physical hazards associated with work tasks have been identified.		
3	Task Safety Analysis has been performed and attached to the HASP.		
4	H&A personnel to be involved with the project have been identified and are current with medical surveillance, OSHA 40 hour and 8 hour refresher training. Hazwoper site supervisor requirements are satisfied.		
5	Additional training requirements have been met: e.g. nuclear density gauge, DOT, Confined Space Entry, Competent Person Training for Excavation, OSHA 10 hour certification, Railway Safety Training, etc.		
6	H&A personnel that may be required to wear a respirator are medically qualified and have current certification of fit testing.		
7	Client's additional H&S requirements have been met: e.g. facility safety orientations, safety documentation, meetings, special PPE requirements		
8	H&A subcontractors have met H&A's minimum requirements including: current OSHA 40 hour training, medical surveillance, written HASP, insurance, MSDSs.		
9	MSDSs are on site and available for chemicals on site.		
10	Safety equipment is available: e.g. flashlight, telephone, ladders, traffic cones, barricade tape, fire extinguisher, first aid kit, PPE, respiratory protection, air and dust monitoring instrumentation (calibrated), personal flotation device (PFD), 90' life line with ring, decontamination equipment, etc.		
11	HASP and supporting documentation is complete and signed by all members.		

APPENDIX A
HASP Amendment Form

This Appendix is to be used whenever there is an immediate change in the project scope that would require an amendment to the HASP. For project scope changes associated with "add-on" tasks, the changes must be made in the body of the HASP. Before changes can be made, a review of the potential hazards must be initiated by the H&A Project Manager.

Amendment No.	
Site Name:	
Work Assignment No.:	
Date:	
Type of Amendment:	
Reason for Amendment:	
Alternate Safeguard Procedures:	
Required Changes in PPE:	

Project Manager Signature: _____ Date: _____

Local Health and Safety Coordinator: _____ Date: _____

This original form must remain on site with the original HASP. If additional HASPs are in the field, it is the Project Manager's responsibility to forward a signed copy of this amendment to those who have copies.

APPENDIX B
Issuance and Compliance
Site Safety Officer Role and Responsibilities
Training Requirements

This Health & Safety Plan (HASP) has been prepared in accordance with the requirements of Title 29 the Code of Federal Regulations (CFR) Section 1910.120/1926.65 to provide guidance for the protection of onsite personnel from physical harm and chemical exposure while working at the subject site.

The specific requirements of this HASP include precautions for hazards that exist during this project and may be revised as new information is received or as site conditions change.

- This HASP must be signed by all Haley & Aldrich (H&A) staff members who will work on the project, including H&A visitors. By signing the Health and Safety Plan Acknowledgement Form personnel are acknowledging that they are aware of the specific hazards of the site and agree to follow the provisions and procedures required to safeguard themselves and others from those hazards.
- This HASP or a current signed copy must be retained at the site at all times when H&A staff members are present.
- Deviations from this HASP are not permitted without prior approval from the above signed. Unauthorized deviations may constitute a violation of H&A company procedures/policies and may result in disciplinary action.
- Revisions to this HASP must be outlined within the contents of the HASP. If immediate or minor changes are necessary, the LHSC and H&A Project Manager may use Appendix A (HASP Amendment Form), located in the back of this HASP. Any revision to the HASP requires personnel to be informed of the changes and that they understand the requirements of the change.
- This HASP is not for H&A Subcontractor use. Each subcontractor engaged is responsible for all matters relating to the health and safety of their personnel and the safe operation of their equipment. This HASP will be made available as a reference so that subcontractors are informed of the potential hazards associated with the site to the extent we are aware. Subcontractors must develop their own HASP which must be, at a minimum, at least as protective as this HASP.
- This Site Specific HASP provides only site-specific descriptions and work procedures. General safety and health compliance programs in support of this HASP (e.g., injury reporting, medical surveillance, personal protective equipment (PPE) selection, etc. are described in detail in the H&A Corporate Health and Safety Program Manual and within Standard Operating Procedures (OPs). Both the manual and OPs can be located on the Company Intranet. When appropriate, users of this HASP should always refer to these resources and incorporate to the extent possible. The manual and OPs are available to clients and regulators per request.

Site Safety Officer:

The site safety officer (SSO) is defined as the individual responsible to the employer with the authority and knowledge necessary to implement the HASP and verify compliance with applicable health and safety requirements.

The H&A Project Manager may designate any person as the site safety officer (SSO) and determines the order of authority on site. Usually the highest ranking person on site is the SSO. A site safety officer must be on site at all times. When none of the designated SSOs are present on site, the senior person for H&A on site will default to the SSO. This project has identified the following hierarchy for SSO.

1. TBD

2. _____

Site Safety Officer Roles and Responsibilities:

The SSO is responsible for field implementation of this HASP and enforcement of safety rules and regulations. SSO functions include:

- Act as H&A's liaison for health and safety issues with client, staff, subcontractors, and agencies.
- Verify that utility clearance has been performed by H&A subcontractors.
- Oversee day-to-day implementation of the HASP by H&A employees on site.
- Interact with subcontractor project personnel on health and safety matters.
- Verify use of required PPE as outlined in the HASP.
- Inspect and maintain H&A safety equipment, including calibration of air monitoring instrumentation used by H&A.
- Perform changes to HASP and document in Appendix A of the HASP as needed and notify appropriate persons of changes.
- Investigate and report on-site accidents and incidents involving H&A and its subcontractors.
- Verify that site personnel are familiar with site safety requirements (e.g., the hospital route and emergency contact numbers).
- Report accidents, injuries, and near misses to the H&A PM and Local Health and Safety Coordinator (LHSC) as needed.

The SSO will conduct initial site safety orientations with site personnel (including subcontractors) and conduct toolbox and safety meetings thereafter with H&A employees and H&A subcontractors at regular intervals and in accordance with H&A policy and contractual obligations. The SSO will track the attendance of site personnel at H&A orientations, toolbox

talks, and safety meetings. Subcontractors will document training and provide training rosters to the H&A SSO.

The SSO will report accidents such as injury, overexposure, or property damage to the Local Health and Safety Coordinator, to the Project Manager, and to the safety managers of other on-site consultants and contractors. The SSO will consult with the safety managers of other on-site consultants and subcontractors on specific health and safety issues arising over the course of the project, as needed.

Health and Safety Training Requirements:

Personnel will not be permitted to supervise or participate in field activities until they have been trained to a level required by their job function and responsibility. H&A staff members, contractors, subcontractors, and consultants who have the potential to be exposed to contaminated materials or physical hazards must complete the training described in the following sections.

The H&A Project Manager/LHSC will be responsible for maintaining and providing to the client/site manager documentation of H&A staff members' compliance with required training as requested. Records shall be maintained per OSHA requirements.

40-Hour Health and Safety Training

The 40-Hour Health and Safety Training course provides instruction on the nature of hazardous waste work, protective measures, proper use of personal protective equipment, recognition of signs and symptoms which might indicate exposure to hazardous substances, and decontamination procedures. It is required for all personnel working on-site, such as equipment operators, general laborers, and supervisors, who may be potentially exposed to hazardous substances, health hazards, or safety hazards consistent with 29 CFR 1910.120.

8-hour Annual Refresher Training

Personnel who complete the 40-hour health and safety training are subsequently required to attend an annual 8-hour refresher course to remain current in their training. When required, site personnel must be able to show proof of completion (i.e., certification) at an 8-hr refresher training course within the past 12 months.

8-Hour Supervisor Training

On-site managers and supervisors directly responsible for, or who supervise staff members engaged in hazardous waste operations, should have eight additional hours of Supervisor training in accordance with 29 CFR 1910.120. Supervisor Training includes, but is not limited to, accident reporting/investigation, regulatory compliance, work practice observations, auditing, and emergency response procedures.

Additional Training for Specific Projects

H&A personnel will ensure their personnel have received additional training on specific instrumentation, equipment, confined space entry, construction hazards, etc., as necessary to perform their duties. This specialized training will be provided to personnel before engaging in the specific work activities including:

- Client specific training or orientation
- Competent person excavations
- Confined space entry (entrant, supervisor, and attendant)
- Heavy equipment including aerial lifts and forklifts
- First aid/ CPR
- Diving certification
- Use of fall protection
- Commercial drivers license
- Use of nuclear density gauges
- Asbestos awareness