

# SITE CHARACTERIZATION WORK PLAN

**Oak Mitsui  
Site # 442052  
80 First Street  
Hoosick Falls, New York**

---

*CHA Project Number: 31861*

***Prepared for:***

*Oak Mitsui  
80 First Street  
Hoosick Falls, NY*

***Prepared by:***



*III Winners Circle  
Albany, NY 12205  
Phone: (518) 453-4500  
Fax: (518) 453-4773*

*April 2018*

## TABLE OF CONTENTS

|       |                                                           |    |
|-------|-----------------------------------------------------------|----|
| 1.0   | Introduction.....                                         | 1  |
| 2.0   | Site Background.....                                      | 2  |
| 2.1   | Site Description.....                                     | 2  |
| 2.2   | Site History .....                                        | 2  |
| 2.3   | Proposed Site Re-Use .....                                | 3  |
| 3.0   | Site Setting.....                                         | 4  |
| 3.1   | Surface Features.....                                     | 4  |
| 3.2   | Site Geology/Hydrogeology .....                           | 4  |
| 3.3   | Surrounding Properties .....                              | 4  |
| 3.4   | Previous Investigations and Reports .....                 | 4  |
| 3.4.1 | Soil .....                                                | 5  |
| 3.4.2 | Groundwater .....                                         | 5  |
| 4.0   | Proposed Site Characterization Investigation .....        | 6  |
| 4.1   | Subsurface Clearance.....                                 | 6  |
| 4.2   | Soil Boring Installation and Soil Sample Collection ..... | 7  |
| 4.3   | Proposed Sampling Analysis .....                          | 8  |
| 4.4   | Decontamination Procedure.....                            | 15 |
| 4.5   | Investigation Derived Waste.....                          | 15 |
| 4.6   | Reporting.....                                            | 15 |
| 5.0   | Field Sampling Plan.....                                  | 16 |
| 6.0   | Quality Assurance Project Plan .....                      | 17 |
| 7.0   | Health and Safety Protocols.....                          | 18 |
| 8.0   | Community Air Monitoring Program .....                    | 19 |
| 9.0   | Schedule.....                                             | 20 |

## TABLES

|          |                         |    |
|----------|-------------------------|----|
| Table 1: | Sampling Rationale..... | 10 |
| Table 2: | Project Schedule.....   | 20 |

## LIST OF FIGURES

|          |                                       |
|----------|---------------------------------------|
| Figure 1 | Site Location Map                     |
| Figure 2 | Site Plan                             |
| Figure 3 | Soil Boring Locations                 |
| Figure 4 | Soil Vapor Locations                  |
| Figure 5 | Groundwater Monitoring Well Locations |

## **APPENDICES**

|             |                                             |
|-------------|---------------------------------------------|
| Appendix A: | Field Sampling Plan (FSP)                   |
| Appendix B: | Quality Assurance Project Plan (QAPP)       |
| Appendix C: | Site Specific Health and Safety Plan (HASP) |
| Appendix D: | Community Air Monitoring Plan (CAMP)        |

---

## LIST OF ACRONYMS & ABBREVIATIONS

|        |                                                         |
|--------|---------------------------------------------------------|
| AOC    | Area of Concern                                         |
| bgs    | Below Ground Surface                                    |
| CAMP   | Community Air Monitoring Program                        |
| CHA    | CHA Consulting, Inc.                                    |
| DER    | Division of Environmental Remediation                   |
| ELAP   | Environmental Laboratory Accreditation Program          |
| ERM    | Environmental Resource Management                       |
| FSP    | Field Sampling Plan                                     |
| HASP   | Health and Safety Plan                                  |
| HSA    | Hollow Stem Auger                                       |
| IDW    | Investigation Derived Waste                             |
| IRM    | Interim Remedial Measure                                |
| MMS    | Mitsui Mining & Smelting Co., LTD                       |
| MS/MSD | Matrix Spike/Matrix Spike Duplicate                     |
| NYCRR  | New York Code, Rules and Regulations                    |
| NYSDEC | New York State Department of Environmental Conservation |
| NYSDOH | New York State Department of Health                     |
| OMI    | Oak Mitsui Industries                                   |
| OMT    | Oak Mitsui Technologies                                 |
| PCB    | Polychlorinated Biphenyls                               |
| PFAS   | Per- and Polyfluoroalkyl Substances                     |
| PID    | Photoionization Detector                                |
| PPE    | Personal Protection Equipment                           |
| QA     | Quality Assurance                                       |
| QAPP   | Quality Assurance Project Plan                          |
| QC     | Quality Control                                         |
| SC     | Site Characterization                                   |
| SCO    | Soil Cleanup Objective                                  |
| SCWP   | Site Characterization Work Plan                         |
| SVOC   | Semi-Volatile Organic Compound                          |
| TAL    | Target Analyte List                                     |
| TCL    | Target Compound List                                    |
| VOC    | Volatile Organic Compound                               |

## 1.0 INTRODUCTION

Oak Mitsui entered into an Order on Consent on September 8, 2017 with the New York State Department of Environmental Conservation (NYSDEC) for the Oak Mitsui Facility (Site), located at 80 First Street in Hoosick Falls, New York. The Site location is shown on Figure 1. The Site has been assigned Site No. 442052 and classified as a “P-Site” (sites that have the potential to be listed on the Registry of Inactive Hazardous Waste Disposal Sites) within the NYSDEC State Superfund Program. The primary goals of the Order are to appropriately characterize the contamination at the Site and implement any necessary remedial work related to on-Site contamination, including any necessary Interim Remedial Measures (IRMs). Pursuant to the Order, Honeywell has agreed to conduct the site characterization groundwater investigation and will be submitting that component of the Site Characterization Work Plan separately.

CHA Consulting (CHA) has been retained by Oak Mitsui to prepare the soils investigation component of a Site Characterization Work Plan (SCWP). This SCWP describes the investigation and technology to determine whether the Site soils pose a threat to public health and the environment. This SCWP is consistent with the guidance provided in Section 3.0 of the NYSDEC’s “Division of Environmental Remediation program policy 10 (DER-10) Technical Guidance for Site Investigation and Remediation” (May 2010). Oak Mitsui has previously proposed to remediate “hot spot” contamination of soils previously identified as exceeding the Industrial Use Soil Cleanup Objectives (SCOs).

The data derived from the SCWP will assist in achieving the primary objectives of the SCWP which is determine whether the Site poses a significant threat to public health and the environment.

To facilitate performance of the field investigation and Site Characterization (SC) activities in a manner consistent with NYSDEC protocols, CHA has also prepared the following Site-specific documents, which make up the SCWP Documents Package:

1. Field Sampling Plan (FSP) (Appendix A);
2. Quality Assurance Project Plan (QAPP) (Appendix B)
3. Health and Safety Plan (HASP) (Appendix C); and
4. Community Air Monitoring Plan (CAMP) (Appendix D).

These documents are integral to this SCWP and are referenced throughout this report.

## 2.0 SITE BACKGROUND

### 2.1 SITE DESCRIPTION

The subject property consists of approximately 7.5 acres and is located in the Village of Hoosick Falls within Rensselaer County. The Site is situated on the southern bank of the Hoosick River and is bounded to the east by the Pan Am Railroad line and to the south by residences. The Site is comprised of three (3) parcels, Tax Map Nos. 27.14-7-2, 27.14-7-3 and 27.14-8-19. According to the current Zoning Map on file with the Village of Hoosick Falls (Barton and Loguidice, D.P.C. January 2015 Draft Existing Zoning Map of the Village of Hoosick Falls), parcel 27.14-7-2 is mainly zoned Industrial except for the parking lot across First St. which is zoned Commercial-Industrial; and parcels 27.14-7-3 and 27.14-8-19 are zoned Residential. The former Oak Mitsui on-Site operations included the production of copper foil; however, between 2014 and 2015, operations at the Oak Mitsui facility ceased and in the summer of 2017 the on-Site buildings were demolished. The former building foundations have been left in place and the Site is surrounded by a chain link fence for security. The Site is currently vacant. A Site location map is provided as Figure 1 and a property boundaries map is provided as Figure 2.

### 2.2 SITE HISTORY

#### Oak Mitsui History

Oak Mitsui is a New York corporation, incorporated in 1976. At that time, Oak Industries, Inc. owned ~68.6%, Mitsui Mining & Smelting Co, LTS (MMS) ~19.1% and Anaconda Company ~12.3% of Oak Mitsui. In 1978, Anaconda sold its share of Oak Mitsui to MMS. At that time Oak Industries owned ~68.6%; and MMS ~31.4%.of Oak Mitsui. In 1986, AlliedSignal Inc. purchased the Oak Industries share of Oak-Mitsui and MMS exercised its option to increase its ownership to 49.9%. Ownership of Oak Mitsui at that time became AlliedSignal 50.1% & MMS 49.9%. In 2000, MMS purchased AlliedSignal's (then Honeywell) entire share of Oak-Mitsui. MMS then owned 100% of Oak-Mitsui.

#### Site Transfer History

Oak Mitsui acquired the 80 First Street Site by Deed from Oak Materials Group, Inc. dated March 17, 1976 and recorded on March 22, 1976 at Volume 1279, page 195 (Tax parcel 27.14-7-2). In addition, by Deed dated June 5, 1981, Oak Mitsui added to their original 1976 land purchase by acquiring an adjacent parcel from Texaco, Inc. (Tax parcel 27.14-7-3). Later in 1986, OMI acquired another adjoining property, this time from the Boston & Maine Corporation (Tax parcel 27.14-8-19). Together, these 3 parcels comprise the existing 80 First Street Site.

#### Site Use History

According to Sanborn Fire Insurance maps, the subject Site was historically utilized for industrial purposes dating back to the late 1800's. Previous operations included a coal gas manufacturing facility (Hoosick Falls Gaslight Co. then Fidelity Gas Co.) from at least 1884 to at least 1910 on the western side of the site; and a foundry, a machine shop, a paper mill machine manufacturing facility (Nobel and Wood Machine

Co.) from at least 1910 to 1976 on the eastern side of the property. Oak Mitsui has occupied the Site since 1976 and the primary business of Oak Mitsui has been the manufacturing of electrodeposited copper foil.

From 1977 to 2001, the Site was used for high volume manufacturing of copper foil and administrative offices. From mid-2001 to 2015, the Site was used for administrative offices and other activities as follows:

- From 2005 to 2010, the Site was used for pilot scale (research and development) copper foil electroplating. This process utilized some of the copper foil manufacturing equipment still at the Site from the high-volume manufacturing period.
- From 2003 to 2015, an Oak Mitsui subsidiary, Oak Mitsui Technologies LLC (OMT) produced FaradFlex products at the 80 First Street Site. FaradFlex is produced by using heat & pressure to bond 2 pieces of adhesive coated copper foil to either side an insulating film. The adhesive coated copper foil was purchased from suppliers in Japan & Malaysia. The insulating film was also purchased from overseas suppliers. A large heated hydraulic press was installed along with other sheeting & collating equipment to manufacture this product.
- In 2015, the FaradFlex manufacturing operations were moved to Malaysia. Remaining administration staffs were moved to leased office space at 8 John Street, Hoosick Falls. Oak Mitsui ceased plant operations and in the summer of 2017, site buildings were demolished.

## **2.3 PROPOSED SITE RE-USE**

There are currently no plans to redevelop the property. Oak Mitsui plans to investigate and remediate “hot spots” previously identified and any additional remediation that may be necessary (i.e. IRMs, cap/cover system) at the Site, install security measures (i.e. fencing) and maintain ownership of the Site indefinitely.

## **3.0 SITE SETTING**

### **3.1 SURFACE FEATURES**

The three main parcels primarily consist of former building foundations surrounded by asphalt and chain link fencing. A portion of the largest parcel (27.14-7-2) is located immediately to the south of First St and is currently an asphalt parking area with a temporary work trailer, surrounded by a chain link fence. Another portion of the largest parcel is located east of the railroad line and is a vacant grassy lot. (Figure 2).

### **3.2 SITE GEOLOGY/HYDROGEOLOGY**

According to recent areas studies as well as a 2016 on-Site investigation, shallow groundwater is found in poorly sorted silt, sand, gravel and fill materials at an average depth of 12 feet below grade. A thick layer of less permeable glacial deposits (silt-rich clay) is situated between shallow groundwater and a deeper overburden aquifer, which consists of sand and gravel. Bedrock was not encountered during the previous on-Site investigation; however, based on area studies completed by Environmental Resource Management (ERM), the depth to bedrock is variable and was encountered at a maximum depth of approximately 110 feet below ground surface.

Groundwater generally occurs within the subsurface at average depths of approximately 9 feet to 16 feet bgs across the Site. Based on 2017 quarterly sampling events conducted by CHA, the groundwater generally flows in a northerly direction towards the Hoosic River. The water level variations throughout the year are most likely seasonal and do not indicate a change in the groundwater flow direction, which is continually to the north.

### **3.3 SURROUNDING PROPERTIES**

Surrounding property uses are mainly residential to the south and a rail line immediately to the east. The Hoosic River borders the Site to the north and west.

### **3.4 PREVIOUS INVESTIGATIONS AND REPORTS**

CHA completed a Phase 1 and Phase 2 Limited Subsurface Environmental Investigation at the Site in 2016. The investigation objective was to evaluate groundwater conditions and subsurface conditions in the sub-slab soils beneath areas of former operations, general chemical storage, hazardous waste storage and certain building features (i.e. trenches, sumps). The investigation was completed to assist in determining the future use of the Site and the possible need for remediation during or after building demolition. Samples were analyzed for a variety of parameters including metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). The sample results and findings are discussed below.

### **3.4.1 Soil**

The results of the Phase 1 and Phase 2 investigations suggest that metal contamination exists in the shallow soils (0-8 feet bgs) located beneath the former on-Site building and areas surrounding the building. The metal concentrations are most likely due to on-Site operations and historical industrial uses dating back to the late 1800's. In addition, low levels of SVOCs were also detected in the shallow soils in limited areas of the Site. The SVOC concentrations are most likely attributed to the historic fill that was observed in the subsurface during this investigation.

Based on the results of the Phase 1 and Phase 2 investigations, the areas of highest metal concentrations (exceeding Industrial SCOs) within the subsurface soils include the areas of Treater 2 & 3, Treater 4 & 5, Drum Deck Area, Dissolving Area (Filter Side), QA Lab Area, 11-20 Spent Tank Area, Waste Water Treatment Area and MW-2 Area (Figure 3). It should be noted that the detected metal concentrations decreased with depth, except in a few locations.

### **3.4.2 Groundwater**

Four groundwater wells were installed in the uppermost unconfined aquifer across the Site as part of the Phase 2 investigation. The wells were sampled as part of the 2016 investigation and again quarterly in 2017. The groundwater samples collected from MW-1 through MW-4 were analyzed for arsenic, chromium, copper, lead, zinc, mercury (both unfiltered and filtered) and pH. The analytical results from each monitoring event indicate that the metal compounds within the groundwater were either non-detect or below the NYSDEC Technical & Operational Guidance Series (TOGS) 1.1.1 values, indicating the metal compounds detected within the shallow soils have not affected the quality of the on-Site groundwater. The pH levels for the groundwater samples ranged from 6.7 to 7.3.

## 4.0 PROPOSED SITE CHARACTERIZATION INVESTIGATION

The SC will be performed in accordance with this SCWP and will involve the fieldwork necessary to complete the soils investigation component of the Site characterization. Based on a review of previous environmental investigation reports for the Oak Mitsui Facility, several data gaps have been identified that require additional investigation. These include the following:

- Additional characterization of subsurface soils needed to more fully determine the nature and extent of known and potential contamination;
- Additional characterization for Target Compound List (TCL) VOCs , TCL SVOCs (including 1,4-Dioxane), TCL Pesticides, PCBs, Target Analyte List (TAL) Metals, total Cyanide, and Per- and Poly-fluoroalkyl substances (PFAS) compounds; and
- Additional Site-wide characterization of groundwater (will be addressed by Honeywell's consultant, ERM).

The SC will assist in identifying any additional areas of concern at the Site and help determine if the Site poses a significant threat to public health and the environment. The proposed investigation activities include utility clearance, the installation of a series of soil borings and groundwater monitoring wells, along with the subsequent collection and analysis of soil and groundwater samples for parameters of concern. The installation of groundwater monitoring wells and groundwater sampling will be addressed under separate SC Work Plan prepared by ERM for Honeywell.

The investigative activities are briefly summarized in the following sections and described in further detail in the FSP. Samples will be collected and analyzed in accordance with field sampling procedures and protocols as described in the FSP (Appendix A). Quality Assurance/Quality Control (QA/QC) samples will be collected and analyzed in accordance with the QAPP (Appendix B).

For SC purposes, the Site has been split into two (2) areas, the East Side and the West Side. The division was determined based on previous on-Site operations; the East Side SC activities focus on the area of the historic Oak Mitsui operations, and the West Side SC activities focus on the area of the historic coal gas manufacturing operations of the Hoosick Falls Gas Light Company and later the Fidelity Gas Company (Figure 4).

### 4.1 SUBSURFACE CLEARANCE

Prior to the boring installations activities, a geophysical subsurface survey will be completed in the areas of each proposed boring. An electromagnetic metal detector, ground penetration radar (GPR) and utility locating instruments will be used within a 10 foot radius of each proposed boring location to identify detectable subsurface utilities and/or structures. All detected utilities and anomalies will be clearly marked on the ground surface with spray paint. Proposed boring locations may be adjusted based on the results of the subsurface clearance survey. Hand clearing will be completed by the drilling contractor if the geophysical subsurface survey techniques are unsuccessful or yield inconclusive results.

## 4.2 Soil Boring Installation and Soil Sample Collection

As part of the SC, up to thirty (30) borings are proposed for installation; 21 on the East Side, 9 on the West Side, using a track-mounted Geoprobe hydraulic-push equipment. Proposed soil boring locations are shown on Figure 4.

Soil samples will be collected continuously from grade to a maximum depth of 16 feet bgs (approximate depth to groundwater in some areas) in four foot intervals using a Macrocore® sampling device. Each soil sample will then be screened in the field for visual, olfactory, and photoionic evidence of contamination. Soils will be logged in the field using a modified Burmeister soil classification method on Soil Probe Logs in accordance with the FSP. To facilitate soil borings SC021 and SC024, shallow test pits will be dug in the vicinity of the former gas holders in an effort to determine the location of the outer rim margin, an area determined to contain the highest likelihood of contamination.

Immediately upon opening the soil sampler, a photoionization detector (PID) will be used to obtain readings along the length of the soil sample. Following this screening, the soils within the soil sampler will be measured, described and photographed. As applicable, soil samples for laboratory analysis will be collected from each borehole in accordance with the following protocols:

1. In the unsaturated zone, soil samples will be collected from each test boring location at the following depth intervals: immediately above the water table; at soil mottling zones; at the fill/native soil interface; and at major stratigraphic changes- in consultation with the NYSDEC representative. In the event that none of the mottling, interface, or stratigraphic features are encountered at the depths explored, a soil sample from the interval immediately above the water table may be collected for laboratory analysis, or at other depths at the discretion of the on-Site NYSDEC representative.
2. In the instance where elevated PID meter readings, oily liquid, strongly odoriferous soils/fill, staining, etc. are noted in soils above the water table, a sample of the representative soil may be collected for laboratory analysis, or at other depths at the discretion of the on-Site NYSDEC representative.

In general, a minimum of one soil sample from each soil boring location will be submitted to an off-Site NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory for a select set of parameters as described in Table 1 below and summarized in Section 4.2. More than one sample from each soil boring may be submitted for analysis if required by the NYSDEC or if field conditions warrant additional samples.

It should be noted that a limited number of characterization samples (S100, B107, B101, S126 as shown on Figure 4) will be collected without the installation of borings and instead sampling will occur during IRM excavation activities. Any characterization soil samples collected during the IRM activities will be completed in accordance with the NYSDEC approved IRM Work Plan dated November 2017.

### 4.3 Proposed Sampling Analysis

Table 1 presents a summary of the proposed sampling and analysis plan, including the sample identifications, depths (if applicable), analytical parameters, and detailed sampling rationale. QA/QC samples will be collected according to the QAPP, included as Appendix B. Proposed sample locations are presented on Figure 3. At least one soil sample will be collected from each of the thirty (30) soil borings installed. Below is a summary of the parameters to be analyzed from each soil sample.

#### **East Side:**

- A. TAL metals will be collected from all twenty-one (21) borings;
- B. Target Compound List (TCL) SVOCs, Pesticides, PCBs, total Cyanide, PFAS, and 1,4-dioxane will be collected at a minimum of six (6) of boring locations (approximately 30% of the samples);
- C. TCL VOCs will be collected at a minimum of five (5) of the boring locations (approximately 30% of the samples); and
- D. TCL VOC s will also be collected at all three boring points along the northern property line (SOIL-SC001 through SOIL-SC003).

Field conditions may warrant additional sample collection from each boring. An additional nine (9) soil samples may be collected for the analysis described under (A), three (3) for the analysis described under (B), three (3) for the analysis described under (C), and one (1) for the analysis described under (D).

#### **West Side:**

- a. TCL VOCs, TCL SVOCs, Pesticides, PCBs, and total Cyanide will be collected at all nine (9) boring locations; and
- b. PFAS, 1,4-dioxane, and TAL metals will be collected at a minimum of three (3) of the boring locations (approximately 30% of the samples).

Field conditions may warrant additional sample collection from each boring. An additional five (5) soil samples may be collected for the analysis described under (a) and two (2) additional samples may be collected for the analysis described under (b).

In addition to the soil samples described above, two duplicate samples and two matrix spike/matrix duplicate (MS/MSD) samples will be collected in accordance with the QAPP.

It should be noted that the PFAS samples from both the East and West Sides will be analyzed via EPA Method 537 which will include the following analytes:

- 1H,1H,2H,2H-perfluorooctane sulfonate (6:2), Abbr. 6:2 FTS, CAS No. 27619-97-2
- 1H,1H,2H,2H-perfluorodecane sulfonate (8:2), Abbr. 8:2 FTS, CAS No. 39108-34-4
- N-ethyl perfluorooctanesulfonamidoacetic acid, Abbr. N-EtFOSAA, CAS No. 2991-50-6

- N-methyl perfluorooctanesulfonamidoacetic acid, Abbr. N-MeFOSAA, CAS No. 2355-31-9
- Perfluorobutanesulfonic acid, Abbr. PFBS, CAS No. 375-73-5
- Perfluorobutanoic acid, Abbr. PFBA, CAS No. 375-22-4
- Perfluorodecanesulfonic acid, Abbr. PFDS, CAS No. 335-77-3
- Perfluorodecanoic acid, Abbr. PFDA, CAS No. 335-76-2
- Perfluorododecanoic acid, Abbr. PFDaA, CAS No. 307-55-1
- Perfluoroheptanesulfonic acid, Abbr. PFHpS, CAS No. 375-92-8
- Perfluoroheptanoic acid, Abbr. PFHpA, CAS No. 375-85-9
- Perfluorohexanesulfonic acid, Abbr. PFHxS, CAS No. 355-46-4
- Perfluorohexanoic acid, Abbr. PFHxA, CAS No. 307-24-4
- Perfluorononanoic acid, Abbr. PFNA, CAS No. 375-95-1
- Perfluorooctanesulfonamide, Abbr. FOSA, CAS No. 754-91-6
- Perfluorooctanesulfonic acid, Abbr. PFOS, CAS No. 1763-23-1
- Perfluorooctanoic acid, Abbr. PFOA, CAS No. 335-67-1
- Perfluoropentanoic acid, Abbr. PFPeA, CAS No. 2706-90-3
- Perfluorotetradecanoic acid, Abbr. PFTA or PFTeDA, CAS No. 376-06-7
- Perfluorotridecanoic acid, Abbr. PFTriaA or PFTTrDA, CAS No. 72629-94-8
- Perfluoroundecanoic acid, Abbr. PFUA or PFUdA, CAS No. 058-94-8

**Table 1: Sampling Rationale**

| <b>Sample ID</b> | <b>Matrix</b> | <b>Sample Depth(s)</b>                                                           | <b>Sample Location</b> | <b>Analytical Parameters</b>                                                        | <b>Rationale</b>                                                                                                        |
|------------------|---------------|----------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| SOIL-SC001       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals, TCL VOCs                                                                | To investigate the potential for contamination at the former Oak Mitsui site operations including chlorinated solvents. |
| SOIL-SC002       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination at the former Oak Mitsui site operations including chlorinated solvents. |
| SOIL-SC003       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals, TCL VOCs                                                                | To investigate the potential for contamination at the former Oak Mitsui site operations including chlorinated solvents. |
| SOIL-SC004       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination at the former Oak Mitsui site operations.                                |
| SOIL-SC005       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations.                                |
| SOIL-SC006       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations.                                |
| SOIL-SC007       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination at the former Oak Mitsui site operations.                                |

| Sample ID  | Matrix | Sample Depth(s)                                                                  | Sample Location | Analytical Parameters                                                               | Rationale                                                                                |
|------------|--------|----------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| SOIL-SC008 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations. |
| SOIL-SC009 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination at the former Oak Mitsui site operations. |
| SOIL-SC010 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations. |
| SOIL-SC011 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations. |
| SOIL-SC012 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations. |
| SOIL-SC013 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations. |
| SOIL-SC014 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations. |

| Sample ID  | Matrix | Sample Depth(s)                                                                  | Sample Location | Analytical Parameters                                                               | Rationale                                                                                                                          |
|------------|--------|----------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| SOIL-SC015 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations.                                           |
| SOIL-SC016 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations.                                           |
| SOIL-SC017 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations.                                           |
| SOIL-SC018 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination at the former Oak Mitsui site operations.                                           |
| SOIL-SC019 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations.                                           |
| SOIL-SC020 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane, TAL Metals | To investigate the potential for contamination at the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC021 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination at the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |

| <b>Sample ID</b> | <b>Matrix</b> | <b>Sample Depth(s)</b>                                                           | <b>Sample Location</b> | <b>Analytical Parameters</b>                                                        | <b>Rationale</b>                                                                                                                   |
|------------------|---------------|----------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| SOIL-SC022       | Soil          | Interval which indicates the highest potential for the presence of contamination | West Side              | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination at the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC023       | Soil          | Interval which indicates the highest potential for the presence of contamination | West Side              | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination at the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC024       | Soil          | Interval which indicates the highest potential for the presence of contamination | West Side              | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination at the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC025       | Soil          | Interval which indicates the highest potential for the presence of contamination | West Side              | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane, TAL Metals | To investigate the potential for contamination at the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC026       | Soil          | Interval which indicates the highest potential for the presence of contamination | West Side              | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination at the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC027       | Soil          | Interval which indicates the highest potential for the presence of contamination | West Side              | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination at the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC028       | Soil          | Interval which indicates the highest potential for the presence of contamination | West Side              | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane, TAL Metals | To investigate the potential for contamination at the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |

| Sample ID                         | Matrix | Sample Depth(s)                                                                  | Sample Location | Analytical Parameters                                                               | Rationale                                                                                                                                                         |
|-----------------------------------|--------|----------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SOIL-SC029                        | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination at the former Oak Mitsui site operations.                                                                          |
| SOIL-SC030                        | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination at the former Oak Mitsui site operations.                                                                          |
| SOIL-DUP-SC001                    | Soil   | TBD                                                                              | East Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | Per QAQC procedures, two blind duplicate samples will be collected with selected soil samples to determine the precision of laboratory analysis.                  |
| SOIL-DUP-SC002                    | Soil   | TBD                                                                              | West Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | Per QAQC procedures, one matrix spike (MS) sample is required for every 20 samples (including duplicate samples and field or equipment blank samples).            |
| SOIL-MS - SC001<br>SOIL-MSD-SC001 | Soil   | TBD                                                                              | East Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | Per QAQC procedures, one matrix spike (MS) sample is required for every 20 samples (including duplicate samples and field or equipment blank samples).            |
| SOIL-MS - SC002<br>SOIL-MSD-SC002 | Soil   | TBD                                                                              | West Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | Per QAQC procedures, one matrix spike duplicate (MSD) sample is required for every 20 samples (including duplicate samples and field or equipment blank samples). |

#### **4.4 Decontamination Procedure**

Decontamination procedures related to the investigative activities at the Site are described in the FSP, included as Appendix A.

#### **4.5 Investigation Derived Waste**

Investigation Derived Waste (IDW) generated during the investigation will include soil cuttings and decontamination water, as well as empty soil jars, personal protective equipment (PPE) and other project-related waste. Handling procedures for the IDW have been outlined in the FSP, included as Appendix A.

#### **4.6 Reporting**

A SC Report will be prepared to summarize the information generated during implementation of this SCWP. The report will be prepared in accordance with the New York State Department of Environmental Conservation's "DER-10 Technical Guidance for Site Investigation and Remediation" (May 2010).

The report will also include the following information and data pertaining to the Site:

1. Soil boring installation/field sampling logs.
2. Tables summarizing the analytical data for soil collected, including comparisons to appropriate standards, criteria, and guidance (e.g., Title 6 New York Codes, Rules, and Regulation (NYCRR) Subpart 375 Soil Cleanup Objectives).
3. A discussion regarding the existence or non-existence of subsurface contamination.
4. A narrative that summarizes the results of the investigation including a discussion of the physical and analytical results.
5. A characterization of the soil, to allow for the confirmation of the source(s) of the contamination, movement of the contamination, and possible receptors at risk.
6. Figures showing the locations of the borings installed at the Site.
7. A qualitative exposure assessment for contamination, if any, emanating from the Site.
8. Conclusions and recommendations regarding the environmental status of the Site.

## **5.0 FIELD SAMPLING PLAN**

The work described in this SCWP will be performed in accordance with the FSP that has been developed for this project. The FSP details the specific sampling objectives, procedures, and protocols associated with this project.

A copy of the FSP is provided in Appendix A.

## **6.0 QUALITY ASSURANCE PROJECT PLAN**

A QAPP has also been prepared for the site investigation activities. The QAPP presents the policies, organization, objectives, functional activities and specific QA and QC activities designed to achieve the specific data quality goals associated with the SCWP that will be conducted at the Site.

A copy of the QAPP is provided in Appendix B.

## **7.0 HEALTH AND SAFETY PROTOCOLS**

A Site-specific HASP was prepared following an assessment of known physical and chemical hazards present at the Site and an evaluation of the risks associated with the assessment and remedial actions. Available Site information was examined and adequate warnings and safeguards for field personnel were selected and implemented. All CHA field personnel are required to review and sign the HASP before entering the field. Subcontractors to CHA are required to develop and implement their own HASP.

A copy of the Site-specific HASP is provided in Appendix C.

## **8.0 COMMUNITY AIR MONITORING PROGRAM**

A CAMP has been prepared 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 the proposed remedial investigation activities. Air monitoring will be conducted in general accordance with the New York State Department of Health (NYSDOH) *Generic Community Air Monitoring Plan*.

A copy of the Site-specific CAMP is provided in Appendix D.

## 9.0 SCHEDULE

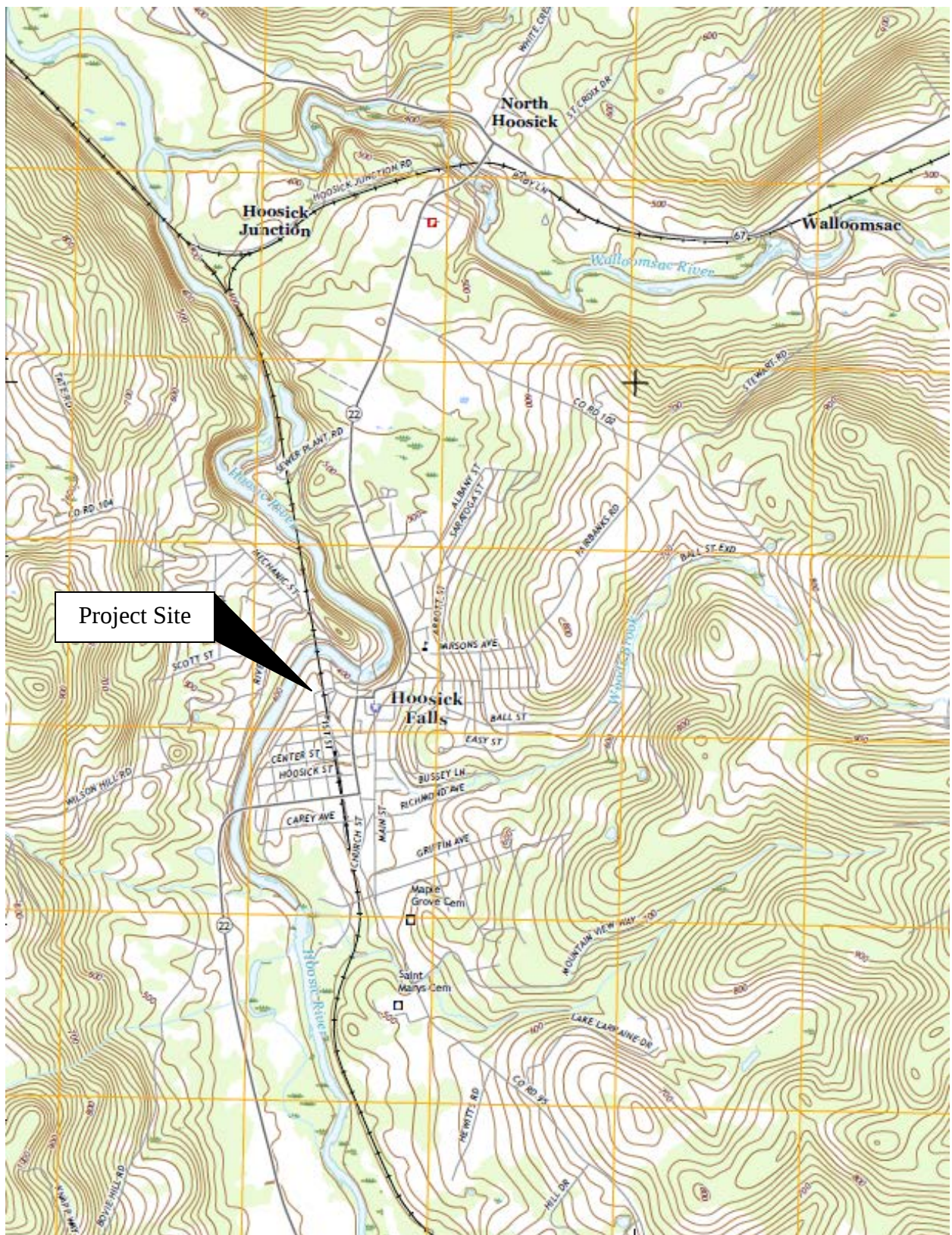
The following provides a proposed schedule for the completion of remedial activities specified in this Work Plan. The overall progress of the project will be dependent upon a number of factors including, but not limited to, NYSDEC review and approval timeframes, time of year at which the final design documents are complete, weather conditions at the time of remedial construction, etc.

**Table 2: Project Schedule**

| DESCRIPTION                              | ESTIMATED<br>START | ESTIMATED<br>FINISH |
|------------------------------------------|--------------------|---------------------|
| NYSDEC Review & Approval of SC Work Plan | November 8, 2017   | May 2018            |
| Implementation of SC field activities    | May 2018           | June 2018           |
| Preparation of the SC Report             | June 2018          | August 2018         |

The NYSDEC will be notified at least 7 days prior to the proposed initiation of the field activities to be conducted in support of the SCWP activities.

## FIGURES



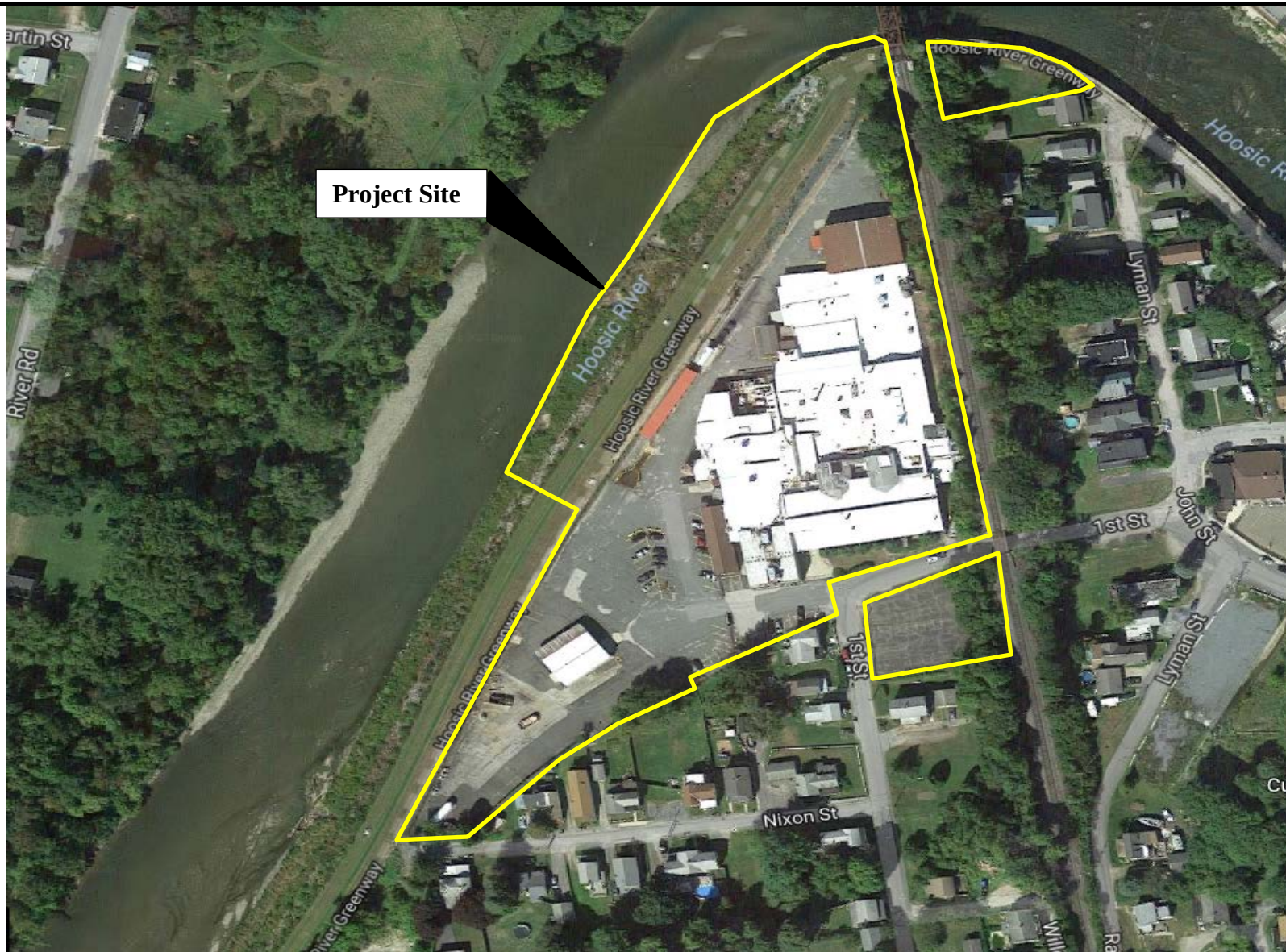
SOURCE: USGS MapViewer



NOT TO SCALE

DATE: September 2017

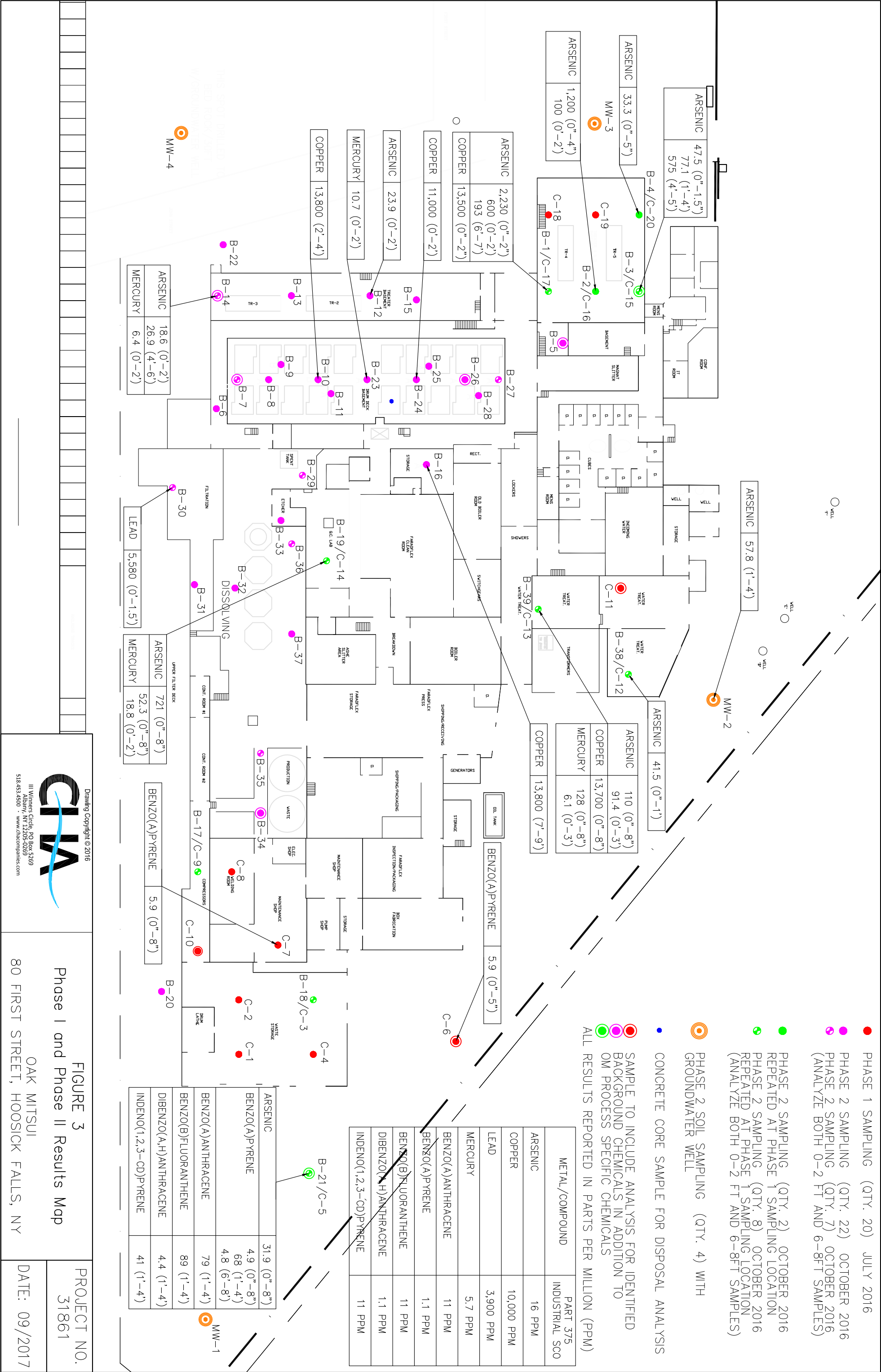
**FIGURE 1**  
**SITE LOCATION MAP**  
 80 FIRST STREET  
 HOOSICK FALLS,  
 RENSSELAER COUNTY, NEW YORK



MAP NOT TO SCALE

DATE: September 2017

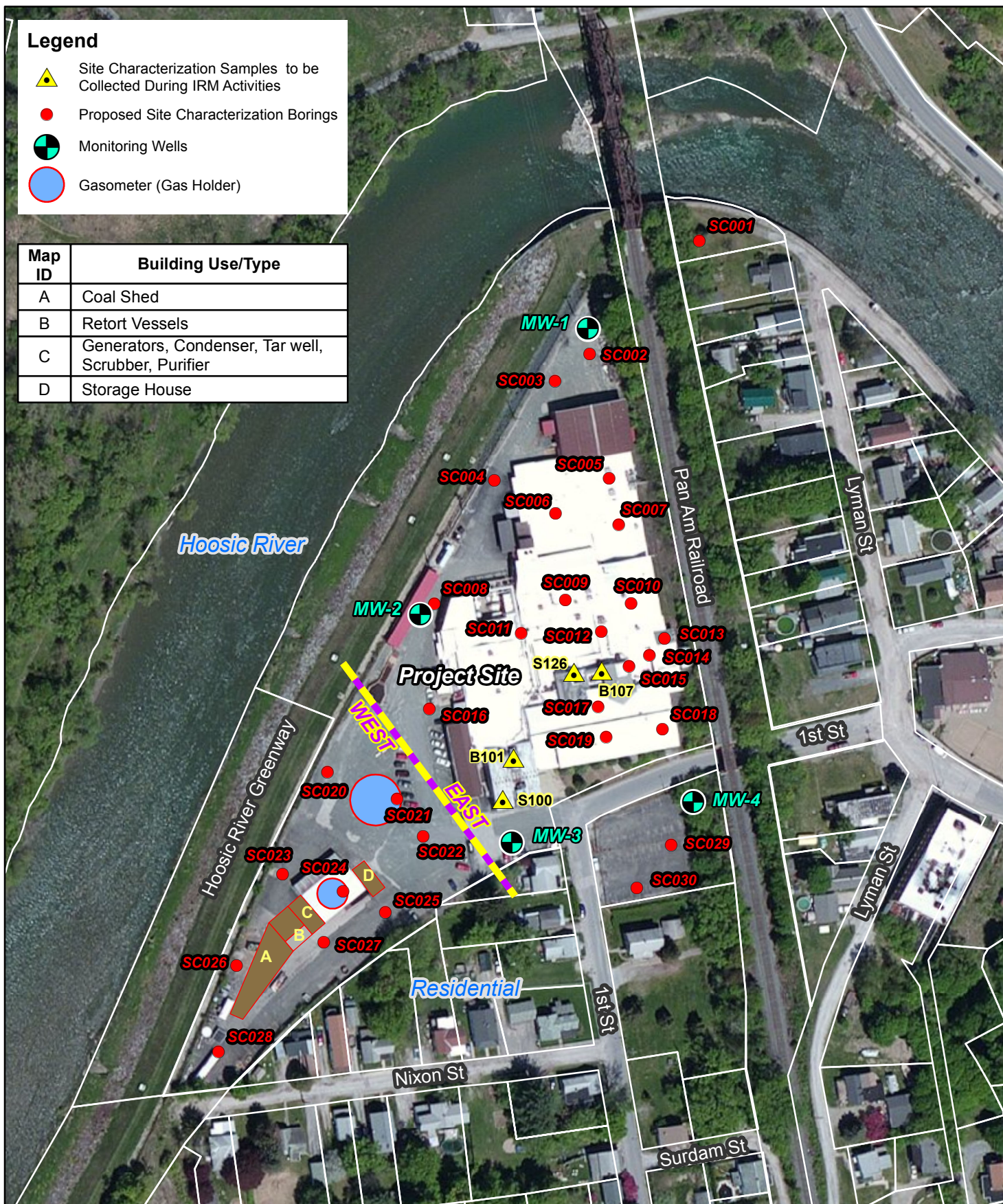
**FIGURE 2**  
**SITE PLAN**  
 80 FIRST STREET  
 HOOSICK FALLS  
 RENSSELAER COUNTY, STATE OF NEW YORK



## Legend

-  Site Characterization Samples to be Collected During IRM Activities
-  Proposed Site Characterization Borings
-  Monitoring Wells
-  Gasometer (Gas Holder)

| Map ID | Building Use/Type                                   |
|--------|-----------------------------------------------------|
| A      | Coal Shed                                           |
| B      | Retort Vessels                                      |
| C      | Generators, Condenser, Tar well, Scrubber, Purifier |
| D      | Storage House                                       |



**Figure 4 - Proposed Boring & Sampling Locations**  
 Oak Mitsui  
 80 First Street  
 Hoosick Falls, New York



**CIA**  
 design/construction solutions

Scale 1" = 150'

Project No.  
 31861

Image Courtesy of USGS and Earthstar Geographics SIO © 2014 Nokia ©  
 Photo Date: 8/13/2014

## **APPENDIX A**

### **Field Sampling Plan**

# FIELD SAMPLING PLAN

**Oak Mitsui  
Site #442052  
80 First Street  
Hoosick Falls, New York**

---

---

*CHA Project Number: 31861*

***Prepared for:***

*Oak Mitsui  
80 First Street  
Hoosick Falls, NY*

***Prepared by:***



*III Winners Circle  
Albany, NY 12205  
Phone: (518) 453-4500  
Fax: (518) 453-4773*

*April 2018*

## TABLE OF CONTENTS

|       |                                  |   |
|-------|----------------------------------|---|
| 1.0   | Introduction.....                | 1 |
| 2.0   | General Sampling Protocols ..... | 2 |
| 2.1   | Sample Designation .....         | 2 |
| 2.2   | Sample Handling.....             | 2 |
| 2.3   | Field Documentation.....         | 2 |
| 3.0   | Investigation Activities .....   | 4 |
| 3.1   | Soil Borings .....               | 4 |
| 3.2   | Survey .....                     | 5 |
| 4.0   | Equipment Decontamination .....  | 6 |
| 4.1.1 | Small Equipment.....             | 6 |
| 4.1.2 | Large Equipment.....             | 6 |
| 5.0   | Investigation Derived Waste..... | 7 |

## FIGURES

|           |                                        |
|-----------|----------------------------------------|
| Figure 1: | Site Location Map                      |
| Figure 2: | Site Plan                              |
| Figure 3: | Proposed Boring and Sampling Locations |

## TABLES

|          |                    |
|----------|--------------------|
| Table 1: | Sampling Rationale |
|----------|--------------------|

## APPENDICES

|             |                                   |
|-------------|-----------------------------------|
| Appendix A: | CHA Standard Operating Procedures |
|-------------|-----------------------------------|

## LIST OF ACRONYMS & ABBREVIATIONS

|        |                                                         |
|--------|---------------------------------------------------------|
| bgs    | Below Ground Surface                                    |
| CHA    | CHA Consulting, Inc.                                    |
| ELAP   | Environmental Laboratory Accreditation Program          |
| FSP    | Field Sampling Plan                                     |
| HASP   | Health and Safety Plan                                  |
| NYSDEC | New York State Department of Environmental Conservation |
| NYSDOH | New York State Department of Health                     |
| PCB    | Polychlorinated Biphenyls                               |
| PFAS   | Per/Poly-fluoroalkyl Substances                         |
| PID    | Photoionization Detector                                |
| QAPP   | Quality Assurance Project Plan                          |
| SOP    | Standard Operating Procedure                            |
| SVOC   | Semi-Volatile Organic Compound                          |
| TAL    | Target Analyte List                                     |
| TCL    | Target Compound List                                    |
| VOC    | Volatile Organic Compound                               |

## 1.0 INTRODUCTION

This Field Sampling Plan (FSP) has been prepared for the Oak Mitsui Facility (Site), located at 80 First Street, in Hoosick Falls, New York, and is to be utilized during implementation of the Site Characterization Work Plan (SCWP) for the Site. Work associated with the given site characterization program is governed by the Order on Consent and Administrative Settlement executed on September 8, 2017 between Oak Mitsui and the New York State Department of Environmental Conservation (NYSDEC). The Site is being tracked as a “potential” Site (P-Site) by the NYSDEC under the name Former Oak Mitsui- First Street and with the Site ID Number 442052. . The Site location is shown on Figure 1. A Site plan is provided as Figure 2.

This FSP outlines the protocols which will be followed during the SCWP activities and has been prepared as an appendix to the SCWP for the project. In general, all activities will be performed in accordance with the CHA Consulting, Inc. (CHA) Standard Operating Procedures (SOP’s) that are included in Appendix A.

The following activities will be conducted as part of the site investigation activities:

- Installation of soil borings;
- Collection of subsurface soil samples;
- Equipment cleaning; and
- Waste handling.

## **2.0 GENERAL SAMPLING PROTOCOLS**

The sampling approach and rationale for sample collection is described in the SCWP. The Data Quality Objectives for the project and the quality assurance and quality control procedures for the project are described in the Quality Assurance Project Plan (QAPP), found in Appendix B of the SCWP. Sampling activities will be conducted in a manner to protect both workers and the general public in accordance with the Health and Safety Plan (HASP), found in Appendix C of the SCWP.

### **2.1 SAMPLE DESIGNATION**

Subsurface soil samples will be identified in accordance with CHA SOP#103 Sample Naming and Numbering. In summary, each sample will be uniquely defined by including the media type and sequential number. To avoid confusion with samples collected prior to this SCWP, CHA will start each soil boring with the prefix SOIL-SC on all media types (e.g. SOIL-SC001).

### **2.2 SAMPLE HANDLING**

A new pair of disposable nitrile gloves will be used at each location sampled for chemical analyses. Additional glove changes will be undertaken as conditions warrant. All proper PFAS sampling protocol, as described in CHA SOP#341, will be implemented during the collection of the PFAS samples.

Sample containers will be new and delivered from the laboratory prior to the sampling event. Sample containers will come with the proper volume of chemical preservative appropriate for the type of analysis as detailed in CHA SOP#603. Specific containers (HDPE or polypropylene unlined containers) will be provided by the lab in separate cooler for the per-and poly-fluoroalkyl substances (PFAS) soil samples. Samples for PFAS will be collected in accordance with CHA SOP#341.

After sample collection, the sample containers will be logged onto a chain of custody record described in the QAPP. The sample containers will be placed on ice and/or ice packs in laboratory-supplied rigid coolers after collection and labeling. Remaining space will be filled with packing material to cushion the containers during transportation or shipment.

For this project CHA staff will hand deliver the sample coolers to the Alpha Analytical, Inc. Service Center located in Albany, New York, or coordinate with their courier service.

Samples will remain under the control of CHA's field representative until relinquished to the laboratory or commercial courier under chain-of-custody (see QAPP).

### **2.3 FIELD DOCUMENTATION**

Pertinent field survey and sampling information shall be recorded in a logbook or on field logs during each day of the field effort per CHA SOP#101 Field Logbook and Photographs.

At a minimum, entries in a logbook shall include:

- Date and time of starting work
- Names of all personnel at site

- Weather conditions
- Purpose of proposed work effort
- Sampling equipment to be used and calibration of equipment
- Description of work area
- Location of work area, including map reference
- Details of work effort, particularly any deviation from the field operations plan or standard operating procedures
- Field observations
- Field measurements (e.g., photoionization detector (PID) readings)
- Field laboratory analytical results
- Daily health and safety entries, including levels of protection
- Type, number, and location of samples
- Sampling method, particularly deviations from the standard operating procedures
- Sample location and number
- Sample handling, packaging, labeling, and shipping information (including destination)

In addition to keeping logs, photographs will be taken to provide a physical record to augment the fieldworker's written observations. For each photograph taken, several items shall be recorded in the field logbooks:

- Date and time
- Name of photographer
- General direction faced and description of the subject

Additional protocols specific to each sampling method are presented in the following sections.

## **3.0 INVESTIGATION ACTIVITIES**

### **3.1 SUBSURFACE CLEARANCE**

Prior to the boring installations activities, a geophysical subsurface survey will be completed in the areas of each proposed boring. An electromagnetic metal detector, ground penetration radar (GPR) and utility locating instruments will be used within a 10 foot radius of each proposed boring location to identify detectable subsurface utilities and/or structures. All detected utilities and anomalies will be clearly marked on the ground surface with spray paint. Proposed boring locations may be adjusted based on the results of the subsurface clearance survey. Hand clearing will be completed by the drilling contractor if the geophysical subsurface survey techniques are unsuccessful or yield inconclusive results.

### **3.2 Soil Borings**

As part of the SCWP, a minimum of thirty (30) borings will be installed using either track-mounted Geoprobe hydraulic-push equipment or hollow-stem auger (HSA) drilling equipment. Proposed soil boring locations are shown on Figure 3 and further described in the SCWP. The soil borings will be advanced to a maximum of sixteen (16), feet below ground surface (bgs). To facilitate soil borings SC021 and SC024, shallow test pits will be dug in the vicinity of the former gasometers in an effort to determine the location of the outer rims, an area determined to contain the highest likelihood of contamination.

Soil samples will be collected continuously from grade to final depth using either a Macrocore® sampling device or a split-spoon sampler. The soil samples will then be screened in the field for visual, olfactory, and photoionic evidence of contamination. Soils will be logged in the field using a modified Burmeister soil classification method on Soil Probe Logs in accordance with CHA SOP#303.

Immediately upon opening the soil sampler, a photoionization detector (PID) or equivalent meter will be used to obtain readings along the length of the soil sample. Following the screening, the soils within the soil sampler will be measured, described and photographed. As applicable, soil samples for laboratory analysis will be collected from each borehole in accordance with the following protocols:

1. In the unsaturated zone, soil samples will be collected from each test boring location at the following depth intervals: immediately above the water table; at soil mottling zones; at the fill/native soil interface; and at major stratigraphic changes- in consultation with the NYSDEC representative. In the event that none of the mottling, interface, or stratigraphic features are encountered at the depths explored, a soil sample from the interval immediately above the water table may be collected for laboratory analysis, or at other depths at the discretion of the on-Site NYSDEC representative.
2. In the instance where elevated PID meter readings, oily liquid, strongly odoriferous soils/fill, staining, etc. are noted in soils above the water table, a sample of the

representative soil may be collected for laboratory analysis, or at other depths at the discretion of the on-Site NYSDEC representative.

In general, a minimum of one soil sample from each soil boring location will be submitted to an off-Site NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory for a select set of parameters as described in Table 1 at the end of this report. More than one sample from each soil boring may be submitted for analysis if required by the NYSDEC or if field conditions warrant additional samples.

Before drilling at each boring location and after drilling at the last location, the drilling equipment and all non-disposable sampling equipment will be decontaminated in accordance with the protocols established in Section 4. Drill cuttings will be managed as described in Section 5.

### **3.3 SURVEY**

After SC activities are complete, CHA personnel will use geographic information system (GIS) enabled tablets to identify the location of each soil boring. This information will be necessary to determine which areas meet the Industrial SCOs for the Site.

## **4.0 EQUIPMENT DECONTAMINATION**

Prior to mobilization, the drill rig and excavator shall be thoroughly cleaned to remove oil, grease, mud, and other foreign matter. Subsequently, before initiating drilling at each boring location, samplers, drill steel, and associated equipment will be cleaned to prevent cross-contamination. All cleaning will be conducted at a predetermined on-site location. Cleaning will be accomplished using the procedures outlined in the following sections and in accordance with CHA SOP's. Effort should be made to prevent the excavator tracks from exposure to potentially contaminated subsurface soil (i.e. prevent tracks from entering test pits).

### **4.1.1 Small Equipment**

For all activities, dedicated sampling equipment is preferred. However, if non-dedicated equipment is used (i.e. Macrocore barrel), the required decontamination procedure for all manual sampling equipment used to collect samples for chemical analysis is provided in CHA SOP#501 and summarized below:

1. Disassemble equipment, as required.
2. Remove gross contamination from the equipment by brushing and then rinsing with tap water.
3. Wash with Alconox and tap water.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air dry equipment.

Decontaminated equipment will be placed on polyethylene sheeting in order to avoid contacting a contaminated surface prior to use.

Field personnel will use a new pair of outer gloves before handling sample equipment after it is cleaned.

### **4.1.2 Large Equipment**

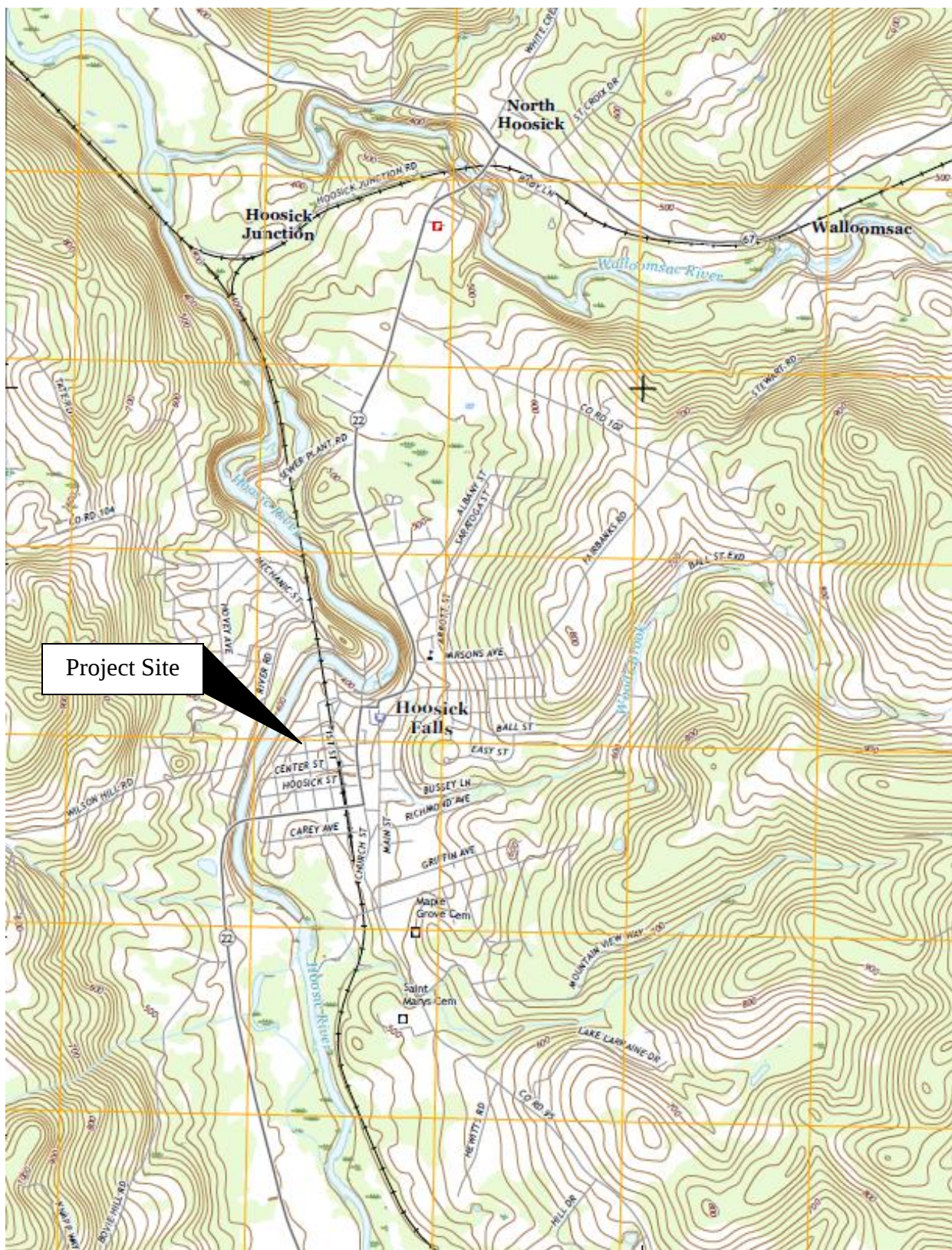
The permanent components of the drill rig and excavator (body, tracks, etc.) are not expected to come into contact with contaminated subsurface soils and, therefore, will not require decontamination. The bucket of the excavator should be decontaminated prior to should be decontaminated in accordance with CHA SOP#503 prior to equipment leaving the Site. A steam cleaning and/or Alconox® rinse of all equipment that has come in contact with potentially contaminated soils is necessary.

## **5.0 INVESTIGATION DERIVED WASTE**

All soil cuttings removed from SC activities will be used as backfill in each respective hole. The cuttings will be placed in the hole in reverse order of which they came out.

Gloves, personal protection equipment, sampling materials, etc. will be collected daily and disposed of as solid waste. All work will be performed in accordance with CHA SOP#507.

## FIGURES



SOURCE: USGS MapViewer



NOT TO SCALE

DATE: September 2017

**FIGURE 1**  
**SITE LOCATION MAP**  
 80 FIRST STREET  
 HOOSICK FALLS,  
 RENSSELAER COUNTY, NEW YORK



MAP NOT TO SCALE

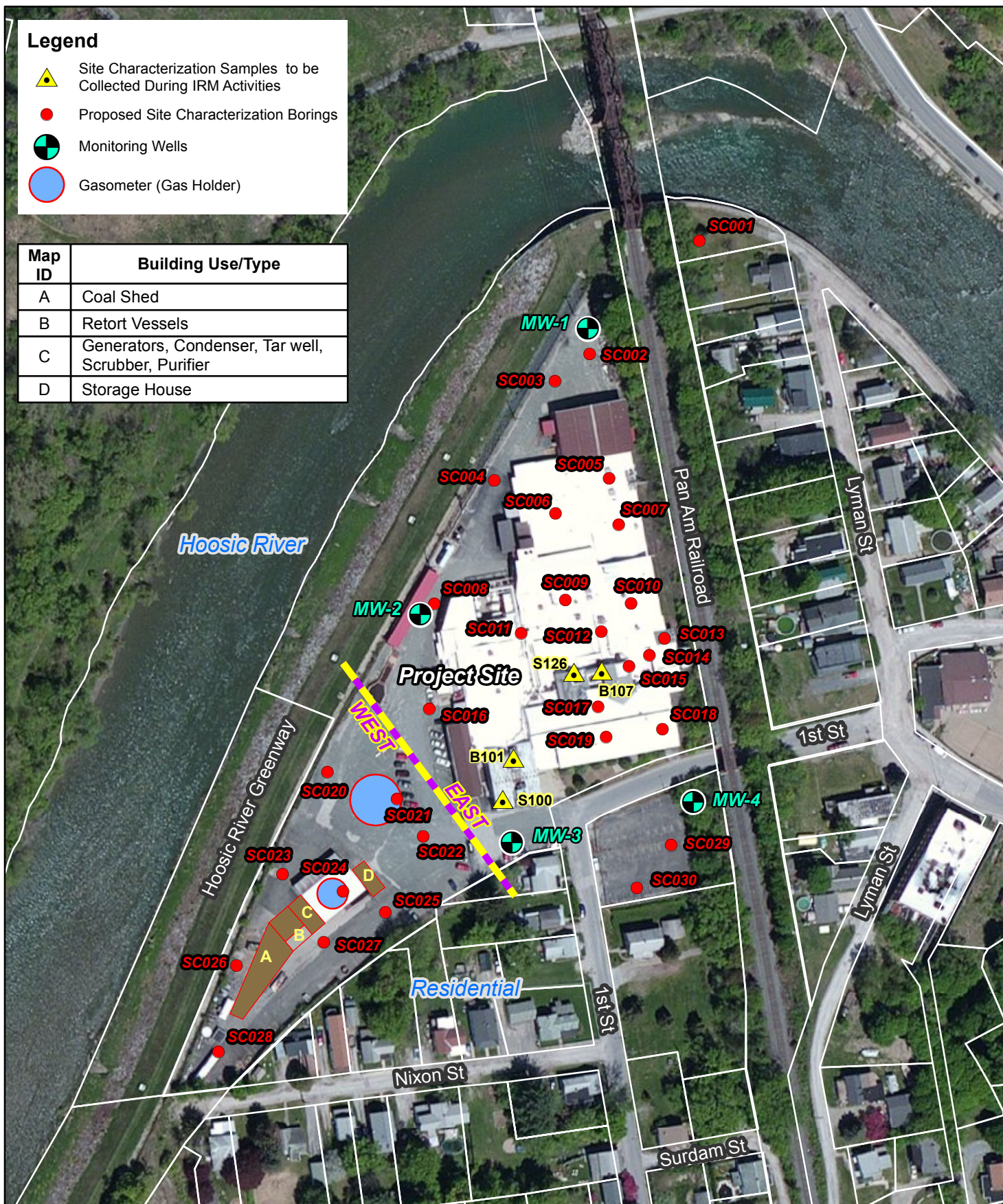
DATE: September 2017

**FIGURE 2**  
**SITE PLAN**  
 80 FIRST STREET  
 HOOSICK FALLS  
 RENSSELAER COUNTY, STATE OF NEW YORK

## Legend

-  Site Characterization Samples to be Collected During IRM Activities
-  Proposed Site Characterization Borings
-  Monitoring Wells
-  Gasometer (Gas Holder)

| Map ID | Building Use/Type                                   |
|--------|-----------------------------------------------------|
| A      | Coal Shed                                           |
| B      | Retort Vessels                                      |
| C      | Generators, Condenser, Tar well, Scrubber, Purifier |
| D      | Storage House                                       |



**CIA**  
design/construction solutions

**Figure 3 - Proposed Boring & Sampling Locations**  
Oak Mitsui  
80 First Street  
Hoosick Falls, New York



Scale 1" = 150'

Project No.  
31861

Image Courtesy of USGS and Earthstar Geographics SIO © 2014 Nokia ©  
Photo Date: 8/13/2014

## TABLE

**Table 1: Sampling Rationale**

| <b>Sample ID</b> | <b>Matrix</b> | <b>Sample Depth(s)</b>                                                           | <b>Sample Location</b> | <b>Analytical Parameters</b>                                                        | <b>Rationale</b>                                                                                                                   |
|------------------|---------------|----------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| SOIL-SC001       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals, TCL VOCs                                                                | To investigate the potential for contamination in regards to the former Oak Mitsui site operations including chlorinated solvents. |
| SOIL-SC002       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination in regards to the former Oak Mitsui site operations including chlorinated solvents. |
| SOIL-SC003       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals, TCL VOCs                                                                | To investigate the potential for contamination in regards to the former Oak Mitsui site operations including chlorinated solvents. |
| SOIL-SC004       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                |
| SOIL-SC005       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                |
| SOIL-SC006       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                |
| SOIL-SC007       | Soil          | Interval which indicates the highest potential for the presence of contamination | East Side              | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                |

| Sample ID  | Matrix | Sample Depth(s)                                                                  | Sample Location | Analytical Parameters                                                               | Rationale                                                                                           |
|------------|--------|----------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| SOIL-SC008 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations. |
| SOIL-SC009 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination in regards to the former Oak Mitsui site operations. |
| SOIL-SC010 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations. |
| SOIL-SC011 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations. |
| SOIL-SC012 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations. |
| SOIL-SC013 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations. |
| SOIL-SC014 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations. |

| Sample ID  | Matrix | Sample Depth(s)                                                                  | Sample Location | Analytical Parameters                                                               | Rationale                                                                                                                                     |
|------------|--------|----------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| SOIL-SC015 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                           |
| SOIL-SC016 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                           |
| SOIL-SC017 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                           |
| SOIL-SC018 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                           |
| SOIL-SC019 | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                           |
| SOIL-SC020 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane, TAL Metals | To investigate the potential for contamination in regards to the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC021 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination in regards to the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |

| Sample ID  | Matrix | Sample Depth(s)                                                                  | Sample Location | Analytical Parameters                                                               | Rationale                                                                                                                                     |
|------------|--------|----------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| SOIL-SC022 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination in regards to the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC023 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination in regards to the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC024 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination in regards to the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC025 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane, TAL Metals | To investigate the potential for contamination in regards to the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC026 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination in regards to the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC027 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide                                | To investigate the potential for contamination in regards to the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |
| SOIL-SC028 | Soil   | Interval which indicates the highest potential for the presence of contamination | West Side       | TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane, TAL Metals | To investigate the potential for contamination in regards to the former Hoosick Falls Gas Light Company's Coal Gasification Plant operations. |

| Sample ID                          | Matrix | Sample Depth(s)                                                                  | Sample Location | Analytical Parameters                                                               | Rationale                                                                                                                                                        |
|------------------------------------|--------|----------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SOIL-SC029                         | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals                                                                          | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                                              |
| SOIL-SC030                         | Soil   | Interval which indicates the highest potential for the presence of contamination | East Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | To investigate the potential for contamination in regards to the former Oak Mitsui site operations.                                                              |
| SOIL-DUP-SC001                     | Soil   | TBD                                                                              | East Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | Per QAQC procedure, two blind duplicate samples will be collected with selected soil samples to determine the precision of laboratory analysis.                  |
| SOIL-DUP-SC002                     | Soil   | TBD                                                                              | West Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | Per QAQC procedure, one matrix spike (MS) sample is required for every 20 samples (including duplicate samples and field or equipment blank samples).            |
| SOIL-MS - SC001<br>SOIL-MSD- SC001 | Soil   | TBD                                                                              | East Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | Per QAQC procedure, one matrix spike (MS) sample is required for every 20 samples (including duplicate samples and field or equipment blank samples).            |
| SOIL-MS - SC002<br>SOIL-MSD- SC002 | Soil   | TBD                                                                              | West Side       | TAL Metals, TCL VOCs, TCL SVOCs, Pesticides, PCBs, total Cyanide, PFAS, 1,4-dioxane | Per QAQC procedure, one matrix spike duplicate (MSD) sample is required for every 20 samples (including duplicate samples and field or equipment blank samples). |

## **APPENDIX A**

### **CHA Standard Operating Procedures**



## FIELD LOGBOOK AND PHOTOGRAPHS

### A. PURPOSE/SCOPE:

To produce an accurate and reliable record of all field activities, including field observations, sample collection activities, etc.

All pertinent field survey and sampling information shall be recorded in a logbook or on field logs during each day of the field effort.

In addition to keeping logs, photographs will be taken to provide a physical record to augment the field worker's written observations. They can be valuable to the field team during future inspections, informal meetings, and hearings. Photographs should be taken with a camera-lens system having a perspective similar to that afforded by the naked eye. A photograph must be documented if it is to be a valid representation of an existing situation.

### B. EQUIPMENT/MATERIALS:

- Bound Field Book (with waterproof paper) or Field Logs
- Chain-of-Custody, Other Appropriate Forms
- Indelible Ink Pens
- Digital Camera with 50 mm lens or similar.

### C. PROCEDURE:

1. At a minimum, entries in a logbook shall include:
  - a. Date and time of starting work
  - b. Names of all personnel at site
  - c. Summary of key conversations with contractors, agency representatives, etc.
  - d. Purpose of proposed work effort
  - e. Sampling equipment to be used
  - f. Field calibration of equipment or documentation of calibration of rented equipment
  - g. Description of work area
  - h. Location of work area, including map reference. Document sample locations with references to fixed landmarks (e.g., 10 feet from southwest corner of building).
  - i. Details of work effort, particularly any deviation from the field operations plan or standard operating procedures
  - j. Field observations and field measurements (e.g., pH)
  - k. Field laboratory analytical results
  - l. Personnel and equipment decontamination procedures
  - m. Daily health and safety entries, including levels of protection
  - n. Type and number of samples



### FIELD LOGBOOK AND PHOTOGRAPHS

- o. Sampling method, particularly deviations from the standard operating procedures
- p. Sample location and number
- q. Sample handling, packaging, labeling, and shipping information (including destination)
- r. Time of leaving site.

For each photograph taken, several items shall be recorded in the field logbooks:

- a. Date and time – Camera set to record on photo
  - b. Name of photographer
  - c. General direction faced and description of the subject
  - d. Sequential number of the photograph
  - e. Always attempt to include an object in the photograph that helps show scale
  - f. Always try to shoot at approximately 50mm focal length (what human eye sees).
2. Each day's entries will be initialed and dated at the end by the author, and a line will be drawn through the remainder of the page.

D. QA/QC REQUIREMENTS:

All entries in the logbook shall be made in indelible ink. All corrections shall consist of single line-out deletions that are initialed.

The field task leader shall be responsible for ensuring that sufficient detail is recorded in the logbooks, and shall review the site logbooks daily.

E. SPECIAL CONDITIONS:

Photographs should be downloaded from the camera to the project folder and notes regarding the photographs should accompany the photos. Photographs should be no larger than 2 MB each unless they are being utilized for presentation purposes. CHA has software available to decrease file sizes if necessary.

As noted above, if a bound logbook is not used, then a field observation form must be used and information above should be captured on the form.

F. REFERENCES:

None

G. APPENDICES/FORMS:

Not Applicable



## SAMPLE NAMING AND NUMBERING

### A. PURPOSE/SCOPE:

The success of large environmental programs is greatly affected by the efficiency of data management and analysis. When performing environmental sampling, one of the most critical steps is appropriately naming or numbering samples so that they are uniquely identified and can be distinguished from all other samples by all future users.

Some of the potential benefits that can be obtained by adopting a naming convention include the following:

- a. To ensure that every sample collected at a site has a unique identifier
- b. To enhance clarity in cases of potential ambiguity
- c. To help avoid "naming collisions" that might occur when the data is imported into our Equis or other databases; and
- d. To provide meaningful data to be used in project handovers.

Note that many of our sampling programs are performed at sites with previously established sample locations and in these cases, we would not change sample names. Additionally, this process shall be applied at larger, more complex sites, and/or sites that are required to follow a site-specific QAAP. Simpler naming conventions may be implemented for small, simple sites.

### B. EQUIPMENT/MATERIALS:

- Field Logbook
- Field Sample Login Sheet
- Site Map/ Work Plan
- Sampling Forms
- Chain-of-Custody
- Sample Containers with Labels

### C. PROCEDURE:

1. Each sample shall be uniquely defined by a multi-field name. In general, three fields are required: [Project # or Name] – [Media Type] – [Location Name/Sequential Number].
2. If using a site name, abbreviate to 2-3 letters. (e.g., Congress St site would be "CS").
3. Use the following abbreviations for media types:

|                       |       |
|-----------------------|-------|
| Subsurface Soil ..... | SOIL  |
| Surface Soil.....     | SURF  |
| Sediment .....        | SED   |
| Groundwater .....     | GW    |
| Surface Water .....   | SW    |
| Waste Water.....      | WW    |
| Soil Vapor.....       | SV    |
| Storm Water.....      | STORM |



## SAMPLE NAMING AND NUMBERING

4. All samples collected at a site shall be numbered sequentially for each media type, regardless of the field event or project phase. The use of hyphens to separate segments of a sample name is beneficial for sample name readability. It is also beneficial to use enough leading zeros to accommodate the Sequential Number (or sys\_loc\_code) portion of the sample name, which will assist in sorting sample IDs in the data management program or database (see EQUIS discussion below).
5. Do not include information such as time, sample depths, etc. in the name. This information should be recorded as defined in Section F (below).
6. In no cases shall the multi-field name be longer than 30 characters, including dashes. Ensure that each name is clearly written on both the sample label as well as the Chain of Custody.
7. Do not use special characters (e.g. #, ' , “ , @, ! ) when naming samples. Including such characters in the Serial Number (sys\_loc\_codes) or Sample Number (sys\_sample\_codes) can be incompatible with the database.
8. For QA/QC blank samples use the following abbreviations in place of the media type:

|                                     |     |
|-------------------------------------|-----|
| Trip Blank .....                    | TB  |
| Equipment Rinse (Field Blank) ..... | FB  |
| Duplicate .....                     | DUP |
| Matrix Spike .....                  | MS  |
| Matrix Spike Duplicate .....        | SD  |

For Duplicate and MS/MSD samples we need to make sure we include the parent sample name. Add the DUP, MS or MSD indicator after the Sequential Number.

For Blind Duplicate samples, use the CHA indicator in place of the Sequential Number. The location should be recorded in the field logs for our evaluation purposes. For example, a blind duplicate sample number for soil collected at the 005 location would be “CS-SOIL-CHA-1.”

You would record in the field log that the blind soil duplicate CHA-1 has SOIL-12345-005 as its parent sample.

9. Option to Include the Sample Collection Date - As an option, the date may be included in the sample name. NYS Electronic Data Deliverable guidance suggests using dates in the YYYYDDMM format. Placing the year first provides for ease of sorting data in the database:

However, adding the date adds 9 characters to the sample name thus increasing the complexity of sample numbering. The date is captured on the Chain-of-Custody and in field records.

### D. QA/QC REQUIREMENTS:

All data must be documented on field data sheets or within site logbooks.

Field personnel should verify that all sample data and supporting information in log books is correct prior to leaving the site.



## SAMPLE NAMING AND NUMBERING

### E. SPECIAL CONDITIONS:

NYSDEC EQUIS Considerations:

NYSDEC uses EQUIS for data management and generally requires data to be submitted in EQUIS format. EQUIS has three different sample name related fields, a sample\_name, a sys\_sample\_code and a location\_name. Location\_name will almost always be simplified to something like SW-1, GW-2 etc. and is usually the last field of the sample name.

In terms of the other two, sample\_name is what we record in the field. That is limited to 30 characters of text.

The laboratory generates the sys\_sample\_code by taking the sample\_name field and adding another qualifier, such as the sample delivery group or work order number. EQUIS requires that the sys\_sample\_code field be unique within a database. This is limited to 40 characters of text so it typically will be the sample name plus up to 10 characters.

It is recommended to keep the CHA sample name as short as possible to work with the EQUIS format. The basic sample names identified above are 14 to 17 characters long. If the optional date format is used, sample names will be 23 to 26 characters which is near the limit for what EQUIS can accommodate (and you may have issues physically fitting the sample names legibly into the COC form).

### F. REFERENCES:

NYSDEC, DER-10, Technical Guidance for Site Investigation and Remediation, May 2010,  
[http://www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/der10.pdf](http://www.dec.ny.gov/docs/remediation_hudson_pdf/der10.pdf)

NYSDEC, Electronic Data Delivery Manual, January 2013,  
[http://www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/eddmanual.pdf](http://www.dec.ny.gov/docs/remediation_hudson_pdf/eddmanual.pdf)

New Jersey Department of Environmental Protection, August 2005, Field Sampling Procedures [Manual](#),  
Chap. 6, <http://www.nj.gov/dep/srp/guidance/fspm/>

### G. APPENDICES/FORMS:

Not Applicable

**END OF SOP**

Final Check by C. Burns 12/2/15

## BOREHOLE INSTALLATION AND SAMPLING

### A. PURPOSE/SCOPE:

The following SOP presents a description of the methods generally employed for the installation of boreholes and the collection of subsurface soil samples. Boreholes are typically advanced to define geologic conditions; allow the installation of monitoring wells and piezometers; and allow the collection of subsurface soil samples (generally above the water table) for chemical analysis. Although several manual methods are available for the collection of subsurface soils samples (e.g. hand augers, post-hole augers [see SOP #305 and SOP #307]), the most common method used by CHA to advance boreholes is a drill rig equipped with hollow-stem augers (HSA) or direct-push technology (DPT). Representative samples are most often collected utilizing split-spoon samplers or Macrocore technology.

The purpose of drilling test borings is typically to characterize the lateral and vertical extent of contamination in the unsaturated zone. The test borings may also be used to allow the installation of ground water monitoring wells. Test borings may also be used to determine the subsurface characteristics for the purpose of geotechnical investigations.

### B. EQUIPMENT/MATERIALS:

Drilling will be performed by a licensed drilling firm under the direction of CHA staff. The drilling field crew will consist of a driller, a driller's assistant, and a CHA field geologist/engineer. The field geologist/engineer will supervise drilling operations and conduct the geologic logging of the boreholes. A list of typical equipment needed for installation of monitoring wells at the site is summarized in the table included in SOP #309.

### C. PROCEDURE:

1. Subcontractor Responsible for Utility Clearance - Subcontractor shall take all reasonable precautions, including contacting the appropriate utility organizations (USPFO, Dig Safe, etc.), in order to verify there are no buried utilities at the test boring and test pit locations.
2. The drilling rig and sampling equipment may be required to be decontaminated by steam-cleaning (high pressure, hot water) prior to drilling and in between borings, depending on the job requirements
3. The borings will be drilled with direct push technology (DPT), hollow-stem augers, flush joint casing, open hole or any combination depending on the type of information needed, geologic conditions, and other limitations that may be imposed due to contamination or state or federal guidelines. The boring shall be advanced to match the sampling interval (continuous or standard sampling).
4. Drilling progress and information about the formations encountered shall be recorded by the geologist on the field boring log. The information should include total depth drilled, depths and thickness of strata, problems with borehole advancement, fill materials encountered, and water levels.



## BOREHOLE INSTALLATION AND SAMPLING

### Hollow Stem Auger/Flush Joint Driven Casing

- a. At the chosen depth interval, drive a clean, standard, 24-inch long, 2-inch O.D. split-spoon sampler into the soil a distance of 24 inches using a 140 lb hammer, free falling 30 inches. Record the number of blows required to drive the sampler every 6 inches on the field boring log. Discontinue driving the sampler if 100 blows have been applied and the sampler has not been driven 6 inches. If 6 inches of penetration has been achieved, discontinue driving the sampler after 50 blows has failed to penetrate fully any of the remaining 6 inch intervals. The first six inches seats the spoon, the next 12 inches represents the Standard Penetration Resistance, and the last six inches is driven to insure sample recovery.
- b. Retrieve the sampler from the borehole and place it on a clean, flat surface. Open the sampler and immediately scan the sample with an air monitoring instrument (e.g., HNu or OVA) if appropriate to the purpose of the investigation. Record instrument readings on the field boring log.

### Direct Push Technology

- a. The DPT is hydraulically powered and mounted in a customized four-wheel drive vehicle. Position the base of the sampling device on the ground over the sampling location and hydraulically raise the vehicle on the base. As the weight of the vehicle is transferred to the probe, the probe is pushed into the ground.
- b. Soil samples will be collected with a Macrocore (or equivalent). The sample tube is pushed and/or vibrated to a specified depth. The interior plug of the sample tube is then removed by inserting small-diameter threaded rods. Drive the sample tube an additional foot to collect the soil sample. Withdraw the probe sections and sample tube.

### Shelby Tube Sampling

- a. Further, describe and record the following properties of the sample: Sample length recovered, presence of any slough in sampler, basic soil type (e.g., sand, gravel, clay), structure, texture, sorting, grain size, grain shape, degree of saturation, competency, color, odor, staining, and presence of foreign material(s). Refer to SOP#301, Field Description of Soils.
  - b. After the soil within the sampler has been described, it will be placed in sealed sample jars directly from the sampling device.
  - c. If appropriate to the investigation, the air space surrounding the borehole shall be scanned with a FID or PID and Explosimeter during all drilling activities to determine the presence or absence of volatile organic compounds. Results of this air monitoring shall be recorded on the Geologic Field Log. Activities shall proceed according to the site HSP if the presence of volatile organic compounds is indicated.
5. Upon completion of the test boring, all drill cuttings shall either be placed back in the borehole or will be drummed based on potential contaminants encountered.
  6. Note the locations of the borings on a site map and/or mark the locations of the boreholes with a labeled wooden stake.



## **BOREHOLE INSTALLATION AND SAMPLING**

D. QA/QC REQUIREMENTS:

Follow QA/QC requirements for field documentation.

E. SPECIAL CONDITIONS:

1. Drilling Subcontract - The Field Team Leader must be familiar with the scope, fee, schedule, and all the terms and conditions of the drilling subcontract. When contractual issues or questions arise during the fieldwork, the Field Team Leader should communicate with the Project Manager and with the owner/client as appropriate.
2. Abandoned Borehole - If the contractor is not able to finish the drilling or has to abandon the borehole due to loss of tools, accidents or any unforeseeable circumstances, the contractor should remove the casings or drive pipes already in the hole and refill it with native soil cuttings, sand, grout, or as approved by the Engineer. All materials extracted from the hole, after refilling it will be managed as investigation derived material and will be disposed of accordingly. Typically, another borehole will be attempted in the area of the initial borehole attempt.
3. Subcontractor/Driller Standby Time - Document any conditions that may result in driller/subcontractor standby time. Such conditions may include adverse weather conditions, lack of access to the property, utilities not marked out, etc. Standby time may result in additional costs from our subcontractor that may not be planned for or approved. Communicate any conditions that may result in standby time to the CHA Project Manager as soon as possible.

F. REFERENCES:

ASTM Standard D 1586

Drilling Subcontract Scope, Schedule, Fee, Terms, and Conditions

NYSDEC DER-10, May 2010 (or current version)

CHA's Legend to Subsurface Logs

G. APPENDICES/FORMS:

Boring Log Form

### **END OF SOP**

Final Check by C. Burns 10/07/15



## SAMPLING PERFLUOROALKYL SUBSTANCES (PFASs) and PERFLUORINATED COMPOUNDS (PFCS)

### A. PURPOSE/SCOPE:

The objective of this SOP is to ensure proper and uncontaminated collection of Perfluoroalkyl Substances (PFASs) and other Perfluorinated Compounds (PFCs). PFASs and PFCs are large groups of manufactured compounds used as surfactants in industrial applications, applied to many household products for grease, water, and stain resistance, and heavily used in Aqueous Film Forming Foams (AFFF) which are often used in firefighting. Although there are no federal regulations currently requiring remedial action for these chemicals, many states are adopting rules and regulation regarding these compounds. As rules continue to develop for these contaminants permitted and non-permitted equipment, materials, and procedure are subject to change. The user of this SOP should consult with applicable regulatory agencies to determine a final list of compounds that need to be analyzed.

Note: This SOP has been developed assuming that there are no elevated concentrations of more toxic chemicals present at the site warranting additional personal protective equipment. However, prior to commencing sampling activities, the sampler should consider all potential contaminants at the site and determine if additional protocols are necessary.

Due to the prevalence of these chemicals in common goods, it is imperative that field personnel are conscious of potential cross contamination. This contamination can be from field equipment, field clothing and PPE, sample containers, decontamination, and food.

### B. EQUIPMENT/MATERIALS:

Field equipment, field clothing, PPE, sample containers, and any other items used or present on site made of or containing the following materials **ARE NOT PERMITTED:**

- Low Density Polyethylene (LDPE) – pumps and tubing Only [permitted for sample containers]
- Aluminum foil
- Glass
- Polytetrafluoroethylene (PTFE) / Teflon™
- Waterproofed clothing or boots
- Clothing containing PTFE material (i.e. GORE-TEX®)
- New clothing (clothing not washed a minimum of 6 times) or clothing washed with fabric softeners
- Polypropylene coated coveralls and PVC boot covers completely covering personnel's street clothes is an acceptable alternative.
- Tyvek® material
- Waterproof/treated paper or field books
- Plastic clipboards, binders, or spiral hard cover notebooks
- Post-it notes or other adhesives
- Sharpies or other permanent markers
- Paint pens, marking paint, etc.
- Most repellents, sunscreens, moisturizers, cosmetics, or other related products
- Decon 90

A complete list of what is and is not permitted can be found in the Appendix A. This list should be given to personnel well in advance of sampling to ensure compliance.

## **SAMPLING PERFLUOROALKYL SUBSTANCES (PFASs) and PERFLUORINATED COMPOUNDS (PFCS)**

Materials such as Teflon™ or PTFE may be found in common sampling equipment. It is important that field personnel examine and assess existing equipment to avoid accidental contamination. The following materials are **ALWAYS PERMITTED** in sampling equipment:

- Stainless steel
- High density polyethylene (HDPE)
- PVC
- Silicone
- Acetate
- Polypropylene
- Loose paper on aluminum clipboards
- Ballpoint pens

There are changes necessary in a number of the CHA's SOPs when sampling for PFASs and PFCs. The changes related to the sampling equipment and supplies used and are as follows for each SOP as referenced:

### **Borehole Installation and Sampling (SOP #303/309)**

- If using hollow stem augers/split spoons or similar, they must be carbon steel and not coated.
- If collecting a soil or sediment core sample (e.g. Geoprobe®), it must be collected directly from single-use PVC liners that must not be decontaminated or reused at different locations.

### **Soil Sampling with a Hand Auger (SOP #305)**

- A stainless steel hand auger without any coatings must be used when sampling.
- Scoops and spatula used must be stainless steel.

### **Well Development (SOP #311)**

- Do not use bailers, unless entirely made of PVC or stainless steel. Teflon in any part of the bailer is not acceptable.
- Do not use bladder pumps, most bladders are made of Teflon. Only bladder pumps with a bladder made of natural rubber are acceptable.
- Other pump types are typically okay but should still be examined for Teflon or other prohibited materials.

### **Conventional Groundwater Sampling (SOP #315) / Low-Flow Groundwater Purging/ Sampling (SOP #317) / Residential Well Sampling (SOP #319)**

- Bailers should not be used unless entirely made of PVC or stainless steel. Teflon is not acceptable. Single use disposable polyethylene or silicone materials are also acceptable.
- Tubing can only be made of HDPE or silicone.
- Do not use bladder pumps, most bladders are made of Teflon. Only bladder pumps with a bladder made of natural rubber are acceptable.
- Other pump types are typically okay but should still be examined for Teflon or other prohibited materials.



## **SAMPLING PERFLUOROALKYL SUBSTANCES (PFASs) and PERFLUORINATED COMPOUNDS (PFCS)**

### Surface Soil Sampling (SOP #405)

- A stainless steel spoon and bowl should be used. Cover the bowl with a stainless steel lid where possible between the addition of each aliquot. Do NOT cover the bowl with aluminum foil.

### Small Equipment Decontamination (SOP #501)

- Water used for decontamination on site should be laboratory certified “PFAS-free” water.

### Field Handling, Packaging, and Shipping (SOP #607)

- Plastic bags must be polyethylene.
- Only ice from water should be used, not chemical (blue) ice.
- These equipment changes can be applied to other SOPs if PFASs and/or PFCs are being sampled. If equipment is not specifically mentioned, refer to the list of materials that are always permitted. If the materials are not mentioned DO NOT use that sampling equipment.

## **SAMPLING PERFLUOROALKYL SUBSTANCES (PFASs) and PERFLUORINATED COMPOUNDS (PFCS)**

### **C. PROCEDURE:**

Standard operating procedures for sampling as outlined in a number of CHA's SOPs should be followed, but with the specific changes listed below for the specific SOPs referenced, if being used:

#### **Borehole Installation and Sampling (SOP #303/309)**

- When drilling the well use PFAS-free drilling fluids.
- Don't use detergent to decon drilling equipment with the exception of Alconox and Liquinox. Scrub with equipment a plastic brush to remove heavy soiling and rinse thoroughly in tap water. Use a steam cleaner or a triple-rinse of PFOA-free water as the final step. If large quantities of PFOA-free water are not available from the lab, additional QA/QC sampling may be required to verify the source as a potential source of cross-contamination.
- , then triple-rinse in distilled or deionized water.
- Collect a representative water sample used during drilling activities.
- If using an auger, it must be carbon steel and un-coated.

#### **Conventional Groundwater Sampling (SOP #315) / Low-Flow Groundwater Purging/ Sampling (SOP #317) / Residential Well Sampling (SOP #319)**

- Collect samples from the pump discharge tubing only. Never collect a water sample that has passed through a flow through cell or similar.
- When sampling prioritize drinking water, followed by surface water, followed by groundwater.
- When sampling groundwater; start with the upgradient well(s), then the furthest downgradient of the interpreted or known source, then wells downgradient to the source, and lastly the wells closest to the interpreted or known source.
- When sampling residential wells, any plumber's sealing tape should be noted, as these typically contain PFCs.
- Prior to sample collection, field personnel must wash their hands and wear a new set of nitrile gloves.
- PFAS/PFC samples should be taken first, prior to collecting samples for any other parameters into any other containers. Field personnel should avoid contact with any other type of sample container or package materials.
- When samples are collected and capped, place the sample bottle(s) in an individual sealed plastic bag (i.e. Ziploc®) separate from all other sample parameter bottles, and place in a shipping container packed only with ice made from frozen water.
- After collecting PFOA samples conduct the "Shaker Test:" A small portion of the sample (~10-25 ml) should be shaken by the sample collector on site. If foaming is noted within the sample, this should be documented when samples are submitted for analysis.

#### **Surface Water Sampling (SOP #401)**

- Surface water must be collected by inserting a capped sampling container with the opening pointing down to avoid the collection of surface films.
- Where conditions permit, sampling devices should be rinsed with site medium to be sampled prior to collection of the sample.

#### **Surface Soil Sampling (SOP #405)**



## **SAMPLING PERFLUOROALKYL SUBSTANCES (PFASs) and PERFLUORINATED COMPOUNDS (PFCS)**

- PFAS/PFC samples should be taken first, prior to collecting samples for any other parameters into any other containers. Field personnel should avoid contact with any other type of sample container or package materials.

### **Large Equipment Decontamination (SOP #503)**

- Don't use detergent to decon drilling equipment, scrub with a plastic brush and rinse thoroughly in tap water, then triple-rinse in distilled or deionized water.

### **Field Handling, Packaging, and Shipping (SOP #607)**

- Ice should be double bagged and secured to avoid meltwater from contacting sample containers, and/or samples should be in an individual sealed plastic bag.

#### **D. QA/QC REQUIREMENTS:**

A variety of blanks should be collected to trace the sources of any artificially introduced contamination. Rinsate or equipment blanks, field blanks, and trip or travel blanks should all be collected during the sampling event. Rinsate or equipment blanks and field blanks should be collected once per day per matrix or once per 20 samples per matrix, whichever comes first. One trip blank is required per cooler.

Samples should be immediately placed in a cooler maintained at  $4 \pm 2^\circ$  Celsius.

#### **E. SPECIAL CONDITIONS:**

In the event of wet weather field personnel must avoid using personal waterproof or water-resistant rain gear. Instead a gazebo tent that is only touched or moved prior to or after sampling activities should be used.

No food or drink is permitted on-site, except for bottled water and hydration drinks, such as Gatorade. These drinks should only be consumed in the staging area. When field personnel require a break to eat or drink, they should remove their gloves and coveralls and move away from the sampling location, preferably downwind. When finished eating, field personnel should clean up and put their coveralls back on and don a new pair of gloves prior to returning to the work area.

Visitors to the site are asked to remain at least 30 feet from sampling areas.

If laboratory results are received and the combined concentration PFOA and PFOS was between 50 and 70 parts per trillion (ppt), consider contacting the laboratory to ensure that the analytical results reported are based on the more comprehensive technique from EPA Method 537 for measuring PFOA.



**SAMPLING PERFLUOROALKYL SUBSTANCES (PFASs) and PERFLUORINATED COMPOUNDS (PFCS)**

F. REFERENCES:

Chiang, D., Ph.D., P.E., Davis, K., Ph.D., Bogdan, D., Ph.D., Aucoin, M., & Woodward, D. (n.d.). PFAS Sampling. AECOM.

Shoemaker, J. A., Grimmet, P. E., & Boutin, B. K. (2009). Method 537. Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) (EPA/600/R-08/092) (USA, EPA, Office of Research and Development). Cincinnati, OH: U.S. Environmental Protection Agency.

G. APPENDICES/FORMS:

Appendix A - PFAS/PFC Sampling – Acceptable and Prohibited Items

**END OF SOP**



## SMALL EQUIPMENT DECONTAMINATION

### A. PURPOSE/SCOPE:

Proper decontamination of small equipment prevents cross-contamination of samples, introduction of contaminants to clean sites, and the mixture of incompatible substances. Equipment decontamination also assures the health and safety of all equipment users. Procedures for decontamination procedures vary depending on the matrix sampled, level of contamination, type of contaminants, and the target analytes of the sampling event. The procedure outlined in this SOP is a general procedure for field/ warehouse decontamination of equipment associated with water, soil and other surficial sampling activities.

Decontamination should be performed before sampling work commences and after each sampling event. Decontaminated equipment should be protected from contact with surroundings during storage and transport, and should be handled as little as possible before its use and always with disposable gloves. Note that all waste generated by decontamination procedures including liquids, solids, rags, gloves, etc., will be collected and disposed of properly according to the procedures outlined in SOP #507.

### B. EQUIPMENT/MATERIALS:

- Alconox®
- Tap water
- Distilled and deionized water
- 10% Nitric acid rinse
- Acetone (or other pesticide grade organic solvent)
- 1-Gallon pressure spray bottles
- Long-handled brushes
- 5-Gallon plastic buckets

### C. PROCEDURE:

Note that if it is logistically impractical/ impossible to complete all steps listed below at the field site, Steps 1-4 should be performed prior to transport of equipment to a facility where all steps can be completed if required. All field decontamination should take place over a container and liquids should be properly disposed of.

1. Disassemble equipment as necessary.
2. Remove gross contamination from equipment by scraping, brushing and rinsing with tap water
3. Wash with Alconox® or other laboratory grade detergent to remove all visible particulate matter and residual oils and grease.
4. Rinse with tap water to remove detergent.
5. Rinse with distilled and deionized water.
6. Field personnel will use a new pair of outer gloves before handling sample equipment after it is cleaned.
7. If equipment will not be used immediately, wrap in aluminum foil (unless sampling for metals analysis) or seal in plastic bags (unless sampling for organics analysis) and store.
8. Record the date and method of decontamination on foil/bag and equipment log.



## SMALL EQUIPMENT DECONTAMINATION

### D. QA/QC REQUIREMENTS:

When necessary, field equipment rinsate blanks will be collected by pouring analyte-free water over decontaminated equipment and submitting them to the lab with the other blanks and samples. These blanks are used to assess the quality of equipment decontamination.

### E. SPECIAL CONDITIONS:

Reusable PPE such as respirators, chemical-resistant overboots and gloves shall also undergo the equipment decontamination sequence. See SOP #505 for related information on Personnel decontamination.

If acetone is a known or expected contaminant another solvent may be substituted. Note that methanol cannot be used for decontamination when sampling gasoline or its by-products.

Additional decontamination procedures may be required for particular contaminants or when samples are to be analyzed at very low concentrations. Identify methods as needed but see for example Wilde, 2004.

### F. REFERENCES:

New Jersey Department of Environmental Protection, August 2005. *Field Sampling Procedures Manual*.

USEPA, 1994. Sampling Equipment Decontamination. Environmental Response Team SOP #2006, Revision #0.0. Edison, NJ. <http://www.ert.org>.

USEPA, 1996. *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual*. Region 4, Science and Ecosystem Support Division. Athens, GA.  
<http://www.epa.gov/region04/sesd/eisopqam/eisopqam.html>

Wilde, F.D., ed., 2004. *Cleaning of Equipment for water sampling (ver. 2.0)*: U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chap. A3, April, accessed January 5, 2009 at <http://pubs.water.usgs.gov/twri9A3/>

### G. APPENDICES/FORMS:

Not Applicable

**END OF SOP**

Final Check by C. Burns 10/27/15



## RESIDUALS MANAGEMENT

### A. PURPOSE/SCOPE:

The following standard operating procedure (SOP) presents a description of the methods generally employed for the management of residual waste. Field personnel are responsible for ensuring that state-specific standards/guidelines/regulations are followed, where applicable. In addition, field personnel are responsible for coordination efforts associated with the waste disposal facility, if known.

Improper handling and storage of residual waste can result in leaks and spills and pose a serious threat to the quality of the environment. Timely characterization and disposal of residual wastes shall be conducted in order to not exceed onsite quantity and/or storage regulations.

### B. EQUIPMENT/MATERIALS:

Off-Site transportation and disposal of residual waste will be performed by a licensed waste hauler under the direction of CHA. The company will supply the necessary equipment and materials needed to remove the residual waste from the Site and transport it to an approved waste disposal facility.

The field geologist/engineer will obtain the necessary sample bottles with the associated preservatives, if required, from the analytical laboratory. See SOP #603, Sample Containers, Volumes, Preservations and Holding Times, for additional information on these topics. In addition, if a flame ionization detector (FID), photoionization detector (PID) and/or gas meter will be used to screen waste containers soils for the presence of volatile organic compounds (VOCs).

All other equipment required during transportation/disposal activities is the responsibility of the Contractor (waste hauler).

### C. PROCEDURE:

1. During remedial activities all residual waste, including, but not limited to, soil cuttings, decontamination wash/rinse water, purge water and personal protective equipment (PPE) shall be containerized in United States Department of Transportation (USDOT) approved 55-gallon drums or similar waste containers, unless the Work Plan indicates otherwise. Each drum shall contain similar materials/matrices (e.g., soil, water, PPE).
2. Label each waste container using a permanent marker and weather proof label with the following:
  - a. Description of the container contents
  - b. Site name and address
  - c. Name of Site contact and associated phone number

Waste container labels shall be legible and easily understood by those unfamiliar with the Site.

3. Upon completion of remedial activities, the field geologist/engineer will conduct waste characterization of the residual waste prior to off-Site transportation and disposal. Depending upon the type of waste present, various waste disposal facilities may have different testing requirements. CHA will complete the required analytical testing. Upon receipt of analytical data and coordination with the disposal facility, the field geologist/engineer will supervise the removal of the waste from the Site.



## RESIDUALS MANAGEMENT

4. Waste containers shall be transported and stored in a secure location on-Site. All waste containers shall be located in one location, if possible.
5. If waste containers are stored for a period of time prior to collecting waste characterization samples, all waste containers shall be inspected for signs of the potential presence of explosive/flammable gases and/or toxic vapors. These signs include pressurization (bulging/dimples); crystals formed around the drum opening; leaks, holes, stains; labels, marking; composition and type (steel/poly and open/bung); condition, age, rust; and sampling accessibility. Drums showing evidence of pressurization and crystals shall be further assessed to determine proper drum opening techniques.
6. All metal waste containers not in direct contact with the earth shall be grounded.
7. Open the waste container with spark resistant tools (e.g., brass, beryllium).
8. Screen the waste containers for explosive gases and/or toxic vapor with appropriate air monitoring instruments as necessary.
9. Obtain the necessary sample bottles with the associated preservatives, if required, from the analytical laboratory. See SOP #603, Sample Containers, Volumes, Preservations and Holding Times, for information regarding field preservation of sample containers, if necessary.
10. Each matrix (e.g., soil, water) shall be sampled for waste characterization purposes. The field geologist/engineer shall determine the quantity of similar waste characterization samples to be collected from the waste containers in conjunction with the project manager and/or waste disposal facility. Containers with similar wastes (e.g., soil, water) generated from one area of the site may require only one composite sample from each of the waste containers. This determination shall also be made in conjunction with the project manager and/or waste disposal facility.
11. Use a decontaminated spade or shovel to collect representative solid waste samples from each waste container or use a beaker, bailer or similar mechanism to collect representative liquid waste samples from each waste container.
12. Immediately place sample in the pre-preserved sample containers and close the waste container(s).
13. Chill all samples to 4°C from sample collection until laboratory analysis.
14. Package and ship samples per SOP #607.

### D. QA/QC REQUIREMENTS:

This section includes QA/QC requirements associated with tank closure activities. The following general requirements apply to this SOP:

1. All data must be documented on field data sheets or within site logbooks.
2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan.
3. Equipment checkout and calibration activities must occur prior to sampling/operation, and must be documented.



## RESIDUALS MANAGEMENT

E. SPECIAL CONDITIONS:

In no case, will CHA be considered the generator of the waste. The site owner shall always take responsibility for waste disposal. Additionally, CHA may only act as agent for the owner relative to signing manifests with specific permission from CHA's in-house counsel. In most every case, the owner should sign waste manifests.

F. REFERENCES:

United States Environmental Protection Agency, Science and Ecosystem Support Division, Waste Sampling Standard Operating Procedure: <http://www.epa.gov/region4/sesd/fbqstp/Waste-Sampling.pdf>

G. APPENDICES/FORMS:

Not Applicable

### END OF SOP

Final Check by C. Burns 10/26/15

## **SAMPLE CONTAINERS, VOLUMES, PRESERVATIONS AND HOLDING TIMES**

### **A. PURPOSE/SCOPE:**

The following standard operating procedure (SOP) presents general guidelines for sample containers, volumes, preservations and holding times associated with air, water and soil/sediment samples. Field personnel are responsible for ensuring that state-specific standards/guidelines/regulations are followed, where applicable.

Improper preserving, storing and handling of air, water and soil/sediment samples are critical if the integrity of the samples are to be maintained. Samples collected in the field may undergo biological, chemical or physical changes following removal from their environment. In order to minimize those changes, many samples must have preservatives in the form of strong acids or bases added prior to delivery to the laboratory. If samples are to be collected as part of a government program, the governing agency typically must be notified 30 days prior to sample collection.

### **B. EQUIPMENT/MATERIALS:**

Pre-cleaned sample containers along with associated preservations within the sample containers will be provided to CHA from the analytical laboratory. The field geologist/engineer will provide the necessary personal protective equipment to place samples collected within the appropriate sample containers per SOPs 300 through 417. However, if field preservation is required the following equipment and materials shall be obtained:

- Hydrochloric (HCl) Acid Reagent A.S.C. 38%
- Nitric (HNO<sub>3</sub>) Acid Reagent A.S.C. 71%
- Sodium Hydroxide (NaOH) 97%
- 10 mL glass pipettes
- Narrow range (0-3 and 12-14) pH paper
- Nitrile gloves

### **C. PROCEDURE:**

1. Review Table 1 which details typical parameters of interest at environmental sites and the associated methods, preservation, container type, holding time and required sample volume.
2. Obtain pre-cleaned and pre-preserved sample containers from the laboratory. If pre-preserved sample containers were provided skip to Step 7; if not proceed to Step 3.
3. Put on a clean pair of nitrile gloves.
4. In a clean, non-dusty environment, remove the cap of the sample container.
5. Using a clean, 10 mL glass pipette draw the required amount of acid or base and insert into the sample container.
6. Volatile Organic Compounds – 2 mL of HCl acid (water samples).
7. Total and Dissolved Metals (including mercury) – 5 mL Nitric acid (water samples).
8. Cyanide – 15-20 Sodium Hydroxide pellets (water samples).



## **SAMPLE CONTAINERS, VOLUMES, PRESERVATIONS AND HOLDING TIMES**

9. Chemical Oxygen Demand, Oil and Grease, Organic Carbon, Phenolics, Total Dissolved Phosphorous, Hydrolyzable Phosphorus, Ammonia, Nitrate and Nitrite – 5 mL Sulfuric acid (water samples).
10. Immediately replace and tighten the sample container cap.
11. Collect sample using equipment and procedures outlined in other SOPs as appropriate. The volume of the sample collected shall be sufficient to conduct the analysis required, as well as associated quality assurance/quality control samples (QA/QC). QA/QC samples shall be collected in accordance with SOP 605.
12. Place samples immediately in the pre-preserved sample containers.
13. Chill all samples to 4°C from sample collection until laboratory analysis.
14. Package and ship samples per SOP #607.

### **D. QA/QC REQUIREMENTS:**

This section includes QA/QC requirements associated with sample containers, volumes, preservations, and holding times. The following general requirements apply to this SOP:

1. All data must be documented on field data sheets or within site logbooks.
2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan.
3. Equipment checkout and calibration activities must occur prior to sampling/operation, and must be documented.
4. QA/QC samples shall be collected in accordance with SOP 605.

The following procedure shall be conducted to provide a QA/QC check of water (aqueous) samples to ensure the samples were preserved to the proper pH prior to shipping for laboratory analysis.

#### **Volatile Organic Compounds:**

1. Collect one additional VOA vial at every third aqueous sampling location.
2. Fill the extra vial with the sample.
3. Using the extra VOA vial, remove the cap and using a clean, 10 mL glass pipette extract approximately 1 mL of water.
4. Place two drops of the water on a 1-inch strip of 0-3 range pH paper.
5. Compare pH strip's color while wet with that of the color key included on the pH paper container.
6. If pH is not less than 2, add additional HCL to the remaining 3 VOA vials prior to collecting the sample.
7. Discard the vial used to check the pH.



## **SAMPLE CONTAINERS, VOLUMES, PRESERVATIONS AND HOLDING TIMES**

Total and Dissolved Metals, Mercury, Ammonia, Nitrate plus Nitrite, Total Dissolved Phosphorus, COD, Oil & Grease, Organic Carbon, Phenolics

1. Collect sample and tightly reseal the cap.
2. Agitate the sample by gently shaking the sample bottle to mix the acid and water.
3. Remove the cap and using a clean, 10 mL glass pipette extract approximately 1 mL of sample.
4. Place approximately two drops of sample on a 1 inch strip of 0-3 range pH paper.
5. Compare pH strip's color while wet with that of the color key included on the pH paper container.
6. If pH is not less than 2, add appropriate additional Sulfuric Acid to the sample using a clean pipette.
7. Recheck sample using steps 2 through 6 until sample pH is less than 2.

### Cyanide

1. Collect sample and tightly reseal the cap.
2. Agitate the sample by gently shaking the sample bottle until the NaOH pellets are dissolved.
3. Remove the cap and using a clean 10 mL glass pipette extract approximately 1 mL of sample.
4. Place approximately two drops of sample on a 1-inch strip of 12-14 range pH paper.
5. Compare pH strip's color while wet with that of the color key included on the pH paper container.
6. If pH is not greater than 12, add additional NaOH to the sample using standard procedures.
7. Recheck sample using steps 2 through 6 until sample pH is greater than 12.

E. SPECIAL CONDITIONS:

Not Applicable

F. REFERENCES:

Alpha Analytical Aqueous and Soil/Solid Reference Guides.

G. APPENDICES/FORMS:

Table 1 Laboratory Analysis: Summarizing parameters, methods, preservations, container type, holding times and minimum sample volumes are included as an attachment to this SOP.

**END OF SOP**

Final Check by C. Burns 10/27/15

Table 1

| Laboratory Analysis              | EPA Method | Standard Method and/or SW846 Method | Preservation                                                                                                                                   | Container                                                           | Holding Time                                         | Minimum Volume |
|----------------------------------|------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------|----------------|
| <b>WATER</b>                     |            |                                     |                                                                                                                                                |                                                                     |                                                      |                |
| Acid Soluble & Insoluble Sulfide | -----      | 9030B                               | Cool to 4 deg C No Headspace                                                                                                                   | P or G                                                              | 7 Days                                               | 8 oz.          |
| Acidity as CaCO <sub>3</sub>     | 305.1      | 2310B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 14 Days                                              | 100 mL         |
| Alkalinity                       | -----      | 2320B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 14 Days                                              | 100 mL         |
| Alkalinity as CaCO <sub>3</sub>  | 310.1      | 2320B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 14 Days                                              | 100 mL         |
| Ammonia                          | 350.2/3    | 4500-NH <sub>3</sub> B,E            | Cool to 4 deg C, H <sub>2</sub> SO <sub>4</sub> to pH<2                                                                                        | P or G                                                              | 28 Days                                              | 400 mL         |
| Aromatic Hydrocarbons            | 602        | 8021B                               | 1:1 HCl to pH <2, Cool to 4 deg C<br>0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present                         | G, Vial screw cap with center hole<br>Teflon- faced silicone septum | 14 Days                                              | 40 mL          |
| Biochemical Oxygen Demand        | 405.1      | 5210B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 48 Hrs.                                              | 500 mL         |
| Bromide                          | 300        | -----                               | None                                                                                                                                           | P or G                                                              | 28 Days                                              | 250 mL         |
| Calcium                          | -----      | 3120B                               | HNO <sub>3</sub> to pH<2                                                                                                                       | P or G                                                              | 6 Months                                             | 100 mL         |
| Calcium- Hardness                | 200.7      | 3111B                               | HNO <sub>3</sub> to pH<2                                                                                                                       | P or G                                                              | 6 Months                                             | 100 mL         |
| Carbamates                       | 531.1      | -----                               | Cool to 4 deg C, 0.08% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present                                              | G, screw cap Teflon faced silicone septum                           | 14 Days                                              | 100 mL mL      |
| Carbonaceous BOD                 | -----      | 5210B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 48 Hrs.                                              | 1000 mL        |
| Chloride                         | 300        | 4500-CL D<br>4110                   | Cool to 4 deg C                                                                                                                                | P or G                                                              | 28 Days                                              | 100 mL         |
| Chloride, Residual Disinfectant  | -----      | 4500Cl-G                            | Cool to 4 deg C                                                                                                                                | P or G                                                              | Analyze Immediately                                  | 200 mL         |
| COD                              | 410.4      | 5220D                               | H <sub>2</sub> SO <sub>4</sub> to pH<2, Cool to 4 deg C                                                                                        | P                                                                   | 28 days                                              | 250 mL         |
| Color                            | -----      | 2120B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 24 Hrs                                               | 100 mL         |
| Conductivity                     | -----      | 2510B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 28 Days                                              | 100 mL         |
| Cyanide                          | 335.4      | 4500-CN C&E                         | Cool to 4 deg C NaOH pH>12                                                                                                                     | P or G                                                              | 14 Days                                              | 250 mL         |
| Cyanide                          | 335.2      | 9010B, 9012A, 9014                  | Cool to 4 deg C, NaOH to pH>12<br>0.6 g ascorbic acid if residual chlorine present                                                             | P or G                                                              | Sulfide absent, 14 days; sulfide present 24 Hrs      | 250 mL         |
| Cyanide, Amenable                | 335.1      |                                     |                                                                                                                                                |                                                                     |                                                      |                |
| Dioxin                           | -----      | 8280A                               | Cool to 4 deg C<br>0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present                                           | G, Amber Teflon-lined screw cap                                     | 7 days until extraction 40 days after extraction     | 1000 mL        |
| DRO                              | -----      | 8015B                               | Cool to 4 deg C<br>0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present                                           | G, Amber Teflon-lined screw cap                                     | 7 days until extraction 40 days after extraction     | 1000 mL        |
| Escherichia Coli                 | -----      | 9222B                               | 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present<br>0.3 mL/125 mL<br>1.5% EDTA if ><br>0.01 mg/L heavy metals | Sterile<br>P or G                                                   | 30 Hrs. for Drinking Water<br>6 Hrs. for Waste Water | 125 mL         |
| Extractable Org. Compounds       |            |                                     | Cool to 4 deg C, Store in dark                                                                                                                 | G, Amber Teflon-lined screw cap                                     | *7 days                                              | 4000 mL        |

Table 1

| Laboratory Analysis        | EPA Method              | Standard Method and/or SW846 Method | Preservation                                                                                            | Container                                                           | Holding Time                                               | Minimum Volume |
|----------------------------|-------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------|----------------|
| Fecal Coliform             | -----                   | 9222B or D                          | 0.008% Na2S2O3 if residual chlorine present<br>0.3 mL/125 mL<br>15% EDTA if ><br>0.01 mg/L heavy metals | Sterile<br>P or G                                                   | 30 Hrs. for<br>Drinking Water<br>6 Hrs. for Waste<br>Water | 125 mL         |
| Fecal Streptococci         | -----                   | 9230C                               | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                                          | Sterile<br>P or G                                                   | 30 Hrs. for<br>Drinking Water<br>6 Hrs. for Waste<br>Water | 125 mL         |
| Fluoride                   | 300                     | 4500 F-B,C,S                        | Cool to 4 deg C                                                                                         | P or G                                                              | 28 Days                                                    | 300 mL         |
| Foaming Agents (MBAS)      | -----                   | 5540C                               | Cool to 4 deg C                                                                                         | P or G                                                              | 48 Hrs                                                     | 250 mL         |
| Gases                      | -----                   | 3810                                | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present<br>1:1 HCl to pH <2                      | G, Vial screw cap with center hole<br>Teflon- faced silicone septum | 7 days without<br>HCl<br>14 days with<br>HCl               | 40 mL          |
| GRO                        | -----                   | 8015B                               | 1:1 HCl to pH <2, Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                        | G, Vial screw cap with center hole<br>Teflon- faced silicone septum | 7 days w/o HCl<br>14 days w/HCl                            | 40 mL          |
| Hardness                   | -----                   | -----                               | HNO3 to pH<2                                                                                            | P                                                                   | 6 months                                                   | 1000 mL        |
| Heterotrophic Plate Count  | -----                   | 9215B                               | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                                          | Sterile<br>P or G                                                   | 30 Hrs. for<br>Drinking Water<br>6 Hrs. for Waste<br>Water | 125 mL         |
| Hexavalent Chromium        | 7196A                   | 3500Cr-D                            | Cool to 4 deg C                                                                                         | P                                                                   | 24 hours                                                   | 500 mL         |
| HPLC (Explosive)           | -----                   | 8330                                | Cool to 4 deg C                                                                                         | G, Amber Teflon-lined screw cap                                     | 7 days until<br>extraction 40<br>days after<br>extraction  | 1000mL         |
| HPLC (Explosive)           | -----                   | 8310                                | Cool to 4 deg C                                                                                         | G, Amber Teflon-lined screw cap                                     |                                                            | 1000mL         |
| Mercury                    | -----                   | 7470A                               | Cool to 4 deg C                                                                                         | P or G                                                              | 28 Days                                                    | 8 oz.          |
| Metals                     | 200.7                   | -----                               | HNO3 to pH<2                                                                                            | P                                                                   | 6 Months                                                   | 100 mL         |
| Nitrate                    | 300                     | -----                               | Cool to 4 deg C                                                                                         | P or G                                                              | 48 Hrs.                                                    | 100 mL         |
| Nitrate (Chlorinated)      | 353.2                   | 4500-NO3 F                          | Cool to 4 deg C                                                                                         | P or G                                                              | 48 Hrs                                                     | 250 mL         |
| Nitrate (Non- chlorinated) | 353.2                   | 4500-NO3 F                          | H2SO4 to pH<2, Cool to 4 deg C                                                                          | P or G                                                              | 14 Days                                                    | 250 mL         |
| Nitrite                    | 300,<br>353.2,<br>354.1 | 4500-NO3 D                          | Cool to 4 deg C                                                                                         | P or G                                                              | 48 Hrs                                                     | 100 mL         |
| Odor                       | -----                   | 2150B                               | Cool to 4 deg C                                                                                         | G only                                                              | 24 Hrs                                                     | 200 mL         |
| Oil and Grease             | -----                   | 1664                                | HCl to pH<2, Cool to 4 deg C                                                                            | G, Amber Teflon-lined screw cap                                     | 28 days                                                    | 1000 mL        |
| Organic Nitrogen           | 351.1                   | -----                               | Cool to 4 deg C, H2SO4 to pH<2                                                                          | G                                                                   | 28 Days                                                    | 500 mL         |

Table 1

| Laboratory Analysis                          | EPA Method | Standard Method and/or SW846 Method | Preservation                                                                                                                | Container                                                        | Holding Time                                         | Minimum Volume |
|----------------------------------------------|------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|----------------|
| Organochlorine Pesticides/PCB                | 608        | 8081A, 8082                         | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present if aldrin is to be determined bind to pH 5-9.                | G, Amber Teflon-lined screw cap                                  | 7 days until extraction 40 days after extraction     | 1000 mL        |
| Ortho Phosphate                              | 300        | 4500 P-E                            | Cool to 4 deg C                                                                                                             | P or G                                                           | 48 Hrs                                               | 50 mL          |
| Orthophosphate                               | 365.2      | -----                               | Filter immediately, Cool to 4 deg C                                                                                         | P or G                                                           | 48 Hrs.                                              | 50 mL          |
| pH, Hydrogen ion                             | -----      | 4500-H-B                            | Cool to 4 deg C                                                                                                             | P or G                                                           | Analyze Immediately                                  | 25 mL          |
| Phenols                                      | 420.1      | 9065, 510ABC                        | Cool to 4 deg C, H2SO4 to pH<2                                                                                              | G                                                                | 28 Days                                              | 500 mL         |
| Pseudomonas Aeruginosa                       | -----      | 9213E                               | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                                                              | Sterile P or G                                                   | 30 Hrs. for Drinking Water<br>6 Hrs. for Waste Water | 125 mL         |
| Purgeable Halocarbons                        | 601        | 8021B                               | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                                                              | G, Vial screw cap with center hole Teflon- faced silicone septum | 14 Days                                              | 40 mL          |
| Radiological                                 | -----      | -----                               | HNO3 to pH<2                                                                                                                | P or G                                                           | 6 Months                                             | 100 mL         |
| Residue- Settleable (SS)                     | 160.5      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 48 Hrs.                                              | 1000 mL        |
| Residue-filtered (TDS)                       | 160.1      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 7 Days                                               | 100 mL         |
| Residue-non- filtered (TSS)                  | 160.2      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 7 Days                                               | 100 mL         |
| Residue-Total Volatile Solids                | 160.4      | 2540 E                              | Cool to 4 deg C                                                                                                             | P or G                                                           | 7 Days                                               | 100 mL         |
| Salinity                                     | -----      | 2520 C                              | Cool to 4 deg C                                                                                                             | G                                                                | 28 Days                                              | 100 mL         |
| Semivolatile Organic Compounds (Unregulated) | 525.2      | -----                               | If residual chlorine is present, add 40-50 mg Sodium Thiosulfate. If not chlorinated, add 6N HCl to pH<2<br>Cool to 4 deg C | G, Amber Teflon-lined screw cap                                  | 7 Days for extraction, 30 after extraction           | 1000 mL        |
| Semivolatile Organics                        | 625        | 8270C                               | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                                                              | G, Amber Teflon-lined screw cap                                  | 7 days for extraction 40 days after extraction       | 1000 mL        |
| Silica                                       | 200.7      | -----                               | Cool to 4 deg C                                                                                                             | P only                                                           | 7 Days                                               | 50 mL          |
| Specific Conductance                         | 120.1      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 28 Days                                              | 100 mL         |
| Sulfate                                      | 300        | 4500-SO4                            | Cool to 4 deg C                                                                                                             | P or G                                                           | 28 Days                                              | 50 mL          |
| Sulfate                                      | 375.4      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 28 Days                                              | 50 mL          |
| Sulfide                                      | 376.2      | 9030 B, 4500S2-AD                   | Cool to 4 deg C, add zinc plus NaOH to pH>9                                                                                 | P or G                                                           | 7 Days                                               | 50 mL          |
| Sulfite (SO3)                                | 377.1      | -----                               | None Required                                                                                                               | G, Bottle and Top                                                | Analyze immediately                                  | 50 mL          |
| Surfactants (MBAS)                           | 425.1      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 48 Hrs.                                              | 250 mL         |

Table 1

| Laboratory Analysis              | EPA Method    | Standard Method and/or SW846 Method | Preservation                                                                                            | Container                                                          | Holding Time                                         | Minimum Volume |
|----------------------------------|---------------|-------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------|----------------|
| TDS                              |               |                                     | Cool to 4 deg C                                                                                         | P                                                                  | 7 days                                               | 500 mL         |
| Temperature                      | -----         | 2550B                               | None                                                                                                    | P or G                                                             | Analyze Immediately                                  | 1000 mL        |
| Temperature                      | 170.1         | -----                               | None Required                                                                                           | G, Bottle and Top                                                  | Analyze immediately                                  | 1000 mL        |
| Total Kjeldahl Nitrogen          | 353.3/1       | 4500Norg-C                          | H2SO4 to pH<2, Cool to 4 deg C                                                                          | P                                                                  | 28 days                                              | 250 mL         |
| Total Coliform                   | -----         | 9221D                               | 0.008% Na2S2O3 if residual chlorine present<br>0.3 mL/125 mL<br>15% EDTA if ><br>0.01 mg/L heavy metals | Sterile<br>P or G                                                  | 30 Hrs. for Drinking Water<br>6 Hrs. for Waste Water | 125 mL         |
| Total Dissolved Solids           | 160.1         | 2540C                               | Cool to 4 deg C                                                                                         | P or G                                                             | 7 Days                                               | 100 mL         |
| Total Hardness                   | 130.2, 200.7  | -----                               | HNO3 to pH<2<br>H2SO4 to pH<2                                                                           | P or G                                                             | 6 Months                                             | 100 mL         |
| Total Kjeldahl Nitrogen          | 351.3         | -----                               | H2SO4 to pH<2                                                                                           | P or G                                                             | 28 Days                                              | 500 mL         |
| Total Metals                     | 200.7 200.8   | 6010B, 6020, 7000A                  | HNO3 to pH<2                                                                                            | P                                                                  | 6 months (Hg 28 days)                                | 500 mL         |
| Total Organic Carbon (TOC)       | 415.1         | 9060, 5310C                         | H2SO4 to pH<2, Cool to 4 deg C                                                                          | G, Amber Teflon-lined screw cap                                    | 28 days                                              | 80 mL          |
| Total Organic Halides            |               | 5320B                               | 1N H2SO4 to pH<2                                                                                        | P or G                                                             | 28 Days                                              | 50 mL          |
| Total Phosphorus                 | 365.2         | -----                               | Cool to 4 deg C, H2SO4 to pH<2                                                                          | G                                                                  | 28 Days                                              | 50 mL          |
| Total Recoverable Oil & Grease   | 413.1, 166 4A | -----                               | Cool to 4 deg C, HCL or H2SO4 to pH<2                                                                   | G                                                                  | Petroleum Based 3 Days; Non-Petroleum Based 24 hours | 1000 mL        |
| Total-Residue (TS)               | 160.3         | 2540B                               | Cool to 4 deg C                                                                                         | P or G                                                             | 7 Days                                               | 100 mL         |
| Turbidity                        | 180.1         | 2130B                               | Cool to 4 deg C                                                                                         | P or G                                                             | 48 Hrs                                               | 100 mL         |
| Volatile Organics                | 624           | 8260B                               | 1:1 HCl to pH <2, Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                        | G, Vial screw cap with center hole<br>Teflon-faced silicone septum | 7 days w/o HCl<br>14 days w/HCl                      | 40 mL          |
| Volatiles (Regulated)            | 524.2         | -----                               | Cool to 4 deg C HCl to pH<2                                                                             | G, Vial screw cap with center hole<br>Teflon-faced silicone septum | 14 Days                                              | 60-120 mL      |
| <b>SOIL</b>                      |               |                                     |                                                                                                         |                                                                    |                                                      |                |
| Acid Soluble & Insoluble Sulfide | -----         | 9030B                               | Cool to 4 deg C, no headspace                                                                           | P or G                                                             | 7 Days                                               | 8 oz.          |
| Amenable Cyanide                 | -----         | 9213                                | Cool to 4 deg C                                                                                         | P or G                                                             | 14 Days                                              | 4 oz.          |
| Bromide                          | -----         | 9211                                | Cool to 4 deg C                                                                                         | P or G                                                             | 28 Days                                              | 8 oz.          |
| Cation - Exchange Capacity       | -----         | 9080, 9081                          | None                                                                                                    | P                                                                  | -----                                                | 8 oz.          |
| Chloride                         | -----         | 9212, 9056, 9253                    | None                                                                                                    | P or G                                                             | 28 Days                                              | 8 oz.          |
| Chlorinated Herbicides           | -----         | 8151A                               | Cool to 4 deg C                                                                                         | G, wide mouth, teflon liner                                        | 14 Days                                              | 8 oz.          |
| Corrosivity pH Waste>20% water   | -----         | 9040B                               | Cool to 4 deg C                                                                                         | P                                                                  | Analyze Immediately                                  | 4 oz.          |

Table 1

| Laboratory Analysis                | EPA Method | Standard Method and/or SW846 Method | Preservation                                                                                                                | Container                       | Holding Time                                         | Minimum Volume |
|------------------------------------|------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------------------------------|----------------|
| Corrosivity Toward Steel           | -----      | 1110                                | Cool to 4 deg C                                                                                                             | P                               | 14 Days                                              | 4 oz.          |
| Cyanide                            | -----      | 9010B, 4500CN                       | Cool to 4 deg C                                                                                                             | G, Amber                        | 14 Days                                              | 4 oz           |
| Dioxin                             | -----      | 8280A                               | Cool to 4 deg C                                                                                                             | G                               | 14 Days                                              | 8 oz.          |
| DRO                                | -----      | 8015B                               | Cool to 4 deg C                                                                                                             | G, Amber                        | 14 Days                                              | 4 oz.          |
| Extractable Organic Compounds      | -----      |                                     | Cool to 4 deg C, Store in dark                                                                                              | G                               | 14 days                                              | 8 oz           |
| Extractable Sulfide                | -----      | 9031                                | Cool to 4 deg C, fill top of sample with 2N Zinc Acetate until moistened                                                    | P or G                          | 7 Days                                               | 8 oz.          |
| Fluoride                           | -----      | 9214                                | None                                                                                                                        | P                               | 28 Days                                              | 8 oz.          |
| Gases                              | -----      | 3810                                | Cool to 4 deg C                                                                                                             | G, Amber                        | 14 Days                                              | 8 oz.          |
| Grain Size                         | -----      |                                     | N/A                                                                                                                         | G                               | N/A                                                  | 8 oz           |
| GRO                                | -----      | 8015B                               | Cool to 4 deg C, check state regulations for proper preservative. NJ (methanol), PA (encore samplers) NY (cool to 4 deg C). | G, Amber VOA vial               | 14 Days                                              | 15 Grams       |
| HPLC (PAH)                         | -----      | 8310                                | Cool to 4 deg C                                                                                                             | G, Amber Teflon-lined screw cap | 14 days until extraction<br>40 days after extraction | 4 oz.          |
| Ignitability                       | -----      | 1010                                | None                                                                                                                        | P or G                          | None                                                 | 8 oz.          |
| Ignitability of Solids             | -----      | 1030                                | None                                                                                                                        | P or G                          | None                                                 | 8 oz.          |
| Mercury                            | 245.1      | 7471A                               | Cool to 4 deg C                                                                                                             | G, Amber                        | 28 Days                                              | 4 oz.          |
| Metals                             | -----      | 6010B, 6020, 7000A                  | Cool to 4 deg C                                                                                                             | G, Amber                        | 6 Months                                             | 8 oz.          |
| Moisture Content                   | -----      |                                     | Store in airtight jar 3-30 deg C                                                                                            | G                               | N/A                                                  | 8 oz           |
| Nitrate                            | -----      | 9210                                | Cool to 4 deg C                                                                                                             | P or G                          | 48 Hrs                                               | 8 oz.          |
| Oil & Grease (Sludge, Sludge- Hem) | -----      | 9071B                               | Cool to 4 deg C                                                                                                             | G                               | 28 Days                                              | 8 oz.          |
| Organochlorine                     | -----      | 8081A                               | Cool to 4 deg C                                                                                                             | P or G                          | 14 Days                                              | 8 oz.          |
| Paint Filter Liquids Test          | -----      | 9095A                               | Cool to 4 deg C                                                                                                             | P or G                          | -----                                                | 8 oz.          |
| PCBs                               | -----      | 8082                                | Cool to 4 deg C                                                                                                             | G, Amber Teflon-lined screw cap | 14 Days                                              | 4 oz.          |
| pH                                 | -----      | 9045C                               | Cool to 4 deg C                                                                                                             | G, Amber                        | Analyze Immediately                                  | 4 oz.          |
| pH, Soil and Waste                 | -----      | 9045A                               | Cool to 4 deg C                                                                                                             | G                               | Analyze Immediately                                  | 8 oz.          |
| Phenol                             | -----      | 9065, 9066, 9067                    | Cool to 4 deg C                                                                                                             | G, Amber                        | 28 Days                                              | 4 oz.          |
| Radiological                       | -----      | -----                               | Cool to 4 deg C                                                                                                             | G                               | 6 Months                                             | 8 oz.          |
| Reactivity Cyanide                 | -----      | SW-846 7.3.3.2                      | Cool to 4 deg C                                                                                                             | P                               | 14 Days                                              | 8 oz.          |
| Reactivity Sulfide                 | -----      | SW-846 7.3.4.2                      | Cool to 4 deg C                                                                                                             | P                               | 14 Days                                              | 8 oz.          |
| Semivolatle Organics               | -----      | 8270C                               | Cool to 4 deg C                                                                                                             | G, Amber                        | 14 Days                                              | 8 oz.          |

Table 1

| Laboratory Analysis                          | EPA Method | Standard Method and/or SW846 Method | Preservation                                                                                                                          | Container                      | Holding Time                                   | Minimum Volume |
|----------------------------------------------|------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------|----------------|
| Sulfate                                      | -----      | 9035, 9036, 9038                    | Cool to 4 deg C                                                                                                                       | P or G                         | 28 Days                                        | 8 oz.          |
| Sulfides                                     | -----      | 9215                                | Cool to 4 deg C                                                                                                                       | P or G                         | 7 Days                                         | 8 oz.          |
| TCLP Metals                                  | -----      | 1311, 6010B, 6020, 7000A, 7470A     | Cool to 4 deg C                                                                                                                       | G, Amber                       | 180 Days (Hg 28 days)                          | 8 oz           |
| TCLP Herbicides                              | -----      | 1311                                | Cool to 4 deg C                                                                                                                       | G, Amber                       | 14 Days                                        | 8 oz.          |
| TCLP Pesticides                              | -----      | 1311                                | Cool to 4 deg C                                                                                                                       | G, Amber                       | 14 Days                                        | 8 oz.          |
| TCLP Semivolatile Organics                   | -----      | 1311, 8270C, 8081A, 8151A           | Cool to 4 deg C                                                                                                                       | G, Amber Teflon Lined          | 14 Days                                        | 8 oz.          |
| TCLP Volatile Organics                       | -----      | 1311, 8260B                         | Cool to 4 deg C                                                                                                                       | G, Amber VOA Vial Teflon Lined | 14 Days                                        | 8 oz.          |
| Temperature                                  | -----      | 2550                                | -----                                                                                                                                 | P                              | Analyze Immediately                            | 4 oz.          |
| TOC                                          | -----      | Lloyd Kahn Method                   | Cool to 4 deg C                                                                                                                       | G, Amber                       | 14 days                                        | 4 oz.          |
| Total Coliform                               | -----      | 9131                                | Cool to 4 deg C                                                                                                                       | Sterile, P or G                | 6 Hrs                                          | 4 oz.          |
| Total Coliform                               | -----      | 9132                                | Cool to 4 deg C                                                                                                                       | Sterile, P or G                | 6 Hrs                                          | 4 oz.          |
| Total Cyanide                                | -----      | 9013                                | Cool to 4 deg C                                                                                                                       | P or G                         | 14 Days                                        | 8 oz.          |
| Volatile Organic Compounds                   | -----      | 8260B                               | Cool to 4 deg C Check individual state regulations for proper preservative. NJ (methanol), PA (encore samplers), NY (cool to 4 deg C) | G, wide mouth, teflon liner    | 14 Days                                        | 4 oz.          |
| Volatile Organic Compounds                   | -----      | 8021                                |                                                                                                                                       | G, wide mouth, teflon liner    | 14 Days                                        | 4 oz.          |
| GLP Sampling and Holding Time Information    |            |                                     |                                                                                                                                       |                                |                                                |                |
| Cyanide (aqueous)                            | ILM04.1    |                                     | NaOH to pH>12, Cool to 4 deg C                                                                                                        | P                              | 12 Days VTSR                                   | 1000ml         |
| Cyanide**                                    | ILM04.1    |                                     | Cool to 4 deg C                                                                                                                       | G                              |                                                | 8 oz           |
| Mercury (aqueous)                            | ILM04.1    |                                     | HNO3 to pH<2, Cool to 4 deg C                                                                                                         | P                              | 26 Days VTSR                                   | 1000ml         |
| Mercury (solid/soils)                        | ILM04.1    |                                     | Cool to 4 deg C                                                                                                                       | G                              |                                                | 8 oz           |
| Metals (aqueous)                             | ILM04.1    |                                     | HNO3 to pH<2, Cool to 4 deg C                                                                                                         | P                              | 180 Days VTSR                                  | 1000ml         |
| Metals (solid/soils)                         | ILM04.1    |                                     | Cool to 4 deg C                                                                                                                       | G                              |                                                | 8 oz           |
| PCBs (aqueous)                               | OLM04.2    |                                     | Na2S2O3, Cool to 4 deg C                                                                                                              | G                              | See Note 7                                     | 1000ml         |
| PCBs (solid/soils)                           | OLM04.2    |                                     | Cool to 4 deg C                                                                                                                       | G                              | See Note 6                                     | 8 oz           |
| Pesticides (aqueous)                         | OLM04.2    |                                     | Na2S2O3, Cool to 4 deg C                                                                                                              | G                              | See Note 7                                     | 1000ml         |
| Pesticides (solid/soils)                     | OLM04.2    |                                     | Cool to 4 deg C                                                                                                                       | G                              | See Note 6                                     | 8 oz           |
| Semivolatile Organic Compounds (aqueous)     | OMLO4.2    |                                     | Cool to 4 deg C                                                                                                                       | G                              | See Note 8                                     | 1000ml         |
| Semivolatile Organic Compounds (solid/soils) | OLM04.2    |                                     | Cool to 4 deg C                                                                                                                       | G                              | See Note 6                                     | 8 oz           |
| Volatile Organic Compounds (aqueous)         | OLM04.2    |                                     | HCL pH < 2, Cool to 4 deg C                                                                                                           | G                              | W/preservative: 10 days VTSR; W/O: 7 days VTSR | 40ml           |
| Volatile Organic Compounds (solid/soils)     | OLM04.2    |                                     | Cool to 4 deg C                                                                                                                       | G                              | 10 Days VTSR                                   | 4 oz           |

Table 1

| Laboratory Analysis | EPA Method | Standard Method and/or SW846 Method | Preservation | Container | Holding Time | Minimum Volume |
|---------------------|------------|-------------------------------------|--------------|-----------|--------------|----------------|
|---------------------|------------|-------------------------------------|--------------|-----------|--------------|----------------|

Notes:

- 1. P - Plastic.
- 2. G - Glass.
- 3. Minimum volume is the minimum volume required by the laboratory to conduct the analysis. The laboratory will likely require additional sample volume.
- 4. \* Extraction within seven (7) days of collection; analysis within 40 days of extraction.
- 5. \*\*When chlorine is present ascorbic acid is used to remove the interference (0.6 g ascorbic acid).
- 6. VTSR - Validated time of sample receipt.
- 7. Ten (10) days from VTSR for extraction and 40 days following extraction.
- 8. Five (5) days from VTSR for extraction 14 days after extraction.
- 9. Five (5) days from VTSR for extraction 40 days after extraction.
- 10. Holding times are from the time of sample collection unless otherwise noted.

## **APPENDIX B**

### **Quality Assurance Quality Control Plan**

100

[illegible]

## TABLE OF CONTENTS

|       |                                                           |    |
|-------|-----------------------------------------------------------|----|
| 1.0   | Introduction.....                                         | 1  |
| 1.1   | Site Description.....                                     | 1  |
| 1.2   | Scope of Work .....                                       | 2  |
| 2.0   | Project Organization and Responsibility .....             | 3  |
| 3.0   | Quality Assurance Objectives For Measurement Data.....    | 7  |
| 4.0   | Level of QA Effort.....                                   | 8  |
| 4.1   | Accuracy, Precisions and Sensitivity of Analyses.....     | 8  |
| 4.2   | Completeness, Representativeness and Comparability.....   | 9  |
| 4.3   | Field Documentation.....                                  | 9  |
| 5.0   | Sampling Procedures .....                                 | 11 |
| 6.0   | Sample Custody and Document Control.....                  | 13 |
| 6.1   | Chain-Of-Custody .....                                    | 13 |
| 6.2   | Sample Documentation in the Laboratory .....              | 13 |
| 6.3   | Storage of Samples .....                                  | 14 |
| 7.0   | Calibration Procedures and Frequency .....                | 15 |
| 7.1   | Instrument Calibration and Tuning.....                    | 15 |
| 7.2   | Field Instrument Calibration .....                        | 15 |
| 8.0   | Data Reduction, Validation, Assessment and Reporting..... | 16 |
| 8.1   | General.....                                              | 16 |
| 8.2   | Field Data.....                                           | 16 |
| 8.3   | Laboratory Reporting.....                                 | 17 |
| 8.4   | Electronic Data.....                                      | 17 |
| 8.5   | Data Validation .....                                     | 17 |
| 9.0   | Internal Quality Control Checks and Frequency .....       | 18 |
| 9.1   | Field Quality Control .....                               | 18 |
| 9.2   | Laboratory Quality Control.....                           | 18 |
| 9.2.1 | Blank Samples .....                                       | 18 |
| 9.2.2 | Matrix Spike/Matrix Spike Duplicates .....                | 18 |
| 9.2.3 | Surrogate Analyses .....                                  | 18 |
| 10.0  | Procedures Used to Assess Performance .....               | 20 |
| 10.1  | Precision.....                                            | 20 |
| 10.2  | Accuracy .....                                            | 20 |
| 10.3  | Representativeness, Completeness and Comparability.....   | 21 |
| 10.4  | Outliers.....                                             | 21 |
| 11.0  | Quality Assurance Report to Management .....              | 22 |

---

## FIGURES

- Figure 1: Site Location Map  
Figure 2: Site Boundaries Map

## TABLES

|          |                                                   |    |
|----------|---------------------------------------------------|----|
| Table 1: | Key Project Personnel.....                        | 6  |
| Table 2: | Analytical Methods/Quality Assurance Summary..... | 12 |

## APPENDICES

- Appendix A: CHA Standard Operating Procedures  
Appendix B: CHA Staff Resumes  
Appendix C: Field Calibration Log

---

## LIST OF ACRONYMS & ABBREVIATIONS

|        |                                                         |
|--------|---------------------------------------------------------|
| CHA    | CHA Consulting, Inc.                                    |
| COC    | Chain of Custody                                        |
| DER    | Division of Environmental Remediation                   |
| FSP    | Field Sampling Plan                                     |
| GC/MS  | Gas Chromatography/Mass Spectrometry                    |
| IRM    | Interim Remedial Measure                                |
| MS/MSD | Matrix Spike/Matrix Spike Duplicate                     |
| NYSDEC | New York State Department of Environmental Conservation |
| NYSDOH | New York State Department of Health                     |
| PCB    | Polychlorinated Biphenyl                                |
| P.G.   | Professional Geologist                                  |
| PID    | Photoionization Detector                                |
| QA     | Quality Assurance                                       |
| QAPP   | Quality Assurance Project Plan                          |
| QC     | Quality Control                                         |
| RPD    | Relative Percent Difference                             |
| SCWP   | Site Characterization Work Plan                         |
| SOP    | Standard Operating Procedure                            |
| SVOC   | Semivolatile Organic Compound                           |
| TAL    | Target Analyte List                                     |
| TCL    | Target Compound List                                    |
| TCLP   | Toxicity Characteristic Leaching Procedure              |
| USEPA  | United States Environmental Protection Agency           |
| VOC    | Volatile Organic Compound                               |

## **1.0 INTRODUCTION**

This Quality Assurance Project Plan (QAPP) presents the policies, organization, objectives, functional activities and specific Quality Assurance (QA) and Quality Control (QC) activities designed to achieve the specific data quality goals associated with the investigation that will be conducted at Oak Mitsui in Hoosick Falls, New York. The scope of work associated with the investigation activities and specific areas of concern that will be addressed are summarized in the Site Characterization Work Plan (SCWP).

This QAPP has been prepared to identify procedures for sample preparation and handling, sample chain-of-custody, laboratory analyses, and reporting to be implemented during this investigation to ensure the accuracy and integrity of the data generated during the investigation. This QAPP has been prepared in accordance with the New York State Department of Environmental Conservation's (NYSDEC) Department of Remediation (DER-10) Technical Guidance for Site Investigation and Remediation. Field activities will be performed in accordance with CHA Consulting, Inc. (CHA) standard operating procedures (SOPs), included in Appendix A.

### **1.1 SITE DESCRIPTION**

The Oak Mitsui Facility (site) is located at 80 First Street in the Village of Hoosick Falls, Rensselaer County, New York. The site is situated on the southern bank of the Hoosick River and is bound to the east by the Pan Am Railroad line and to the south by residences. The site is comprised of three (3) parcels, Tax Map Nos. 27.14-7-2, 27.14-7-3 and 27.14-8-19. According to the current Zoning Map on file with the Village of Hoosick Falls (Barton and Loguidice, D.P.C. January 2015 Draft Existing Zoning Map of the Village of Hoosick Falls), parcel 27.14-7-2 is mainly zoned Industrial except for the parking lot across First St. which is zoned Commercial-Industrial; and parcels 27.14-7-3 and 27.14-8-19 are zoned Residential.

The subject Site was historically utilized for industrial purposes dating back to the late 1800's. Previous operations included a coal gas manufacturing facility (Hoosick Falls Gaslight Co. then Fidelity Gas Co.) from at least 1884 to at least 1910 on the western side of the site; and a foundry, a machine shop, and a paper mill machine manufacturing facility (Nobel and Wood Machine Co.) from at least 1910 to 1976 on the eastern side of the property. The former Oak Mitsui onsite operations included the production of copper foil since 1976, however between 2014 and 2015 operations at the Oak Mitsui facility ceased and in the summer of 2017 the onsite buildings were demolished. The former building foundations have been left in place and the site is surrounded by a chain link fence for security. The site is currently vacant. A site location map is provided as Figure 1 and a property boundaries map is provided as Figure 2.

Characterization of the contamination via Phase I and Phase II Subsurface Environmental Investigation indicated widespread metal contamination in the area of the former building. No underground storage tanks or other containers (e.g. drums) are known to be present on the site. A complete description of the current information regarding nature and extent of contamination and previous environmental investigations is provided in the Site Characterization Work Plan.

## **1.2 SCOPE OF WORK**

This QAPP has been prepared in accordance with Section 3.0 of the NYSDEC's "Division of Environmental Remediation program policy 10 (DER-10) Technical Guidance for Site Investigation and Remediation" (May 2010). The primary objectives of this SCWP include the following:

The primary objectives of the SCWP include the following:

- Assist in identifying any additional areas of concern at the Site and help determine if the Site poses a significant threat to public health and the environment; and
- If a threat is identified, determine whether further investigation is required.

In general, the SC program will include the following activities:

- Installation of soil borings;
- Collection of subsurface soil samples from the borings as well as certain IRM areas;
- Review groundwater sample data collected by Honeywell's consultant, ERM, under a separate SCWP; and
- Equipment cleaning.

The data derived from the SCWP will assist in identifying any additional areas of concern at the Site and help determine if the site poses a significant threat to public health and the environment. If a significant threat determination is made, additional investigation may be warranted.

## **2.0 PROJECT ORGANIZATION AND RESPONSIBILITY**

The SCWP activities are being conducted by Oak Mitsui under the supervision of the Oak Mitsui Project Manager, who is the prime contact for communication with the NYSDEC. Engineering oversight and coordination of the soil investigation activities of site characterization are to be provided by CHA. Engineering oversight and coordination of the groundwater investigation activities of the site characterization are to be provided by ERM under a separate SC Work Plan. The CHA Project Manager is responsible for the delivery of CHA services. Resumes for CHA staff providing environmental services are included in Appendix B.

### **Oak Mitsui Facility**

#### **Larry Vosh – Director of Engineering**

- Responsible for the overall engineering program for the Former Oak Mitsui facility.

### **CHA**

#### **Cailyn Locci – CHA Project Manager, Technical Manager/Project Coordinator**

- Responsible for following the approved SCWP, notifying the NYSDEC of any deficiencies, and obtaining approval by the NYSDEC for all modifications to the project;
- Provide overall and day-to-day project management;
- Ensure all resources of CHA are available on an as-required basis;
- Participate in key technical negotiations with the NYSDEC, as necessary;
- Provide managerial guidance to CHA's technical group;
- Evaluate data;
- Prepare and coordinate the issuance of reports;
- Provide immediate supervision of all on-site activities;
- Assist in preparation and review of final report; and
- Provide technical representation for field activities.

#### **Dr. Christopher Burns, PG - CHA QA/QC**

- Conduct internal audit of field investigation and sampling;
- Review laboratory activities;
- Determine laboratory data corrective action;
- Review analytical data validation and assessment;
- Review laboratory QA/QC;
- Assist in preparation and review of final report; and,
- Provide technical representation for analytical activities.

#### **John Favreau - Field Oversight and Quality Control Coordinator**

- Serve as Field Team Leader;

- Work with field crew to prepare for field activities and conduct investigations; and,
- On-Site to:
  1. Provide oversight and coordination of field activities.
  2. Ensure that required QC procedures are followed for soil boring and monitoring well installation activities, material handling, and sample collection.
  3. Initiate informal and/or formal corrective actions as necessary.
  4. Maintain and report QC records (i.e. chain-of-custody, field equipment calibration, etc.).
  5. Report to the Project Manager.
  6. Provide field management of sample collection and field QA/QC;
  7. Responsible for maintenance of the field equipment; and
  8. Assist in preparation and review of final report.

## **Laboratory**

Alpha Analytical, Inc. is the analytical laboratory chosen to perform the proposed work and is certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) Number 11148 to perform the required analyses in accordance with the most recent version of the NYSDEC Analytical Services Protocol (ASP).

### **Project Manager, Analytical Contractor**

- Ensure resources of laboratory are available on an as-required basis;
- Coordinate laboratory analyses;
- Supervise laboratory's in-house chain-of-custody (COC);
- Schedule analyses of samples;
- Oversee review of data;
- Oversee preparation of analytical reports; and,
- Approve final analytical reports prior to submission to CHA.

### **Quality Assurance/ Quality Control Officer, Analytical Contractor**

- Overview laboratory QA/QC;
- Overview QA/QC documentation;
- Conduct detailed data review;
- Decide laboratory corrective actions, if required; and,
- Provide technical representation for laboratory QA/QC procedures.

### **Sample Custodian, Analytical Contractor**

- Receive and inspect the sample containers;
- Record the condition of the sample containers;
- Sign appropriate documents;
- Verify chain-of-custodies and their correctness;

- Notify laboratory project manager and laboratory QA/QC Officer of sample receipt and inspection;
- Assign a unique laboratory identification number correlated to CHA's sample identification number, and enter each into the sample receiving log;
- Initiate transfer of the samples to the appropriate lab sections with assistance from the laboratory project manager; and,
- Control and monitor access to and storage of samples and extracts.

Table 1 below, identifies key personnel assigned to the project and provides contact information.

**Table 1: Key Project Personnel**

| <b>Name</b>                                                                             | <b>Address</b>                                                                                                                                                      | <b>Responsibilities</b>                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Larry Vosh<br>Oak Mitsui<br><i>Oak Mitsui Director of Engineering</i>                   | 80 First St.<br>Hoosick Fall, NY 12090<br>(518) 260-4028<br><a href="mailto:larry.vosh@oakmitsui.com">larry.vosh@oakmitsui.com</a>                                  | Mr. Vosh will represent Oak Mitsui in the review and oversight of the project and serve as the point of contact for Oak Mitsui.                                                                                                                     |
| Cailyn Locci<br>CHA<br><i>Project Manager</i>                                           | III Winners Circle<br>Albany, NY 12205<br>(518) 453-4733<br><a href="mailto:clocci@chacompanies.com">clocci@chacompanies.com</a>                                    | Ms. Locci will oversee the project, provide quality control on documents and determinations and mentor the daily task manager.                                                                                                                      |
| Dr. Christopher Burns, P.G.<br>CHA<br><i>Quality Assurance/ Quality Control Officer</i> | 9020 Stony Point Parkway<br>Suite 160<br>Richmond, VA 23235-4700<br>(804) 897-0954 ext. 248<br><a href="mailto:cburns@chacompanies.com">cburns@chacompanies.com</a> | Dr. Burns will act as CHA's QA/QC Officer, which will include providing an internal audit of field sampling procedures, a review of laboratory activities and QA/QC, assistance in the preparation and review of final reports.                     |
| Cailyn Locci<br>CHA<br><i>Technical Manager/ Project Coordinator</i>                    | III Winners Circle<br>Albany, NY 12205<br>(518) 453-4733<br><a href="mailto:clocci@chacompanies.com">clocci@chacompanies.com</a>                                    | Ms. Locci will provide immediate supervision of all on-site activities, provide field management of sample collection and field QA/QC, assist in preparation and review of final report, and provide technical representation for field activities. |
| John Favreau<br>CHA<br><i>Field Leader &amp; Health and Safety Officer</i>              | III Winners Circle<br>Albany, NY 12205<br>(518) 453-8795<br><a href="mailto:jfavreau@chacompanies.com">jfavreau@chacompanies.com</a>                                | Mr. Favreau will supervise field investigation activities and will also serve as database manager. Mr. Favreau will serve as the Health and Safety point of contact for CHA staff.                                                                  |
| Candace Fox<br>Alpha Analytical<br><i>Laboratory Project Manager</i>                    | 275 Cooper Ave<br>Tonawanda, NY 14150<br>(716) 427-5223<br><a href="mailto:cfox@alphalab.com">cfox@alphalab.com</a>                                                 | Ms. Fox will act as CHA's point of contact with the contracted laboratory.                                                                                                                                                                          |

### **3.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA**

The overall QA objective is to develop and implement procedures for sample preparation and handling, sample COC, laboratory analyses, and reporting, in order to provide accurate data. Specific procedures to be followed for sampling, sample custody and document control, calibration, laboratory analyses and data reduction, validation, assessment and reporting are presented in Sections 4.0 through 8.0 of this QAPP.

The purpose of this Section is to define the goals for the level of QA effort; namely, accuracy; precision and sensitivity of analyses; and completeness, representativeness and comparability of measurement data from the analytical laboratories. QA objectives for field measurements are also discussed.

## **4.0 LEVEL OF QA EFFORT**

To assess the quality of data resulting from the field sampling program, field duplicate samples, field blank samples, samples for laboratory matrix spike/matrix spike duplicate (MS/MSD) analyses, and trip blank samples will be collected (where appropriate) and submitted to the contract laboratory. CHA SOP#605 will be adhered to for all QAQC procedures. CHA SOP#603 will be adhered to for all sample containers, volumes, preservations and holding times.

For field samples collected, field duplicate samples will be submitted at a frequency of one per 20 investigative samples or, in the event that a sampling round consists of less than 20 samples, one field duplicate will be collected. Field duplicate samples for subsurface soil matrices will be collected and analyzed as a check on the aggregate analytical and sampling protocol precision. MS/MSD samples will be analyzed at a minimum frequency of one set per 20 investigative samples. In the event that a sampling event consists of less than 20 samples, one MS/MSD sample will be collected. MS/MSD samples will be analyzed as a check on the analytical method's accuracy and precision.

The sampling and analysis program is summarized in Table 2 and lists the specific parameters to be measured, the number of samples to be collected and the level of QA effort required for each matrix.

### **4.1 ACCURACY, PRECISIONS AND SENSITIVITY OF ANALYSES**

The fundamental QA objective with respect to the accuracy, precision and sensitivity of analytical data is to achieve the QC acceptance of each analytical protocol. The method(s) precision (relative percent difference of duplicate analysis) will be determined from the duplicate analyses of MS samples. A minimum of one sample will be spiked and analyzed in duplicate. Additional details are provided in CHA SOP#605. Analysis will compare with the criteria presented in the appropriate methods identified in Section 4.0.

The method(s) accuracy (percent recovery) for water and soil samples will be determined by spiking selected samples (matrix spikes) with test compounds. Accuracy will be reported as the percent recovery of the test compound and will compare with the criteria given in the appropriate methods as identified in Section 4.0.

Project-specific accuracy and precision goals are identified in Section 9.0.

## **4.2 COMPLETENESS, REPRESENTATIVENESS AND COMPARABILITY**

It is expected that all analyses conducted in accordance with the selected methods will provide data meeting QC acceptance criteria for 80 percent of all samples tested. Any reasons for variances will be documented.

The sampling program has been designed to provide data representative of Site conditions. During development of these networks, consideration was given to location of historic activities, existing data from past studies completed for the Site and the physical Site setting. The extent to which existing and planned analytical data will be comparable depends on the similarity of sampling and analytical methods. The procedures used to obtain the planned analytical data are documented in this QAPP. Comparability of laboratory analyses will be ensured by the use of consistent units. Following completion of data collection, the existing database will be evaluated for representativeness.

## **4.3 FIELD DOCUMENTATION**

Pertinent field survey and sampling information shall be recorded in a logbook or on field logs during each day of the field effort per CHA SOP#101 Field Logbook and Photographs.

At a minimum, entries in a logbook shall include:

- Date and time of starting work;
- Names of all personnel at site;
- Weather conditions
- Purpose of proposed work effort;
- Sampling equipment to be used and calibration of equipment;
- Description of work area;
- Location of work area, including map reference;
- Details of work effort, particularly any deviation from the field operations plan or standard operating procedures;
- Field observations;
- Field measurements (e.g., Photoionization Detector (PID) readings);
- Field laboratory analytical results;
- Daily health and safety entries, including levels of protection;
- Type, number, and location of samples;
- Sampling method, particularly deviations from the standard operating procedures;
- Sample location and number; and
- Sample handling, packaging, labeling, and shipping information (including destination).

In addition to keeping logs, photographs will be taken to provide a physical record to augment the fieldworker's written observations. For each photograph taken, several items shall be recorded in the field logbooks:

- Date and time;
- Name of photographer;
- General direction faced and description of the subject

Additional protocols specific to each sampling method are presented in the following sections.

The general QA objective for measurement data is to obtain reproducible and comparable measurements to a degree of accuracy consistent with the use of standardized procedures.

## 5.0 SAMPLING PROCEDURES

The sampling program to be implemented by CHA will include the collection and analyses of subsurface soil samples. Groundwater samples will be collected by ERM under a separate Site Characterization Work Plan. Details regarding specific sampling activities are provided in the SCWP and the procedures for collecting samples and for performing related field activities are described in detail in the Field Sampling Plan (FSP), included in Appendix A of the SCWP. The number of samples, analytical methods, sample volumes, preservation techniques and holding times are provided in Table 2, below.

**Table 2: Analytical Methods/Quality Assurance Summary**

| <b>Matrix<br/>(Sample Type)</b> | <b>Type of Sample</b> | <b>Analysis</b>         | <b>Parameter</b> | <b>Number of Primary Samples</b> | <b>Number of Duplicates / MS/MSD</b> | <b>Sampling Locations</b> | <b>Minimum Sample Volume/ Container</b> | <b>Sample Preservation</b>       | <b>Technical Holding Time</b>  |
|---------------------------------|-----------------------|-------------------------|------------------|----------------------------------|--------------------------------------|---------------------------|-----------------------------------------|----------------------------------|--------------------------------|
| <b>Soil</b>                     | Subsurface Soil       | EPA Method 8260C        | TCL VOCs         | 17                               | 2/2/2                                | East Side & West Side     | 5 grams/40mL Amber VOA                  | NaSO <sub>4</sub> , Cool to 4 °C | 14 days                        |
|                                 | Subsurface Soil       | EPA Method 8270D        | TCL SVOCs        | 15                               | 2/2/2                                | East Side & West Side     | 4 oz glass wide                         | Cool to 4°C                      | 14 days                        |
|                                 | Subsurface Soil       | EPA 6010C, 7471B        | TAL Metals       | 24                               | 2/2/2                                | East Side & West Side     | 8 oz glass wide                         | Cool to 4°C                      | 180 days (28 days for mercury) |
|                                 | Subsurface Soil       | EPA Method 8082A        | TCL PCBs         | 15                               | 2/2/2                                | East Side & West Side     | 4 oz glass wide                         | Cool to 4°C                      | 14 days                        |
|                                 | Subsurface Soil       | EPA Method 8081BC       | TCL Pesticides   | 15                               | 2/2/2                                | East Side & West Side     | 4 oz glass wide                         | Cool to 4°C                      | 14 days                        |
|                                 | Subsurface Soil       | EPA Method 9010C        | Total Cyanide    | 15                               | 2/2/2                                | East Side & West Side     | 8 oz glass wide                         | Cool to 4°C                      | 14 days                        |
|                                 | Subsurface Soil       | EPA Method 8270 SIM     | 1,4-Dioxane      | 9                                | 2/2/2                                | East Side & West Side     | 4 oz glass wide                         | Cool to 4°C                      | 14 days                        |
|                                 | Subsurface Soil       | EPA Modified Method 537 | PFAS             | 9                                | 2/2/2                                | East Side & West Side     | 250 mL plastic container (3)            | 1.25 g Trizma, Cool to 4°C       | 14 days                        |

## **6.0 SAMPLE CUSTODY AND DOCUMENT CONTROL**

### **6.1 CHAIN-OF-CUSTODY**

As per CHA SOP#105, a COC will be maintained to document the transfer of all samples. Each sample container will be properly sealed. Sample container labels will include the sample name, required analysis, and date and time of collection. Sample containers will be taken to the Contract Laboratory courier center at 4°C ( $\pm 2^{\circ}\text{C}$ ) in sealed coolers.

Each sample cooler will contain an appropriately completed COC form. One copy will be returned to CHA upon receipt of the samples by the laboratory. One copy will be returned to CHA with the data deliverables package.

Upon receipt of the cooler at the laboratory, it will be inspected by the designated sample custodian. The condition of the cooler and sample containers will be noted on the COC record sheet by the sample custodian. The sample custodian will also document the date and time of receipt of the container and sign the form.

If damage or discrepancies are noticed, they will be recorded in the remarks column of the record sheet, and be dated and signed. Any damage or discrepancies will be reported to the lab supervisor who will inform the lab manager, QA Officer and CHA Project Manager.

### **6.2 SAMPLE DOCUMENTATION IN THE LABORATORY**

Each sample or group of samples shipped to the laboratory for analysis will be given a unique identification number by the laboratory. The laboratory sample custodian will record the client name, number of samples and date of receipt of samples in the Sample Control Log Book.

The Contract Laboratory will be responsible for maintaining analytical log books and laboratory data as well as sample inventory on hand for submittal to CHA on an "as required" basis. Samples will be maintained by the laboratory for a period of 30 days, under the conditions prescribed by the appropriate United States Environmental Protection Agency (USEPA) methods, for additional analyses, if necessary. Raw laboratory data files will be inventoried and maintained by the Contract Laboratory for a period of five years, at which time CHA will advise them as to the need for additional storage.

### **6.3 STORAGE OF SAMPLES**

Evidentiary files for the entire project will be inventoried and maintained by CHA and will consist of the following:

- 1) Project related plans;
- 2) Project log books;
- 3) Field data records;
- 4) Sample identification documents;
- 5) Chain-of-Custody records;
- 6) Report notes, calculations, etc.;
- 7) References, literature;
- 8) Miscellaneous - photos, maps, drawings, etc.; and
- 9) Copies of all final reports pertaining to the project.

The project file materials will be the responsibility of CHA's Project Manager with respect to document maintenance and management.

## **7.0 CALIBRATION PROCEDURES AND FREQUENCY**

### **7.1 INSTRUMENT CALIBRATION AND TUNING**

Calibration of instrumentation is required to ensure that the analytical system is operating correctly and functioning at the proper sensitivity to meet established reporting limits. Each instrument is calibrated with standard solutions appropriate to the type of instrument and the linear range established for the analytical method. The frequency of calibration and the concentration of calibration standards is determined by the manufacturer's guidelines, the analytical method, or the requirements of special contracts.

### **7.2 FIELD INSTRUMENT CALIBRATION**

Calibration of the field instruments will be completed prior to each day's use in accordance with the manufacturer's instructions. The field equipment will be maintained, calibrated and operated in a manner consistent with the manufacturer's guidelines and EPA standard methods. However, since the majority of field measurements will be limited to organic vapor readings (PID readings), pH, conductivity, turbidity, and depth (water level) the calibration procedures will be conducted at a minimum frequency of once per day. Records of calibration, repair or replacement will be filed and maintained by the Field Team Leader on the log provided in Appendix C.

## **8.0 DATA REDUCTION, VALIDATION, ASSESSMENT AND REPORTING**

### **8.1 GENERAL**

The Contract Laboratory will perform analytical data reduction and validation in-house under the direction of the laboratory QA Officer. The laboratory's QA Officer will be responsible for assessing data quality and advising of any data which were rated "preliminary" or "unacceptable" or other qualifications based on the QC criteria outlined in the methods, which would caution the data user of possible unreliability.

Assessment of analytical and field data will include checks for data consistency by looking for comparability of duplicate analyses, laboratory QA procedures, adherence to accuracy and precision criteria, transmittal errors and anomalously high or low parameter values. The results of these data validations will be reported to the project managers, noting any discrepancies and their effect upon acceptability of the data.

### **8.2 FIELD DATA**

Raw data from field measurements and sample collection activities that are used in project reports will be appropriately identified and appended to the report. Where data have been reduced or summarized, the method of reduction will be documented in the report. Field data will be reviewed for anomalously high or low values that may appear to be inconsistent with other data.

Field sampling data will be reviewed by the CHA QA/QC Officer to ensure the following information has been properly documented:

- Sample identification;
- Source;
- Date and time of sampling;
- Sampling equipment;
- Person(s) collecting the sample; and
- Results of field monitoring and/or observations.

In addition, the field sampling data will be evaluated to ensure:

- The use of approved sampling and sample handling procedures;
- Proper packing/shipping procedures were used; and
- Proper COC was maintained.

### **8.3 LABORATORY REPORTING**

Reporting and deliverables for groundwater and soil samples will be in accordance with NYSDEC July 2005 ASP, Category B. Reports will be received by CHA within 30 days of the last day of sampling. Sample data and its corresponding QA/QC data shall be maintained accessible to CHA either in hard copy or on disk. All other reporting and deliverables (i.e. waste characterization samples) will be in accordance with Standard Laboratory Procedure.

### **8.4 ELECTRONIC DATA**

The laboratory will also provide the analytical data in an electronic format. The data will be added into the existing database maintained by CHA staff. From there the data can be processed and compared to existing standards using the existing software. An electronic copy of the analytical data in Category B format and in EQuIS format will be provided to NYSDEC.

### **8.5 DATA VALIDATION**

A qualified third party will conduct an independent evaluation of the Category B data reduction and reporting by the laboratory. The data validation will be performed in accordance with the following documents: "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review EPA 540/R-99-008, October 1999" and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review EPA 540/R-04-004, October 2004". Data analyzed using methods not covered in these documents will be validated using the general principles used in these documents, and the analytical requirements specified in the methods pertaining to USEPA Region 2 Data Validation.

---

## **9.0 INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY**

### **9.1 FIELD QUALITY CONTROL**

QC procedures for field measurements will be limited to checking the reproducibility of the measurement in the field by obtaining multiple readings and by calibrating the instruments (where appropriate).

QC of field sampling will involve collecting field duplicates and trip blanks with the applicable site activities described in the SCWP/FSP. Field QC samples are also discussed in Section 4.0.

### **9.2 LABORATORY QUALITY CONTROL**

Specific procedures related to internal laboratory QC samples (namely blanks, MS/MSD, surrogates and QC check samples) are described in the following subsections.

#### **9.2.1 Blank Samples**

A reagent blank will be analyzed by the laboratory at a frequency of one blank per 10 analyses, or in the event that an analytical round consists of less than 10 samples, one reagent blank will be analyzed. The reagent blank, an aliquot of analyte-free water or solvent, will be carried through the entire analytical procedure.

#### **9.2.2 Matrix Spike/Matrix Spike Duplicates**

An MS/MSD sample will be analyzed at a minimum frequency one sample for every 20 investigative samples that are collected. For sampling events consisting of less than 20 investigative samples, one MS/MSD sample set will be collected. Acceptable criteria and compounds that will be used for matrix spikes are identified in the appropriate methods. Percent spike recoveries will be used to evaluate analytical accuracy while percent relative standard deviation or the relative percent difference (RPD) between matrix spike analyses will be used to assess analytical precision.

#### **9.2.3 Surrogate Analyses**

Surrogates are organic compounds which are similar to the analytes of interest, but which are not normally found in environmental samples. Surrogates are added to samples, by the laboratory, to monitor the effect of the matrix on the accuracy of the analysis. Every blank, standard and environmental sample analyzed by GC or GC/MS, including MS/MSD samples, will be spiked with surrogate compounds prior to sample preparation.

Surrogates will be spiked into samples according to the appropriate analytical methods. Surrogate spike recoveries will be compared with the control limits set by procedures specified in the method (or from laboratory specific control limits) for analytes falling within the quantification limits without dilution. Dilution of samples to bring the analyte concentration into the linear range of calibration may dilute the surrogates out of the quantification limit; assessment of analytical quality in these cases will be based on the quality control embodied in the check and MS/MSD samples.

## 10.0 PROCEDURES USED TO ASSESS PERFORMANCE

### 10.1 PRECISION

Precision will be assessed by comparing the analytical results between duplicate spike analyses. Precision as relative percent difference (RPD) will be calculated as follows:

$$\text{Precision} = \frac{[D_2 - D_1]}{(D_1 + D_2)/2} \times 100$$

D<sub>1</sub> = matrix spike recovery

D<sub>2</sub> = matrix spike duplicate spike recovery

Acceptance criteria for duplicate soil samples will be ≤30% RPD. Acceptance criteria for duplicate water samples will be ≤20% RPD between field and laboratory data.

Percent relative standard deviation or the RPD between matrix spike analyses will be used to assess laboratory analytical precision. Acceptable criteria and compounds that will be used are identified in the appropriate USEPA methods.

### 10.2 ACCURACY

Accuracy will be assessed by comparing a set of analytical results to the accepted or "true" values that would be expected. In general, MS/MSD and surrogate spike recoveries will be used to assess accuracy. Accuracy as percent recovery will be calculated as follows:

$$\text{Accuracy} = \frac{A-B}{C} \times 100$$

A = The analyte determined experimentally from the spike sample.

B = The background level determined by a separate analysis of the unspiked sample.

C = The amount of spike added.

Percent spike recoveries in MS/MSD and surrogate spike recoveries will be used to evaluate analytical accuracy. Acceptable criteria and compounds that will be used for matrix spikes are identified in the appropriate EPA methods.

The evaluation of accuracy of field measurements will be limited to checking the reproducibility of the measurement in the field by obtaining multiple readings and by calibrating the instruments (where appropriate).

### **10.3 REPRESENTATIVENESS, COMPLETENESS AND COMPARABILITY**

Completeness is a measure of the amount of valid data obtained from a measurement system compared with the amount that was expected to be obtained under normal conditions.

To be considered complete, the data set must contain all QC check analyses verifying precision and accuracy for the analytical protocol. In addition, all data are reviewed in terms of stated goals in order to determine if the database is sufficient.

When possible, the percent completeness for each set of samples will be calculated as follows:

$$\text{Completeness} = \frac{\text{valid data obtained}}{\text{total data planned}} \times 100 \text{ percent}$$

A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, site decisions may be based on any, or all of, the remaining, validated data. Representativeness will be addressed by collecting the samples as described in this document. Comparability will be addressed by collecting, analyzing, and reporting the data as described in this document.

### **10.4 OUTLIERS**

Procedures discussed previously will be followed for documenting deviations. In the event that a result deviates significantly from method established control limits, this deviation will be noted and its effect on the quality of the remaining data will be assessed and documented.

## **11.0 QUALITY ASSURANCE REPORT TO MANAGEMENT**

The CHA Project Manager will receive reports on the performance of the measurement system and the data quality following each sampling round and at the conclusion of the project.

At a minimum, these reports will include:

- 1) Assessment of measurement quality indicators; (i.e. data accuracy, precision and completeness);
- 2) Results of systems audits; and
- 3) QA problems and recommended solutions.

CHA's QA/QC Officer will be responsible within the organizational structure for preparing these periodic reports. The final report for the project will also include a separate QA section which will summarize data quality information contained in the periodic QA/QC reports to management, and present an overall data assessment and validation in accordance with the data quality objectives outlined in this QAPP.

**APPENDIX A**  
**CHA Standard Operating Procedures**



## FIELD LOGBOOK AND PHOTOGRAPHS

### A. PURPOSE/SCOPE:

To produce an accurate and reliable record of all field activities, including field observations, sample collection activities, etc.

All pertinent field survey and sampling information shall be recorded in a logbook or on field logs during each day of the field effort.

In addition to keeping logs, photographs will be taken to provide a physical record to augment the field worker's written observations. They can be valuable to the field team during future inspections, informal meetings, and hearings. Photographs should be taken with a camera-lens system having a perspective similar to that afforded by the naked eye. A photograph must be documented if it is to be a valid representation of an existing situation.

### B. EQUIPMENT/MATERIALS:

- Bound Field Book (with waterproof paper) or Field Logs
- Chain-of-Custody, Other Appropriate Forms
- Indelible Ink Pens
- Digital Camera with 50 mm lens or similar.

### C. PROCEDURE:

1. At a minimum, entries in a logbook shall include:
  - a. Date and time of starting work
  - b. Names of all personnel at site
  - c. Summary of key conversations with contractors, agency representatives, etc.
  - d. Purpose of proposed work effort
  - e. Sampling equipment to be used
  - f. Field calibration of equipment or documentation of calibration of rented equipment
  - g. Description of work area
  - h. Location of work area, including map reference. Document sample locations with references to fixed landmarks (e.g., 10 feet from southwest corner of building).
  - i. Details of work effort, particularly any deviation from the field operations plan or standard operating procedures
  - j. Field observations and field measurements (e.g., pH)
  - k. Field laboratory analytical results
  - l. Personnel and equipment decontamination procedures
  - m. Daily health and safety entries, including levels of protection
  - n. Type and number of samples



### FIELD LOGBOOK AND PHOTOGRAPHS

- o. Sampling method, particularly deviations from the standard operating procedures
- p. Sample location and number
- q. Sample handling, packaging, labeling, and shipping information (including destination)
- r. Time of leaving site.

For each photograph taken, several items shall be recorded in the field logbooks:

- a. Date and time – Camera set to record on photo
  - b. Name of photographer
  - c. General direction faced and description of the subject
  - d. Sequential number of the photograph
  - e. Always attempt to include an object in the photograph that helps show scale
  - f. Always try to shoot at approximately 50mm focal length (what human eye sees).
2. Each day's entries will be initialed and dated at the end by the author, and a line will be drawn through the remainder of the page.

D. QA/QC REQUIREMENTS:

All entries in the logbook shall be made in indelible ink. All corrections shall consist of single line-out deletions that are initialed.

The field task leader shall be responsible for ensuring that sufficient detail is recorded in the logbooks, and shall review the site logbooks daily.

E. SPECIAL CONDITIONS:

Photographs should be downloaded from the camera to the project folder and notes regarding the photographs should accompany the photos. Photographs should be no larger than 2 MB each unless they are being utilized for presentation purposes. CHA has software available to decrease file sizes if necessary.

As noted above, if a bound logbook is not used, then a field observation form must be used and information above should be captured on the form.

F. REFERENCES:

None

G. APPENDICES/FORMS:

Not Applicable



## COMPLETING A CHAIN-OF-CUSTODY RECORD

### A. PURPOSE/SCOPE:

This protocol provides a standard operating procedure (SOP) for initiating and maintaining a Chain of Custody (COC) document. A COC is a legal document designed to track persons who are responsible for the preparation of the sample container, sample collection, sample delivery, sample storage, and sample analysis. A COC is an appropriate format to record important data associated with each individual sample. In general, a sample requiring a COC will follow a path as follows:

Sample Collector → Sample Courier/Operator → Sample Custodian

Verification of who has possessed the samples and data and where the samples have been is completed when staff follow chain-of-custody procedures.

### B. EQUIPMENT/MATERIALS:

- Chain of Custody form
- Ball-point, permanent pens
- Gallon-Sized Ziploc Bag (to keep COC dry)
- Field Logbook
- Custody seals
- Padlock(s) (optional)

### C. PROCEDURE:

1. Once a sample has been determined to require a COC, the Sample Collector must initiate the COC. The Sample Collector must fill in the fields provided on the COC. The words “Chain of Custody” must be located in a conspicuous location at the top of the document.
2. The form is generally a three-page carbon copy document, including a white, yellow and pink sheet. While CHA generally uses COCs provided by the applicable laboratory, it is important to ensure that the COC from each lab contains places for all necessary information.
3. The COC at that time should include the fourteen-digit CHA project number and phase, the project name and location.
4. The Client Information Section must be completed. In most cases the “client” will be CHA Consulting, Inc.
5. The first field of information is the Sample Identification or Sample Identification Number. This identification/number must match the identification/number located on the sample container.
6. An information line for the date, time, phone number, printed name of Sample Collector, signature of Sample Collector, organization name (no acronyms), organization’s full mailing address, and sample description must also be included.
7. Sampling personnel should enter the sample number(s) (which should correspond with a unique number on a sample container [SOP #103] if applicable, and parameters to be analyzed. The “Sample ID” must be included and must match the number on the sample.



## COMPLETING A CHAIN-OF-CUSTODY RECORD

8. Subsequent fields must be provided to allow for documentation of information about any subsequent Sample Couriers/Operators or Sample Custodians. These fields must contain the date, time, phone number, printed name of person taking custody of sample, signature of person taking custody of sample and organization name (no acronyms).
9. Field Information - The COC must contain places to enter the following field information: sample number, sampling date, and type of sample. Other field information may be recorded as specified in the field sampling plan or proposal for the project. It is imperative that there be only one sample with a particular sample number per project/study so as to prevent duplicates in Excel files and EQuIS databases.
10. Laboratory Information - Once the sample is delivered to the lab, the laboratory personnel will sign and date the "received by" line located at the bottom of the COC. Other laboratory information may be recorded as specified in the project/study work plan/proposal.
11. Signatures - The COC must contain places for all people who handle the sample to sign his/her name. This is a record of persons who had custody of the sample during all steps of the process from container preparation, sample collection, sample storage and transport, and sample analysis. There should be signature lines to relinquish custody of the sample and to receive custody of the sample.

### D. QA/QC REQUIREMENTS:

The Field Team Leader or senior person on the sampling team will review the completed COC form to verify that all fields are properly completed. For purposes of this SOP, signing the form under Collected/Delivered by is considered evidence that the COC form has been checked for accuracy and completeness.

### E. SPECIAL CONDITIONS:

Whenever samples are split with a source or government agency, a separate chain of custody form should be completed for the samples and the relinquisher (sampler) and recipient should sign. If a representative is unavailable or refuses to sign for the samples, this can be noted in the "remarks" area of the form. When appropriate, as in the case where the representative is unavailable, the custody record should contain a statement that the samples were delivered to the designated location at the designated time. A copy of the chain of custody form for split samples must be kept with the project file.

Samples may require short term storage in field locations prior to delivery to the laboratory for analyses. The storage may be in vehicles or lodging locations. The samples must be secured to limit access to them. A locked vehicle is considered controlled access. However, simply a locked lodging room is not secure due to potential custodial access. If an unattended lodging room is used for sample storage, the samples must be further secured. This may entail a padlock on the ice chest, samples in an ice chest secured in an inner bag with a custody seal on it, and/or ice chest taped shut with custody seal on the outside of it.

### F. REFERENCES:

Sampling Guidelines and Protocols, NYSDEC, <http://www.dec.ny.gov/regulations/2636.html>  
Chain of Custody Protocol is in Appendix 5X.2.



**SOP #105**  
**Revision #01**  
**02/13/2013**  
**Page 1 of 3**

**Author: Sarah Newell, Mark Corey**  
**Reviewer: Keith Cowan, Sandy Warner**

## **COMPLETING A CHAIN-OF-CUSTODY RECORD**

Chain of Custody Procedures for Samples and Data, EPA 50 minute Self Instructional Course:  
<http://www.epa.gov/apti/coc/>

SOP for Chain of Custody, EPA Region 1:  
[http://www.epa.gov/region6/qa/qadevtools/mod5\\_sops/misc\\_docs/r1\\_chain-of-custody.pdf](http://www.epa.gov/region6/qa/qadevtools/mod5_sops/misc_docs/r1_chain-of-custody.pdf)

G. **APPENDICES/FORMS:**

CHA COC Form

### **END OF SOP**

Final Check by C. Burns 10/7/15

## **SAMPLE CONTAINERS, VOLUMES, PRESERVATIONS AND HOLDING TIMES**

### **A. PURPOSE/SCOPE:**

The following standard operating procedure (SOP) presents general guidelines for sample containers, volumes, preservations and holding times associated with air, water and soil/sediment samples. Field personnel are responsible for ensuring that state-specific standards/guidelines/regulations are followed, where applicable.

Improper preserving, storing and handling of air, water and soil/sediment samples are critical if the integrity of the samples are to be maintained. Samples collected in the field may undergo biological, chemical or physical changes following removal from their environment. In order to minimize those changes, many samples must have preservatives in the form of strong acids or bases added prior to delivery to the laboratory. If samples are to be collected as part of a government program, the governing agency typically must be notified 30 days prior to sample collection.

### **B. EQUIPMENT/MATERIALS:**

Pre-cleaned sample containers along with associated preservations within the sample containers will be provided to CHA from the analytical laboratory. The field geologist/engineer will provide the necessary personal protective equipment to place samples collected within the appropriate sample containers per SOPs 300 through 417. However, if field preservation is required the following equipment and materials shall be obtained:

- Hydrochloric (HCl) Acid Reagent A.S.C. 38%
- Nitric (HNO<sub>3</sub>) Acid Reagent A.S.C. 71%
- Sodium Hydroxide (NaOH) 97%
- 10 mL glass pipettes
- Narrow range (0-3 and 12-14) pH paper
- Nitrile gloves

### **C. PROCEDURE:**

1. Review Table 1 which details typical parameters of interest at environmental sites and the associated methods, preservation, container type, holding time and required sample volume.
2. Obtain pre-cleaned and pre-preserved sample containers from the laboratory. If pre-preserved sample containers were provided skip to Step 7; if not proceed to Step 3.
3. Put on a clean pair of nitrile gloves.
4. In a clean, non-dusty environment, remove the cap of the sample container.
5. Using a clean, 10 mL glass pipette draw the required amount of acid or base and insert into the sample container.
6. Volatile Organic Compounds – 2 mL of HCl acid (water samples).
7. Total and Dissolved Metals (including mercury) – 5 mL Nitric acid (water samples).
8. Cyanide – 15-20 Sodium Hydroxide pellets (water samples).



## **SAMPLE CONTAINERS, VOLUMES, PRESERVATIONS AND HOLDING TIMES**

9. Chemical Oxygen Demand, Oil and Grease, Organic Carbon, Phenolics, Total Dissolved Phosphorous, Hydrolyzable Phosphorus, Ammonia, Nitrate and Nitrite – 5 mL Sulfuric acid (water samples).
10. Immediately replace and tighten the sample container cap.
11. Collect sample using equipment and procedures outlined in other SOPs as appropriate. The volume of the sample collected shall be sufficient to conduct the analysis required, as well as associated quality assurance/quality control samples (QA/QC). QA/QC samples shall be collected in accordance with SOP 605.
12. Place samples immediately in the pre-preserved sample containers.
13. Chill all samples to 4°C from sample collection until laboratory analysis.
14. Package and ship samples per SOP #607.

### **D. QA/QC REQUIREMENTS:**

This section includes QA/QC requirements associated with sample containers, volumes, preservations, and holding times. The following general requirements apply to this SOP:

1. All data must be documented on field data sheets or within site logbooks.
2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan.
3. Equipment checkout and calibration activities must occur prior to sampling/operation, and must be documented.
4. QA/QC samples shall be collected in accordance with SOP 605.

The following procedure shall be conducted to provide a QA/QC check of water (aqueous) samples to ensure the samples were preserved to the proper pH prior to shipping for laboratory analysis.

#### **Volatile Organic Compounds:**

1. Collect one additional VOA vial at every third aqueous sampling location.
2. Fill the extra vial with the sample.
3. Using the extra VOA vial, remove the cap and using a clean, 10 mL glass pipette extract approximately 1 mL of water.
4. Place two drops of the water on a 1-inch strip of 0-3 range pH paper.
5. Compare pH strip's color while wet with that of the color key included on the pH paper container.
6. If pH is not less than 2, add additional HCL to the remaining 3 VOA vials prior to collecting the sample.
7. Discard the vial used to check the pH.



## **SAMPLE CONTAINERS, VOLUMES, PRESERVATIONS AND HOLDING TIMES**

Total and Dissolved Metals, Mercury, Ammonia, Nitrate plus Nitrite, Total Dissolved Phosphorus, COD, Oil & Grease, Organic Carbon, Phenolics

1. Collect sample and tightly reseal the cap.
2. Agitate the sample by gently shaking the sample bottle to mix the acid and water.
3. Remove the cap and using a clean, 10 mL glass pipette extract approximately 1 mL of sample.
4. Place approximately two drops of sample on a 1 inch strip of 0-3 range pH paper.
5. Compare pH strip's color while wet with that of the color key included on the pH paper container.
6. If pH is not less than 2, add appropriate additional Sulfuric Acid to the sample using a clean pipette.
7. Recheck sample using steps 2 through 6 until sample pH is less than 2.

### Cyanide

1. Collect sample and tightly reseal the cap.
2. Agitate the sample by gently shaking the sample bottle until the NaOH pellets are dissolved.
3. Remove the cap and using a clean 10 mL glass pipette extract approximately 1 mL of sample.
4. Place approximately two drops of sample on a 1-inch strip of 12-14 range pH paper.
5. Compare pH strip's color while wet with that of the color key included on the pH paper container.
6. If pH is not greater than 12, add additional NaOH to the sample using standard procedures.
7. Recheck sample using steps 2 through 6 until sample pH is greater than 12.

E. SPECIAL CONDITIONS:

Not Applicable

F. REFERENCES:

Alpha Analytical Aqueous and Soil/Solid Reference Guides.

G. APPENDICES/FORMS:

Table 1 Laboratory Analysis: Summarizing parameters, methods, preservations, container type, holding times and minimum sample volumes are included as an attachment to this SOP.

**END OF SOP**

Final Check by C. Burns 10/27/15

Table 1

| Laboratory Analysis              | EPA Method | Standard Method and/or SW846 Method | Preservation                                                                                                                                   | Container                                                           | Holding Time                                         | Minimum Volume |
|----------------------------------|------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------|----------------|
| <b>WATER</b>                     |            |                                     |                                                                                                                                                |                                                                     |                                                      |                |
| Acid Soluble & Insoluble Sulfide | -----      | 9030B                               | Cool to 4 deg C No Headspace                                                                                                                   | P or G                                                              | 7 Days                                               | 8 oz.          |
| Acidity as CaCO <sub>3</sub>     | 305.1      | 2310B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 14 Days                                              | 100 mL         |
| Alkalinity                       | -----      | 2320B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 14 Days                                              | 100 mL         |
| Alkalinity as CaCO <sub>3</sub>  | 310.1      | 2320B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 14 Days                                              | 100 mL         |
| Ammonia                          | 350.2/3    | 4500-NH <sub>3</sub> B,E            | Cool to 4 deg C, H <sub>2</sub> SO <sub>4</sub> to pH<2                                                                                        | P or G                                                              | 28 Days                                              | 400 mL         |
| Aromatic Hydrocarbons            | 602        | 8021B                               | 1:1 HCl to pH <2, Cool to 4 deg C<br>0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present                         | G, Vial screw cap with center hole<br>Teflon- faced silicone septum | 14 Days                                              | 40 mL          |
| Biochemical Oxygen Demand        | 405.1      | 5210B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 48 Hrs.                                              | 500 mL         |
| Bromide                          | 300        | -----                               | None                                                                                                                                           | P or G                                                              | 28 Days                                              | 250 mL         |
| Calcium                          | -----      | 3120B                               | HNO <sub>3</sub> to pH<2                                                                                                                       | P or G                                                              | 6 Months                                             | 100 mL         |
| Calcium- Hardness                | 200.7      | 3111B                               | HNO <sub>3</sub> to pH<2                                                                                                                       | P or G                                                              | 6 Months                                             | 100 mL         |
| Carbamates                       | 531.1      | -----                               | Cool to 4 deg C, 0.08% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present                                              | G, screw cap Teflon faced silicone septum                           | 14 Days                                              | 100 mL mL      |
| Carbonaceous BOD                 | -----      | 5210B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 48 Hrs.                                              | 1000 mL        |
| Chloride                         | 300        | 4500-CL D<br>4110                   | Cool to 4 deg C                                                                                                                                | P or G                                                              | 28 Days                                              | 100 mL         |
| Chloride, Residual Disinfectant  | -----      | 4500Cl-G                            | Cool to 4 deg C                                                                                                                                | P or G                                                              | Analyze Immediately                                  | 200 mL         |
| COD                              | 410.4      | 5220D                               | H <sub>2</sub> SO <sub>4</sub> to pH<2, Cool to 4 deg C                                                                                        | P                                                                   | 28 days                                              | 250 mL         |
| Color                            | -----      | 2120B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 24 Hrs                                               | 100 mL         |
| Conductivity                     | -----      | 2510B                               | Cool to 4 deg C                                                                                                                                | P or G                                                              | 28 Days                                              | 100 mL         |
| Cyanide                          | 335.4      | 4500-CN C&E                         | Cool to 4 deg C NaOH pH>12                                                                                                                     | P or G                                                              | 14 Days                                              | 250 mL         |
| Cyanide                          | 335.2      | 9010B, 9012A, 9014                  | Cool to 4 deg C, NaOH to pH>12<br>0.6 g ascorbic acid if residual chlorine present                                                             | P or G                                                              | Sulfide absent, 14 days; sulfide present 24 Hrs      | 250 mL         |
| Cyanide, Amenable                | 335.1      |                                     |                                                                                                                                                |                                                                     |                                                      |                |
| Dioxin                           | -----      | 8280A                               | Cool to 4 deg C<br>0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present                                           | G, Amber Teflon-lined screw cap                                     | 7 days until extraction 40 days after extraction     | 1000 mL        |
| DRO                              | -----      | 8015B                               | Cool to 4 deg C<br>0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present                                           | G, Amber Teflon-lined screw cap                                     | 7 days until extraction 40 days after extraction     | 1000 mL        |
| Escherichia Coli                 | -----      | 9222B                               | 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> if residual chlorine present<br>0.3 mL/125 mL<br>1.5% EDTA if ><br>0.01 mg/L heavy metals | Sterile<br>P or G                                                   | 30 Hrs. for Drinking Water<br>6 Hrs. for Waste Water | 125 mL         |
| Extractable Org. Compounds       |            |                                     | Cool to 4 deg C, Store in dark                                                                                                                 | G, Amber Teflon-lined screw cap                                     | *7 days                                              | 4000 mL        |

Table 1

| Laboratory Analysis        | EPA Method              | Standard Method and/or SW846 Method | Preservation                                                                                            | Container                                                           | Holding Time                                               | Minimum Volume |
|----------------------------|-------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------|----------------|
| Fecal Coliform             | -----                   | 9222B or D                          | 0.008% Na2S2O3 if residual chlorine present<br>0.3 mL/125 mL<br>15% EDTA if ><br>0.01 mg/L heavy metals | Sterile<br>P or G                                                   | 30 Hrs. for<br>Drinking Water<br>6 Hrs. for Waste<br>Water | 125 mL         |
| Fecal Streptococci         | -----                   | 9230C                               | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                                          | Sterile<br>P or G                                                   | 30 Hrs. for<br>Drinking Water<br>6 Hrs. for Waste<br>Water | 125 mL         |
| Fluoride                   | 300                     | 4500 F-B,C,S                        | Cool to 4 deg C                                                                                         | P or G                                                              | 28 Days                                                    | 300 mL         |
| Foaming Agents (MBAS)      | -----                   | 5540C                               | Cool to 4 deg C                                                                                         | P or G                                                              | 48 Hrs                                                     | 250 mL         |
| Gases                      | -----                   | 3810                                | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present<br>1:1 HCl to pH <2                      | G, Vial screw cap with center hole<br>Teflon- faced silicone septum | 7 days without<br>HCl<br>14 days with<br>HCl               | 40 mL          |
| GRO                        | -----                   | 8015B                               | 1:1 HCl to pH <2, Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                        | G, Vial screw cap with center hole<br>Teflon- faced silicone septum | 7 days w/o HCl<br>14 days w/HCl                            | 40 mL          |
| Hardness                   | -----                   | -----                               | HNO3 to pH<2                                                                                            | P                                                                   | 6 months                                                   | 1000 mL        |
| Heterotrophic Plate Count  | -----                   | 9215B                               | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                                          | Sterile<br>P or G                                                   | 30 Hrs. for<br>Drinking Water<br>6 Hrs. for Waste<br>Water | 125 mL         |
| Hexavalent Chromium        | 7196A                   | 3500Cr-D                            | Cool to 4 deg C                                                                                         | P                                                                   | 24 hours                                                   | 500 mL         |
| HPLC (Explosive)           | -----                   | 8330                                | Cool to 4 deg C                                                                                         | G, Amber Teflon-lined screw cap                                     | 7 days until<br>extraction 40<br>days after<br>extraction  | 1000mL         |
| HPLC (Explosive)           | -----                   | 8310                                | Cool to 4 deg C                                                                                         | G, Amber Teflon-lined screw cap                                     |                                                            | 1000mL         |
| Mercury                    | -----                   | 7470A                               | Cool to 4 deg C                                                                                         | P or G                                                              | 28 Days                                                    | 8 oz.          |
| Metals                     | 200.7                   | -----                               | HNO3 to pH<2                                                                                            | P                                                                   | 6 Months                                                   | 100 mL         |
| Nitrate                    | 300                     | -----                               | Cool to 4 deg C                                                                                         | P or G                                                              | 48 Hrs.                                                    | 100 mL         |
| Nitrate (Chlorinated)      | 353.2                   | 4500-NO3 F                          | Cool to 4 deg C                                                                                         | P or G                                                              | 48 Hrs                                                     | 250 mL         |
| Nitrate (Non- chlorinated) | 353.2                   | 4500-NO3 F                          | H2SO4 to pH<2, Cool to 4 deg C                                                                          | P or G                                                              | 14 Days                                                    | 250 mL         |
| Nitrite                    | 300,<br>353.2,<br>354.1 | 4500-NO3 D                          | Cool to 4 deg C                                                                                         | P or G                                                              | 48 Hrs                                                     | 100 mL         |
| Odor                       | -----                   | 2150B                               | Cool to 4 deg C                                                                                         | G only                                                              | 24 Hrs                                                     | 200 mL         |
| Oil and Grease             | -----                   | 1664                                | HCl to pH<2, Cool to 4 deg C                                                                            | G, Amber Teflon-lined screw cap                                     | 28 days                                                    | 1000 mL        |
| Organic Nitrogen           | 351.1                   | -----                               | Cool to 4 deg C, H2SO4 to pH<2                                                                          | G                                                                   | 28 Days                                                    | 500 mL         |

Table 1

| Laboratory Analysis                          | EPA Method | Standard Method and/or SW846 Method | Preservation                                                                                                                | Container                                                        | Holding Time                                         | Minimum Volume |
|----------------------------------------------|------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|----------------|
| Organochlorine Pesticides/PCB                | 608        | 8081A, 8082                         | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present if aldrin is to be determined bind to pH 5-9.                | G, Amber Teflon-lined screw cap                                  | 7 days until extraction 40 days after extraction     | 1000 mL        |
| Ortho Phosphate                              | 300        | 4500 P-E                            | Cool to 4 deg C                                                                                                             | P or G                                                           | 48 Hrs                                               | 50 mL          |
| Orthophosphate                               | 365.2      | -----                               | Filter immediately, Cool to 4 deg C                                                                                         | P or G                                                           | 48 Hrs.                                              | 50 mL          |
| pH, Hydrogen ion                             | -----      | 4500-H-B                            | Cool to 4 deg C                                                                                                             | P or G                                                           | Analyze Immediately                                  | 25 mL          |
| Phenols                                      | 420.1      | 9065, 510ABC                        | Cool to 4 deg C, H2SO4 to pH<2                                                                                              | G                                                                | 28 Days                                              | 500 mL         |
| Pseudomonas Aeruginosa                       | -----      | 9213E                               | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                                                              | Sterile P or G                                                   | 30 Hrs. for Drinking Water<br>6 Hrs. for Waste Water | 125 mL         |
| Purgeable Halocarbons                        | 601        | 8021B                               | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                                                              | G, Vial screw cap with center hole Teflon- faced silicone septum | 14 Days                                              | 40 mL          |
| Radiological                                 | -----      | -----                               | HNO3 to pH<2                                                                                                                | P or G                                                           | 6 Months                                             | 100 mL         |
| Residue- Settleable (SS)                     | 160.5      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 48 Hrs.                                              | 1000 mL        |
| Residue-filtered (TDS)                       | 160.1      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 7 Days                                               | 100 mL         |
| Residue-non- filtered (TSS)                  | 160.2      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 7 Days                                               | 100 mL         |
| Residue-Total Volatile Solids                | 160.4      | 2540 E                              | Cool to 4 deg C                                                                                                             | P or G                                                           | 7 Days                                               | 100 mL         |
| Salinity                                     | -----      | 2520 C                              | Cool to 4 deg C                                                                                                             | G                                                                | 28 Days                                              | 100 mL         |
| Semivolatile Organic Compounds (Unregulated) | 525.2      | -----                               | If residual chlorine is present, add 40-50 mg Sodium Thiosulfate. If not chlorinated, add 6N HCl to pH<2<br>Cool to 4 deg C | G, Amber Teflon-lined screw cap                                  | 7 Days for extraction, 30 after extraction           | 1000 mL        |
| Semivolatile Organics                        | 625        | 8270C                               | Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                                                              | G, Amber Teflon-lined screw cap                                  | 7 days for extraction 40 days after extraction       | 1000 mL        |
| Silica                                       | 200.7      | -----                               | Cool to 4 deg C                                                                                                             | P only                                                           | 7 Days                                               | 50 mL          |
| Specific Conductance                         | 120.1      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 28 Days                                              | 100 mL         |
| Sulfate                                      | 300        | 4500-SO4                            | Cool to 4 deg C                                                                                                             | P or G                                                           | 28 Days                                              | 50 mL          |
| Sulfate                                      | 375.4      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 28 Days                                              | 50 mL          |
| Sulfide                                      | 376.2      | 9030 B, 4500S2-AD                   | Cool to 4 deg C, add zinc plus NaOH to pH>9                                                                                 | P or G                                                           | 7 Days                                               | 50 mL          |
| Sulfite (SO3)                                | 377.1      | -----                               | None Required                                                                                                               | G, Bottle and Top                                                | Analyze immediately                                  | 50 mL          |
| Surfactants (MBAS)                           | 425.1      | -----                               | Cool to 4 deg C                                                                                                             | P or G                                                           | 48 Hrs.                                              | 250 mL         |

Table 1

| Laboratory Analysis              | EPA Method    | Standard Method and/or SW846 Method | Preservation                                                                                            | Container                                                          | Holding Time                                         | Minimum Volume |
|----------------------------------|---------------|-------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------|----------------|
| TDS                              |               |                                     | Cool to 4 deg C                                                                                         | P                                                                  | 7 days                                               | 500 mL         |
| Temperature                      | -----         | 2550B                               | None                                                                                                    | P or G                                                             | Analyze Immediately                                  | 1000 mL        |
| Temperature                      | 170.1         | -----                               | None Required                                                                                           | G, Bottle and Top                                                  | Analyze immediately                                  | 1000 mL        |
| Total Kjeldahl Nitrogen          | 353.3/1       | 4500Norg-C                          | H2SO4 to pH<2, Cool to 4 deg C                                                                          | P                                                                  | 28 days                                              | 250 mL         |
| Total Coliform                   | -----         | 9221D                               | 0.008% Na2S2O3 if residual chlorine present<br>0.3 mL/125 mL<br>15% EDTA if ><br>0.01 mg/L heavy metals | Sterile P or G                                                     | 30 Hrs. for Drinking Water<br>6 Hrs. for Waste Water | 125 mL         |
| Total Dissolved Solids           | 160.1         | 2540C                               | Cool to 4 deg C                                                                                         | P or G                                                             | 7 Days                                               | 100 mL         |
| Total Hardness                   | 130.2, 200.7  | -----                               | HNO3 to pH<2<br>H2SO4 to pH<2                                                                           | P or G                                                             | 6 Months                                             | 100 mL         |
| Total Kjeldahl Nitrogen          | 351.3         | -----                               | H2SO4 to pH<2                                                                                           | P or G                                                             | 28 Days                                              | 500 mL         |
| Total Metals                     | 200.7 200.8   | 6010B, 6020, 7000A                  | HNO3 to pH<2                                                                                            | P                                                                  | 6 months (Hg 28 days)                                | 500 mL         |
| Total Organic Carbon (TOC)       | 415.1         | 9060, 5310C                         | H2SO4 to pH<2, Cool to 4 deg C                                                                          | G, Amber Teflon-lined screw cap                                    | 28 days                                              | 80 mL          |
| Total Organic Halides            |               | 5320B                               | 1N H2SO4 to pH<2                                                                                        | P or G                                                             | 28 Days                                              | 50 mL          |
| Total Phosphorus                 | 365.2         | -----                               | Cool to 4 deg C, H2SO4 to pH<2                                                                          | G                                                                  | 28 Days                                              | 50 mL          |
| Total Recoverable Oil & Grease   | 413.1, 166 4A | -----                               | Cool to 4 deg C, HCL or H2SO4 to pH<2                                                                   | G                                                                  | Petroleum Based 3 Days; Non-Petroleum Based 24 hours | 1000 mL        |
| Total-Residue (TS)               | 160.3         | 2540B                               | Cool to 4 deg C                                                                                         | P or G                                                             | 7 Days                                               | 100 mL         |
| Turbidity                        | 180.1         | 2130B                               | Cool to 4 deg C                                                                                         | P or G                                                             | 48 Hrs                                               | 100 mL         |
| Volatile Organics                | 624           | 8260B                               | 1:1 HCl to pH <2, Cool to 4 deg C<br>0.008% Na2S2O3 if residual chlorine present                        | G, Vial screw cap with center hole<br>Teflon-faced silicone septum | 7 days w/o HCl<br>14 days w/HCl                      | 40 mL          |
| Volatiles (Regulated)            | 524.2         | -----                               | Cool to 4 deg C HCl to pH<2                                                                             | G, Vial screw cap with center hole<br>Teflon-faced silicone septum | 14 Days                                              | 60-120 mL      |
| <b>SOIL</b>                      |               |                                     |                                                                                                         |                                                                    |                                                      |                |
| Acid Soluble & Insoluble Sulfide | -----         | 9030B                               | Cool to 4 deg C, no headspace                                                                           | P or G                                                             | 7 Days                                               | 8 oz.          |
| Amenable Cyanide                 | -----         | 9213                                | Cool to 4 deg C                                                                                         | P or G                                                             | 14 Days                                              | 4 oz.          |
| Bromide                          | -----         | 9211                                | Cool to 4 deg C                                                                                         | P or G                                                             | 28 Days                                              | 8 oz.          |
| Cation - Exchange Capacity       | -----         | 9080, 9081                          | None                                                                                                    | P                                                                  | -----                                                | 8 oz.          |
| Chloride                         | -----         | 9212, 9056, 9253                    | None                                                                                                    | P or G                                                             | 28 Days                                              | 8 oz.          |
| Chlorinated Herbicides           | -----         | 8151A                               | Cool to 4 deg C                                                                                         | G, wide mouth, teflon liner                                        | 14 Days                                              | 8 oz.          |
| Corrosivity pH Waste>20% water   | -----         | 9040B                               | Cool to 4 deg C                                                                                         | P                                                                  | Analyze Immediately                                  | 4 oz.          |

Table 1

| Laboratory Analysis                | EPA Method | Standard Method and/or SW846 Method | Preservation                                                                                                                | Container                       | Holding Time                                         | Minimum Volume |
|------------------------------------|------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------------------------------|----------------|
| Corrosivity Toward Steel           | -----      | 1110                                | Cool to 4 deg C                                                                                                             | P                               | 14 Days                                              | 4 oz.          |
| Cyanide                            | -----      | 9010B, 4500CN                       | Cool to 4 deg C                                                                                                             | G, Amber                        | 14 Days                                              | 4 oz           |
| Dioxin                             | -----      | 8280A                               | Cool to 4 deg C                                                                                                             | G                               | 14 Days                                              | 8 oz.          |
| DRO                                | -----      | 8015B                               | Cool to 4 deg C                                                                                                             | G, Amber                        | 14 Days                                              | 4 oz.          |
| Extractable Organic Compounds      | -----      |                                     | Cool to 4 deg C, Store in dark                                                                                              | G                               | 14 days                                              | 8 oz           |
| Extractable Sulfide                | -----      | 9031                                | Cool to 4 deg C, fill top of sample with 2N Zinc Acetate until moistened                                                    | P or G                          | 7 Days                                               | 8 oz.          |
| Fluoride                           | -----      | 9214                                | None                                                                                                                        | P                               | 28 Days                                              | 8 oz.          |
| Gases                              | -----      | 3810                                | Cool to 4 deg C                                                                                                             | G, Amber                        | 14 Days                                              | 8 oz.          |
| Grain Size                         | -----      |                                     | N/A                                                                                                                         | G                               | N/A                                                  | 8 oz           |
| GRO                                | -----      | 8015B                               | Cool to 4 deg C, check state regulations for proper preservative. NJ (methanol), PA (encore samplers) NY (cool to 4 deg C). | G, Amber VOA vial               | 14 Days                                              | 15 Grams       |
| HPLC (PAH)                         | -----      | 8310                                | Cool to 4 deg C                                                                                                             | G, Amber Teflon-lined screw cap | 14 days until extraction<br>40 days after extraction | 4 oz.          |
| Ignitability                       | -----      | 1010                                | None                                                                                                                        | P or G                          | None                                                 | 8 oz.          |
| Ignitability of Solids             | -----      | 1030                                | None                                                                                                                        | P or G                          | None                                                 | 8 oz.          |
| Mercury                            | 245.1      | 7471A                               | Cool to 4 deg C                                                                                                             | G, Amber                        | 28 Days                                              | 4 oz.          |
| Metals                             | -----      | 6010B, 6020, 7000A                  | Cool to 4 deg C                                                                                                             | G, Amber                        | 6 Months                                             | 8 oz.          |
| Moisture Content                   | -----      |                                     | Store in airtight jar 3-30 deg C                                                                                            | G                               | N/A                                                  | 8 oz           |
| Nitrate                            | -----      | 9210                                | Cool to 4 deg C                                                                                                             | P or G                          | 48 Hrs                                               | 8 oz.          |
| Oil & Grease (Sludge, Sludge- Hem) | -----      | 9071B                               | Cool to 4 deg C                                                                                                             | G                               | 28 Days                                              | 8 oz.          |
| Organochlorine                     | -----      | 8081A                               | Cool to 4 deg C                                                                                                             | P or G                          | 14 Days                                              | 8 oz.          |
| Paint Filter Liquids Test          | -----      | 9095A                               | Cool to 4 deg C                                                                                                             | P or G                          | -----                                                | 8 oz.          |
| PCBs                               | -----      | 8082                                | Cool to 4 deg C                                                                                                             | G, Amber Teflon-lined screw cap | 14 Days                                              | 4 oz.          |
| pH                                 | -----      | 9045C                               | Cool to 4 deg C                                                                                                             | G, Amber                        | Analyze Immediately                                  | 4 oz.          |
| pH, Soil and Waste                 | -----      | 9045A                               | Cool to 4 deg C                                                                                                             | G                               | Analyze                                              | 8 oz.          |
| Phenol                             | -----      | 9065, 9066, 9067                    | Cool to 4 deg C                                                                                                             | G, Amber                        | Immediately                                          | 4 oz.          |
| Radiological                       | -----      | -----                               | Cool to 4 deg C                                                                                                             | G                               | 28 Days                                              | 4 oz.          |
| Reactivity Cyanide                 | -----      | SW-846 7.3.3.2                      | Cool to 4 deg C                                                                                                             | P                               | 6 Months                                             | 8 oz.          |
| Reactivity Sulfide                 | -----      | SW-846 7.3.4.2                      | Cool to 4 deg C                                                                                                             | P                               | 14 Days                                              | 8 oz.          |
| Semivolatle Organics               | -----      | 8270C                               | Cool to 4 deg C                                                                                                             | G, Amber                        | 14 Days                                              | 8 oz.          |

Table 1

| Laboratory Analysis                          | EPA Method | Standard Method and/or SW846 Method | Preservation                                                                                                                          | Container                      | Holding Time                                   | Minimum Volume |
|----------------------------------------------|------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------|----------------|
| Sulfate                                      | -----      | 9035, 9036, 9038                    | Cool to 4 deg C                                                                                                                       | P or G                         | 28 Days                                        | 8 oz.          |
| Sulfides                                     | -----      | 9215                                | Cool to 4 deg C                                                                                                                       | P or G                         | 7 Days                                         | 8 oz.          |
| TCLP Metals                                  | -----      | 1311, 6010B, 6020, 7000A, 7470A     | Cool to 4 deg C                                                                                                                       | G, Amber                       | 180 Days (Hg 28 days)                          | 8 oz           |
| TCLP Herbicides                              | -----      | 1311                                | Cool to 4 deg C                                                                                                                       | G, Amber                       | 14 Days                                        | 8 oz.          |
| TCLP Pesticides                              | -----      | 1311                                | Cool to 4 deg C                                                                                                                       | G, Amber                       | 14 Days                                        | 8 oz.          |
| TCLP Semivolatile Organics                   | -----      | 1311, 8270C, 8081A, 8151A           | Cool to 4 deg C                                                                                                                       | G, Amber Teflon Lined          | 14 Days                                        | 8 oz.          |
| TCLP Volatile Organics                       | -----      | 1311, 8260B                         | Cool to 4 deg C                                                                                                                       | G, Amber VOA Vial Teflon Lined | 14 Days                                        | 8 oz.          |
| Temperature                                  | -----      | 2550                                | -----                                                                                                                                 | P                              | Analyze Immediately                            | 4 oz.          |
| TOC                                          | -----      | Lloyd Kahn Method                   | Cool to 4 deg C                                                                                                                       | G, Amber                       | 14 days                                        | 4 oz.          |
| Total Coliform                               | -----      | 9131                                | Cool to 4 deg C                                                                                                                       | Sterile, P or G                | 6 Hrs                                          | 4 oz.          |
| Total Coliform                               | -----      | 9132                                | Cool to 4 deg C                                                                                                                       | Sterile, P or G                | 6 Hrs                                          | 4 oz.          |
| Total Cyanide                                | -----      | 9013                                | Cool to 4 deg C                                                                                                                       | P or G                         | 14 Days                                        | 8 oz.          |
| Volatile Organic Compounds                   | -----      | 8260B                               | Cool to 4 deg C Check individual state regulations for proper preservative. NJ (methanol), PA (encore samplers), NY (cool to 4 deg C) | G, wide mouth, teflon liner    | 14 Days                                        | 4 oz.          |
| Volatile Organic Compounds                   | -----      | 8021                                |                                                                                                                                       | G, wide mouth, teflon liner    | 14 Days                                        | 4 oz.          |
| GLP Sampling and Holding Time Information    |            |                                     |                                                                                                                                       |                                |                                                |                |
| Cyanide (aqueous)                            | ILM04.1    |                                     | NaOH to pH>12, Cool to 4 deg C                                                                                                        | P                              | 12 Days VTSR                                   | 1000ml         |
| Cyanide**                                    | ILM04.1    |                                     | Cool to 4 deg C                                                                                                                       | G                              |                                                | 8 oz           |
| Mercury (aqueous)                            | ILM04.1    |                                     | HNO3 to pH<2, Cool to 4 deg C                                                                                                         | P                              | 26 Days VTSR                                   | 1000ml         |
| Mercury (solid/soils)                        | ILM04.1    |                                     | Cool to 4 deg C                                                                                                                       | G                              |                                                | 8 oz           |
| Metals (aqueous)                             | ILM04.1    |                                     | HNO3 to pH<2, Cool to 4 deg C                                                                                                         | P                              | 180 Days VTSR                                  | 1000ml         |
| Metals (solid/soils)                         | ILM04.1    |                                     | Cool to 4 deg C                                                                                                                       | G                              |                                                | 8 oz           |
| PCBs (aqueous)                               | OLM04.2    |                                     | Na2S2O3, Cool to 4 deg C                                                                                                              | G                              | See Note 7                                     | 1000ml         |
| PCBs (solid/soils)                           | OLM04.2    |                                     | Cool to 4 deg C                                                                                                                       | G                              | See Note 6                                     | 8 oz           |
| Pesticides (aqueous)                         | OLM04.2    |                                     | Na2S2O3, Cool to 4 deg C                                                                                                              | G                              | See Note 7                                     | 1000ml         |
| Pesticides (solid/soils)                     | OLM04.2    |                                     | Cool to 4 deg C                                                                                                                       | G                              | See Note 6                                     | 8 oz           |
| Semivolatile Organic Compounds (aqueous)     | OMLO4.2    |                                     | Cool to 4 deg C                                                                                                                       | G                              | See Note 8                                     | 1000ml         |
| Semivolatile Organic Compounds (solid/soils) | OLM04.2    |                                     | Cool to 4 deg C                                                                                                                       | G                              | See Note 6                                     | 8 oz           |
| Volatile Organic Compounds (aqueous)         | OLM04.2    |                                     | HCL pH < 2, Cool to 4 deg C                                                                                                           | G                              | W/preservative: 10 days VTSR; W/O: 7 days VTSR | 40ml           |
| Volatile Organic Compounds (solid/soils)     | OLM04.2    |                                     | Cool to 4 deg C                                                                                                                       | G                              | 10 Days VTSR                                   | 4 oz           |

Table 1

| Laboratory Analysis | EPA Method | Standard Method and/or SW846 Method | Preservation | Container | Holding Time | Minimum Volume |
|---------------------|------------|-------------------------------------|--------------|-----------|--------------|----------------|
|---------------------|------------|-------------------------------------|--------------|-----------|--------------|----------------|

Notes:

- 1. P - Plastic.
- 2. G - Glass.
- 3. Minimum volume is the minimum volume required by the laboratory to conduct the analysis. The laboratory will likely require additional sample volume.
- 4. \* Extraction within seven (7) days of collection; analysis within 40 days of extraction.
- 5. \*\*When chlorine is present ascorbic acid is used to remove the interference (0.6 g ascorbic acid).
- 6. VTSR - Validated time of sample receipt.
- 7. Ten (10) days from VTSR for extraction and 40 days following extraction.
- 8. Five (5) days from VTSR for extraction 14 days after extraction.
- 9. Five (5) days from VTSR for extraction 40 days after extraction.
- 10. Holding times are from the time of sample collection unless otherwise noted.



## QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

### A. PURPOSE/SCOPE:

This standard operating procedure explains the purpose and correct usage of Quality Assurance/Quality Control (QA/QC) samples. QA/QC samples are intended to validate the results of sample analysis by providing the means to determine the influence of outside factors on the sample and analysis. There are several types of QA/QC samples in use to ensure the best practices are being followed by both the laboratory performing the analysis and the sampling team in the field. This is a general procedure for the use of QA/QC samples. Also refer to any guidelines provided by the laboratory.

### B. EQUIPMENT/MATERIALS:

QA/QC samples require the following materials:

- Sample containers:  
They should be the same containers in number and type of preservative as the containers for the samples for which QA/QC samples are being taken.
- Analyte-free water
- Any laboratory supplied QA/QC materials.

### C. PROCEDURE:

The following are types of QA/QC samples.

#### 1. Duplicate Sample

A duplicate sample is a sample that is collected concurrently with the routine samples. It consists of an additional set of sample containers to be analyzed for the same parameters as the routine samples. It is taken at a sample point of the samplers choosing and at the same time as the routine sample for that sample point is taken. It is labeled and included on the Chain of Custody (COC) Form (see SOP 105) with a name unknown to the laboratory.

##### **Example:**

- Sample Point ID is **MW-1**
- Duplicate Sample ID is **CHA-1**

The duplicate sample is submitted as a 'blind' sample to the laboratory. The purpose of a duplicate sample is to allow the sampler to determine the precision of laboratory analysis. The results of the duplicate sample are compared with the results of the concurrent routine sample by the sampler. These results should be within the margin of error for the test being performed.

One duplicate sample should be taken for every twenty (20) routine samples. For example if 16 samples points were sampled, there would be 1 duplicate sample taken at one of the sample points for a total of 17 sample sets submitted to the lab.

#### 2. Field Blank

The Field Blank sample is a type of QA/QC sample used to account for possible external contamination of the routine samples, usually by exposure to the air from being on site. It consists of an additional set of sample containers to be analyzed for the same parameters as the routine samples. It is common to only conduct a Field Blank for volatile organic compound (VOC) parameters even when sampling



## QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

to additional parameters. This is because VOCs are more likely to be present in the atmosphere at the site than a parameter like metals. However a Field Blank can be conducted for any parameter.

The containers are prepared prior to sampling by filling the containers with analyte-free water. The containers are then transported with the routine sample containers to the site. Once at the site the containers are placed in a location representative of the site conditions and their caps are removed. At the end of the sampling event the caps are then replaced. The sample is labeled and included on the COC as **Field Blank** or **FB**.

If any results are positive for the Field Blank it can be assumed that the routine samples have also been exposed to a similar amount of contaminant and that contaminant is probably present in the atmosphere at the site.

One Field Blank should be taken as required for each day of sampling at the site. They are only used for the collection of aqueous samples.

### 3. Equipment Blank

An Equipment Blank is a QA/QC sample designed to measure the effectiveness of the decontamination of field equipment. It consists of an additional set of sample containers being analyzed for the same parameters as the routine samples.

An Equipment Blank is collected by pouring analyte-free water directly over/on/into the decontaminated sampling equipment coming into contact with the samples being collected. The water is then collected in the sample containers. Once the containers are filled they are capped and sent to the lab with the other routine samples. The sample is labeled and included on the COC as **Equipment Blank** or **EQ Blank**.

A positive result for the analysis of the Equipment Blank could signal inadequate decontamination of the equipment which may result in cross-contaminated samples and thus suspect results.

One Equipment Blank should be taken for every twenty (20) routine samples collected. The Equipment Blank is not necessary when using dedicated sampling equipment or sampling equipment that is disposed of between each sample point.

### 4. Matrix Spike/Matrix Spike Duplicate Sample

The Matrix Spike/Matrix Spike Duplicate (MS/MSD) Sample is a quality control system used by the laboratory to check the accuracy of their instruments. It consists of a set of two (2) samples taken at a sample point concurrently with the routine sample for a total of three (3) sets of containers for that sample point. Therefore, the MS/MSD samples should be collected from sample points with sufficient sample volume (e.g., monitoring wells that have low recharge are not good candidates). They are labeled and included on the COC as 'Sample ID' MS and 'Sample ID MSD'.

#### **Example:**

- Sample Point ID is **MW-1**
- Matrix Spike would be **MW-1 MS**
- Matrix Spike Duplicate would be **MW-1 MSD**



## QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

The MS/MSD samples are submitted to the laboratory with the routine samples. Once at the laboratory they will have a known amount of an analyte added, known as the spike. The sample will then be run as a routine sample. Once the results are received they are compared to the results of the routine sample (MW-1 results are compared to MW-1 MS results). There should be a difference in the amount of analyte detected between the samples that should be within the margin of error of the amount of analyte spike that was added to the MS sample. This process is repeated for the MSD sample. This process is an internal review of results for the laboratory to determine the accuracy of their instruments.

One MS/MSD set should be taken for every twenty (20) samples (including Duplicate Samples and Field or Equipment Blank Samples). For example if 12 samples are taken, there should also be a set of MS/MSD samples taken for a total of 14 sample sets submitted to the lab. If 20 samples will be taken, only one set of MS/MSD samples needs to be submitted (total number of samples being 22).

*The following QA/QC samples are used for only specific analyses or functions.*

### 5. Trip Blank

A Trip Blank is a form of QA/QC that is utilized to account for possible exposure to an external source of VOCs during storage and transport of the sample containers and samples to and from the laboratory. It consists of a VOC sample container prepared by the laboratory and filled with analyte-free water. Trip Blanks are only required when aqueous samples are being collected for VOC analysis, all other parameters do not need one.

The Trip Blank is placed in the cooler with the sample containers when they are sent from the lab to the client. The Trip Blanks will remain in the cooler with the sample containers at all times. When the samples are collected they are placed in the cooler and put on ice with the Trip Blanks for shipment to the lab. At no time should the Trip Blanks be opened or removed from the coolers containing VOC samples. The Trip Blank should be labeled and included on the COC as **Trip Blank** or **TB**.

Each cooler that contains samples for VOC analysis must have a Trip Blank. It is good practice to combine all VOC containers from a site into one cooler to minimize the number of Trip Blanks required. For example if there are five coolers of samples, place all the VOC containers into one cooler and the remaining containers in the other four coolers. Thus only the VOC cooler requires a Trip Blank, which saves on the cost of analysis.

A positive result on the Trip Blank for a VOC could indicate the samples had been exposed during transportation which can have an effect on the results of the routine samples.

Different laboratories have different practices concerning their Trip Blanks. For example some laboratories will include just one VOA vial as their trip blank while others will utilize multiple vials for theirs. The extra vials are often included only as a backup in the event one of the Trip Blank vials is broken during transport, and will not be analyzed unless necessary.

### D. QA/QC REQUIREMENTS:

Not Applicable



## QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

### E. SPECIAL CONDITIONS:

**Temperature Blanks** are a type of QA/QC that fall outside of the umbrella of QA/QC Samples.

A Temperature Blank is a container provided by the lab and is used to obtain the temperature of the cooler upon receipt at the lab, usually with an infrared thermometer. It is generally a ~125 mL plastic bottle filled with tap water.

- The Temperature Blank should be left in the cooler during sampling. When the cooler is being prepared for shipment, place the Temperature Blank in the center of the cooler next to the sample containers. There is no need to open the container; it is filled with tap water and therefore harmless unless otherwise noted on the container.
- It should be noted that not all laboratories require a Temperature Blank. There is no cost associated with the Temperature Blanks in the coolers.

### F. REFERENCES:

United States Environmental Protection Agency (July 2007), *Samplers Guide, Contract Laboratory Program Guidance for Field Samplers*, Section 3.4, retrieved April 6, 2009, from [http://www.epa.gov/superfund/programs/clp/download/sampler/clp\\_sampler\\_guidance.pdf](http://www.epa.gov/superfund/programs/clp/download/sampler/clp_sampler_guidance.pdf)

United States Environmental Protection Agency (May 2002), *Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers*, Page 34, retrieved December 15, 2010, from [http://www.epa.gov/tio/tsp/download/gw\\_sampling\\_guide.pdf](http://www.epa.gov/tio/tsp/download/gw_sampling_guide.pdf)

### G. APPENDICES/FORMS:

Not Applicable

**END OF SOP**

Final Check by C. Burns 10/27/15

**APPENDIX B**  
**CHA Staff Resumes**



# Scott M. Smith, PE

## Principal Engineer/Technical Group Leader

Scott has over 20 years' experience providing consulting engineering services for civil and environmental projects. His expertise includes Phase I & II ESAs, site design, listed hazardous waste site characterizations and feasibility studies, and subsurface investigations for brownfield projects. Representative project experience includes:

### Education

*University at Buffalo, NY, M.S. in  
Civil Engineering*

*Rochester Institute of Technology,  
NY, B.S. in Civil Engineering  
Technology*

*Alfred State College, NY, A.A.S.  
in Construction Engineering  
Technology*

### Memberships & Affiliations

*Professional Engineer, VA, PA, NY*

*Air and Waste Management  
Association*

*American Society of Civil Engineers*

### Firm

*CHA*

### Years Experience

*Total: 20 | With CHA: 20*

**Town of Salina, NY, Salina Landfill Superfund Site.** Senior Project Engineer responsible for reviewing the remedial design documents and was the lead engineer responsible for design modifications during the implementation of the remedial action of a 55-acre inactive hazardous waste landfill. The primary elements of the remedial action included off-site disposal hazardous (PCB) waste, waste consolidation of over 145,000 cubic yards of waste, a gas venting system, a combination of clay and geosynthetic Part 360 caps, a leachate collection trench, stormwater controls, and wetlands mitigation. The project was complicated by numerous aboveground and subsurface utilities bisecting the Site and involvement of multiple agencies. Mr. Smith also provided guidance to engineering staff during the preparation of the Final Engineering Report and Site Management Plan for the site.

**Confidential Client, Environmental Remedial Design Services.** Senior Project Engineer responsible for preparing design documents for an in-situ remediation system, including a thermally enhanced soil vapor extraction (SVE) system, a conductive soil heating system using a network of wells, a groundwater extraction system to dewater the treatment zone, and controls for each system. As part of the remedial design process, Mr. Smith developed design work plan submittals for NYSDEC approval as well as a detailed Site Management Plan. Mr. Smith was also responsible for preparation of two Construction Completion Reports (CCRs) in accordance with the NYSDEC requirements. The CCRs were associated with site preparation to facilitate the proposed in-situ remedy and the installation of a groundwater collection system along the down-gradient side of the site to address the migration of off-site contamination.

**DeLaval Property, Poughkeepsie, NY, Environmental Restoration Project.** Senior Project Engineer responsible for all technical aspects of this \$14.5 Million cleanup project along the Hudson River waterfront for mixed use development. Mr. Smith developed work plans for the project, prepared all remedial design documents, and was instrumental in the construction administration of this challenging project. Mr. Smith was also responsible for developing the post-cleanup site management plan and the final engineer report for the project.



# Cailyn E. Locci

## Senior Scientist

Cailyn has more than 15 years of experience in providing environmental consulting services to various state agencies including the NYSDEC, private industries, municipalities, developers, and financial institutions. Her current responsibilities include the oversight and management of environmental site assessments, site investigations and remediation design and implementation. Ms. Locci is well versed in all aspects of site investigations including soil, groundwater, vapor, bedrock, sediment, and surface water sampling. Other projects completed by Cailyn include Phase I/II Environmental Site Assessments, Brownfield investigations, remediation and redevelopment. Her strong expertise lies in petroleum contaminated soils, groundwater and soil vapor. Representative project experience includes:

### Oak Mitsui:

- **Limited Subsurface Investigation.** Senior Scientist for a two phase sub-slab investigation including coring and soil sample collection. Phase I includes investigation of a treater area, hazardous waste storage area, wastewater treatment area, lab, outdoor parking, maintenance and air compressor area. Phase II will include remaining treater areas, oxygen dissolving area, drum deck and dissolving room areas.
- **Permit Closeout for Air and SPDES Permits.** Senior Scientist for a wastewater treatment system closure plan in accordance with Part 750-2.11(b).

**Confidential Client, Environmental Services Term Agreement.** Senior Scientist working with the client to maintain and implement environmental programs at their NY facility. The programs have included site remediation, investigation of wastewater exceedances, establishment of mechanical integrity program for the WWTP, completion of a mechanical inspection of the WWTP, preparation of BMP plans, permitting of the WWTP, preparation of SPCC Plans and inspection of bulk storage tanks.

**The Pioneer Companies, Remedial Construction Phase Consulting Services.** Senior Scientist for a site within the NYSDEC Brownfield Cleanup Program. The goal was to investigate and remediate to achieve Track 1: Unrestricted Use requirements. The work included archeological investigation oversight, collection of waste characterization soil samples, preparation of Alternative Analysis Report and the Remedial Action Work Plan, oversight of remedial activities and the preparation of a Final Engineering Report.

**Hannaford Bros. Co., SPCC Plan and Annual Training.** Senior Scientist providing annual training and updating the SPCC Plan for the distribution center.

**Dormitory Authority of New York State, Cooling Tower Monitoring and Testing.** Weekly and bi-weekly inspections and dip slide testing for cooling towers at 17 OMH facilities statewide.

### Education

*Tulane University, LA, B.S. in Geology*

### Memberships & Affiliations

*Hudson-Mohawk Professional Geologist Association (HMPGA)*

*Association for Corporate Growth (ACG-NY)*

*Upstate Venture Association of New York (UVANY)*

*NY Association of Convenient Stores (NYACS)*

*Long Island Gasoline Retailers Association (LIGRA)*

### Firm

CHA

### Years Experience

*Total: 17 | With CHA: 1*



# John L. Favreau, CHMM

## Senior Scientist

John has over 26 years of diverse experience in environmental consulting, including site assessment, remediation, regulatory compliance and hazardous materials management. Mr. Favreau has extensive experience in environmental due diligence assessments of commercial and industrial properties, soil and groundwater investigation and remediation of petroleum-contaminated sites, and preparation of technical reports. In addition, he has experience in many aspects of environmental contracting work, including remedial system installation, hazardous waste disposal and emergency spill response. Mr. Favreau is also experienced in the management and execution of environmental services associated with the design and development of wireless telecommunications facilities. Representative project experience includes:

### Education

*State University of New York at Buffalo, NY, B.S. in Environmental Studies*

### Registrations

*Certified Hazardous Materials Manager*

### Memberships & Affiliations

*Environmental & Historic Preservation Compliance Training (Federal Communications Commission)*

*The Princeton Course: Groundwater Pollution and Hydrology (NGWA, 1991)*

*Evaluation of Geochemical Data: The Project Manager's Perspective (NGWA, 1994)*

*Remediation Technology Training (Groundwater Technology, Inc., 1994)*

### Firm

*CHA*

### Years Experience

*Total: 26 | With CHA: 5*

### **Village of Dolgeville, 102 South Main Street – Site Investigation/Interim Remedial Measures.**

Senior Scientist for a site investigation and completion of interim remedial measures at a former petroleum distribution facility/gasoline retail station/automobile repair garage. The project was completed under the NYSDEC's Environmental Restoration Program and involved excavation of test pits, installation of monitoring wells, soil and groundwater sampling, removal of 15 underground storage tanks (up to 15,000 gallons in size), removal of hydraulic lifts, abatement of asbestos containing materials, building demolition, excavation and off-site disposal of approximately 5,000 tons of petroleum-contaminated soil and restoration of the site for future development. Mr. Favreau was responsible for preparation of the SI and IRM work plans, oversight and documentation of field activities and preparation of the SI/IRM and Remedial Alternatives Analysis reports.

### **Schenectady Metroplex Development Authority, Broadway – Site Investigation/Interim Remedial Measures.**

Senior Scientist for a site investigation at a former commercial property/municipal parking lot. The project was completed under the NYSDEC's Environmental Restoration Program (ERP) and involved installation of monitoring wells, soil and groundwater sampling, and removal of PCB-contaminated waste. Mr. Favreau was responsible for preparation of the SI and IRM work plans, oversight and documentation of field activities and preparation of the SI/IRM and Remedial Alternatives Analysis reports.

**Schuyler Heights Fire District – Site Investigation.** Senior Scientist for a site investigation at a former rail and scrap metal yard. The project was completed under the NYSDEC's Environmental Restoration Program (ERP) and involved excavation of test pits, installation of monitoring wells, and soil and groundwater sampling. Mr. Favreau was responsible for preparation of the SI work plan, oversight and documentation of field activities and preparation of the SI and Remedial Alternatives Analysis reports.



# Keith E. Cowan, CPG

## Senior Principal Scientist

Keith has over 20 years of experience in the environmental consulting industry. His resume includes remedial investigations and feasibility studies, petroleum spill and remediation projects, solid and hazardous waste landfill investigations and closures, environmental site characterizations, hazardous materials assessments, environmental compliance projects, and brownfields projects. Representative project experience includes:

### Education

*University at Buffalo, NY, BA. in  
Geology*

### Registrations

*Certified Professional Geologist*

### Memberships & Affiliations

*National Ground Water  
Association*

*Hudson-Mohawk Professional  
Geologists Association*

*Air and Water Management  
Association*

### Firm

*CHA*

### Years Experience

*Total: 21 | With CHA: 17*

**Confidential Client, Environmental Services Term Agreement.** Project Manager, for environmental consulting services to an international chemical manufacturing company at two of their New York facilities. CHA has conducted a series of RCRA Facility Investigations (RFI), as well as Feasibility Studies (FS) for the investigation and remediation of soil and groundwater contamination. CHA's services have included subsurface investigations, Corrective Measures Studies to screen and evaluate the potential remedial alternatives, as well as remedial design services.

**NYSOGS, Rome School for the deaf PCB Remedial Services.** Project Manager for the investigation of PCB impacts related to leaking transformers at the Rome School for the Deaf. The project included the delineation of the extent of contamination and a remedial action plan that was approved by the NYSDEC. Following the investigation, CHA was responsible for providing the necessary plans and specifications for the remediation activities.

**Town of Floyd, Highway Garage, Environmental Engineering Services.** This project is being conducted per the conditions of a NYSDEC Stipulation Agreement. Mr. Cowan was responsible for the evaluation and determination of the extent of impact from a historic release from a series of former, underground fuel storage tanks. The scope of the investigation includes the implementation of an extensive subsurface investigation program including groundwater monitoring, providing agency interface and regulatory guidance.

**Former ALCO Site, USEPA Brownfield Investigation.** Project Manager for a large-scale Remedial Investigation of the Former ALCO Brownfield Site located along the waterfront. The investigation was performed under a USEPA Brownfield Grant and included the installation of soil borings and monitoring wells, a surficial soil screening program, river sediment sampling, a large-scale soil vapor investigation, test pitting, as well as the collection and analysis of numerous soil and groundwater samples. The site is currently in the planning phase for redevelopment into a multi-use waterfront area.



# Christopher A. Burns, PhD, PG

## Chief Scientist

Dr. Burns has 29 years of experience managing CERCLA remedial investigations and feasibility studies, hydrogeological investigations, Phase I & II site assessments, and siting studies for solid waste management facilities. He has provided project management for new municipal wells, well contamination investigations, and water resource protection:

### Education

*University of Delaware, DE, Ph.D.  
in Geology*

*University of Delaware, DE, M.S.  
in Geology*

*Colgate University, NY, B.A. in  
Geology*

### Registration & Certification

*Professional Geologist- DE, IN,  
NH, VA, NY*

### Memberships & Affiliations

*National Ground Water  
Association*

*Solid Waste Association of North  
America*

### Years Experience

*Total: 29 With CHA: 23*

**Town of Salina, NY, Salina Landfill Superfund Site.** Project Manager for completion of a Remedial Investigation, Feasibility Study, and Remedial Design of 55-acre inactive hazardous waste landfill. Investigated extent of contamination associated with PCBs and solvents and impact on surface waters and ground waters. Project also included a search for Potentially Responsible Parties and a Human Health and Ecological Risk Assessment. Project was challenging because it required review and interaction with both the NYSDEC and the USEPA.

**HDR, Inc., Utica City Dump, NY Inactive Hazardous Waste Site.** Project Manager for completion of a Remedial Investigation and Feasibility Study (RI/FS) of 110-acre inactive hazardous waste landfill. Used magnetometry, test pits, historical aerial photography to define nature and limits of waste. Investigated impact to surface water bodies bordering the site to the north and to the south. Conducted groundwater investigation influenced by controlled discharge through adjacent Erie Canal. Documented that groundwater flow direction can vary seasonally as influenced by flow in adjacent surface water bodies.

**Solvents & Petroleum Service, RCRA Facility Investigation.** Project Manager responsible for completing RCRA Facility Investigation Report for solvent and petroleum distribution facility. The Report consisted of a summary of all activities and sampling performed over the last 7 years. A review of historical information revealed gaps in the understanding of groundwater contamination.

**Confidential Client, Buffalo, NY Inactive Hazardous Waste Sites.** Project Manager for 7 Buffalo, NY- area sites involving potential disposal of hazardous -wastes. Projects were in different phases of investigation and clean-up. Directly communicated with NYSDEC and City Officials on project and supervised team of consultants and attorneys.

**USEPA Region III, Butz Landfill Superfund Site, PA.** Project Manager of RI/FS to define nature and extent of TCE plume in fractured bedrock aquifer. Used borehole geophysics, packer testing, pump testing, and ground water sampling to delineate plume and performed fate and transport analysis to predict plume migration.



# Elizabeth M. Wos

## Project Engineer

Ms. Wos is an Engineer I in our Environmental Technical Group with two years of consulting experience. Her experience includes conducting compliance evaluations, Phase I Environmental Site Assessments, groundwater monitoring, and asbestos abatement oversight and air monitoring for both public and private industrial clients. Representative project experience includes:

### Education

Clarkson University, NY, B.S. in  
Environmental Engineering

### Registrations/Certifications

OSHA 40-Hour Hazwoper Training

OSHA Confined Space Training

NYS Asbestos Project Monitor  
Certification

### Firm

CHA

### Years Experience

Total: 2 | With CHA: 2

**Former Oak Mitsui Manufacturing Plan, Sub-Surface Investigation and Sampling.** Ms. Wos oversaw the installation of several soil borings and groundwater monitoring wells in order to determine the potential presence of groundwater contamination at a large industrial property. Ms. Wos also carried out the initial and follow up rounds of groundwater sampling at the site.

**Albany City School District Middle School Property, Phase I ESA with Limited Subsurface Investigation.** Environmental Engineer completing the site inspection, records review, interviews, and report writing for a Due Diligence Phase I ESA of a multi-story middle school facility and surrounding grounds. The Phase I ESA was performed in accordance with ASTM E 1527-13 standard guidelines. In addition, a limited subsurface investigation was conducted concurrently which consisted of the collection of surface soil samples to be analyzed for an array of compounds. Ms. Wos reduced the analytical data by comparison to applicable NYSDEC regulatory standards, and summarized the subsurface findings in the Phase I ESA report.

**Hudson River Psychiatric Center, Confidential Document Destruction.** Lead Engineer at the Site overseeing the removal and destruction of confidential documents at the Hudson River Psychiatric Center (HRPC) lower campus. Confidential records were retrieved and destroyed in accordance with the Health Insurance Portability and Accountability Act (HIPAA) requirements. Files were assumed to be contaminated with asbestos and lead due to the poor building conditions. Ms. Wos was the onsite project monitor overseeing the removal activities from the building as well as the processing of the files at a specialized "file destruction room". The files were shredded, bagged, and disposed of as asbestos waste by a team of certified individuals.

**Finch Waste Company, LLC, Consolidated Landfill Facility.** Ms. Wos oversaw the installation of ten groundwater monitoring wells associated with planned expansion of the landfill facility. Once the wells were installed, Ms. Wos was involved with gauging the wells and conducting slug testing of the wells. While in the field Ms. Wos was responsible for the observation and documentation of all field activities being conducted. In addition, Ms. Wos has assisted with the collection of groundwater samples from the existing monitoring well network at the landfill on a quarterly basis.

**APPENDIX C**  
**Field Calibration Log**

## PID Calibration Log

| <b>Meter Make and Model:</b>                  |            |                           | <b>Serial Number:</b>      |           |           |           |
|-----------------------------------------------|------------|---------------------------|----------------------------|-----------|-----------|-----------|
| <b>Name of Person Performing Calibration:</b> |            |                           | <b>CHA Project Number:</b> |           |           |           |
| Test Type<br>(Bump/full cal.)                 | Gas Tested | Calibration<br>Parameters | Results                    | Pass/Fail | Date/Time | Signature |
|                                               |            |                           |                            |           |           |           |
|                                               |            |                           |                            |           |           |           |
|                                               |            |                           |                            |           |           |           |
|                                               |            |                           |                            |           |           |           |
|                                               |            |                           |                            |           |           |           |
|                                               |            |                           |                            |           |           |           |
|                                               |            |                           |                            |           |           |           |
|                                               |            |                           |                            |           |           |           |
|                                               |            |                           |                            |           |           |           |
|                                               |            |                           |                            |           |           |           |
|                                               |            |                           |                            |           |           |           |



## **APPENDIX C**

### **Health and Safety Plan**

# HEALTH AND SAFETY PLAN

*for*

**OAK MITSUI**

**SITE # 442052**

**80 FIRST STREET**

**HOOSICK FALLS, NEW YORK 12090**

---

---

*CHA Project Number: 31861*

***Prepared for:***

***Oak Mitsui***

***80 First Street***

***Hoosick Falls, NY 12090***

***April 2018***

***Prepared by:***



***III Winners Circle***

***Albany, NY 12205***

***Phone: (518)453-4700***

---

---

## Table of Contents

|      |                                         |    |
|------|-----------------------------------------|----|
| 1.0  | INTRODUCTION .....                      | 1  |
| 2.0  | KEY PERSONNEL .....                     | 2  |
| 2.1  | OFF-SITE PERSONNEL.....                 | 2  |
| 2.2  | ON-SITE PERSONNEL .....                 | 2  |
| 2.3  | ON-SITE OPTIONAL PERSONNEL .....        | 3  |
| 2.4  | AS-NEEDED PERSONNEL .....               | 4  |
| 2.5  | CLIENT-SPECIFIC CONTACTS .....          | 4  |
| 3.0  | SITE ENTRY .....                        | 5  |
| 3.1  | OBJECTIVES .....                        | 5  |
| 3.2  | SAFETY MEETINGS.....                    | 5  |
| 3.3  | SAFETY TRAINING .....                   | 5  |
| 3.4  | MEDICAL SURVEILLANCE.....               | 6  |
| 3.5  | SITE MAPPING .....                      | 6  |
| 4.0  | SITE CHARACTERIZATION.....              | 7  |
| 4.1  | SITE DESCRIPTION .....                  | 7  |
| 4.2  | NEIGHBORING PROPERTIES.....             | 8  |
| 4.3  | SITE TOPOGRAPHY.....                    | 8  |
| 4.4  | METEOROLOGIC DATA .....                 | 9  |
| 5.0  | HAZARD EVALUATION.....                  | 10 |
| 5.1  | CHEMICAL HAZARDS .....                  | 10 |
| 5.2  | DISPERSION PATHWAYS.....                | 12 |
| 5.3  | PHYSICAL HAZARDS .....                  | 13 |
| 5.4  | BIOLOGICAL HAZARDS.....                 | 13 |
| 5.5  | HAZARD IDENTIFICATION AND CONTROL ..... | 14 |
|      | Hazards .....                           | 14 |
| 6.0  | AIR MONITORING AND ACTION LEVELS .....  | 19 |
| 6.1  | AIR MONITORING .....                    | 19 |
| 6.2  | ACTION LEVELS.....                      | 20 |
| 7.0  | SITE CONTROL MEASURES .....             | 21 |
| 7.1  | COMMUNICATION .....                     | 21 |
| 8.0  | HAZARD COMMUNICATION .....              | 22 |
| 9.0  | CONFINED SPACE .....                    | 23 |
| 10.0 | PERSONAL PROTECTIVE EQUIPMENT .....     | 24 |

---

---

|      |                                     |    |
|------|-------------------------------------|----|
| 11.0 | DECONTAMINATION .....               | 26 |
| 12.0 | EMERGENCY PROCEDURES.....           | 29 |
| 13.0 | EMERGENCY MEDICAL CARE.....         | 31 |
| 13.1 | EMERGENCY NOTIFICATION NUMBERS..... | 32 |
| 13.2 | ON-SITE FIRST AID .....             | 32 |
| 14.0 | CERTIFICATION .....                 | 34 |
| 15.0 | STANDARD OPERATING PROCEDURES ..... | 35 |

---

---

## SITE SPECIFIC HEALTH AND SAFETY PLAN

### 1.0 INTRODUCTION

The following Health and Safety Plan (HASP) has been created for the protection of CHA Consulting, Inc. (CHA) staff during the Site Characterization Work Plan (SCWP) activities to be performed at the Oak Mitsui site, located at 80 First Street, in the Village of Hoosick Falls, New York (see Figure 1). This project's various assignments require CHA employees to perform tasks where personal safety could be compromised due to chemical, physical, and/or biological hazards. While conducting field work, CHA employees may be exposed to chemical, physical, and/or biological hazards including but not limited to:

- Chemical and dust exposure due to the presence of subsurface contamination in areas of proposed soil borings and/or excavations.
- Slip/Trips/Falls and falls from differing elevations (i.e. pits)
- Excavations
- Heat/Cold Stress
- Excessive noise for certain operations
- Heavy equipment operation
- Environmental and Biological hazards (e.g. insects, plants, UV exposure, etc.)

The requirements and guidelines in this HASP are based on a review of available information and an evaluation of potential on-site hazards, including: Phase I and Phase II Subsurface Environmental Investigation. This HASP will be discussed with site personnel and will be available on-site for review while work is underway. CHA personnel will report to the Project Manager (PM) and consult with the Health and Safety Coordinator (HSC) in matters of health and safety. The Site Safety Officer (SSO) and Field Team Leader (FTL) is the same person for this project and is responsible for ensuring compliance with this HASP, stopping work when necessary, and for implementation of this HASP for daily site activities.

*Non-intrusive activities within CHA's Scope of work are those that do NOT have the potential to jeopardize the health and safety of site workers, the public, or the environment with respect to site contaminants. Intrusive activities within CHA's Scope of Work are those that have the potential to cause health and safety concerns to site workers, the public, or the environment. These activities and any non-intrusive activities conducted in an Exclusion Zone require training per 29 CFR 1910.120 on a NYSDEC remedial site.*

## **2.0 KEY PERSONNEL**

### **2.1 OFF-SITE PERSONNEL**

**Title: CHA Corporate Director of Health & Safety**

**Description:** Responsible for the CHA's corporate health and safety program and developing procedures, policies, and coordinating training programs. Additionally, provides senior level guidance on development of HASPs and interpretation of regulations.

**Contact:**

Jeff Malo

(518) 453-4702 (Office)

**Title: Project Manager**

**Description:** Reports to upper level management, provides sufficient authority and resources to satisfy health and safety requirements, and assumes total control over site activities. The Project Manager is ultimately responsible for ensuring field implementation of this HASP.

**Contact:**

Cailyn Locci, PG

(518) 453-4733 (Office)

(518) 727-6555 (Cell)

### **2.2 ON-SITE PERSONNEL**

**Title: Site Safety Officer**

**Description:** Advises the field team on all aspects of health and safety issues, recommends stopping work if any operation threatens worker or public health and safety.

**Contact:**

John Favreau

(518) 453-8795 (Office)

(518) 858-7068 (Cell)

**Title: Field Team Leader**

**Description:** Responsible for coordinating project requirements in the field. The Field Team Leader oversees daily activities of the project and are, therefore, responsible for implementing health and safety requirements and following safety procedures in the field. The Field Team Leader will contact the local emergency response organizations to notify concerned affiliates of the hazards associated with this project.

**Contact:**

John Favreau

(518) 453-8795 (Office)

(518) 858-7068 (Cell)

**Title: Work Party**

**Description:** Performs field operations

**Contact:**

John Favreau

(518) 453-8795 (Office)

(518) 858-7068 (Cell)

## 2.3 ON-SITE OPTIONAL PERSONNEL

**Title: Health and Safety Coordinator**

**Description:** Responsible for making recommendations regarding the work area to the SSO. Inspections may be periodically conducted to monitor worker health and safety and will address such issues as appropriate PPE, required air monitoring, decontamination procedures, and worker safety.

**Contact:**

Jeff Malo

(518) 453-4702 (Office)

**Title: Scientific Advisor**

**Description:** Guides the Project Team Leader in scientific matters.

**Contact:**

Christopher Burns, Ph.D., PG

(804) 897-0954 x 248 (Office)

---

## 2.4 AS-NEEDED PERSONNEL

### **Title: Fire Department**

**Description:** Responds to fires and performs rescues

### **Contact:**

911

### **Title: NRC**

**Description:** Responds to spills and other environmental emergencies that may arise

### **Contact:**

Chris Kirgan

(518) 355-0197

### **Title: EPA National Response Center**

**Description:** Responds to all oil, chemical, radiological, biological and etiological discharges into the environment, anywhere in the United States and its territories.

### **Contact:**

(800) 424-8802

## 2.5 CLIENT-SPECIFIC CONTACTS

### **Title: Director of Engineering**

**Description:** Oak Mitsui Director of Engineering

### **Contact:**

Larry Vosh

(518) 260-4028

### **3.0 SITE ENTRY**

#### **3.1 OBJECTIVES**

The objectives of the site entry are to:

1. Oversee the site characterization activities carried out as described in the Site Characterization Work Plan.
2. Document contractor activities.
3. Collect characterization soil samples.

The intrusive site activities may include the following:

1. Oversight of drilling contractor during completion of soil borings.
2. Oversight of excavation contractor during installation of shallow test pits for borings SC021 and SC024.
3. Sampling of soil for laboratory analysis.

#### **3.2 SAFETY MEETINGS**

To ensure that the HASP is being followed, the SSO shall conduct a safety meeting prior to entry to the site or the initiation of any site activity, if any conditions change, and before each work day. The Daily Job Site Safety Brief form in Attachment A should be utilized to document these daily jobsite briefings.

#### **3.3 SAFETY TRAINING**

The SSO will confirm that every person assigned to a task has had adequate training for that task and that the training is up-to-date by checking with the CHA Safety Coordinator and online database. CHA staff working on this project shall have a minimum of:

- 40-Hour Initial Hazardous Waste Operations and Emergency Response (HAZWOPER) training in accordance with 29 CFR 1910.120
- Current 8-hour HAZWOPER Refresher Training
- Training on CHA Respiratory Protection Plan

- Field equipment safety training where applicable

All training will have been conducted and certified by CHA in accordance with OSHA regulations.

### 3.4 MEDICAL SURVEILLANCE

All CHA personnel will have had a medical surveillance physical consistent with CHA Procedures and/or OSHA regulations and performed by a qualified occupational health physician. The SSO shall confirm prior to initiation of work on this site that every CHA person assigned to a task has had an annual physical and respiratory fit test, has passed the medical examination, and has been determined medically fit by the occupational health physician for respirator use and this type of work if deemed necessary by the PM.

### 3.5 SITE MAPPING

Site mapping has been included in the Figures section of the HASP. Figure 1 illustrates the location of the subject Site. Figure 2 illustrates the route to the nearest hospital from the subject site.

---

## 4.0 SITE CHARACTERIZATION

### 4.1 SITE DESCRIPTION

The Oak Mitsui Facility (site) is located at 80 First Street in the Village of Hoosick Falls, Rensselaer County, New York. The site is situated on the southern bank of the Hoosick River and is bound to the east by the Pan Am Railroad line and to the south by residences. The site is comprised of three (3) parcels which are zoned Industrial and Commercial. A site location map is provided as Figure 1.

According to Sanborn Fire Insurance maps, the subject site was historically utilized for industrial purposes dating back to the late 1800s. Previous operations included a foundry, a machine shop, paper mill machine manufacturing facility, and a coal gas manufacturing facility. Oak Mitsui has occupied the site since 1976 and the primary business of Oak Mitsui has been the manufacture of electrodeposited copper foil. All copper foil manufacturing operations in Hoosick Falls occurred at the 80 First Street location. From 1977 to 2001, the site was used for high volume manufacturing of copper foil and administrative offices. From mid-2001 to 2015, the site was used for administrative offices and other activities as follows:

- From 2005 to 2010, the site was used for pilot scale (research and development) copper foil electroplating. This process utilized some of the copper foil manufacturing equipment still at the site from the high volume manufacturing period.
- From 2003 to 2015, an OMI subsidiary, Oak Mitsui Technologies LLC (OMT) produced FaradFlex products at the 80 First Street site. FaradFlex is produced by using heat & pressure to bond 2 pieces of adhesive coated copper foil to either side an insulating film. The adhesive coated copper foil was purchased from suppliers in Japan & Malaysia. The insulating film was also purchased from overseas suppliers. A large heated hydraulic press was installed along with other sheeting & collating equipment to manufacture this product.

In 2015, the manufacturing operations were moved to Malaysia. Remaining administrative staff were moved to leased office space at 8 John Street, Hoosick Falls. Oak Mitsui ceased plant operations and has since been in the process of decommissioning and demolishing the Hoosick Falls facility.

Characterization of the contamination via Phase I and Phase II Subsurface Environmental Investigation indicated widespread metal contamination. No underground storage tanks or other containers (e.g. drums) are known to be present on the site. A complete description of the current information regarding nature and extent of contamination and previous environmental investigations is provided in the Site Characterization Work Plan.

Modifications to this HASP and its PPE requirements must occur if site investigations indicate higher levels of contamination than the previous investigations noted, site sampling, or the presence of underground storage tanks or other containers are discovered.

**NOTE:** Underground Storage Tanks (USTs) are not known to be present on the site. However, if USTs (drums or drum carcasses and/or other containers) are encountered:

1. Work will stop and the PM will be notified.
2. Upgrade to Level C PPE is required regardless of the air monitoring results.

## 4.2 NEIGHBORING PROPERTIES

The site is bordered by the following:

- **North:** Hoosic River
- **East:** Pan Am Railroad
- **South:** Residential Buildings, First Street and Nixon Street
- **West:** Hoosic River

## 4.3 SITE TOPOGRAPHY

The topography of the site is relatively flat, with an elevation of approximately 420 feet above mean sea level. The Hoosick River bounds the site to the west and north and is directly adjacent to the Oak Mitsui property boundary. The project area slopes gently toward the Hoosick River to the west and north.

#### 4.4 METEOROLOGIC DATA

The time of year that work is to be conducted is from late spring into summer. The weather and temperature for that time of year is expected to vary, but mild to hot temperatures are typically expected and it is possible that extreme heat or thunderstorm conditions could be encountered. Prior to each day's activities, the daily forecast should be monitored for indications of adverse work conditions. If poor weather hinders the continuation of the day's activities, the Team Leader may notify the PM and stop work for the day. To monitor wind direction in real time on site a wind sock will be established.

## 5.0 HAZARD EVALUATION

Hazards are generally divided into three (3) categories; 1) exposure to chemicals and hazardous materials, 2) safety/physical hazards, and 3) biological hazards. Chemical and hazardous materials are further segregated by their specific compound, exposure threshold, and route of exposure. Safety/physical hazards are generally hazards such as slips/trips/falls, falls from elevated surfaces and confined spaces. Biological hazards typically include plants, animals, and insects.

### 5.1 CHEMICAL HAZARDS

| Chemical | OSHA PEL                    | NIOSH REL                                | IDLH                  | Ionization Potential (I.P) | Characteristics                                               | Routes of Exposure                                              | Symptoms of Exposure and Health Effects                                                                                                                                                                                                                                       |
|----------|-----------------------------|------------------------------------------|-----------------------|----------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Arsenic  | TWA 0.010 mg/m <sup>3</sup> | Ca C 0.002 mg/m <sup>3</sup> (15-minute) | 5 mg/m <sup>3</sup>   | N/A                        | Metal: silver-gray or tin-white, brittle, odorless solid      | inhalation, skin absorption, skin and/or eye contact, ingestion | ulceration of nasal septum; dermatitis; GI disturbances; peripheral neuropathy; respiratory irritation; hyperpigmentation of the skin; carcinogenic                                                                                                                           |
| Chromium | TWA 0.05 mg/m <sup>3</sup>  | TWA 0.05 mg/m <sup>3</sup>               | 25 mg/m <sup>3</sup>  | NA                         | Appearance and odor vary depending upon the specific compound | inhalation, ingestion, skin and/or eye contact                  | irritation of the eyes; sensitization dermatitis                                                                                                                                                                                                                              |
| Copper   | TWA 1 mg/m <sup>3</sup>     | TWA 1 mg/m <sup>3</sup>                  | 100 mg/m <sup>3</sup> | NA                         | Reddish, lustrous, malleable, odorless solid                  | Inhalation, ingestion, skin and/or eye contact                  | irritation of eyes, nose, throat; nasal septum perforation; metallic taste; dermatitis; in animals: lung, liver, kidney damage; anemia                                                                                                                                        |
| Lead     | TWA 0.05 mg/m <sup>3</sup>  | TWA 0.05 mg/m <sup>3</sup>               | 100 mg/m <sup>3</sup> | NA                         | A heavy, ductile, soft, gray solid                            | inhalation, ingestion, skin and/or eye contact                  | lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, low-weight, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremors; paralysis of the wrists, ankles; encephalopathy; kidney disease; irritation of the eyes; hypotension |

| Chemical                                      | OSHA PEL                                                                            | NIOSH REL                                                        | IDLH                                         | Ionization Potential (I.P) | Characteristics                                                                              | Routes of Exposure                                                            | Symptoms of Exposure and Health Effects                                                                                                                                                                                                        |
|-----------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------------|----------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mercury                                       | TWA C<br>0.105<br>mg/m <sup>3</sup> (skin)                                          | TWA 200<br>pm0.050.1<br>mg/m <sup>3</sup> (skin)                 | 1000ppm<br>1010<br>mg/m <sup>3</sup> (as Hg) | NA                         | Metal: Silver-white, heavy, odorless liquid                                                  | inhalation, absorption, ingestion, skin and/or eye contact                    | irritation of eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremors, insomnia, irritability, indecision, headache, lassitude; stomatitis, salivation; GI distress, anorexia, low-weight; proteinuria |
| Zinc                                          | TWA 15<br>mg/m <sup>3</sup> (total dust)<br>TWA 5<br>mg/m <sup>3</sup> (resp. dust) | Dust:<br>TWA 5<br>mg/m <sup>3</sup><br>C 15<br>mg/m <sup>3</sup> | 500<br>mg/m <sup>3</sup>                     | NA                         | White, odorless solid                                                                        | inhalation                                                                    | Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude; metallic taste; headache; blurred vision; lower back pain; vomiting; malaise; chest tightness; dyspnea; decreased pulmonary function                       |
| Polychlorinated Biphenyl (PCB - Aroclor 1245) | 0.5 mg/m <sup>3</sup>                                                               | Ca<br>TWA<br>0.0001<br>mg/m <sup>3</sup>                         | CA<br>5 mg/m <sup>3</sup>                    | NA                         | Colorless to pale-yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor | inhalation, absorption, ingestion, skin and/or eye contact                    | Irritation of the eyes; liver damage; reproductive effects; carcinogenic                                                                                                                                                                       |
| Potassium Cyanide                             | TWA 5<br>mg/m <sup>3</sup>                                                          | C<br>5 mg/m <sup>3</sup><br>(4.7 ppm)                            | 25<br>mg/m <sup>3</sup>                      | NA                         | White, granular or crystalline solid with a faint, almond-like odor                          | Inhalation, absorption, ingestion, skin and/or eye contact                    | Irritation of the eyes, skin, upper respiratory system; asphyxia; lassitude, headache, confusion; nausea, vomiting; increased respiration rate, slow gasping respiration; thyroid, blood changes                                               |
| Benzo [a] pyrene                              | TWA<br>0.2 mg/m <sup>3</sup>                                                        | Ca<br>TWA 0.1<br>mg/m <sup>3</sup>                               | 80<br>mg/m <sup>3</sup>                      | N/A                        | Black or dark-brown amorphous residue                                                        | inhalation, skin and/or eye contact                                           | dermatitis; bronchitis; carcinogenic                                                                                                                                                                                                           |
| PFAS (Perfluoroalkyls)                        | NA                                                                                  | NA                                                               | NA                                           | NA                         | Chemical Compound                                                                            | Ingestion predominant route), inhalation, absorption, skin and/or eye contact | Research is ongoing. Preliminarily mice/rat research indicates: liver damage, changes in blood cholesterol and triglyceride levels, decreases in the size of the                                                                               |

| Chemical | OSHA PEL | NIOSH REL | IDLH | Ionization Potential (I.P) | Characteristics | Routes of Exposure | Symptoms of Exposure and Health Effects         |
|----------|----------|-----------|------|----------------------------|-----------------|--------------------|-------------------------------------------------|
|          |          |           |      |                            |                 |                    | spleen and thymus and impaired immune function. |

Ca – Cancerous

C – Ceiling value

TWA – Time Weighted Average

IDLH – Immediately Dangerous to Life and Health

OSHA – Occupational Safety and Health Administration

PEL – Permissible Exposure Limit

NIOSH – National Institute for Occupational Safety and Health

REL – Recommended Exposure Limit

NA – Not Available

## 5.2 DISPERSION PATHWAYS

The potential exposure mechanism that can transport constituents of concern from the areas of the intrusive site activities to other areas of the site as well as beyond the boundaries of the site are:

- Projection of contaminated material in air
- Movement of dust particles
- Conveyance in sediment laden water runoff
- Failure to adhere to containerization and/or decontamination procedures
- Failure to adhere to the Field Sampling Plan and/or Standard Operating Procedures

Visible emissions can be a problem at any site that involves intrusive activities and should be controlled. The primary effect of visible dust is irritation of the eyes, nose, and throat. While it is not anticipated, visible emissions should be monitored and the following corrective actions can be implemented if irritation or concern of dust arises.

- Minimizing the amount of exposed ground surface/covering exposed surfaces
- Reducing speed of excavation activities

- Lightly wetting surfaces or applying misters
- Using chemical or foam dust suppressants (with authorization only)
- Reducing vehicle speeds

The primary effect of nuisance dust is irritation of the eyes, nose, and throat with elevated concentrations.

### 5.3 PHYSICAL HAZARDS

Physical hazards such as the following may be encountered on site:

- Slip/Trip/Fall
- Falls from elevated surfaces
- Excavations
- UV radiation
- Lifting (generators, drums, equipment)
- Traffic – on access roadways at the facility
- Caught in/between moving parts or equipment
- Heat Stress

### 5.4 BIOLOGICAL HAZARDS

Biological hazards such as the following may be encountered on site:

- Ticks, mosquitoes, stinging insects, arachnids, chiggers
- Rodents, snakes, zoonotic diseases (Infectious diseases that can be transmitted to humans by animals)

## 5.5 HAZARD IDENTIFICATION AND CONTROL

Hazard controls generally consist of following specific safety procedures, training, engineering controls, air monitoring, and PPE selection. CHA employees are required to use the PPE appropriate to their work task and potential exposures as outlined in this HASP.

The levels of PPE assigned to each activity are based on available information on the estimation of exposure potential associated with each work task.

| Affected Personnel                                               | Task/Operation                              | Hazards                                                                                                                                                                                                                                                                                                         | Hazard Control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All personnel in Exclusion Zone and Contamination Reduction Zone | contamination excavation/removal            | <ul style="list-style-type: none"> <li>• Skin and/or eye contact with contaminated soil and/or groundwater, decontamination solutions, and sample preservation agents.</li> <li>• The inhalation of volatile organic vapors, dusts, and other airborne vapor or particulates during site activities.</li> </ul> | <ul style="list-style-type: none"> <li>• Conduct air monitoring in accordance with Section 6.0. Wear the required personal protective equipment when conditions or activities indicate the need for it. Stand upwind to extent possible to reduce inhalation hazard.</li> <li>• Establish a wind sock local to operations.</li> <li>• Avoid walking through puddles, and contacting other potential sources of contaminants such as drums.</li> <li>• Keep airborne dust levels to a minimum by wetting surfaces.</li> </ul> |
| All personnel in Exclusion Zone and Contamination Reduction Zone | Collection of soil, and groundwater samples | <ul style="list-style-type: none"> <li>• Skin and/or eye contact with contaminated soil and/or groundwater, decontamination solutions, and sample preservation agents.</li> <li>• The inhalation of volatile organic vapors, dusts, and other airborne particulates during site activities.</li> </ul>          | <ul style="list-style-type: none"> <li>• Conduct air monitoring in accordance with Section 6.0. Wear the required personal protective equipment when conditions or activities indicate the need for it. Stand upwind to extent possible to reduce inhalation hazard.</li> </ul>                                                                                                                                                                                                                                              |

| Affected Personnel | Task/Operation       | Hazards                                                                                      | Hazard Control                                                                                                                                                                                                                                                                          |
|--------------------|----------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                      |                                                                                              | <ul style="list-style-type: none"> <li>• Avoid walking through puddles, and contacting other potential sources of contaminants such as drums.</li> <li>• Keep airborne dust levels to a minimum by wetting surfaces.</li> </ul>                                                         |
| All personnel      | All field activities | Slips, trips, & falls                                                                        | <ul style="list-style-type: none"> <li>• Wear appropriate work boots.</li> <li>• Avoid slippery surfaces.</li> <li>• exercise good housekeeping practices.</li> <li>• Be observant of activities around.</li> <li>• Cover, barricade and/or demark all pits and excavations.</li> </ul> |
| All personnel      | All field activities | Physical injuries, such as abrasions or cuts                                                 | <ul style="list-style-type: none"> <li>• Use safe work practices</li> <li>• Don proper PPE</li> <li>• Have a first aid kit readily available at site</li> </ul>                                                                                                                         |
| All personnel      | Heavy lifting        | Back injuries from lifting                                                                   | <ul style="list-style-type: none"> <li>• Practice safe lifting techniques.</li> <li>• Always use a minimum of 2 people for lifts over 50lbs</li> <li>• Lift with legs. Do not twist while carrying load.</li> </ul>                                                                     |
| All personnel      | Cold stress          | Exposure to low temperatures associated with working outdoors in variable weather conditions | <ul style="list-style-type: none"> <li>• Wear warm, dry clothing &amp; layers</li> <li>• Take frequent breaks in warm areas</li> <li>• Understand cold stress symptoms</li> </ul>                                                                                                       |

| Affected Personnel | Task/Operation       | Hazards                                  | Hazard Control                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|----------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All personnel      | All field activities | Fire (general)                           | <ul style="list-style-type: none"> <li>• Identify location of fire extinguisher(s) – contractor sourced</li> <li>• Keep ignition sources away from flammable materials and atmospheres.</li> </ul>                                                                                                                                                                                                             |
| All personnel      | All field activities | Noise Exposure                           | <ul style="list-style-type: none"> <li>• Wear hearing protection if you must shout to hear someone who is standing one foot or less away.</li> </ul>                                                                                                                                                                                                                                                           |
| All personnel      | All field activities | Contact with heavy equipment and traffic | <ul style="list-style-type: none"> <li>• Do not stand unnecessarily close to the excavator, geoprobe® or other equipment when it is operating</li> <li>• Do not stand in lanes of traffic. Use cones or barricades to delineate work areas when work within access roads is required.</li> <li>• Wear a hard hat and high visibility clothing</li> <li>• Make eye contact with the operator/drivers</li> </ul> |
| All personnel      | All field activities | Security                                 | <ul style="list-style-type: none"> <li>• Stay alert to all on-site activities</li> <li>• Report suspicious activities to PM and/or Oak Mitsui</li> </ul>                                                                                                                                                                                                                                                       |
| All personnel      | All field activities | Ticks                                    | <ul style="list-style-type: none"> <li>• Avoid unnecessary entry into tall grass and brushy areas.</li> </ul>                                                                                                                                                                                                                                                                                                  |

| Affected Personnel | Task/Operation       | Hazards                                                    | Hazard Control                                                                                                                                                                                                                                                                                                                                           |
|--------------------|----------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                      |                                                            | <ul style="list-style-type: none"> <li>• Wear insect repellents containing DEET.</li> <li>• Wear light colored clothing to easily identify ticks.</li> <li>• Inspect yourself throughout the day and following completion of field activities.</li> <li>• Tuck pants into socks or boots, wear long sleeves and minimize skin exposure.</li> </ul>       |
| All personnel      | All field activities | Stinging insects (bees, hornets, wasps and yellow jackets) | <ul style="list-style-type: none"> <li>• Do not agitate nests unless absolutely necessary.</li> <li>• Be aware of holes in the ground within the work area.</li> <li>• Avoid wearing/using scented items (e.g., perfume, cologne, soaps).</li> <li>• Inspect food and drinks prior to consumption.</li> <li>• Use insecticide when necessary.</li> </ul> |
| All personnel      | All field activities | zoonotic diseases                                          | <ul style="list-style-type: none"> <li>• Avoid dermal contact with animals, droppings or carcasses.</li> <li>• Avoid inhalation of dust that is contaminated with droppings or carcasses.</li> </ul>                                                                                                                                                     |

| Affected Personnel | Task/Operation       | Hazards                       | Hazard Control                                                                                                                                                                                                                                                                                                           |
|--------------------|----------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All personnel      | All field activities | Mosquitos/EEE/West Nile Virus | <ul style="list-style-type: none"> <li>• Eliminate mosquito breeding areas (standing water) at the work site.</li> <li>• Apply insect repellent containing DEET to exposed, unbroken skin per the manufacturer's instructions.</li> <li>• Wear light colored clothing (pants, long sleeved shirts and socks).</li> </ul> |
| All personnel      | All field activities | Snakes                        | <ul style="list-style-type: none"> <li>• Avoid actions which increase the risk of encountering a snake (e.g., overturning logs, rocks, etc.).</li> <li>• Wear tall leather work boots.</li> </ul>                                                                                                                        |
| All personnel      | All field activities | Rodents                       | <ul style="list-style-type: none"> <li>• Avoid contact with rodents and burrowing animals.</li> </ul>                                                                                                                                                                                                                    |
| All personnel      | All field activities | Arachnids                     | <ul style="list-style-type: none"> <li>• Avoid actions which increase the risk of encountering arachnids (e.g., overturning logs, placing hands in dark places).</li> </ul>                                                                                                                                              |
| All personnel      | All field activities | UV Exposure                   | <ul style="list-style-type: none"> <li>• Cover skin and limit time in sun to extent practical.</li> <li>• Apply all natural sunscreen.</li> </ul>                                                                                                                                                                        |

---

## 6.0 AIR MONITORING AND ACTION LEVELS

### 6.1 AIR MONITORING

The following environmental monitoring instruments shall be used on site at the specified intervals. Monitoring instruments will be calibrated prior to each full day of equipment usage or more frequently in accordance with manufacturer's recommendations. Calibrations will be performed and specified as noted in the QAPP, included in Appendix B of the Site Characterization Work Plan.

- Photoionization Detector (VOC)
- DustTrak (Particulates)

The photoionization detector (PID) shall be used to detect volatile organic compounds in the ambient air and will be calibrated and setup prior to the start of each day's activities.

| Contaminant/Method | Frequency                             | Action Level | SSO Action                                         |
|--------------------|---------------------------------------|--------------|----------------------------------------------------|
| Organic Vapors     | At least hourly within breathing zone | 10 ppm       | Stop work and notify PM of elevated organic vapors |

Particulate concentrations will be monitored continuously using DustTrak particulate meters, placed at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will 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 will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

## 6.2 ACTION LEVELS

Should action levels be reached, work operations shall cease until further evaluation is performed and safe levels are prevalent. If through engineering controls and monitoring, safe levels (below action levels) cannot be achieved, an upgrade in personal protection equipment shall be mandated by the SSO, or operations shall cease in that portion of the site. The PM will be notified of any changes in PPE. All PPE level changes must be authorized by PM.

## 7.0 SITE CONTROL MEASURES

**Exclusion Zone (EZ):** Will include a 25-foot buffer around all excavation areas, and all areas where soil sampling and screening activities will occur including contaminated soil excavation areas.

Hazards within the EZ include excessive noise, slips/trips/falls, falls from elevated surfaces, contact with heavy equipment, and hazards associated with proximity to excavation activities; including direct contact with contaminated soil or water and inhalation of vapors from contamination.

**Contamination Reduction Zone (CRZ):** Will be established immediately adjacent to the Exclusion Zone and will be utilized for decontamination of personnel and equipment donning and doffing of PPE. Whenever possible, the CRZ shall be placed upwind of the EZ. A wind sock will be established within the CRZ.

Hazards within the CRZ include contact with contaminated soil or water, inhalation of vapors from contamination, and slips/trips/falls. Physical hazards may pose a risk and good judgement should be utilized.

**Support Zone:** Will include all areas outside the EZ and CRZ.

Hazards within the support zone include slips/trips/falls and other physical hazards associated with work area.

### 7.1 COMMUNICATION

Communication shall be accomplished by person to person verbal correspondence and through the use of cellular telephones. Communication procedures will be reviewed during the Daily Jobsite Safety Brief before entering the work zone.

## **8.0 HAZARD COMMUNICATION**

In compliance with 29 CFR 1910.1200, any hazardous materials brought on site by any personnel (CHA or other onsite contractors) shall be accompanied with the material's Safety Data Sheet (SDS). The SSO shall be responsible for maintaining the SDSs on site, reviewing them for hazards that working personnel may be exposed to, and evaluating their use on site with respect to compatibility with other materials including personal protective equipment, and their hazards. Should the SSO deem the material too hazardous for use on the subject site, the party responsible for bringing the material on site will be required to remove it from the site.

## 9.0 CONFINED SPACE

During this project CHA personnel will not be permitted to enter any confined space. If a confined space entry becomes necessary, the PM will be notified, this HASP will be revised to outline all confined space entry procedures, techniques, and equipment consistent with OSHA regulations 29 CFR part 1926, subpart AA—Confined Spaces in Construction as set forth in 29 CFR 1926.1201. Additionally, all entrants and attendants will be trained in Confined Space Awareness training consistent with the applicable regulation.

## 10.0 PERSONAL PROTECTIVE EQUIPMENT

Level A and B PPE are not expected to be needed. If site conditions change and contamination is present at levels above the action level, the PM will be notified and this HASP will be updated to reflect greater protection of personnel. The following is a list of required PPE.

| Task/Operation                                                                                                                                                                                                                                                                                                                                                                                          | Level of PPE | Equipment                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>General site observation at a distance greater than 25 feet from intrusive activities.</p> <ul style="list-style-type: none"> <li>• No drums present</li> <li>• No free product visible</li> <li>• 2-Minute Breathing Zone PID Readings &lt; 10 ppm with the 10.6 eV bulb</li> <li>• &lt;0.025 mg/m<sup>3</sup> metals</li> <li>• &lt;50mg/m<sup>3</sup> dust</li> <li>• No odors present</li> </ul> | D            | <ul style="list-style-type: none"> <li>• Long pants (no shorts)</li> <li>• Shirts with sleeves</li> <li>• Hard hat</li> <li>• Safety glasses</li> <li>• Reflective vests or yellow Hi-Visibility shirt</li> <li>• Work boots with safety toe</li> <li>• Hearing protection (if required)</li> <li>• Gloves (as appropriate)</li> </ul> |
| <p>Site Observation or Screening/Sampling Activities within the Exclusion Zone</p> <ul style="list-style-type: none"> <li>• No drums present</li> <li>• No free product visible</li> <li>• 2-Minute Breathing Zone PID Readings &gt;10 ppm with the 10.6 eV bulb</li> <li>• &gt;0.025 mg/m<sup>3</sup> metals</li> </ul>                                                                                | C            | <ul style="list-style-type: none"> <li>• Same as D, plus</li> <li>• Full-faced air purifying respirator (APR) with dual particulate-organic/acid vapor cartridges</li> <li>• Protective coveralls (e.g. Tyvek)</li> <li>• Protective outer boot covers</li> <li>• Outer gloves with disposable nitrile or latex</li> </ul>             |

---

|                                                                                                     |  |                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• &gt;50mg/m<sup>3</sup> dust</li><li>• odors noted</li></ul> |  | <p>inner gloves Inner polyethylene boot covers with outer latex boot covers</p> <ul style="list-style-type: none"><li>• Both inner and outer gloves must be chemically resistant</li><li>• Flame retardant coveralls under protective coveralls whenever drums or drum carcasses are encountered.</li></ul> |
|-----------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 11.0 DECONTAMINATION

Personnel working in the Exclusion Zone (within 25 feet of Site activities) will be required to enter and exit the work area through the Contamination Reduction Zone. Personnel engaged in decontamination will wear protective equipment including appropriate disposable clothing and respiratory protection and will also undergo decontamination procedures prior to leaving the decontamination area. The decontamination area will be placed upwind of the Exclusion Zone.

The following equipment is needed for decontamination:

- Alconox
- Water
- Impermeable Containers

The following list summarizes typical decontamination steps for personnel exiting the Exclusion Zone. Additional steps may be warranted based upon specific site conditions.

### ***Level D***

- Remove any protective equipment.
- Discard disposable garments.
- Wash/rinse boots.
- Containerize wash and decontamination water for disposal, as necessary.

### ***Level C***

- Wash/rinse outer suit and boots.
  - Wash/rinse outer gloves.
  - Remove outer boots.
  - Remove outer gloves.
  - Deposit disposables in container for proper disposal.
  - Remove suit.
  - Remove respirator.
  - Remove inner gloves.
-

- Containerize wash and decontamination water for disposal, as necessary.

***Level B***

- Will not be used.

***Level A***

- Will not be used.

PPE will be decontaminated with soap (i.e. Alconox) and water. Disposable items will be disposed of in dry, impermeable containers.

Equipment and vehicles used in the Exclusion zone to handle contaminated materials will undergo decontamination procedure in the Contamination Reduction Zone prior to leaving the Site. The SSO will document in the daily field log that each piece of equipment has been decontaminated prior to removal from the Site. The decontamination procedures will include but are not limited to:

- Movement of equipment to the decontamination pad
- Removal of heavily-caked material with brushes or shovels and
- Triple-rinsing with high pressure water or steam.

**Small Equipment:**

For soil sampling, dedicated sampling equipment is preferred. However, if non-dedicated equipment is used (i.e. stainless steel soil sampling equipment), the required decontamination procedure for all manual sampling equipment used to collect samples for chemical analysis is:

- Disassemble equipment, as required.
- Remove gross contamination from the equipment by brushing and then rinsing with tap water.
- Wash and scrub with low phosphate detergent (e.g. Alconox®).
- Tap water rinse.

- Distilled water rinse.
- Air dry.

All decontaminated equipment will be placed on polyethylene sheeting or aluminum foil in order to avoid contacting a contaminated surface prior to use. Field personnel will use a new pair of outer gloves before handling sample equipment after it is cleaned. During periods of transportation and non-use, all decontaminated sampling equipment will be wrapped in aluminum foil.

**Large Equipment:**

CHA personnel are not responsible for the decontamination of large equipment. Information for large equipment decontamination is provided by the site contractor. Decontamination of heavy construction equipment will be performed by the contractor under the contractor's HASP.

## 12.0 EMERGENCY PROCEDURES

911 service is available and confirmed at this location; always call 911 immediately as the first option for emergency medical assistance. Only if 911 is unavailable or has a long lead time should someone be driven to the nearest medical facility.

On-site emergencies can range in intensity from minor to serious conditions. Various procedures for responding to site emergencies are listed in this section. The designated SSO is responsible for contacting the CHA Project Manager who will notify the Oak Mitsui Representative and local emergency services as appropriate in emergency situations (however, others must assume responsibility if the situation warrants). An injured person shall be accompanied by another worker at all times.

Should an on-site emergency occur at the project site (related to the project or otherwise) the following procedures shall be followed:

- Call 911 for emergency response.
- If the emergency occurs and is project specific, notify your assigned Health and Safety Coordinator after emergency care is provided to activate the appropriate actions.
- Properly trained personnel will determine if the emergency can be contained or remediated and initiate the appropriate action(s). Personnel shall not respond beyond their level of training.
- Employees are not to risk their health or life in taking aggressive action(s) to fight fire or stop releases. Only defensive actions shall occur until an action plan is resolved.
- Choose an exit route that provides fast, and safe, egress from the work area. The route taken should always be away from obvious obstructions or other hazardous conditions. Consult an evacuation map if you are unsure of where the nearest exit route is located.
- Do not delay evacuation to retrieve personal items or equipment.
- All persons shall exit areas in groups and attempt to stay together during evacuation procedures.
- While evacuating, notice any conditions which should be reported to emergency personnel. Be alert for the location of smoke, fire and/or vapors. Report any of these conditions to emergency personnel.

- Be aware of emergency response vehicles and avoid interference with these.

Remain calm, keep voices low and wait for instructions from the Incident Commander. Do not leave the scene prior to notifying your assigned Project Manager and Site Field Team Leader. An incident report form is included in Appendix C.

### 13.0 EMERGENCY MEDICAL CARE

In general, if emergency care is needed, personnel should call 911 and request emergency service come to the site. Trained EMS personnel will have better training and equipment to administer care immediately. However, if necessary, transport injured personnel to the nearest hospital: Southwestern Vermont Medical Center

Address: 100 Hospital Drive  
Bennington, VT 05201

Emergency Room Telephone Number: (802) 442-6361

Directions from site:

1. Take John St to Church St, 39 s (0.1 mi)
2. Head east on 1st St toward John St, 276 ft
3. Turn right onto John St, 449 ft
4. Turn right onto Church St, 2 min (0.3 mi)
5. Take Hill Rd to NY-7 E in Hoosick, 5 min (2.8 mi)
6. Continue straight to stay on Church St, 0.4 mi
7. Continue onto Main St, 0.2 mi
8. Continue onto Hill Rd, 2.3 mi
9. Follow NY-7 E and VT-9 E to West Rd in Bennington, 9 min (6.6 mi)
10. Turn left onto NY-7, 2.4 mi
11. Turn right to stay on NY-7 E, Entering Vermont, 0.9 mi
12. Continue onto VT-9 E/West Rd, 3.4 mi
13. Take Monument Ave to your destination, 4 min (1.2 mi)
14. Turn right onto West Rd, 118 ft
15. Turn right at the 1st cross street onto Monument Ave, 0.9 mi
16. Turn left, 0.2 mi
17. Turn right, 200 ft
18. Turn left
19. Destination will be on the right, 69 ft

### 13.1 EMERGENCY NOTIFICATION NUMBERS

Fire Dept.: 911

Police Dept.: 911

Department of Emergency Services: 911

Poison Control: (800) 222-1222

CHA Contact: Cailyn Locci, (518) 453-4733 (Office) (518) 727-6555 (Cell)

### 13.2 ON-SITE FIRST AID

First aid kits will be available in the Support Zone (e.g. vehicles). General first aid procedures include:

**Skin/Eye Contact:** Flush eyes and/or skin thoroughly with water for 15 minutes. Remove contaminated clothing. If skin was contacted with a dry material, brush it off first, then flush with water. Seek medical attention if irritation develops.

**Ingestion:** Do not induce vomiting. Call Poison Control Center. Tell them what was swallowed, if possible. Follow instructions. Have SDS available for reference.

**Inhalation:** Remove person from contaminated environment without risking your own safety. DO NOT ENTER A CONFINED SPACE. DO NOT ENTER EXCLUSION ZONE UNLESS WEARING ONE LEVEL HIGHER PROTECTION THAN VICTIM WAS WEARING.  
Administer CPR, if necessary.

**Injuries:** Do not move a victim who may have a back injury. Cover them with coats, blankets, or other appropriate items to keep them warm. Personnel should immediately dial emergency services (i.e. 911).

Use latex gloves. Apply pressure to bleeding wounds. If the victim is able, have the victim apply pressure to the wound. If they are not able, wear gloves to protect from exposure to blood. Put gauze bandages or other clean cloth over the wound. Do not remove blood-soaked bandages or cloth - instead put additional bandages or cloths over the blood-soaked bandages. Elevate the limb with the injury above the heart.

Administer CPR if victim does not have a pulse and if you are currently certified in CPR. Have someone call for an ambulance immediately if there is any possibility that the victim is having or had a heart attack.

Shock is likely to develop in any serious injury or illness. The following are signals of shock: restlessness or irritability; altered consciousness; pale, cool, moist skin; rapid breathing; and/or rapid pulse. In the event of shock, do the following: Immediately have someone call for an ambulance; have the victim lie down; elevate legs 12 inches unless you suspect head, neck, or back injuries; if victim is cool, cover the victim to prevent chilling; do not give the victim anything to drink, even if thirsty. Note time symptoms began and report to emergency responders.

---

## 14.0 CERTIFICATION

All site personnel covered by this HASP have read the HASP and are familiar with its contents and provisions.

Name

Title

Date

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## **15.0 STANDARD OPERATING PROCEDURES**

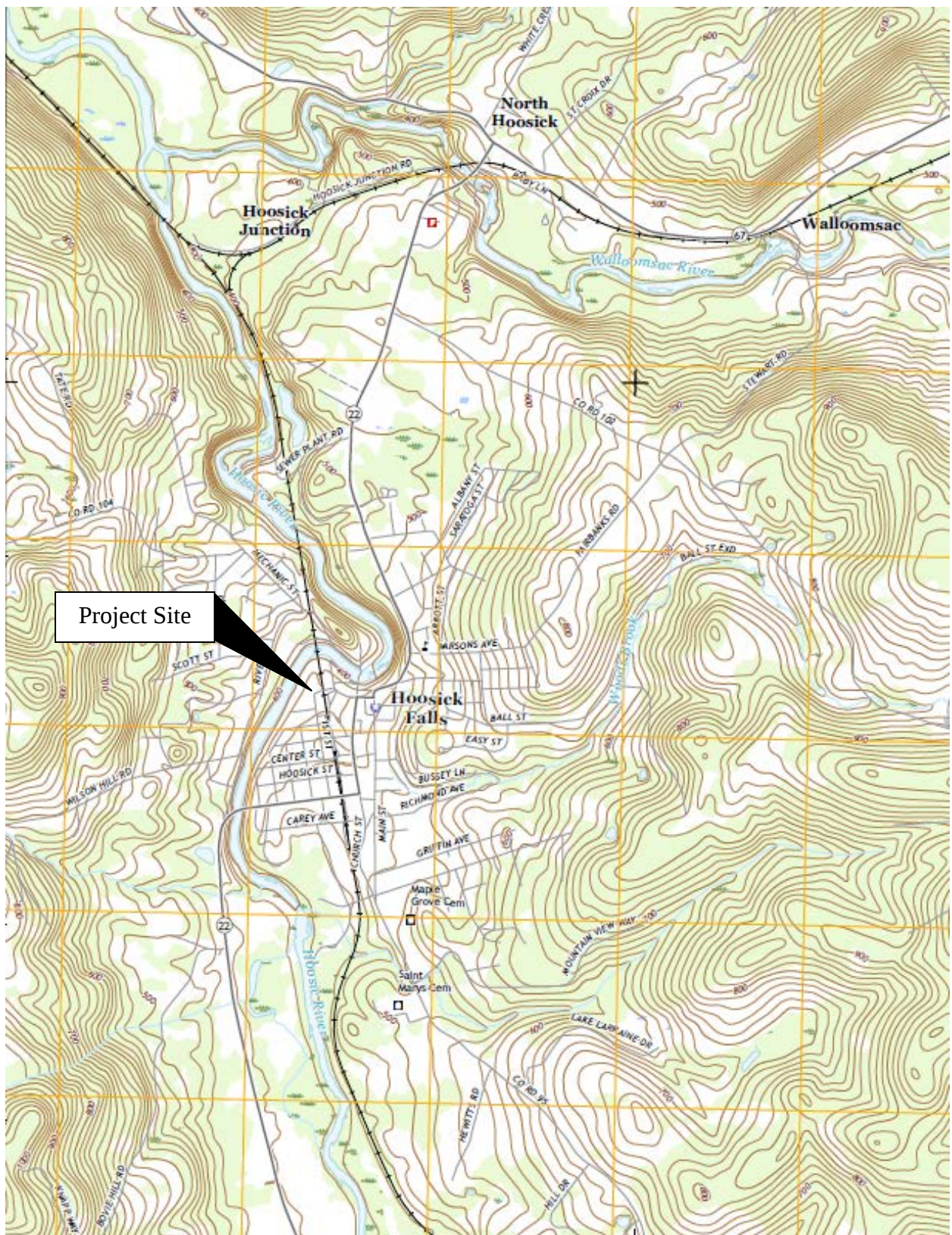
OSHA Quick Cards and applicable standard operating procedures are available in Appendix A.

---

**16.0 JOB HAZARD ANALYSIS -- attach the following if needed**

- |                                                     |                                                                       |
|-----------------------------------------------------|-----------------------------------------------------------------------|
| <input type="checkbox"/> Airport Safety             | <input type="checkbox"/> Exposure to Electrical<br>Transmission Lines |
| <input type="checkbox"/> Asbestos Abatement         | <input type="checkbox"/> Hand-Power Tools                             |
| <input type="checkbox"/> ATV-4 Wheeler              | <b>X Heat Stress</b>                                                  |
| <input type="checkbox"/> Bridge Inspection          | <b>X Heavy Equipment</b>                                              |
| <input type="checkbox"/> Cold Stress/Winter Weather | <input type="checkbox"/> Pressurized Cans                             |
| <input type="checkbox"/> Confined Space             | <input type="checkbox"/> Rail Safety                                  |
| <input type="checkbox"/> Dogs                       | <b>X Slips, Trips, Falls</b>                                          |
| <input type="checkbox"/> Electrical Safety          | <b>X Working In-Around Traffic</b>                                    |
| <b>X Environmental<br/>Sampling/Outdoor Hazards</b> | <input type="checkbox"/> Working Over Water                           |
| <b>X Excavation</b>                                 | <input type="checkbox"/> Working With Ladders                         |

## Figures



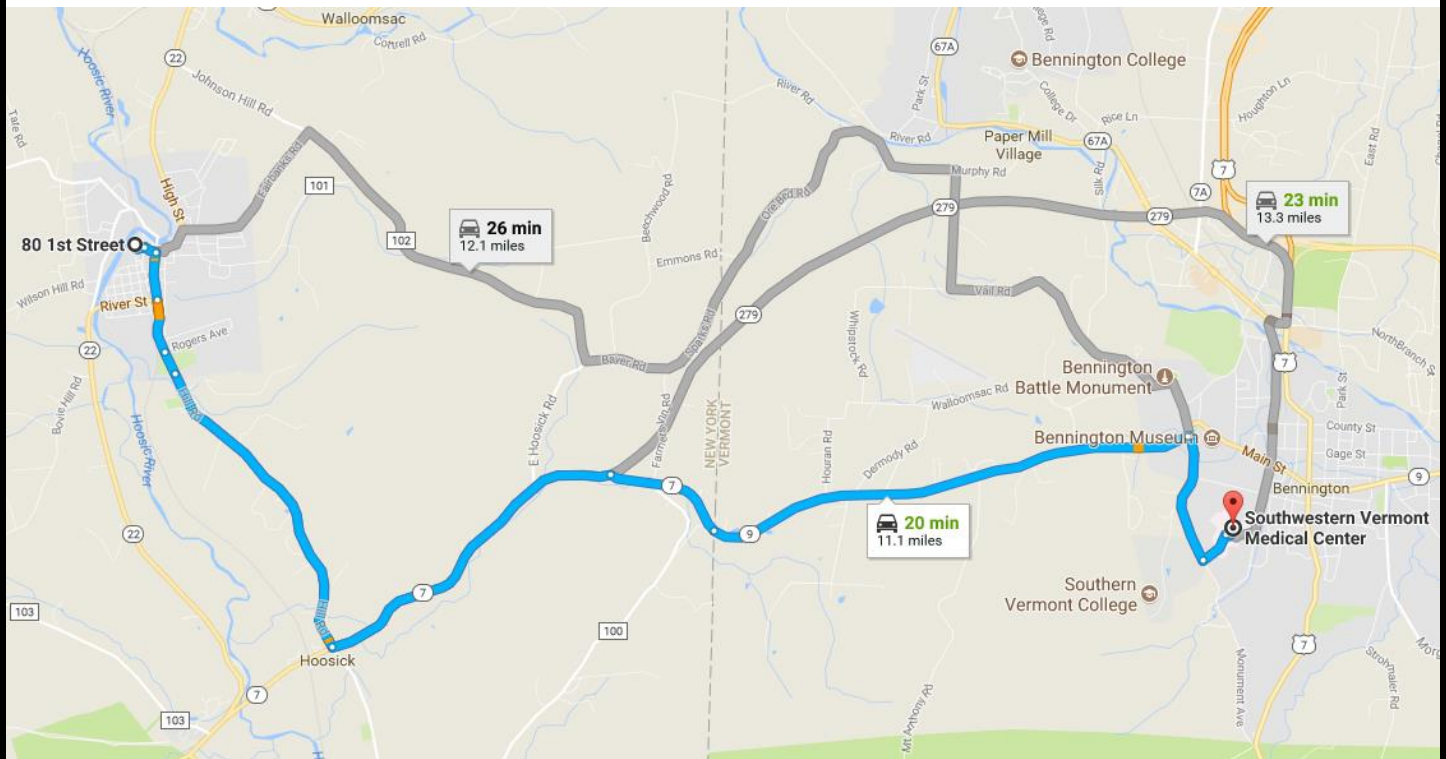
SOURCE: USGS MapViewer



NOT TO SCALE

DATE: September 2017

**FIGURE 1**  
**SITE LOCATION MAP**  
 80 FIRST STREET  
 HOOSICK FALLS,  
 RENSSELAER COUNTY, NEW YORK



SOURCE: Google Maps

80 1st St

Hoosick Falls, NY 12090

1. Take John St to Church St, 39 s (0.1 mi)
2. Head east on 1st St toward John St, 276 ft
3. Turn right onto John St, 449 ft
4. Turn right onto Church St, 2 min (0.3 mi)
5. Take Hill Rd to NY-7 E in Hoosick, 5 min (2.8 mi)
6. Continue straight to stay on Church St, 0.4 mi
7. Continue onto Main St, 0.2 mi
8. Continue onto Hill Rd, 2.3 mi
9. Follow NY-7 E and VT-9 E to West Rd in Bennington, 9 min (6.6 mi)
10. Turn left onto NY-7, 2.4 mi
11. Turn right to stay on NY-7 E, Entering Vermont, 0.9 mi
12. Continue onto VT-9 E/West Rd, 3.4 mi
13. Take Monument Ave to your destination, 4 min (1.2 mi)
14. Turn right onto West Rd, 118 ft
15. Turn right at the 1st cross street onto Monument Ave, 0.9 mi
16. Turn left, 0.2 mi
17. Turn right, 200 ft
18. Turn left
19. Destination will be on the right, 69 ft

Southwestern Vermont Medical Center

100 Hospital Dr, Bennington, VT 05201



441 S Salina Street, Syracuse, NY 13202  
www.chacompanies.com

NOT TO SCALE

DATE: September 2017

**FIGURE 2**  
**DIRECTIONS TO NEAREST HOSPITAL**  
**80 FIRST STREET**  
**HOOSICK FALLS**  
**RENSSELAER, NEW YORK**

**Appendix A**  
**Daily Jobsite Safety Brief**



## DAILY JOBSITE SAFETY BRIEF

### PROJECT INFORMATION

|                      |                        |                                                          |                            |
|----------------------|------------------------|----------------------------------------------------------|----------------------------|
| Project Name:        |                        | CHA Project No.                                          |                            |
| Project Start Date:  | Completion Date:       | Weather:                                                 |                            |
| Project Location:    |                        | Project Task:                                            |                            |
|                      |                        | <i>Complete a Site Health &amp; Safety Plan per Task</i> |                            |
| Description of Work: |                        |                                                          |                            |
| <i>Be Specific:</i>  |                        |                                                          |                            |
| Key Personnel:       |                        |                                                          |                            |
| Responsibilities:    | <i>Project Manager</i> | <i>Field Team Leader</i>                                 | <i>Site Safety Officer</i> |

Description of Hazards:

*\*The Daily Jobsite Safety Brief must be completed before work begins daily or Scope of Work changes\**

Weather: \_\_\_\_\_

|                                                         |                                                          |                           |                                                          |
|---------------------------------------------------------|----------------------------------------------------------|---------------------------|----------------------------------------------------------|
| All staff have reviewed and signed site and safety plan | <input type="checkbox"/> Yes <input type="checkbox"/> No | All staff have proper PPE | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Hazards and precautions have been discussed             | <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety Controls in place  | <input type="checkbox"/> Yes <input type="checkbox"/> No |

Additional Notes/Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signed: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Signed: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Signed: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Weather: \_\_\_\_\_

|                                                         |                                                          |                           |                                                          |
|---------------------------------------------------------|----------------------------------------------------------|---------------------------|----------------------------------------------------------|
| All staff have reviewed and signed site and safety plan | <input type="checkbox"/> Yes <input type="checkbox"/> No | All staff have proper PPE | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Hazards and precautions have been discussed             | <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety Controls in place  | <input type="checkbox"/> Yes <input type="checkbox"/> No |

Additional Notes/Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signed: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Signed: \_\_\_\_\_ Date/Time: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**Signed:** \_\_\_\_\_

**Date/Time:** \_\_\_\_\_

**Weather:** \_\_\_\_\_

|                                                         |                                                          |                           |                                                          |
|---------------------------------------------------------|----------------------------------------------------------|---------------------------|----------------------------------------------------------|
| All staff have reviewed and signed site and safety plan | <input type="checkbox"/> Yes <input type="checkbox"/> No | All staff have proper PPE | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Hazards and precautions have been discussed             | <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety Controls in place  | <input type="checkbox"/> Yes <input type="checkbox"/> No |

**Additional Notes/Comments:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Protect Yourself  
**Construction  
Personal Protective  
Equipment (PPE)**

**Eye and Face Protection**

- Safety glasses or face shields are worn any time work operations can cause foreign objects to get in the eye. For example, during welding, cutting, grinding, nailing (or when working with concrete and/or harmful chemicals or when exposed to flying particles). Wear when exposed to any electrical hazards, including working on energized electrical systems.
- Eye and face protectors – select based on anticipated hazards.

**Foot Protection**

- Construction workers should wear work shoes or boots with slip-resistant and puncture-resistant soles.
- Safety-toed footwear is worn to prevent crushed toes when working around heavy equipment or falling objects.

**Hand Protection**

- Gloves should fit snugly.
- Workers should wear the right gloves for the job (examples: heavy-duty rubber gloves for concrete work; welding gloves for welding; insulated gloves and sleeves when exposed to electrical hazards).

**Head Protection**

- Wear hard hats where there is a potential for objects falling from above, bumps to the head from fixed objects, or of accidental head contact with electrical hazards.
- Hard hats – routinely inspect them for dents, cracks or deterioration; replace after a heavy blow or electrical shock; maintain in good condition.

**Hearing Protection**

- Use earplugs/earmuffs in high noise work areas where chainsaws or heavy equipment are used; clean or replace earplugs regularly.

**For more complete information:**



OSHA 3260-09N-05

## Protect Yourself Respirators

Respiratory protection must be worn whenever you are working in a hazardous atmosphere. The appropriate respirator will depend on the contaminant(s) to which you are exposed and the protection factor (PF) required. Required respirators must be NIOSH-approved and medical evaluation and training must be provided before use.

**Single-strap dust masks** are usually not NIOSH-approved. They must not be used to protect from hazardous atmospheres. However, they may be useful in providing comfort from pollen or other allergens.



**Approved filtering facepieces** (dust masks) can be used for dust, mists, welding fumes, etc. They do not provide protection from gases or vapors. **DO NOT USE FOR ASBESTOS OR LEAD**; instead, select from the respirators below.



**Half-face respirators** can be used for protection against most vapors, acid gases, dust or welding fumes. Cartridges/filters must match contaminant(s) and be changed periodically.



**Full-face respirators** are more protective than half-face respirators. They can also be used for protection against most vapors, acid gases, dust or welding fumes. The face-shield protects face and eyes from irritants and contaminants. Cartridges/filters must match contaminant(s) and be changed periodically.



**Loose-fitting powered-air-purifying respirators** (PAPR) offer breathing comfort from a battery-powered fan which pulls air through filters and circulates air throughout helmet/hood. They can be worn by most workers who have beards. Cartridges/filters must match contaminant(s) and be changed periodically.



**A Self-Contained Breathing Apparatus** (SCBA) is used for entry and escape from atmospheres that are considered immediately dangerous to life and health (IDLH) or oxygen deficient. They use their own air tank.



For more complete information:



Occupational  
Safety and Health  
Administration

U.S. Department of Labor

[www.osha.gov](http://www.osha.gov) (800) 321-OSHA

# CHA Consulting, Inc.

## Job Hazard Analysis

### Heavy Equipment

| Task                                   | Hazard Type and Description                                                       | Hazard Control                                                                                                                                                                                                                                                                                       |
|----------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        |                                                                                   |                                                                                                                                                                                                                                                                                                      |
| Heavy equipment                        | Pinch points<br>Struck-by/Caught between                                          | Never work or walk under loads, and only one person is to act as the signal person. Avoid working near swing radius's. Maintain eye contact with operators when approaching equipment. Rigger s and Operators must possess additional safety training for competency. (Competent/Qualified Training) |
| Road grading and material cleanup      | Potential for personnel to be run over with equipment<br>Struck-by/Caught between | Ensure equipment is operated by qualified operator, and all personnel working on or near roadway wear reflective vests. Be sure that equipment back-up alarms are working properly. Always make eye contact with equipment operators prior to approaching                                            |
| Personnel working near heavy equipment | Slips and falls<br>Struck-by/Caught between                                       | Make sure there is a good working surface. Cover or barricade excavations as soon as practical. Wear a hard hat, safety glasses, ear plugs, a Class II ANSI safety vest as well as steel toed boots when necessary                                                                                   |
| Operation                              | Strains and sprains                                                               | Think about your body position; avoid over- reaching, hyper-extending, location/ position of extremities, and think if you are in the best position for leverage                                                                                                                                     |

Occupational  
HealthWorksite  
ClinicsEmployee & Student  
Assistance

Wellness

Population Health  
Management

## How to Stay Safe and Warm in Cold Temperatures

Home > NEWS & MEDIA > 2017 > 01 > 17 >  
How to Stay Safe and Warm in Cold  
Temperatures

### 7 Tips for Working in Extreme Cold

The risks of being exposed to the extreme cold are numerous and dangerous. The AllOne Health medical expertise has compiled information on how to stay warm in the cold and how to notice the warning signs of hypothermia.

#### Tips for Working in the Extreme Cold

- *Wear appropriate clothing.*
  - *Wear several layers of clothing. The layers should fit loosely because tight clothing reduces blood circulation and warm blood needs to be circulated to the extremities.*
  - *When choosing clothing, be aware that some clothing may restrict movement which, in and of itself, may create a hazardous working situation.*
- *Make sure to protect the ears, face, hands and feet in extremely cold weather.*
  - *Boots should be waterproof and insulated.*
  - *Be sure to wear a hat.*
  - *The goal should be to expose as little skin as possible to the cold environment.*
- *Workers in extreme conditions should take frequent, short breaks in warm, dry shelters to allow their bodies to warm up.*
- *Drink warm beverages and eat warm, high-calorie foods.*
- *Avoid exhaustion and fatigue because they can*

#### RELATED NEWS ITEMS

[Preventing Heat Related Illness](#)

[Everything You Need to Know About Ticks](#)  
[Scary Incident Highlights Importance of DOT Changes Going Into Effect This Week](#)  
[Are You Ready for the Summer? A Guide for Staying Safe in the Heat!](#)  
[Leading Indicators: The Future for Great Safety Performance](#)  
[Recent Developments in the Ebola Outbreak](#)  
[Quarantines During the Ebola Outbreak](#)  
[The Long Term Benefits of Audiometric Testing](#)  
[E-Cigarettes in the Workplace](#)  
[The Dangers of Ebola](#)  
[Waste Disposal](#)  
[Corporate Medical Director Fred Kohanna, MD, MBA, FACOEM Presenting at OSHA Oil and Gas Conference](#)  
[AllOne Health Executive](#)

- *Avoid exhaustion and fatigue because they sap energy, and energy is needed to keep muscles warm.*
- *Use the buddy system - work in pairs so that one worker can recognize danger signs.*
- *Learn the signs and symptoms of cold-induced illnesses and injuries and what to do to help workers.*

## Signs and Symptoms of Hypothermia (dangerously low body temperature)

### Early Stage

- *Shivering*
- *Fatigue*
- *Loss of coordination*
- *Confusion and disorientation*

Hypothermia is a medical emergency. If not treated in the early stage, the condition will become life-threatening.

### Late Stage

- *No shivering*
- *Blue skin*
- *Dilated pupils*
- *Slowed pulse and breathing*
- *Loss of consciousness*
- *Request immediate medical assistance.*

### First Aid for Hypothermia

- *Request emergency medical assistance.*
- *Move the victim into a warm room or shelter.*
- *Remove any wet clothing.*
- *Warm the center of the victim's body first, that is, the chest, neck, head, and groin. One may also use loose, dry layers of blankets, clothing, towels, or sheets.*
- *If the victim is conscious, warm beverages may help increase the body temperature, but do not give alcoholic beverages.*
- *After the victim's body temperature has increased, keep the victim dry and wrapped in a warm blanket, including the head and neck.*

If victim has no pulse, begin cardiopulmonary resuscitation (CPR).

Extremely cold weather presents unique challenges to employers and employees. The best weapon against the cold is knowledge of how to prepare for it and what to do in the event of an emergency.

[More Health Experts](#)  
[Leader Deborah Talbot, RN, COHN-S/CM](#)  
[Featured in Safety + Health Magazine](#)  
[Surviving the Stresses of the Holiday Season: A Guide](#)  
[Importance of a Safety Culture in the Workplace](#)  
[The Real Cost of Workplace Injuries and How to Prevent Them](#)  
[Your Complete Guide to Understanding and Managing Stress](#)  
[Understanding the New OSHA Recordkeeping Requirements](#)  
[One of the Biggest Reasons Workers Don't Return from Injury](#)  
[Tuberculosis: Still a Modern Threat](#)  
[Handle Heat Hazards with Prevention and Preparation](#)  
[A Safety Guide for Outdoor Workers](#)  
[Commonly Overlooked OSHA Standards](#)  
[Decrease in the Death Rate in the Oil & Gas Industry](#)  
[The Benefits of Pre-Work Screening Programs](#)  
[Are You Prepared for Employees' Exposure to Heavy Metals?](#)

To keep you and your workplace safe during the harsh winter months remember planning ahead, dressing in loose layers that cover all of your body and checking the forecast before leaving the house goes a long way to protect you from the cold.

[Privacy](#) | [Forms & Downloads](#) | [Terms & Conditions](#)

© AllOne Health 2015.

All rights reserved.

**Email** or call

**1.877.720.7770**

**to speak with a specialist now.**

# CHA Consulting, Inc.

## Job Hazard Analysis

### Excavations

| Task                                       | Hazard Type and Description                                                 | Hazard Control                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noise exposure                             | Hearing loss & psychological stress                                         | Utilize muffler systems and other engineering controls with increasing working distance. Wear approved safety ear plugs when working close enough to heavy equipment/backhoe                                                                                                                                                                                     |
| Drilling                                   | Inhalation hazards from dust and dirt.<br><br>Struck-by and caught between. | Wear appropriate PPE to protect from dust such as a fit- tested half-face air purifying respirator with appropriate dust cartridges. The respirator should be worn whenever field instruments indicate the need, or when wind-blown dust is obvious in combination with detected contaminants<br><br>Stay alert and maintain safe distance from operating parts. |
| General excavation activity                | Contact of dirt or dust after work activities on one's skin                 | Wear coveralls or tyvek suits to protect clothing, boots, hair, and skin. Remove work clothes including boots before entering environments outside of the work site                                                                                                                                                                                              |
| Being near moving parts of machinery       | Physical injury from moving parts<br><br>Struck-by and caught between       | Avoid moving parts of machinery. Keep finger, hand and arms away from backhoe bucket and other pinch points. Wear leather gloves when using hands for activities other than sampling, and steel-toed boots. Wear hard hat at all times                                                                                                                           |
| Working in the vicinity of heavy machinery | Struck-by and caught between                                                | Personnel on the ground should keep away from the work area and backhoe unless they are required for the task. Ask for assistance when                                                                                                                                                                                                                           |

|                                                                 |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                 |                                                                          | <p>carrying or moving heavy loads. Use legs to lift. Do not carry heavy equipment without first establishing eye contact with the operator. Use standard hand signals when noise levels inhibit auditory communication. Ensure that all heavy machinery have audible back-up signals. All workers must wear reflective traffic vests when appropriate. Barricade work area and permit only excavation personnel in the area</p> |
| Working where there is site vehicle traffic                     | Struck-by and caught between                                             | Restrict outside vehicular traffic on the job site. Use flaggers and a specific traffic route if necessary                                                                                                                                                                                                                                                                                                                      |
| Digging where there are unknown underground utilities and pipes | Striking underground utilities or other significant obstructions         | Observe marked locations of underground utilities if marked. Excavate by hand when within five feet in any direction of known underground obstructions. Machine digging allowed within two feet after visual identification and de-energized. If utilities can be confirmed as abandoned, hand digging is not required. Use detection systems if applicable!                                                                    |
|                                                                 | Running into an electrical duct bank                                     | Hand digging required to visually establish location. Machine digging per competent person evaluation and JSA/STA                                                                                                                                                                                                                                                                                                               |
|                                                                 | Potential for fires, spills, damaged underground utilities, high noise   | Utilize a qualified spotter probe bar, appropriate PPE (hard hat, safety glasses, steel toed boots, Nomex coveralls, ear plugs and gloves as necessary)                                                                                                                                                                                                                                                                         |
|                                                                 | Slips, trips and falls walking in general vicinity of planned excavation | Review general terrain and evaluate surface conditions. Look for ruts, large rocks, and uneven terrain                                                                                                                                                                                                                                                                                                                          |
| Scanning with electronic                                        | Trips and falls, strain from                                             | Have an assistant help spot various                                                                                                                                                                                                                                                                                                                                                                                             |

|                                           |                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| equipment                                 | lifting heavy instruments                                                                                                | hazards in area if focusing on instrument is too distracting. If lifting or pushing scanning instruments of heavier weights, get assistance with movements to avoid strains                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Probing with metal tipped fiberglass rods | Slips, trips, and falls walking in general area of intended excavation<br><br>Back strains, hand injury from probing rod | Review overall terrain and identify surface conditions. Look for ruts, large rocks, and uneven terrain<br><br>Avoid excessive force attempting to penetrate deeper with rods. Wear leather gloves to avoid blisters and other hand injuries                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Working in the Ditch                      | Potential for cave-in, atmospheric hazards, struck by/caught-between.<br><br>Ladder safety<br><br>Water accumulation     | Have a competent person evaluate the excavations. Excavations over 5 feet deep shall properly protected from cave-ins (protective systems – sloped, benched, shoring, A competent person shall oversee all excavation safety issues and properly assess working conditions. shielding). Utilize a 4 way calibrated monitor at all times while employees are in the ditch. Only one person act as signalman, but anyone can call emergency stop. The spoil pile shall be located at least two feet from the edge of the trench if not as far away as possible and slope the pile away from the excavation<br><br>Ladders used for access must be tied off and extend 3' over landing. When ascending/descending employee must face ladder and maintain three (3) points of contact. Angle ladder at a ¼ of working length (75degrees) for safe climbing.<br><br>The competent person shall inspect the installation of the protective |

|                                   |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   |                                                                                                                      | <p>barrier and the conditions of trenching before it is entered and daily before every shift thereafter, or after a rain storm. Thus, the competent person shall also monitor the water level, and determine when safe limits have been exceeded. Any accumulation of water in the trench shall be kept at a minimum by portable pumps</p>                                                                                                                                                                |
| Working near the ditch            | Falling into eight foot deep trench                                                                                  | <p>At a minimum, barricades shall be erected six feet away from the edge of the trench. Such barricades must be made visible by using high visibility methods when left unattended. Anyone within a six feet boundary must be protected from falls utilizing fall protection (i.e. railing or fall restraint by tethering workers). Provide a walkway or bridge with standard guardrails if employee must cross over the excavation</p>                                                                   |
| Equipment Damage                  | Excavations left open and unattended near roadways & walkways, equipment roll over hazard, high noise, airborne dust | <p>Confirm location of all power lines. If lines are unable to shut-in maintain a minimum of ten feet clearance from equipment. Verify and increase distance (per approach charts) for lines in excess of 50,000 volts. Maintain spotter with no other duties than watching for interference, if power lines are within swing radius. Inform local operations and any remote operation of activities. Do not use cell phones while operating equipment. Tape and/or barricade unattended excavations.</p> |
| Working outside                   | Bad weather (rain, cold/heat, etc..)                                                                                 | <p>If rain and/or lightning starts, stop all activities and allow competent person to advise further regarding safety practices and procedures.</p>                                                                                                                                                                                                                                                                                                                                                       |
| Excavator with grapple attachment | Employees working near building(s) can potentially have a crushing injury and atmospheric hazard. Striking           | <p>Keep personnel at a safe distance from the equipment. Monitor atmospheric conditions. Make eye contact with the operator before</p>                                                                                                                                                                                                                                                                                                                                                                    |

|  |                                |                                                                                                        |
|--|--------------------------------|--------------------------------------------------------------------------------------------------------|
|  | a person within radius of boom | approaching equipment. Only one person is to act as signalman; however, anyone can call emergency stop |
|--|--------------------------------|--------------------------------------------------------------------------------------------------------|

# CHA Consulting, Inc.

## Job Hazard Analysis

## Environmental Sampling/Outdoor Hazards

| Task                        | Hazard Type and Description                                            | Hazard Control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Working in hot environments | Heat disorders including heat cramps, heat exhaustion, and heat stroke | Employers can control this hazard by providing heat stress training to exposed employees, providing access to shade, and allowing employees to gradually get used to hot environments. Employees working in hot environments are advised to take breaks in cool rest areas, rotate physically demanding tasks, save most demanding work for cooler times of day, and utilize the heat index chart to determine exposure risk. Be sure that every employee working in the hot environments is drinking one cup of water ever fifteen minutes. Recognize the signs such as above normal body temperature, headaches, nausea, cramping, fainting, increased heart rate, and pale as well as clammy skin |
|                             | Sunburn                                                                | The risk of sunburn is higher when working at high elevations, or when working around water (from reflection). In these conditions, you can be burned even in overcast conditions; therefore, wear protective clothing and use sunscreen                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| High wind events            | Severe wind events can create                                          | Employees should avoid areas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                           |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           | “wind throws” where strong winds can blow down trees | during high wind occurrences that exhibit previous wind damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Working at high altitudes | Altitude sickness                                    | Recognize signs of acute mountain sickness including headaches, light-headedness, inability to catch one’s breath, nausea, and vomiting. Practice prevention by acclimating slowly to high elevations and staying hydrated. If the following symptoms progress, immediately descend to lower elevations and seek medical attention: difficulty breathing, chest pain, confusion, decreased consciousness, and loss of balance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Electrical storms         | Being struck by lightning                            | While working outside, watch the sky for thunderstorms and seek shelter before the weather deteriorates. Stop working in streams and lakes. Someone at the job site must be able to begin revival techniques (i.e. CPR) if someone is struck by lightning. Do not use telephones. If caught in electrical storms, seek shelter inside a vehicle or building. When in a building, keep away from doors, windows, plugged in appliances, and metal. When in a vehicle, avoid contact with metal objects inside. If outside with no shelter, obey the following procedures: do not congregate, do not use metal objects, avoid standing near isolated trees, seek lower elevations such as valleys or canyons, and avoid being on peaks as well as trees. If you feel your hairs standing on end and your skin tingling, this is a sign that lightening might be about to strike so crouch immediately (feet together, hands on knees). Wait a minimum of 20-30 minutes after the last lightning flash to return to the field or outside area. |

|                                                             |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Being outdoors in cold weather for extended periods of time | Hypothermia | Recognize the signs including shivering, numbness, drowsiness, muscle weakness, dizziness, nausea, unconsciousness, low/weak pulse, and large pupils. Exercise practice prevention such as staying dry, wearing the appropriate clothing (layers), listen to the weather forecast to plan accordingly, stay hydrated, cover head with warm clothing, and stay active. Be aware of the role that wind-chill can play in hypothermia; under certain conditions, hypothermia can occur without any rain or being wet.                                                                                                                                                                                                                                                                                                                                                  |
|                                                             | Frostbite   | Dress for the weather- layers are best, and mittens are better than gloves (keeps your warm fingers together while warming each other). Wear two pairs of socks with the inner layer made of synthetic fiber, such as polypropylene, to wick water away from the skin and the outer layer made of wool for increased insulation. Shoes should be waterproof. Keep your head, face, nose, and ears covered at all times. Clothes should fit loosely to avoid a decrease in blood flow to the arms and legs. Always travel with a friend in case help is needed. Be especially wary of wet and windy conditions; the "feels like" temperature (wind chill) is actually much lower than the stated air temperature. The very old, those who are not in good physical condition, and people with diabetes and anyone with vessel disease should take extra precautions. |
| Working in areas with                                       | Giardia     | Treat, filter, or boil drinking water.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|                                        |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| limited access to clean drinking water |                | Do not drink untreated water from streams, lakes or springs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Working outdoors                       | Rattlesnakes   | Be alert and do not put your feet or hands where you cannot see what is on the ground (for example if you are stepping over a log and you cannot see what's on the other side). If you encounter a rattle snake do not pick it up- give it a wide berth and walk around it. If bitten, seek immediate professional medical attention and remove jewelry. If bitten on an extremity lower than the heart, cover wound with a sterile band while seeking medical attention.                                                                                                                                  |
|                                        | Bears          | If you encounter a bear, be alert but stay calm, and give it as much room as possible. Try to leave the area, but DO NOT RUN. Back away slowly. If the bear follows, stop and hold your ground: wave your arms to make yourself look big and talk in a normal voice. Work in teams of two to deter bear attacks. If the bear makes contact, surrender: fall to the ground and play dead (a bear will break off an attack once it feels the threat has been eliminated). If the bear continues to bite after you assume a defensive posture. Their attack is predatory and you should fight back vigorously |
|                                        | Mountain Lions | Be alert, calm, and do not panic. If you see a mountain lion, do not run as it may stimulate its predatory nature. Instead, shout and wave arms to let it know that you are not prey: fight back                                                                                                                                                                                                                                                                                                                                                                                                           |

|                                                               |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                               | <p>Tick bites</p> <p>Roughskin Newts</p> <p>Bee stings</p> | <p>Use DEET based repellants on exposed skin and/or permethrin on clothes. Check for ticks during and after field work. If you find a tick remove it with tweezers within 24 hours, preferably immediately: do not leave the head embedded or extract the tick with matches, petroleum jelly, or other coatings (e.g. motor oil)</p> <p>Avoiding handling them as their skin contains a potent neurotoxin. If necessary for the protocol, handle only when wearing gloves. Do not “lick” for “killer buzz” as people have died from attempting to eat roughskin newts</p> <p>If you know or suspect you are allergic to bee stings, carry appropriate allergy kits prescribed by a doctor for treating anaphylactic shock. Carry and take diphenhydramine (Benadryl). Follow the label instructions for allergy control. Inform your supervisor if you suspect you are allergic. Watch for ground nests</p> |
| Travel movement or work in area with poison oak or poison ivy | Allergic reaction to poison oak/poison ivy plants          | <p>Learn to recognize poison oak. Avoid contact by using ivy block and wearing long pants and long-sleeve shirts if traveling in dense areas. If skin contact is made, flush the area with cold water as soon as possible. Do not flush your skin with warm water or soap as it can open your pores and increase the reaction. To wash and rinse use</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                                                                         |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                         |                                              | Tecnu or similar product with cold water to remove oils                                                                                                                                                                                                                                                                                                                                                                                          |
| Encountering irrigation pipes, marijuana plantation, or grow operations | Unfriendly encounters with criminal elements | Do not wear uniforms and carry a radio backpack that is not visible. Do not confront strangers and act like a tourist if you must speak. Work in pairs or groups. If working in areas likely to contain operations, check in with park staff when leaving vehicle and returning to vehicle. Watch for black piping or other signs. If you find a definite grow operation, leave immediately, note the location, and report it to the authorities |

# **CHA Consulting, Inc.**

## **Job Hazard Analysis**

### **Slips/Trips/Falls**

#### **Common hazards**

- Slippery surfaces (e.g., wet, oily or greasy)
- Seasonal trip hazards (snow and ice)
- Spills of wet or dry substances
- Changes in walkway levels and slopes
- Unsecured mats
- Poor lighting
- Debris and items stored in walkways
- Trailing cables in pedestrian walkways
- Smoke, steam or dust obscuring view
- Unsuitable footwear

#### **Controlling hazards**

When establishing safe work practices, consider:

- Characteristics of physical work area
- Weather conditions (snow, ice, rain)
- Tasks performed
- Workers' work practices
- Equipment

#### **Hazard Control/Engineering Controls**

- Type of flooring
- Slope of surface (ramps, handrails)
- Surface free of obstructions/holes
- Drainage
- Lighting levels, non-glare, contrast
- Equipment to be used/not carrying too much at once
- Signage
- Sufficient space
- Minimizing environmental influences, e.g., blocking wind to prevent wet surfaces icing at entrances

## **Hazard Control/Administrative Controls**

- Training workers/awareness
- Safe practices such as a procedure for cleaning spills or requirement for two workers to transport a large equipment that one worker cannot see around or can't handle
- Reporting hazards
- Prompt maintenance
- Job design (identifying tasks requiring excessive pushing/pulling, line-of-sight obstruction)
- Equipment readily available
- Addressing poor work practices
- Inspections
- Review slips, trips and same-level fall hazards

## **Hazard Control/Housekeeping**

- Clean spills
- Remove debris, snow and ice
- Keep equipment clean
- Keep wires, etc. controlled, taped, etc.

## **Hazard Control/Personal Protective Equipment**

- Appropriate footwear for task, which may include appropriate heels, soles and anti-slip boots

**Appendix B**  
**Respiratory Protection Plan Checklist**

---



**RESPIRATOR INSPECTION RECORD**  
(To Be Completed Daily when Respirator is Used)

Name \_\_\_\_\_  
Date \_\_\_\_\_

Project \_\_\_\_\_

1. TYPE \_\_\_\_\_

2. MODEL \_\_\_\_\_

3. Half Mask APR ☐  
SAR ☐  
PAPR ☐

Full Face APR ☐  
SCBA ☐

**4. Respirator Component:**

**Defects: NO**

**YES**

- |                                            |                          |                          |
|--------------------------------------------|--------------------------|--------------------------|
| A. Facepiece                               | <input type="checkbox"/> | <input type="checkbox"/> |
| B. Inhalation/ Exhalation Valve            | <input type="checkbox"/> | <input type="checkbox"/> |
| C. Headbands                               | <input type="checkbox"/> | <input type="checkbox"/> |
| D. Cartridge Holder                        | <input type="checkbox"/> | <input type="checkbox"/> |
| E. Cartridge/Canister                      | <input type="checkbox"/> | <input type="checkbox"/> |
| F. Filter                                  | <input type="checkbox"/> | <input type="checkbox"/> |
| G. Harness Assembly                        | <input type="checkbox"/> | <input type="checkbox"/> |
| H. Hose Assembly                           | <input type="checkbox"/> | <input type="checkbox"/> |
| I. Speaking Diaphragm                      | <input type="checkbox"/> | <input type="checkbox"/> |
| J. Gaskets                                 | <input type="checkbox"/> | <input type="checkbox"/> |
| K. Connections                             | <input type="checkbox"/> | <input type="checkbox"/> |
| L. Defective Component Not Mentioned Above | _____                    |                          |

**If any of the above were answered yes, please complete the following pages and contact Margaret Rudzinski in the Health & Safety Department at 518-453-2830 or Amanda Fripp at 518-453-3903 before using this respirator.**

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

**Potential Defect:****Defected: Yes****Elaborate:****Facepiece**

|                              |                          |       |
|------------------------------|--------------------------|-------|
| Excessive dirt               | <input type="checkbox"/> | _____ |
| Distorted (not flexible)     | <input type="checkbox"/> | _____ |
| Cracks/Tears/Holes           | <input type="checkbox"/> | _____ |
| Valves not properly inserted | <input type="checkbox"/> | _____ |
| Purifying units damaged      | <input type="checkbox"/> | _____ |
| Threads badly worn           | <input type="checkbox"/> | _____ |
| Missing gaskets              | <input type="checkbox"/> | _____ |
| Other                        | <input type="checkbox"/> | _____ |

**Inhalation/ Exhalation Valve**

|                                     |                          |       |
|-------------------------------------|--------------------------|-------|
| Foreign material                    | <input type="checkbox"/> | _____ |
| Cracks/Tears/Distortions            | <input type="checkbox"/> | _____ |
| Defects in sealing surface          | <input type="checkbox"/> | _____ |
| Valve put in facepiece incorrectly  | <input type="checkbox"/> | _____ |
| Valve put in valve body incorrectly | <input type="checkbox"/> | _____ |
| Defective/Missing valve cover       | <input type="checkbox"/> | _____ |
| Other                               | <input type="checkbox"/> | _____ |

**Headbands**

|                              |                          |       |
|------------------------------|--------------------------|-------|
| Breaks                       | <input type="checkbox"/> | _____ |
| Loss of elasticity or twists | <input type="checkbox"/> | _____ |
| Buckles in poor condition    | <input type="checkbox"/> | _____ |
| Other                        | <input type="checkbox"/> | _____ |

**Cartridge Holder**

|                    |                          |       |
|--------------------|--------------------------|-------|
| Cracks/Distortions | <input type="checkbox"/> | _____ |
| Other              | <input type="checkbox"/> | _____ |

**Cartridge/Canister**

|                           |                          |       |
|---------------------------|--------------------------|-------|
| Incorrect cartridge       | <input type="checkbox"/> | _____ |
| Used/Seal broken          | <input type="checkbox"/> | _____ |
| Expired                   | <input type="checkbox"/> | _____ |
| Cracks/Dents              | <input type="checkbox"/> | _____ |
| Incorrect installation    | <input type="checkbox"/> | _____ |
| Loose connections         | <input type="checkbox"/> | _____ |
| Thread-crossing in holder | <input type="checkbox"/> | _____ |
| Missing/Worn gaskets      | <input type="checkbox"/> | _____ |
| Other                     | <input type="checkbox"/> | _____ |

**Filter**

|                |                          |       |
|----------------|--------------------------|-------|
| Leaks detected | <input type="checkbox"/> | _____ |
| Other          | <input type="checkbox"/> | _____ |

**Harness Assembly**

|                     |                          |       |
|---------------------|--------------------------|-------|
| Attachments damaged | <input type="checkbox"/> | _____ |
| Other               | <input type="checkbox"/> | _____ |

**Hose Assembly**

- |                                |                          |       |
|--------------------------------|--------------------------|-------|
| Material contains cracks/tears | <input type="checkbox"/> | _____ |
| Missing/Defective parts        | <input type="checkbox"/> | _____ |
| Other                          | <input type="checkbox"/> | _____ |

**Speaking Diaphragm**

- |                      |                          |       |
|----------------------|--------------------------|-------|
| Not working properly | <input type="checkbox"/> | _____ |
| Other                | <input type="checkbox"/> | _____ |

**Gaskets**

- |                   |                          |       |
|-------------------|--------------------------|-------|
| In poor condition | <input type="checkbox"/> | _____ |
| Missing gaskets   | <input type="checkbox"/> | _____ |
| Other             | <input type="checkbox"/> | _____ |

**Connections**

- |                                   |                          |       |
|-----------------------------------|--------------------------|-------|
| Connections not all firmly sealed | <input type="checkbox"/> | _____ |
| Leaks/Defects                     | <input type="checkbox"/> | _____ |
| Other                             | <input type="checkbox"/> | _____ |

**Other Defects Not Mentioned Above**

---

---

---

---

**Donning/Doffing Procedures for APR's****Donning Procedures:**

- Extend the straps out to the end tabs. Pull back over facepiece.
- Put the facepiece on, chin first, pull the head harness over the head with the opening in the web centered in position on the back of the head. (Clear hair from seal.)
- Pull the straps snug, starting with the chin straps, then the temple straps and finishing with the forehead strap.
- The straps should be pulled snug enough to ensure a good seal but not so tight that you are uncomfortable or distort your face.

**Doffing procedures shall be the reverse of the above procedures.**

- The head harness should be pulled over the facepiece for storage.

## **Appendix C**

### **Incident Reports**



## Incident Report

Please note: This form must be completed within (24) hours of an employee's injury or illness during the workday. This form can be completed by the employee or supervisor (or a witness if his/her supervisor is unavailable).

| Employee Information                                                                                                                      |                                 |                                                       |                                                                                |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------|------------------------|
| Employee's Name                                                                                                                           | Title                           | Group                                                 | Supervisor                                                                     |                        |
|                                                                                                                                           |                                 |                                                       |                                                                                |                        |
| Incident Details                                                                                                                          |                                 |                                                       |                                                                                |                        |
| Date of Incident                                                                                                                          | Time of Incident                | Location of Incident (provide address, if available)  |                                                                                |                        |
|                                                                                                                                           |                                 |                                                       |                                                                                |                        |
| List the Nature of the Employee's Injury & Body Parts Affected (Indicate whether a similar work-related injury has occurred in the past): |                                 |                                                       |                                                                                |                        |
|                                                                                                                                           |                                 |                                                       |                                                                                |                        |
| Explain What the Employee Was Doing When the Incident Occurred:                                                                           |                                 |                                                       |                                                                                |                        |
|                                                                                                                                           |                                 |                                                       |                                                                                |                        |
| Describe How the Incident Occurred:                                                                                                       |                                 |                                                       |                                                                                |                        |
|                                                                                                                                           |                                 |                                                       |                                                                                |                        |
| List any Applicable Objects That Were Directly Involved in the Injury (i.e. motor vehicle, etc):                                          |                                 |                                                       |                                                                                |                        |
|                                                                                                                                           |                                 |                                                       |                                                                                |                        |
| Did the Employee Stop Work Due to the Injury?                                                                                             |                                 |                                                       | If Yes, Has the Employee Returned to Work?                                     |                        |
|                                                                                                                                           |                                 |                                                       |                                                                                |                        |
| Medical Treatment (if known)                                                                                                              |                                 |                                                       |                                                                                |                        |
| Did the Employee Seek Medical Treatment?                                                                                                  | Date of First Medical Treatment | Location of Treatment (provide address, if available) | Type of Facility (i.e. emergency room, hospital, urgent care, doctor's office) | What Type of Treatment |
|                                                                                                                                           |                                 |                                                       |                                                                                |                        |
| Acknowledgment                                                                                                                            |                                 |                                                       |                                                                                |                        |
| Employee Signature:                                                                                                                       |                                 |                                                       | Date:                                                                          |                        |
|                                                                                                                                           |                                 |                                                       |                                                                                |                        |
| Supervisor (or Witness) Name (Printed):                                                                                                   |                                 | Supervisor (or Witness) Signature:                    |                                                                                |                        |
|                                                                                                                                           |                                 |                                                       |                                                                                |                        |

RETURN COMPLETED FORM TO MEGAN ROBERTSON IN HUMAN RESOURCES

PHONE NUMBER - (518) 453-8750

FAX NUMBER - (518) 453-2889

E-MAIL ADDRESS - [MROBERTSON@CHACOMPANIES.COM](mailto:MROBERTSON@CHACOMPANIES.COM)

cc: Health & Safety  
M. Platt

## CHA (Your Location) Office

### - What to do for Accidents, Incidents, Safety Hazards & Near Misses

#### 1) If any injury occurs, no matter how minor:

- a. Get it treated immediately as required. Notify supervisor.
- b. Contact Megan Robertson as soon as possible. Contact Margaret Rudzinski if Megan cannot be reached.
- c. Complete a CHA incident report form and return to Megan Robertson within 24 hours. (V:\Public\ANY\Health\_&\_Safety\Incident Reporting)

‘Contact’ means phone until you talk to the person directly. Voicemails and emails do not count.

*(Employees should not provide their personal medical insurance information to the medical facility for work-related incidents. Please contact HR for further direction on how your work-related medical claim will be paid.)*

#### 2) For any accident, incident, safety hazard or near miss (no injury occurs)

- a. Use your ‘Stop Work’ Authority as required. EVERYONE has the authority to stop work if they see a significant safety issue.
- b. For all – Report to your supervisor within 24 hours.

‘Report’ means phone, leave voicemail or email as appropriate.

|                                                                         |                                                                                                                                              |                                                                                       |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Megan Robertson<br>(Director of HR Operations)                          | 1-518-453-8750 – Office phone<br>1-518-453-2889 – Fax<br><a href="mailto:mrobertson@chacompanies.com">mrobertson@chacompanies.com</a>        | For all Project accidents and incident and/or potential workmen’s compensation claims |
| Margaret Rudzinski<br>(Sr. VP, Corporate Environmental Health & Safety) | 1-518-453-2830 – Office phone<br>1-518-469-9259 – Cell phone<br><a href="mailto:mrudzinski@chacompanies.com">mrudzinski@chacompanies.com</a> | Report all safety hazards/issues to Margaret Rudzinski                                |

Recommendations for additional contacts:

- Office Leader
- Safety Coordinator

## **APPENDIX D**

### **Community Air Monitoring Plan**

---

## Community Air Monitoring Plan (CAMP)

**Oak Mitsui Site  
80 First St.  
Hoosick Falls, New York**

The following Community Air Monitoring Plan (CAMP) will be implemented during the Site Characterization Work Plan to be performed at the Oak Mitsui site (Site). Air monitoring will be conducted in accordance with the New York State Department of Health (NYSDOH) *Generic Community Air Monitoring Plan (CAMP)*. All air monitoring will be conducted on a real-time basis, using both hand-held field instruments and perimeter air monitoring stations, for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area.

Continuous monitoring will be performed for all ground intrusive activities including boring installations, the break-up and removal of concrete foundations and the excavation of contaminated soil. Periodic monitoring for VOCs and particulates will be required during non-intrusive activities (if required) such as the collection of soil samples from stockpiles or the placement of clean backfill or cover materials.

This CAMP is not intended for use in establishing action levels for worker respiratory protection that shall be described in the site-specific HASP prepared by the Contractor for the proposed excavations. Rather, its intent is to provide a measure of protection for the downwind community (i.e. off-site receptors including residences and businesses) from potential airborne contaminant releases as a direct result of the proposed remedial work activities. Reliance on this CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, this CAMP will help prevent the remedial construction activities from spreading contamination off-site through the air.

### **Particulate Monitoring, Response Levels, and Actions**

Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations (one placed upwind and one placed downwind). The particulate monitoring will 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 will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m<sup>3</sup>) 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<sup>3</sup> above the upwind level and provided that no visible dust is migrating from the work area.
2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m<sup>3</sup> 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<sup>3</sup> of the upwind level and in preventing visible dust migration.
3. All readings will be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review if requested.

### **VOC Monitoring, Response Levels, and Actions**

Volatile organic compounds (VOCs) will 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 will be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

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