design/construction solutions

June 17, 2019

New York State Department of Environmental Conservation
Division of Environmental Remediation – Region 7
615 Erie Boulevard West
Syracuse, New York 13204-2400
Attn: Mr. Michael Belveg

RE: Revised Contaminant Source Removal Interim Remedial Measure Work Plan
Former Coyne Textile Facility
CHA Project No.: 33525
NYSDEC Site No.: C734144

Dear Mr. Belveg,

On behalf of Ranalli/Taylor St., LLC (Ranalli/Taylor St.), please find an enclosed copy of the Final Contaminant Source Removal Interim Remedial Measure Work Plan (Source Removal IRMWP) for the Former Coyne Textile Facility located at 140 Cortland Avenue in the City of Syracuse, New York. The document has been revised to reflect the comments provided in the New York State Department of Environmental Conservation's (NYSDEC's) and Department of Health's (NYSDOH's) email dated June 13, 2019. The NYSDEC/NYSDOH comments and CHA responses/report amendments are summarized below:

Comment 1: In relation to your comment response letter dated May 28, 2019, comment response 11a – please describe how the following remedial activities will take place within the building:

a. The collection, transport, storage, and loading of soil into piles and/or trucks;
b. The collection, transport, and the filling/storage of fluids in the frac tanks;
c. The cleaning/crushing of the USTs;
d. Where the decontamination activities will take place;
    - Is the exclusion zone only within the building or does it expand outside of the building;
e. The location of the frac tank

Response 1*: Figure 5 identifies the area of concern, work zones, soil stockpile location, and loading zones.*

a. The soil will be excavated from the area of concern and placed into a skid steer loader that will transport soil to the loading dock ramp that has been built on the north end of the building. The soil will be stockpiled in an area to the north of the ramp that has been segregated with concrete barriers and lined with polyethylene sheeting. A loader will load the soil into trucks that have been backed up immediately adjacent to the ramp and stockpile. It is anticipated that the entire stockpile will be transported from the site at the conclusion of each day. However, if soil remains on site at the end of the day it will be covered with polyethylene sheeting and secured with sandbags.

b. If necessary, a frac tank will be filled via a portable submersible pump with flexible hosing that can be connected directly to the frac tank. The water within the frac tank will be characterized for waste disposal and sent off site for disposal at a permitted facility. The tank will then be cleaned and transported off site. The frac tank is not anticipated to be opened for any reason during the pumping of any potentially contaminated water. It is anticipated that should smaller containers be utilized within proximity to the excavation, 55-gallon drums or similarly sized containers will be utilized.

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c. *The USTs will be removed from the excavation and placed on polyethylene sheeting within the exclusion zone, inside of the building. Once the soil excavation has been completed, the USTs will be placed in the former soil stockpile area located outside for cleaning and crushing. The cleaning will consist of power washing or steam cleaning the exterior of the tanks, and the interior to the extent practical. At this time, it is anticipated that the tanks may be filled with concrete which would make interior cleaning unfeasible. The tanks will then be crushed or cut-up (if filled with concrete) with the heavy machinery (i.e. excavator or loader) or equipment, to the extent practical, and transported off site for disposal.*
d. *The personnel decontamination activities will take place within the contamination reduction zone shown on Figure 5. After the soil stockpile and tanks have been transported offsite, the stockpile area will be converted to the large equipment decontamination area.*
    i. *The exclusion zone expands outside of the building, as shown on Figure 5. The exclusion zone will encompass the truck loading zone, the soil stockpile/tank cleaning/large equipment decontamination area, and the water management container.*
e. *Water will be containerized immediately adjacent to the soil stockpile or in proximity to the excavation area.*

Comment 2: Even if all remedial activities can take place within the building, we believe there is still a potential for high concentrations to escape via vapor or particulates into outdoor air, and we highly recommend a third monitoring station. Its location should be stationed near receptors who may be impacted by work activities that will produce VOCs and dust.

Response 2: *A third CAMP station has been included, as shown on the site plan. The anticipated location of each station is shown on Figure 5. The exact locations of each station will be field adjusted depending on the anticipated work and wind direction.*

Comment 3: In relation to your comment response letter dated May 28, 2019, comment response 11a – Please provide more details on the ventilation of the building, particular in areas where the remedial work will be performed.

a. Is there an exhaust in the building? And if so, how do you plan to prevent high concentrations from escaping to the outdoor air and migrating off-site?
b. How do you plan to manage increasing concentrations in an enclosed space?

Response 3: *The exclusion zone will be ventilated using portable fans and the opening of overhead and manway doors.*

a. *The building will be ventilated using fans. A CAMP station will be placed near the door on the west side of the building and near the overhead doors on the north side of the building and adjusted as necessary. If VOC concentrations are elevated to the action levels stated in the CAMP (Appendix E of the IRMWP), work will cease, the doors will be shut, personnel will evacuate, and the situation will be assessed before resuming excavation activities.*
b. *The concentration of VOCs will be monitored using a PID within the breathing space of the exclusion zone periodically during excavation. If increasing concentrations are observed, additional fans may be brought in for further ventilation. If VOC concentrations exceed action levels identified within the HASP, appropriate measures as detailed in the HASP will be implemented.*

Comment 4: Please provide figures showing where the tanks will be cleaned/crushed, where the different zones will be, the location of the frac tank, the location of the soil storage pile, and the proposed locations of the CAMP monitoring stations.

Response 4: *This information can be found on Figure 5.*

Comment 5: Please provide a figure in the HASP showing where the different zones will be.

Response 5: *This comment has been addressed and is included as Figure 2 of the HASP (also Figure 5 of the IRMWP).*

Comment 6: Please provide a figure in the HASP showing the truck route mapped out for trucks entering and leaving the area.

Response 6: *This comment has been addressed and is included as Figure 2 of the HASP (also Figure 5 of the IRMWP).*

If you have any questions, please do not hesitate to contact me at (315) 257-7145.

Sincerely,

Meghan M. Platt

Meghan M. Platt, P.E.
Senior Engineer V

ecc: Mr. Harry Warner, NYSDEC
Ms. Angela Martin, NYSDOH
Mr. James Ranalli, Ranalli/Taylor St., LLC
Mr. James Trasher, CHA Consulting, Inc.

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Contaminant Source Removal Interim Remedial Measure Work Plan

Former Coyne Textile Facility
140 Cortland Ave
Syracuse, New York 13202

BCP Site No. C734144

CHA Project Number: 33525.2001

Prepared for:
Ranalli/Taylor St., LLC
1200 State Fair Boulevard
Syracuse, New York 13209

Prepared by:

One Park Place
300 South State Street, Suite 600
Syracuse, New York 13202
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June 17, 2019

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CERTIFICATION

I, Scott M. Smith, certify that I am currently a NYS registered professional engineer and that this Interim Remedial Measure Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, the undersigned, of CHA Consulting, Inc. have been designated by the Site owner to sign this certification for the Site.

For CHA Consulting, Inc.:

(Professional Seal)

Scott M. Smith, P.E.
Printed Name of Certifying Engineer

Signature of Certifying Engineer

June 17, 2019
Date of Certification

083885
NYS Professional Engineer Registration Number

New York
Registration State

CHA Consulting, Inc.
Company

Principal Engineer VI
Title

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LIST OF ACRONYMS & ABBREVIATIONS

AST	Aboveground Storage Tank
ASTM	American Standard for Testing Materials
AOC	Area of Concern
bgs	below ground surface
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CHA	CHA Consulting, Inc.
CFR	Code of Federal Regulations
CAMP	Community Air Monitoring Plan
CERP	Community and Environmental Response Plan
CCR	Construction Completion Report
DNAPL	Dense Non-Aqueous Phase Liquid
DCE	Dichloroethene
DER	Division of Environmental Remediation
ELAP	Environmental Laboratory Approval Program
ESA	Environmental Site Assessment
FSP	Field Sampling Plan
GPR	Geophysical Penetrating Radar
GZA	GZA GeoEnvironmental
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
IRMWP	Interim Remedial Measures Work Plan
LNAPL	Light Non-Aqueous Phase Liquid
LEL	Lower Explosive Limit
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PFAS	Perfluoroalkyl Substances
PPE	Personal Protective Equipment
PID	Photoionization Detector
PCB	Polychlorinated Biphenyl
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
REC	Recognized Environmental Condition
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
RCRA	Resource Conservation Recovery Act
SVOC	Semi-volatile Organic Compound
SCO	Soil Cleanup Objective
SOP	Standard Operating Procedure
TAL	Target Analyte List
TCL	Target Compound List
TOGS	Technical and Operational and Guidance Series

TMW	Temporary Monitoring Well
PCE	Tetrachloroethene
TO-15	Toxic Organics - Method 15
TCLP	Toxicity Characteristic Leaching Procedure
TCE	Trichloroethene
UST	Underground Storage Tank
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compound

µg/L	Microgram per Liter
$\mu g/m^3$	Microgram per Cubic Meter
mg/kg	Milligram per Kilogram
yd^3	Cubic Yard

1.0 INTRODUCTION

The Former Coyne Textile Facility (Site) is located at 140 Cortland Avenue in Syracuse, New York. The owner, Ranalli/Taylor St. LLC (Ranalli/Taylor St.), entered into a Brownfield Cleanup Agreement (BCA) in September 2017 through the New York State Department of Environmental Conservation's (NYSDEC's) Brownfield Cleanup Program (BCP) and is registered as BCP Site No. C734144. CHA Consulting, Inc. (CHA) was retained to conduct a Remedial Investigation (RI) of the Site. The results of the RI and a summary of historical sampling efforts conducted by the previous Site owner are detailed in the RI Report (CHA, February 2019).

CHA has been retained by Ranalli/Taylor St. to prepare this Interim Remedial Measure Work Plan (IRMWP) to detail the planned interim remedial steps that will be implemented at the Site to address the contaminant source area identified during the RI. Based upon the information obtained to date, the IRMWP recommends the removal of three underground storage tanks (USTs) and associated impacted soils for off-Site transportation and disposal. This IRMWP has been prepared in general conformance with Sections 5.3 and 5.5 of the NYSDEC's "Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation" (May 2010).

1.1 REPORT ORGANIZATION

This Report is organized as follows:

- Section 1.0 introduces the Site and provides background information;
- Section 2.0 summarizes the nature and extent of contamination at the Site;
- Section 3.0 summarizes the remedial action to be implemented;
- Section 4.0 summarizes the anticipated project schedule; and
- Section 5.0 summarizes the components of the construction completion report.

1.2 SITE BACKGROUND

1.2.1 Site Description

The Former Coyne Textile Facility is located in an urban area at 140 Cortland Avenue in the City of Syracuse, Onondaga County, New York. The Site limits are generally bounded by commercial buildings to the north, South Salina Street to the east, Tallman Street to the south and South Clinton Street to the west (Figure 1). Several rows of multi-family houses are located northwest of the Site.

The Site is currently unoccupied, apart from use as a storage facility for Ranalli/Taylor St. and is zoned for commercial use. The Site is identified as two non-contiguous areas as described below:

- The former main laundry facility and offices are known as 140 Cortland Avenue (Tax Map No. 094.-05-06.0) and consist of one parcel of land totaling approximately 1.75 acres. This parcel consists of the currently vacant former laundering facility and offices (approximately 118,500 square feet), and concrete sidewalks. The building is a concrete block building with a slab-on-grade foundation.
- The park area and employee parking area are known as 1002-1022 South Salina Street/Cortland Avenue (Tax Map No. 094.-20-01.0) and 1024-1040 South Salina Street/Tallman Street (Tax Map No. 094.-20-02.0) and consist of two parcels totaling approximately 1.70 acres (0.57 and 1.13 acres, respectively). These parcels consist of a small park and a fenced in asphalt parking lot.

This IRMWP focuses on a portion of the former main laundry facility known as 140 Cortland Avenue.

1.2.2 Site History

A Phase I Environmental Site Assessment (ESA) was prepared in 2014 by GZA GeoEnvironmental of New York (GZA) in general accordance with the American Society for Testing and Materials (ASTM) Standard Practice E 1527-13. According to the Phase I ESA, prior to Ranalli/Tracy St. purchase of the property in 2016, the 140 Cortland Avenue property was occupied by several manufacturing facilities and a gasoline station. Various entities of Coyne Textile Services have owned the property since the mid-1930s and the property was utilized as an industrial laundering facility. Coyne Textile Services filed for bankruptcy and ceased operations in late 2015. Dry-cleaning activities using tetrachloroethylene (PCE) and Stoddard solvent (a petroleum mixture made from distilled alkanes, cycloalkanes (naphthenes) and aromatic compounds) were conducted at the property until 2000. These dry-cleaning products were noted to be stored in aboveground storage tanks (ASTs). Additionally, three USTs were noted as being located beneath the dry-cleaning room floor (containing Stoddard solvent) and the boiler room at 140 Cortland Avenue. A gasoline filling station was present in the southern portion of the Site in the 1980s. Historical information is identified on Figure 2.

During May 2019, the location of three USTs was confirmed within the former UST area. At that time, it appeared that each of these tanks was filled with concrete. Two of these tanks were approximately 6-feet in diameter and a smaller tank was approximately 200 gallons in size.

Based on historic use and conditions observed during the Phase I ESA, recognized environmental conditions (RECs) were identified and subsequent investigation activities were completed. A summary of the previous investigations associated with the 140 Cortland Avenue property is provided in Section 2.1.

Ranalli/Taylor St. purchased the property in 2016 and entered a BCA in September 2017. An RI was conducted throughout 2018. Results from the RI identified four areas of concern (AOCs): (1) the former UST area, (2) site-wide groundwater, (3) office vapor, and (4) warehouse vapor. The focus of this IRMWP is the former UST area, identified on Figure 3, which was found to be the primary source of contamination.

1.2.3 Site Geology and Hydrogeology

According to the United States Department of Agriculture (USDA) Web Soil Survey, the soil beneath the Site is indicative of Urban Land, which is a soil material having a non-agricultural, manmade surface layer that has been produced by mixing and filling in urban and suburban areas. Surficial geology consists mostly of lacustrine silts and clays. Bedrock at the Site is mapped by the United States Geological Survey (USGS) as the Syracuse formation, which consists of dolostone, shale, gypsum and salts.

The Site is generally flat, with a gentle slope from the east to the west across the employee parking lot and beneath the main building. Generally, the slope indicates groundwater flows in the westerly direction and toward Onondaga Creek, located approximately 0.2 miles to the west of the Site.

Field observations and the stratigraphic cross sections provided in the RI Report (CHA, February 2019) confirmed the presence of urban fill to approximately 8 to 10 feet below ground surface (ft bgs). Generally, silts and clays are beneath the urban fill to a depth of approximately 13 to 15 ft bgs. Alternating lacustrine silts and clays, then sands and gravels, were encountered beneath the fill material to the end of each boring. At least two silt and clay layers, one below the urban fill and one at varying depths, but approximately 26 to 30 ft bgs, may act as confining layers to impede the vertical transport of contamination.

Based on groundwater elevations measured on April 19, 2018, a groundwater contour map was prepared for the unconfined aquifer. The depth to groundwater at the Site is typically less than 15 ft bgs. Groundwater flow across the employee parking lot generally flows from east to west; toward Onondaga Creek. Beneath the building, groundwater contours are nearly flat, apart from the

northwestern portion of the building where slightly elevated groundwater indicates a localized flow path from the north-western portion of the building toward the center of the building, near well GW-102.

2.0 NATURE AND EXTENT OF CONTAMINATION

2.1 SUMMARY OF HISTORICAL SITE INVESTIGATIONS

A Phase I ESA identified the Site as having been used for a variety of industrial purposes between 1892 and 2015. Historic uses have included mechanical manufacturing, textile manufacturing, a gasoline station, and industrial dry cleaning. Based on historic use and conditions observed during the Phase I ESA, RECs associated with the laundry facility were identified, and subsequent investigation activities were completed. The resulting RECs are:

- USTs containing dry cleaning solvents were found under the floor of the dry-cleaning room. Use of PCE occurred until the year 2000. These tanks were said to be "closed in place" in 1986, but no closure documentation was provided.
- Former gasoline station where the building expansion (circa 1980) exists currently.
- UST for heating oil under the floor of the main boiler room.
- Evidence of potential leaks from in-ground hydraulic lifts located in the main building.

Based on the information provided in the Phase I ESA, a Site Layout Figure (Figure 2) was developed to provide context to the historical use of the Site.

Under the direction of the previous Site Owner, a Phase II ESA was conducted in November of 2014 by GZA. Based upon the results of the Phase II ESA, additional investigation activities were conducted by GZA during 2015.

The Phase II ESA included a limited subsurface investigation to evaluate if historical Site usage had impacted Site soil and/or groundwater. The following summarizes the activities and findings that occurred as part of this investigation:

- Soil analytical results indicated detectable concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and Resource Conservation and Recovery Act (RCRA) 8 metals plus copper.
- Groundwater samples were collected from two temporary monitoring wells. During the installation of temporary monitoring well (TMW) number TMW-2, an oil-like sheen was observed on the groundwater surface and elevated photoionization detector (PID) readings were observed. A spill was reported to NYSDEC (Spill #1408779) based upon these findings. The NYSDEC closed Spill #1408779 on March 30, 2015 and consolidated it with Spill #1412187 which occurred as part of the March 2015 Phase III Subsurface Investigation. Additional details on the March 2015 Phase III ESA are provided below.

Based on the results, including high PID readings, petroleum odors, black stained soil, and an oil-like sheen on groundwater samples collected during the Phase II ESA, GZA recommended supplementary soil and groundwater sampling to further define the extent of contamination at the Site.

A report titled Phase III Environmental Site Assessment was prepared in 2015 by GZA to further delineate the vertical and horizontal extent of petroleum contamination near well TMW-2 (associated with NYSDEC Spill #1408779), and to further evaluate the soil and groundwater conditions near the boiler room and dry-cleaning area. It is noted that the NYSDEC closed Spill #1408779 on March 30, 2015 for administrative reasons. This spill was ultimately consolidated with Spill #1412187 which occurred as part of the March 2015 Phase III Subsurface Investigation. Spill #1412187 is reported as closed on July 16, 2015.

Analytical results from additional soil borings and multiple temporary or permanent groundwater monitoring wells identified several areas with VOC and SVOC contamination above their applicable soil and groundwater standards, as discussed in the RI Report (CHA, February 2019) respectively.

A vapor intrusion investigation was performed in 2015 to identify the potential for soil vapors inside the building on the Site. GZA collected sub-slab vapor, indoor air, and outdoor ambient air samples as part of this assessment. A total of ten indoor air, samples were collected approximately four to five feet above the floor, ten sub-slab air samples were collected within ten feet of the indoor air samples, and one outdoor air sample was collected from an exterior upwind location. Samples were sent to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory for analysis of for Toxic Organics, EPA Air Method 15 (TO-15).

The investigation determined that PCE and its breakdown daughter products were present in the northern portion of the Site building where the laundering activities were conducted. Indoor air vapor contamination was present at concentrations that would warrant mitigation under NYSDOH Guidance for Evaluating Soil Vapor Intrusion, dated 2006. Monitoring and/or source identification and exposure measures were determined to be necessary throughout the remainder of the Site building. GZA recommended the installation of a vapor mitigation system to address the potential vapor intrusion conditions.

2.2 SUMMARY OF REMEDIAL INVESTIGATION

The RI activities were completed in April 2018 to further characterize Site media. Field activities were conducted in accordance with United States Environmental Protection Agency (USEPA) and NYSDEC protocols, the NYSDEC-approved *Remedial Investigation Work Plan* (RIWP), (CHA, March 2018), and the Site-Specific Health and Safety Plan (HASP). Based upon historical Site investigation activities, several data gaps were identified which required additional investigation.

The specific field activities and results that were found during the RI are described fully in the RI Report (CHA, February 2019). Generally, the impact of VOC concentrations in subsurface soils is primarily located near the former UST area. The remainder of the building was found to be considerably less impacted by the historical use of the Site. Isoconcentration maps indicating subsurface soil VOC and SVOC contamination across the Site are provided on Figures 17 and 18 of the RI Report, respectively. The data shows a source area near sample SOIL-116, located in the central portion of a room that previously contained an industrial dry-cleaning machine and now referred to as the Former UST Area.

The AOC that is the subject of this IRMWP (Former UST Area) is further described below. Additional details associated with the remaining AOCs are provided in the RI Report (CHA, February 2019).

2.2.1 Former UST Area

The former UST area is located in the northwestern portion of the building (Figure 3). Several subsurface soil samples, groundwater samples, and soil vapor samples have been collected in this area.

Historical subsurface soil sampling identified the presence of chlorinated VOC contamination, namely PCE, 1,1-dichlorethene (DCE), and vinyl chloride, in soil samples SB-32 and SB-33, at concentrations exceeding their respective Part 375 Commercial Soil Cleanup Objective (SCO), which is consistent with the findings of the RI. During the RI, PCE was identified at concentrations exceeding its respective Part 375 Commercial SCO in sample SOIL-116 and lesser concentrations of trichloroethene (TCE), DCE, and vinyl chloride in samples SOIL-116 and SOIL-119. PCE was detected in excess of the Part 375 Commercial SCO throughout this area. Metals (mercury and lead) and total polychlorinated biphenyls (PCBs) exceeded the Part 375 Unrestricted SCO in this area but are less than the respective Part 375 Commercial SCOs.

Historical groundwater sampling identified the presence of chlorinated VOC contamination, including PCE, TCE, DCE, and vinyl chloride, in the wells directly adjacent to the former UST area. During the RI, well Temp-GW001 and the well cluster at GW-103 were located within and adjacent to the former UST area, respectively. Concentrations of PCE, TCE, DCE, and vinyl chloride, among others, were detected at concentrations exceeding their applicable Technical and Operational and Guidance Series (TOGS 1.1.1) Class GA Ambient Water Quality Standards.

3.0 REMEDIAL ACTION

Under this proposed IRM, the major work task includes the excavation and removal of three USTs identified in the former UST area and associated impacted soil. Figure 4 identifies the extent of the remedial action including the approximate horizontal excavation limits and proposed confirmation sampling locations.

3.1 REMEDIAL ACTION APPROACH

The factors considered during the selection of the Site remedy are those listed in Title 6 of New York Codes, Rules, and Regulations (NYCRR), Part 375-1.8. Generally, the remedial action to be completed is source removal from the AOC identified as the former UST area. Major components of the source removal are described more fully throughout Section 3.0. The following are the anticipated components of the selected remedy:

- In the Former UST Area, the concrete slab will be removed as necessary to provide access to the USTs.
- The USTs will be removed and transported for off-Site disposal.
- Contaminated soil within the AOC will be excavated to a maximum depth of the water table, which is anticipated between eight and ten ft bgs.
- Post-excavation samples will be collected along the excavation sidewalls and bottom.
- The excavation area will be backfilled with clean structural fill material.
- The excavation area will be finished with a mixture of asphalt, concrete or vegetative landscape upon completion.

3.2 SITE CONTROLS

3.2.1 Site Access & Work Zones

Appropriate work zones, as detailed below, will be established prior to commencing intrusive remedial activities at the Site. Fencing will be erected and maintained as necessary by the Contractor to control access to the portions of the Site where soils with potential contamination are exposed. Work zones, if appropriate, will be clearly marked and reviewed prior to the start of each work day. The following work zones are shown on Figure 5.

Exclusion Zone

An exclusion zone will be established around the AOC. Orange construction fencing or other similar

barricades, along with appropriate signage, will be installed around the door on the western perimeter of the AOC to keep unauthorized personnel away from intrusive activities. Temporary soil containment pads will be constructed within the exclusion zone and to the north of the warehouse area to stage materials awaiting characterization and/or off-Site disposal. The exclusion zone may be extended within the property boundaries owned by Ranalli/Taylor St., if necessary. It is anticipated that soil will be placed on polyethylene sheeting within the asphalt loading dock area to the north of the building and within the exclusion zone. Upon removal of the soil, tanks will be cleaned and crushed, to the extent practical, in the same area.

The primary contaminants within the exclusion zone are chlorinated VOCs, namely PCE, TCE, DCE, and vinyl chloride, in the soil, soil vapor, and groundwater. Volatilization of said chemicals is expected during the removal of the USTs and excavation of contaminated soil.

Contamination Reduction Zone

A Contamination Reduction Zone will be established within the warehouse to facilitate decontamination of the personnel and equipment that come into contact with impacted soils. Personnel working inside the exclusion zone will decontaminate or dispose of soiled clothing in the contamination reduction zone each time the exclusion zone is exited. Appropriate equipment, supplies, and personal protective equipment (PPE) will be made available in the contamination reduction zone to facilitate the protection and decontamination of personnel working in the exclusion zone. Decontamination of equipment and personnel will be handled in accordance with CHA Standard Operating Procedures (SOP's) #501, #503, #505, #507 included in Appendix A.

Equipment will be decontaminated at the conclusion of intrusive activities and prior to demobilizing equipment from the project Site. Upon completion of soil and tank disposal, the area of soil stockpiling and tank cleaning will be converted to the large equipment decontamination area. Appropriate precautions will be taken throughout the intrusive processes to limit contact with contaminated soil. Only parts of equipment that have come in contact with the soil will require decontamination. Examples of such precautions include, but are not limited to:

- Care will be taken such that impacted soil is not spilled on the sides of the trucks as they are loaded and that the trucks do not drive through contaminated soils. If wet soils are encountered, dry soils will be placed near the rear tailgate of the truck and wetter soils will be placed near the front of the truck. If the soils are saturated, either poly liners will need to be installed in the dump box or the soils will be stabilized on containment pads prior to loading to avoid spillage or liquids dripping out of the truck during the hauling process. All trucks will be covered with canvas or tarpaulins (netting will not be permitted) to minimize the potential for dust and material to fall out of the truck during transport.

- Efforts will be made to keep the tracks of the excavator out of the excavation such that the tracks on the machine do not track impacted soils across the Site. Efforts will be made to minimize the amount of equipment and machinery that contacts the impacted soils.
- Polyethylene sheeting will be placed between the excavation equipment and trucks being loaded to capture any incidental spillage and to minimize the need to decontaminate hard surfaces.

Non-disposable personal protective clothing will be decontaminated by first washing the soiled items with a non-phosphate detergent and potable water mixture, followed by potable water and distilled water rinses. Disposable/expendable clothing will be placed into plastic trash bags for off-Site disposal at a solid waste facility. Equipment that comes into contact with contaminated soil will be decontaminated with a high-pressure steam cleaner.

The Contamination Reduction Zone setup will involve the construction of up to two temporary decontamination pads. The first decontamination pad will be used for the decontamination of personnel and small hand tools. The water generated from decontaminating equipment will be collected by placing 10-mil polyethylene sheeting over an approximately ten-foot by ten-foot area with raised sides and one low spot to direct the water to one corner of the pad. The second decontamination pad will be used for decontaminating large equipment. The pad will be constructed with a minimum of two layers of 10-mil polyethylene sheeting with raised berms and overspray guards around the perimeter to maintain wash fluids on the pad. A portable spill containment pad with drive through berms and side panels may be used in lieu of building a temporary equipment decontamination pad. All wash water will be collected and managed in accordance with Section 3.3.4. It is anticipated that decontamination pads will be placed in sequence either to the north or east of the AOC.

Support Zone

A Support Zone will be established in close proximity to the Contamination Reduction Zone. It is anticipated that this zone will consist of equipment and supplies required for implementing the remedy. While the Contractor performing the excavations will provide their own site-specific HASP for this project, the support zone should also be used for the storage of first aid kits, fire extinguishers, PPE for site workers, the HASP, air monitoring equipment, spill containment equipment, etc.

3.2.2 Sediment and Erosion Control

The area of disturbance will be maintained to less than one acre during the remedy. Therefore, only

semi-permanent erosion control measures and best management practices will be utilized. These control measures will include the protection of stormwater drains located within the asphalt loading dock area to the north of the building.

3.2.3 Truck Routing

Truck transport routes will be determined taking into consideration the following: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) limiting total distance to major highways; (d) promoting safety in access to highways, and (e) overall safety in transport. Truck routing has been included on Figure 5. The asphalt loading dock area to the north of the building can be accessed from Cortland Avenue. The road and entrance driveway width are sufficient for truck access. Trucks will be required to turn right when exiting the Site in order to maintain flow of traffic. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during remedial construction. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

3.2.4 Vapor/Odor Suppression

A Community Air Monitoring Plan (CAMP) will be implemented during all active ground intrusive activities including excavation and live loading of soil and disturbance of the concrete slab. To control or minimize odors encountered during the excavation activities, one or more of the following procedures shall be implemented:

- The rate of progress of the excavation activity shall be reduced.
- Contaminated soil/sediment stockpiles shall be covered as material is placed on them.
- The amount of open excavation shall be reduced and/or polyethylene sheeting shall be placed over the excavation faces.
- Spray foam products (e.g., RusFoam® by Rusmar Foam Technologies™) shall be applied to the excavation faces and stockpiles should other techniques be insufficient to address odors emanating from the excavation.

3.3 UST REMOVAL AND EXCAVATION OF CONTAMINATED SOIL

3.3.1 Accessing the Area of Concern

Mobilization to the Former UST Area will occur within the warehouse section of the building and the asphalt loading dock area to the north of the building. Access is granted from several overhead

doors on Cortland Avenue or South Clinton Street, or through the loading docks to the north of the building. All work is anticipated to be conducted within the building or on the asphalt loading dock area to the north of the building.

3.3.2 Shoring of Existing Building Foundation

It is anticipated the foundation of the building may be encountered and may be compromised during the removal of the USTs and excavation of contaminated soil. The Contractor is responsible for proper shoring of the existing building foundation around the AOC, along with proper shielding and shoring associated with the excavation. Additionally, the Contractor is responsible for shoring the adjacent public sidewalk, roadway and underground utilities.

3.3.3 Soil Management

Excavation will continue until confirmatory samples indicate the 6 NYCRR Part 375 Commercial SCOs have been met, or until excavation is no longer feasible. At no point will excavation occur deeper than the building foundation footers or expose the foundation walls and footers. Due to the proximity of the building foundation, CHA anticipates excavation of an approximately 24 foot by 20-foot area within the Former UST Area. Accounting for the size of the tanks and the anticipated depth to groundwater of eight to ten feet below the ground surface, approximately 200 cubic yards of soil is anticipated to be removed from the excavation.

Contaminated soil will be placed in a stockpile on the asphalt loading dock. A temporary soil containment pad will be utilized to allow soil to drain to a low spot/sump and contaminated water will be handled according to Section 3.3.4. Temporary soil containment pads shall be sufficiently large to contain all stockpiled material. The following procedures and requirements shall be followed:

1. The location of all temporary soil containment pads shall be approved by the Owner or Owner's representative and shall not hinder the continuation of other construction activities.
2. Prepare the subgrade, which shall consist of a stable subgrade where all visible sharps have been removed. The temporary soil containment areas shall be sufficiently large to contain all stockpiled material and accessible to excavation equipment and trucks for eventual loading.
3. A low point or sump shall be constructed on the temporary soil containment pad to collect water generated from dewatering of the materials placed on the pad and the pad shall be graded towards the low point.
4. A minimum of two layers of 10-mil polyethylene sheeting with at least 2-foot of overlap at all seems shall be placed on the subgrade. The top sheet shall be lapped over the bottom

sheet in a shingle type pattern.

5. A minimum of a 1-foot high soil berm, hay bales, wood timbers, or similar shall be placed around the perimeter of the containment area so that no saturated soils and/or water migrate off the containment pad. Secure the edges of the sheets to keep the polyethylene sheeting in place.
6. Erosion and sediment controls shall be erected around the perimeter of stockpiles, including silt fence at a minimum. Stormwater runoff shall be directed around all stockpiles and excavation.
7. Construct stockpiles in a height not exceeding 15-feet and with side slopes no steeper than 2H:1V unless otherwise accepted by the Owner's representative.
8. If stockpiled material is left for more than one day, the stockpiles shall be kept covered with appropriately anchored 10-mil polyethylene sheeting (minimum) or waterproof tarpaulins. Stockpiles will be routinely inspected and ripped or damaged stockpile covers will be promptly replaced.
9. Maintain all stockpiles and embankments until material is disposed of off-Site. Inspect stockpiles frequently to ensure that material is not released into the surrounding environment.
10. Dispose of contaminated soils as quickly as feasible. Refer to Section 3.3.6 for waste characterization requirements associated with contaminated soil.

Stockpiled soil will be loaded into trucks for off-Site disposal. Care will be taken such that impacted soil is not spilled on the sides of the trucks as they are loaded and that the trucks do not drive through contaminated soils. All trucks will be covered with canvas or tarpaulins (netting will not be permitted) to minimize the potential for dust and material to fall out of the truck during transport. All trucks will have appropriate placarding and permits, including a NYSDEC Part 364 permit.

3.3.4 Fluids Management

Groundwater is anticipated to be encountered during source removal activities between approximately eight and ten feet bgs. Construction wastewater may be generated from the removal/pumping of the collection of wastewater from contaminated soil stockpiles and the decontamination of personnel and equipment. If light non-aqueous phase liquid (LNAPL) is encountered, the contractor shall use one or more of the following methods to control and remove the free product:

- Absorbent booms, pads, etc.
- Floating skimmer systems.
- Removal with a vacuum truck.

It is noted that dense non-aqueous phase liquids (DNAPLs) are not expected to be encountered during the implementation of this IRM given that the excavation is terminating at water table.

Pumping and collection of water will be completed in a manner to prevent the migration of particulates. Water collected from excavations and decontamination/containment pads will be managed properly in accordance with this section and applicable regulations to prevent the endangerment of human health, property, or any portion of the remedial activities.

The Contractor is responsible for the proper disposal of all water collected from dewatering of stockpiled materials, wash water for cleaning of the USTs (if necessary), and wash water associated with decontamination activities. If dewatering of the excavation is deemed necessary, smaller containers will be place adjacent to the excavation for collection and transfer to larger water management container(s) placed next to the soil stockpile, located on Figure 5. All wastewater shall be managed in accordance with applicable federal, state and local regulations and this approved IRMWP.

The Contractor will provide a container(s) (e.g., frac tank, 55-gallon drum, etc.) for water management and transport to an off-Site disposal facility. Water samples will be analyzed, at a minimum, for the following:

- Target Compound List (TCL) VOCs by USEPA Method 8260;
- TCL SVOCs by USEPA Method 8270;
- TCL PCBs by USEPA Method 8082;
- Target Analyte List (TAL) metals and cyanide by USEPA Methods 6010, 7471 and 9012;
- Pesticides via USEPA method 8081;
- Herbicides via USEPA method 8151; and,
- pH.

Additional characterization may be necessary prior to transporting for off-Site disposal. Samples will be stored in a cooler with ice and submitted to an ELAP certified laboratory under chain-of-custody protocols. Water will be transported for disposal in accordance with all United States Department of Transportation (USDOT) requirements as well as NYSDEC Part 364 requirements.

Appropriate controls will be used to prevent spills and overflows, including but not limited to, monitoring, gauging, quick-close shut-off valves, and secondary containment. Storage containers will be decontaminated following disposal or discharge activities. Residual sediment in the storage

containers will be dewatered/stabilized, if necessary, and disposed of off-Site in a similar manner as the impacted soils.

3.3.5 UST Removal

According to historical documentation, the USTs to be removed previously contained PCE for dry-cleaning activities and were said to have been closed in place but lack proper closure documentation. Upon inspection of the UST area, a manhole cover obscuring a large circular tank opening was observed. During May 2019, the three USTs identified within the former UST area appeared to be closed in place using concrete. However, it is unknown if there was any residual material remaining in the tanks prior to closure or if there was any remaining void space in the tanks following the filling with concrete.

At a minimum, the Contractor shall follow CHA SOP #s 901 and 902 and their site-specific HASP for tank removal. Generally, the procedure shall be:

1. Excavate to the top of the tank and remove soils to expose the upper half of the tank. If applicable, remove all tank top equipment including the fill pipe, gauge pipe, product lines and other tank fixtures. Remove each drop tube. Remove all non-product lines, such as vapor recovery lines and vent lines. Cap or plug open ends of lines which are not to be used further.
2. If applicable, the product piping must be drained back into the tank. If the piping system is pressurized, the functional element check valve will require removal or opening (completely). Use small amounts (e.g., one or two gallons) of water to flush the pipe.
3. If applicable, remove all contents from the tank using hand methods (for sand) and explosion-proof or air-operated pumps (for product). Ground all pump motors and suction hoses to prevent a buildup of static electricity. If a vacuum truck is used, the area around the truck must be vapor-free. The vacuum vent should be located downwind of the truck and tank.
    a. The USTs appear to be closed-in-place with concrete but lack the appropriate closure documentation. If sand is identified within the USTs, the sand will be removed from the tank and be stockpiled, in accordance with Section 3.3.3, analyzed the parameters listed in Section 3.3.6, and disposed of properly.
4. If applicable, test the tank headspace for vapors by placing a combustible gas indicator probe into the fill opening of the tank. Collect readings at the bottom, middle, and upper portions of the tank; clearing the instrument after each reading. Readings of less than 10 percent lower explosive limit (LEL) must be obtained before the tank is considered safe. Note: Combustible gas indicator readings may be misleading where the tank atmosphere contains less than 5 percent by volume oxygen, as in a tank vapor-freed with CO_2, N_2, or other inert gas. In general, readings in oxygen-deficient atmospheres will be high (or safe), however it

may be desirable to use an oxygen indicator to assess the oxygen concentration. It is the Contractor's responsibility to perform all testing and monitoring.

5. Prepare to excavate/remove the tank(s). Excavated soil will be placed within the soil stockpile area of the northern asphalt loading dock and the Exclusion Zone prior to loading for off-Site disposal. Following transportation of soil off-Site, tanks will be removed and placed in the same location in order to be cleaned, crushed or cut, and disposed of.
6. Remove flammable vapors inside the tank by either displacing the vapor by purging with air or inerting with a gas such as CO_2 or N_2. Note: the tank atmosphere and the excavation area should be tested regularly for flammable or combustible concentrations until the tank is removed. Explosive atmospheres can regenerate within the tank.
7. Excavate remaining portion of tank and associated soils. Remove tank from excavation area. If any liquid/sludge, if present, cannot be removed from the tank prior to removal from the excavation, plug any existing holes in the tank to minimize spillage during removal.
8. Excavation progress and information about the geologic formations encountered will be recorded by the construction observer on the field excavation log or within the field book. The information will include total depth excavated, depths and thickness of strata, problems encountered during excavation, fill materials encountered, visually impacted materials encountered, and water levels.
9. Clean tank using a high-pressure spray rinse or steam, if cleaning was not possible prior to removal from the excavation. Collect tank wash water, containerize, characterize and dispose of in accordance with SOP #507. The UST shall be cleaned on-Site.
10. The tank should be crushed on-site such that it cannot be reused as a tank prior to being shipped off-site.
11. Collect a minimum of six confirmation soil samples in accordance with Section 3.3.7; one from each sidewall and two from the bottom of the tank excavation area. Confirmation samples will be compared to 6 NYCRR Part 375 Commercial SCOs.
12. The air space surrounding the excavation shall be scanned with a PID and four-gas meter during intrusive activities to determine the presence of VOCs.
13. Air monitoring results shall be recorded on the field log or within the field book.
14. All residual waste generated during excavation activities shall be packaged, characterized, labeled and disposed off-Site in accordance with SOP #507.
15. Backfill excavation in accordance with Section 3.3.10.

3.3.6 Waste Characterization

The specific analytical waste characterization requirements of the waste disposal facility may vary and will be verified prior to sampling. Sampling frequency is anticipated to be one sample for every 1,000 cubic yards (yd^3) of soil disposed. The waste characterization samples will be submitted to a laboratory certified under the NYSDOH's ELAP for analysis following appropriate chain-of-custody protocols in accordance with the CHA SOPs included in Appendix A. The parameters likely

required by the waste disposal facility may include the following:

- Toxicity Characterization Leaching Procedure (TCLP) VOCs by United States Environmental Protection Agency (USEPA) Method 8260;
- TCLP SVOCs by USEPA Method 8270;
- TCLP Resource Conservation and Recovery Act (RCRA) 8 Metals by USEPA Methods 6010;
- TCLP Pesticides via USEPA Method 8081;
- TCLP Herbicides via USEPA Method 8151;
- Total PCBs via USEPA Method 8082;
- Ignitability (flashpoint);
- Corrosivity (pH);
- Reactivity; and,
- Percent Solids.

3.3.7 Confirmation Sampling

Once soil is removed from the excavation, confirmation soil sampling will be conducted in accordance with DER-10, Section 5.5. One soil sample will be collected from near the bottom of the sidewalls from the interior area of the excavation support system, for every 30 linear feet of sidewall. A minimum of one bottom of excavation sample will be collected at a depth from zero to two feet below the bottom of the UST for every 15 linear feet of trench. Based on estimated size of the excavation, it is presumed that a minimum of six confirmation soil samples (four sidewall and two bottom) will be collected from the excavation. Based upon the conditions following UST removal and contaminated soil excavation, additional samples may be required based upon several factors, including but not limited to, observed contamination remaining in the excavation. All samples will be submitted to an ELAP approved laboratory, following proper chain-of-custody protocols and analyzed for the following minimum parameters:

- TCL VOCs via USEPA Method 8260;
- TCL SVOCs via USEPA Method 8270;
- TAL Metals via USEPA Methods 6010C and 7470A; and
- Total PCBs via USEPA Method 8082A.

Additionally, three of the confirmation soil samples will be submitted and analyzed for the following:

- PFAS via EPA Method Modified 537; and
- 1,4-Dioxane via EPA Method 8270D.

Analytical methods, sample volumes, preservation techniques and holding times associated with the above samples are provided in the Quality Assurance Project Plan (QAPP) included as Appendix B.

The analytical results of the confirmation sampling will be provided to the NYSDEC and NYSDOH once available from the laboratory. The decision to backfill the excavation will be determined in consultation with the NYSDEC based upon the analytical results meeting the 6 NYCRR Part 375 Commercial SCOs and/or the feasibility of continued excavation (e.g., proximity to building foundation footers, building limitations, etc.).

3.3.8 Off-Site Disposal

Soil excavated for off-Site disposal will be characterized, transported and disposed of at an approved disposal facility in accordance with all local, State (including 6 NYCRR Part 360) and Federal regulations. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Construction Completion Report (CCR). This documentation will include waste profiles, test results, facility acceptance letters, manifests/bills of lading and facility receipts/weight tickets.

All transport of materials requiring off-Site disposal at a permitted facility will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, and local requirements.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas and/or mesh-type truck covers will be prohibited. Trucks will be prohibited from transporting saturated soil. Rather, saturated soil should be placed on a containment pad to facilitate dewatering prior to shipment.

3.3.9 Imported Material

The material imported to the Site includes clean construction fill in accordance with Section 5.4(e) of NYSDEC DER-10. The Contractor will be responsible for maintaining an accurate count of the

quantity of material delivered to and used on the Site. The Contractor will, at a minimum, provide the following documentation for each imported material:

- The quantity of the material imported to Site;
- Source of the material;
- The date the material was imported; and
- The quantity of material used.

All imported backfill will be sampled at a frequency in accordance with Table 5.4(e)10 in DER-10, analyzed, and will meet Unrestricted Soil Cleanup Objectives provided in Appendix 5 of DER-10 for the following criteria:

- VOCs via USEPA Method 8260
- SVOCs via USEPA Method 8270
- PCBs via USEPA Method 8082
- TAL Metals via USEPA Method 6010
- Perfluoroalkyl Substances (PFAS) via USEPA Method Modified 537
- 1,4-Dioxane via USEPA Method 8270D

The frequency of sampling described above pertains to imported fine grained soils only. Large grained fill with less than 10 percent fines passing a standard No. 80 sieve (such as open-graded stone or rip rap) will not be subject to the above sampling requirements only if a letter from the facility/quarry is also provided, which states that the source is a virgin material and the source area was never utilized for commercial/industrial purposes.

It is anticipated that four discrete samples for VOCs, and one composite sample for SVOCs, PCBs, TAL Metals, PFAS, and 1,4-Dioxane will be collected for fill material imported to the Site. Analytical methods, sample volumes, preservation techniques and holding times associated with the above samples are provided in the QAPP included as Appendix B.

3.3.10 Excavation Backfill

The excavation will remain open until analytical results for the confirmation samples indicate the concentrations meet the applicable 6 NYCRR Part 375 Commercial SCO or upon approval to begin backfilling is granted by the NYSDEC. The excavation will be supported with trench box(es), or other suitable temporary support system; however, no sheet piling or foundation pinning will be

installed for this project. Additionally, signs will be placed on all points of entry to the former tank area to warn personnel of the open excavation and entry points will be secured by locking doors and/or placement of temporary barricades inside the warehouse. Prior to backfilling with the imported fill material, a minimum of a 6-ounce per square yard non-woven geotextile demarcation layer will be placed along the bottom and sidewalls of the excavation.

3.4 REMEDIAL ACTION PROJECT PLANS

3.4.1 Field Sampling Plan

A Field Sampling Plan (FSP) has been prepared for the activities described in this Source Removal IRMWP. The FSP describes the sampling approach and rationale. Major elements of the FSP including the frequency of sampling, analytical parameters, sample designation and handling, decontamination procedures, and field documentation. A copy of the FSP is provided in Appendix B.

3.4.2 Quality Assurance Project Plan

A Quality Assurance Project Plan (QAPP) has been prepared for the activities described in this Source Removal IRMWP. The 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 this investigation. A copy of the QAPP is provided in Appendix C.

3.4.3 Health and Safety Plan

A site-specific HASP for CHA personnel was prepared to provide specific guidelines and establish procedures for the protection of CHA's on-site personnel during construction activities. A copy of the HASP is included in Appendix D.

Hazards within the AOC consist of hazardous vapors from chlorinated VOCs, working around large equipment, struck-by/caught-between, and slips/trips/falls. In vapor form, chlorinated VOCs are denser than air and will tend to accumulate at the bottom of the excavation. Care shall be taken for anyone entering the excavation but should be avoided to the extent practical.

The health and safety requirements for the remedial activities were developed in accordance with 29 CFR 1910 and 1926. The selected remedial Contractor will be responsible for developing their

own site-specific HASP that addresses aspects of health and safety for the proposed project as it relates to the Contractor's on-site personnel. While CHA's HASP provides a basis for the overall plan, particularly relative to environmental conditions, the Contractor will be responsible for supplementing the plan with additional specific requirements as necessary. Major elements of the plan include:

- Health and safety risk or hazard analysis (i.e., physical or chemical hazard involved, concentration, primary hazard) for each site task or operation referenced in the work plan.
- Employee training assignments to assure compliance with 29 Code of Federal Regulations (CFR) 1910.120 (e) including identification.
- Personal protective level/equipment to be used for each site task or operation [29 CFR1910.120 (g)] selected as a result of the hazard analysis and consistent with OSHA Permissible Exposure Limits referenced in 29 CFR 1910.1000. This includes the identification of head, eye, ear, face, body, foot, skin, and respiratory protection necessary and the minimum level of protection that should be worn on-site at all times.
- Medical surveillance requirements [29 CFR 1910.120 (f)] including the identification of the medical surveillance performed for 24-Hour and 40-Hour OSHA trained workers onsite, medical surveillance required for on-site workers to wear respirators, if necessary, and medical surveillance required should an on-site worker be overexposed.
- Frequency and types of air monitoring (i.e., organic vapor, combustible gas, particulate), personnel monitoring (i.e., cold/heat, stress), and environmental sampling techniques and instrumentation, including methods of maintenance and calibration of equipment. This section should also list action levels, that when reached on the monitoring equipment, will cause operations to cease and further contingency actions to be taken.
- Site control measures [29 CFR 1910.120 (d)] including the aerial designation of the exclusion, contamination reduction, and support zones and identification of how site security will be accomplished.
- Decontamination procedures [29 CFR 1910.120 (k)] for on-site personnel and equipment including decontamination procedures to use in the event of an emergency as well as the identification of decontamination station equipment, and solutions.
- Emergency response plan including location of and directions to the nearest hospital, fire/police emergency numbers, and communication procedures, on-site first aid available, acute exposure symptoms of hazards involved, and emergency procedures for injury within work zones, fire explosion, equipment failure, and chemical exposure.
- Confined space entry procedures, if required, including a description of the permit system, attendant duty/system, barricading of space, atmospheric testing requirements, lockout, tagout requirements, and specialized equipment used.
- Spill containment program [29 CFR 1910.120 (j)].

- Line of command on-site (identification of Contractor Health and Safety Supervisor onsite) as well as identification of management, advisors, medical support, fire/rescue support, field team/work party, security hygienists, and others, if deemed necessary in the HASP.

3.4.4 Community Air Monitoring Plan/Community and Environmental Response Plan

Air monitoring will be performed along the perimeter of the Site during the remedial activities in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP). A Community and Environmental Response Plan (CERP) has been developed to address the short-term impacts to the surrounding community and environmental resources during the implementation of this IRMWP. This plan includes measures for monitoring both fugitive dust and organic vapors upwind and downwind of the active construction zone. Unlike work zone air monitoring conducted for the protection of workers, the CAMP will be utilized to alert the Contractor of any dust or organic vapors that may leave the Site so that mitigation measures can be implemented. Additionally, the plan identifies action levels during construction and the mitigation methods to address any exceedances of the action levels. Monitoring equipment (i.e., PID, DustTrak) will be calibrated according to manufacturer's instructions prior to field work, bump tested daily and field calibrated weekly. CHA will maintain a copy of the calibration log on Site. The NYSDEC and NYDOH Project Managers will receive a copy each day's reports that will include the CAMP raw data. A copy of the CAMP/CERP is provided in Appendix E.

4.0 SCHEDULE

The following provides a proposed schedule for the completion of remedial activities specified in this IRMWP:

Table 1: Project Schedule

Description	Estimated Start	Estimated Finish
NYSDEC Review & Approval of IRMWP	May 13, 2019	June 21, 2019
Implementation of field activities	June 24, 2019	July 5, 2019
Preparation of CCR	June 2019	July 2019

The overall progress of the remedial activities will be dependent upon a number of factors including, but not limited to: NYSDEC review periods, weather conditions at the time of construction, etc.

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 remedial action.

5.0 CONSTRUCTION COMPLETION REPORT

A Construction Completion Report (CCR) will be prepared in accordance with DER-10 guidance to document the IRMWP activities. The CCR will include a description of the remedial activities, sample results, waste profiles, facility acceptance letters, manifests/bill of lading, and facility receipts/weight slips. The CCR will be reviewed and certified by a professional engineer. The CCR will be included as part of Alternatives Analysis for the Site. The CCR will include:

- Certification requirements in accordance with applicable statue and/or regulations;
- Description of the selected remedy;
- Remedial contracts;
- Description of remedial actions performed;
- Governing documents;
- Elements of the remedial program;
- Summary of contaminated material removal included manifests documenting off-Site transport of waste material;
- Summary of remedial performance/confirmation sampling;
- Data collected from the CAMP;
- Details of imported materials;
- Remaining contamination;
- Deviations from the IRMWP.

REFERENCES

GZA, *Phase I Environmental Site Assessment,* October 2014

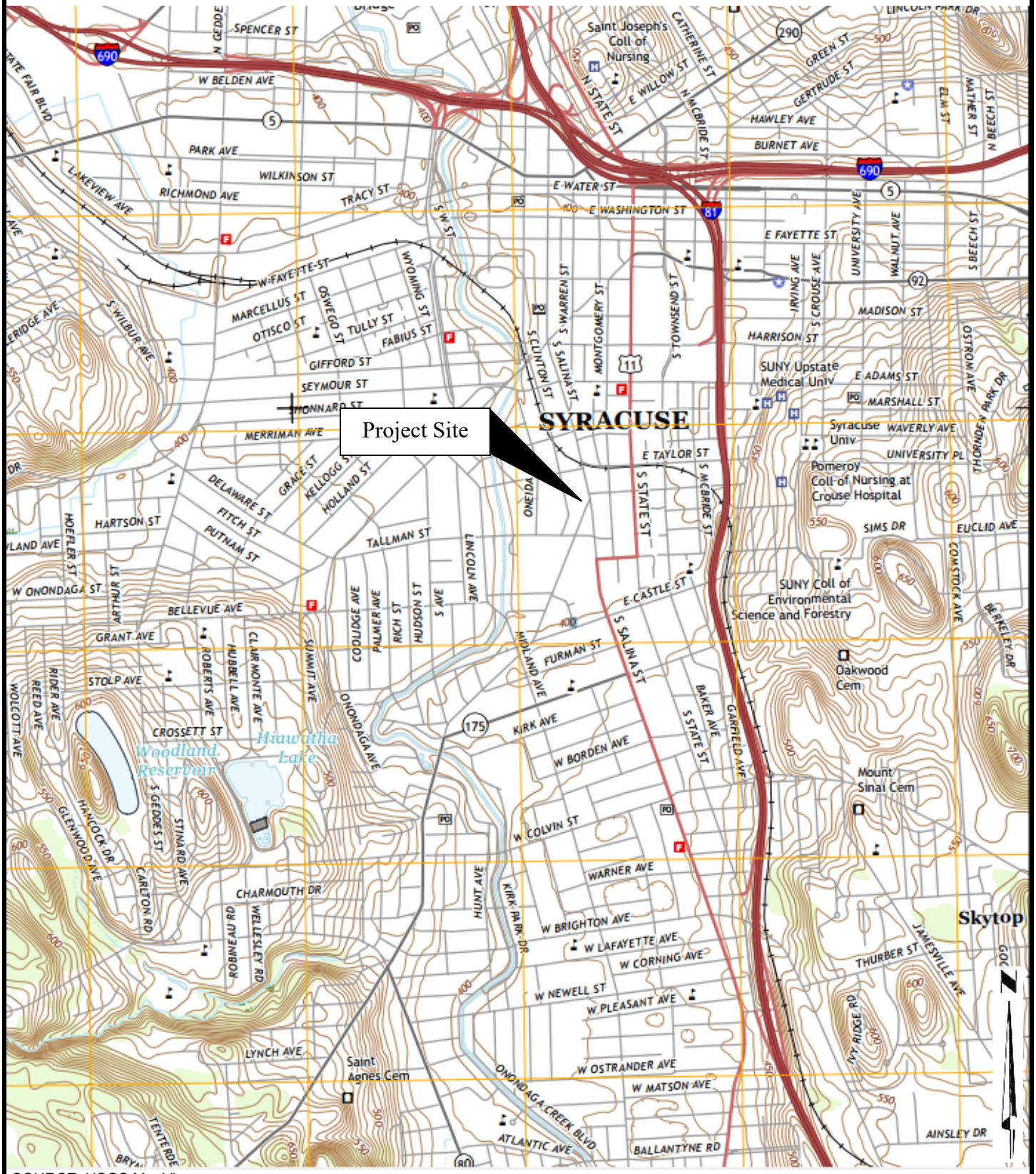
GZA, *Phase II Environmental Site Assessment,* January 2014

GZA, *Phase III Environmental Site Assessment,* April 2015

CHA, *Remedial Investigation Work Plan,* March 2018

CHA, *Remedial Investigation Report,* February 2019

FIGURES



SOURCE: USGS MapViewer

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NOT TO SCALE

DATE: May 2019

FIGURE 1
SITE LOCATION MAP
140 CORTLAND AVE
SYRACUSE,
ONONDAGA COUNTY, NEW YORK

\\cha-llp.com\proj\Projects\ANY\K4\33525\Reports\Source Removal

CHA

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MAP NOT TO SCALE

DATE: May 2019

FIGURE 2

SITE LAYOUT

140 CORTLAND AVE
SYRACUSE
ONONDAGA COUNTY, NEW YORK

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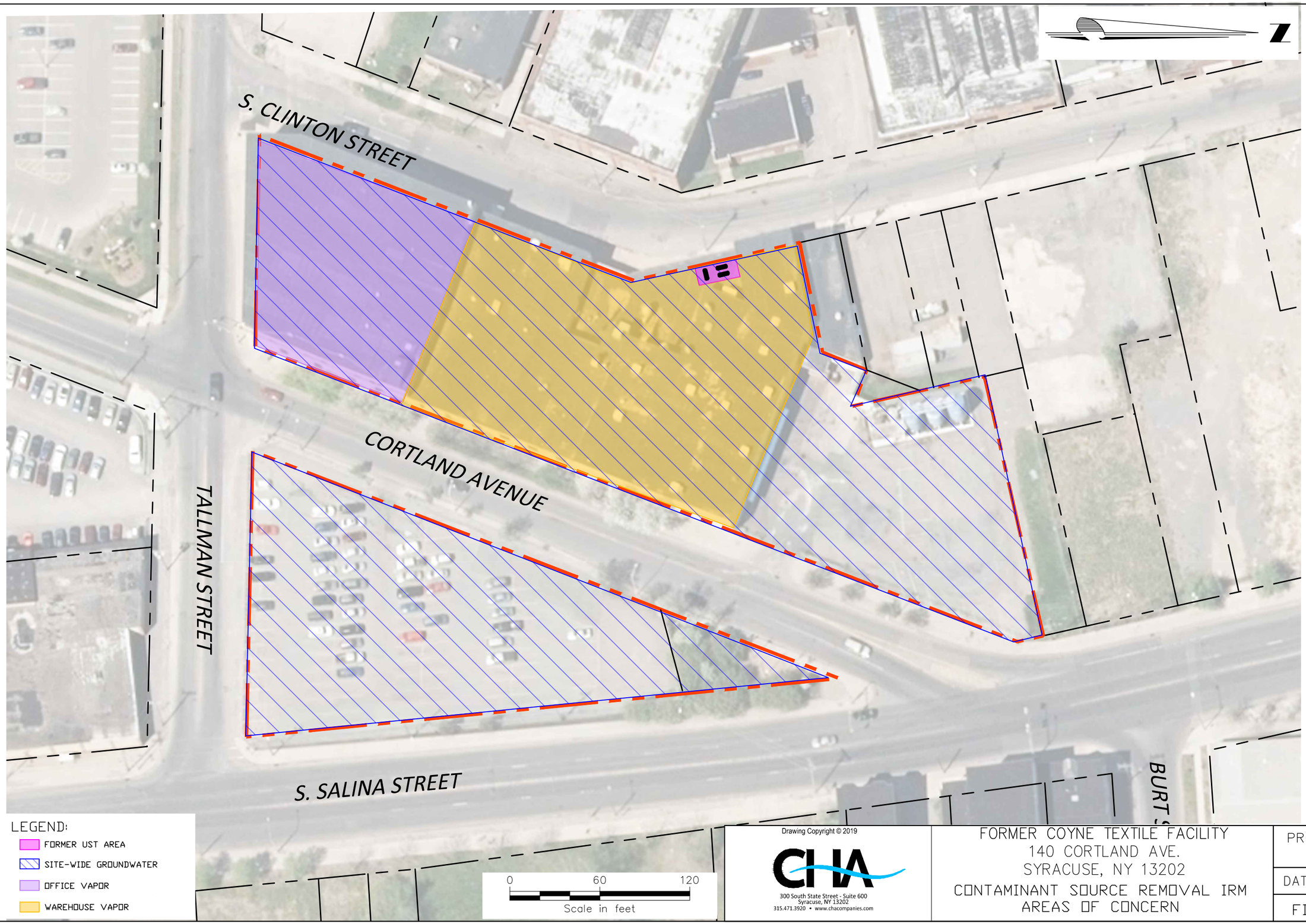

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FORMER COYNE TEXTILE FACILITY
140 CORTLAND AVE.
SYRACUSE, NY 13202
CONTAMINANT SOURCE REMOVAL IRM
AREAS OF CONCERN

PROJECT NO. 33525

DATE: 05/2019

FIGURE 3

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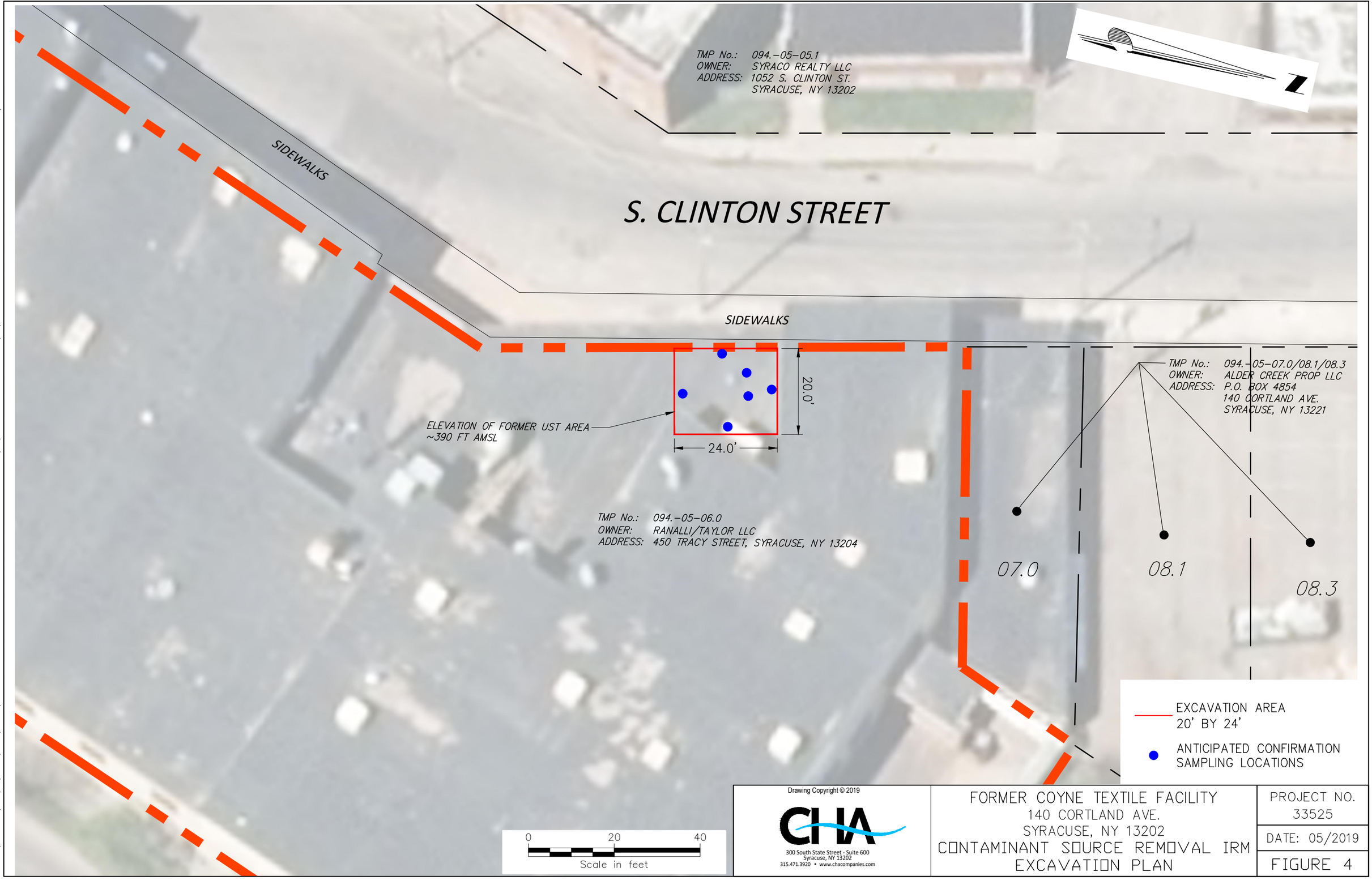

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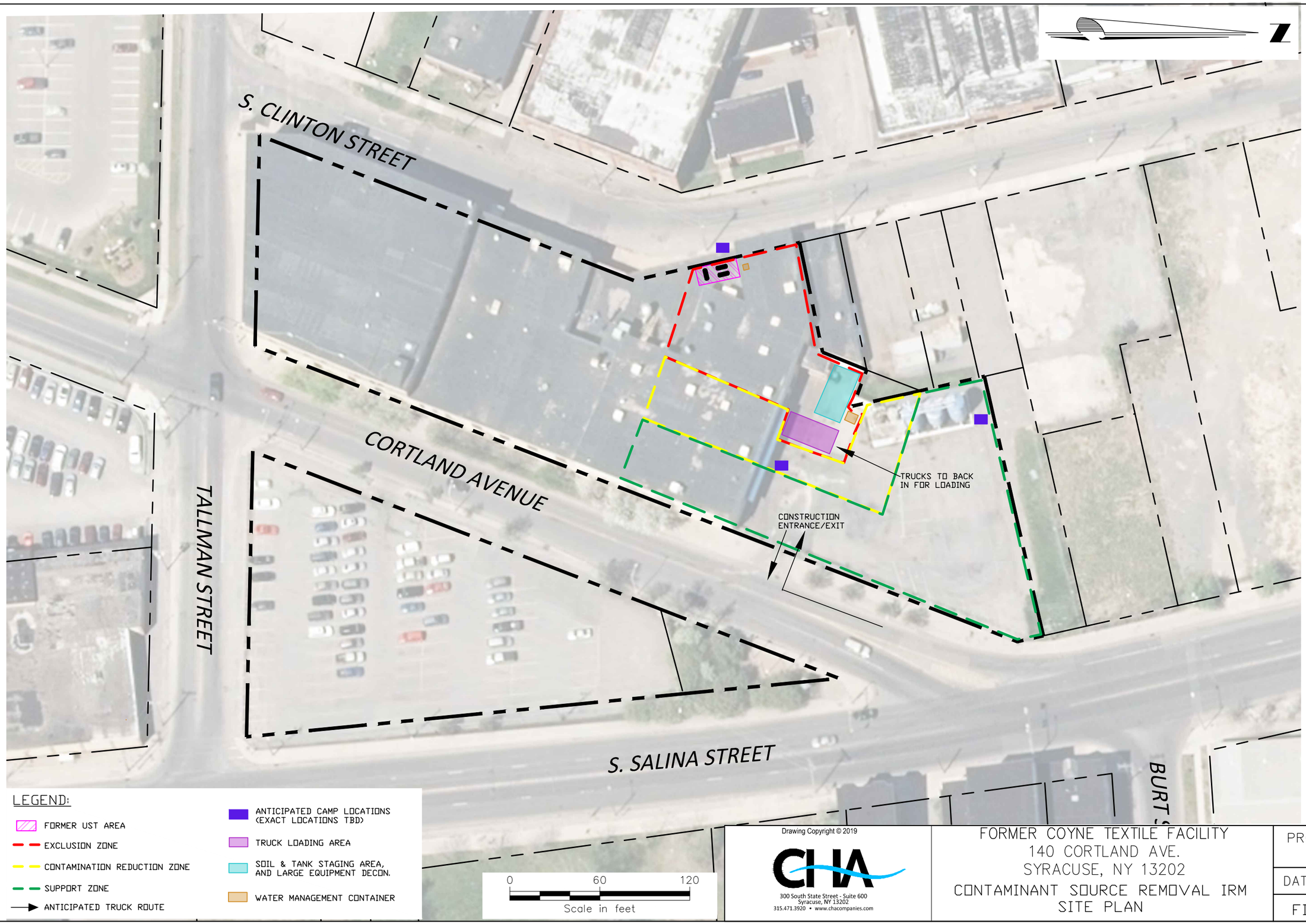
SYRACUSE, NY 13202
CONTAMINANT SOURCE REMOVAL IRM
EXCAVATION PLAN

PROJECT NO. 33525

DATE: 05/2019

FIGURE 4



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CONTAMINANT SOURCE REMOVAL IRM
SITE PLAN

PROJECT NO. 33525

DATE: 06/2019

FIGURE 5

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APPENDIX A

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

END OF SOP
Final Check by C. Burns 10/2/15

Author: Sarah Benson
Reviewer(s): Keith Cowan
Sandy Warner

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

NYSDEC, Electronic Data Delivery Manual, January 2013, 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

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

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.

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

G. APPENDICES/FORMS:

CHA COC Form

END OF SOP
Final Check by C. Burns 10/7/15

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

DECONTAMINATION OF PERSONNEL

A. PURPOSE/SCOPE:

The objective of decontamination is to prevent the transmission of contaminants to personnel and equipment and to prevent the spread of contaminants off-site. Decontamination is performed as a quality assurance measure and as a safety precaution during sampling. The following SOP outlines general decontamination procedures that apply to personal protection Level C. Projects that necessitate higher levels of protection (Levels B or A) require site-specific decontamination plans as part of the project's Health and Safety Plan.

The decontamination area must be set up before any entry into contaminated areas or the Exclusion Zone. All personnel must undergo decontamination prior to leaving the site. Sites with relatively low contamination levels and no Exclusion Zone activities (Level D PPE) still may require decontamination. At Level D activity sites, decontamination should be provided for the following: washing of boots, or the removal and disposal of boot covers (booties); removal and disposal of disposable coveralls; removal and disposal of outer and inner gloves; and the washing of hands, arms and face prior to leaving the site, or taking any breaks for eating, drinking, etc.

B. EQUIPMENT/MATERIALS:

- Decontamination pad
- Brushes
- Polyethylene
- Tap water
- Detergent
- Appropriate decontamination solutions
- 55-Gallon drum
- Shallow wash buckets

C. PROCEDURE:

1. Maximum and minimum decontamination procedures for Level C protection are described in detail in Tables 1 and 2 on the following pages, and the procedure sequence is shown on associated flow-charts.
2. Arrange disposal of all waste generated during decontamination procedures according to guidelines in SOP #507. Check that all reusable PPE has been adequately decontaminated for future use.

D. QA/QC REQUIREMENTS:

Not Applicable

E. SPECIAL CONDITIONS:

Note that decontamination procedures will vary between sites depending on contaminants present.

DECONTAMINATION OF PERSONNEL

F. REFERENCES:

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

NIOSH, OSHA, USCG, EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, DHHS (NIOSH) Publication No. 85-115, October, 1985.

G. APPENDICES/FORMS:

Associated Flow Charts - The following Tables are included:

- Table 1. Maximum Measures for Level C Decontamination and Procedure Sequence
- Table 2. Minimum Measures for Level C Decontamination and Procedure Sequence

END OF SOP

Final Check by C. Burns 10/22/15

DECONTAMINATION OF PERSONNEL

Table 1. Maximum Measures for Level C Decontamination

Station	1:	Segregated Equipment Drop	1.	Deposit equipment used on site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool down station may be set up within this area.
Station	2:	Boot Cover and Glove Wash	2.	Scrub outer boot covers and gloves with decon solution or detergent and water.
Station	3:	Boot Cover and Glove Rinse	3.	Rinse off decon solution from station 2 using copious amounts of water.
Station	4:	Tape Removal	4.	Remove tape around boots and gloves and deposit in container with plastic liner.
Station	5:	Boot Cover Removal	5.	Remove boot covers and deposit in containers with plastic liner.
Station	6:	Outer Glove Removal	6.	Remove outer gloves and deposit in container with plastic liner.
Station	7:	Suit and Boot Wash	7.	Wash splash suit, gloves, and safety boots. Scrub with long-handle scrub brush and decon solution.
Station	8:	Suit and Boot, and Glove Rinse	8.	Rinse off decon solution using water. Repeat as many times as necessary.
Station	9:	Canister or Mask Change	9.	If worker leaves exclusion zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, and joints taped worker returns to duty.
Station	10:	Safety Boot Removal	10.	Remove safety boots and deposit in container with plastic liner.
Station	11:	Splash Suit Removal	11.	With assistance of helper, remove splash suit. Deposit in container with plastic liner.
Station	12:	Inner Glove Rinse	12.	Wash inner gloves with decon solution.
Station	13:	Inner Glove Wash	13.	Rinse inner gloves with water.
Station	14:	Face Piece Removal	14.	Remove face piece. Deposit in container with plastic liner. Avoid touching face with fingers.

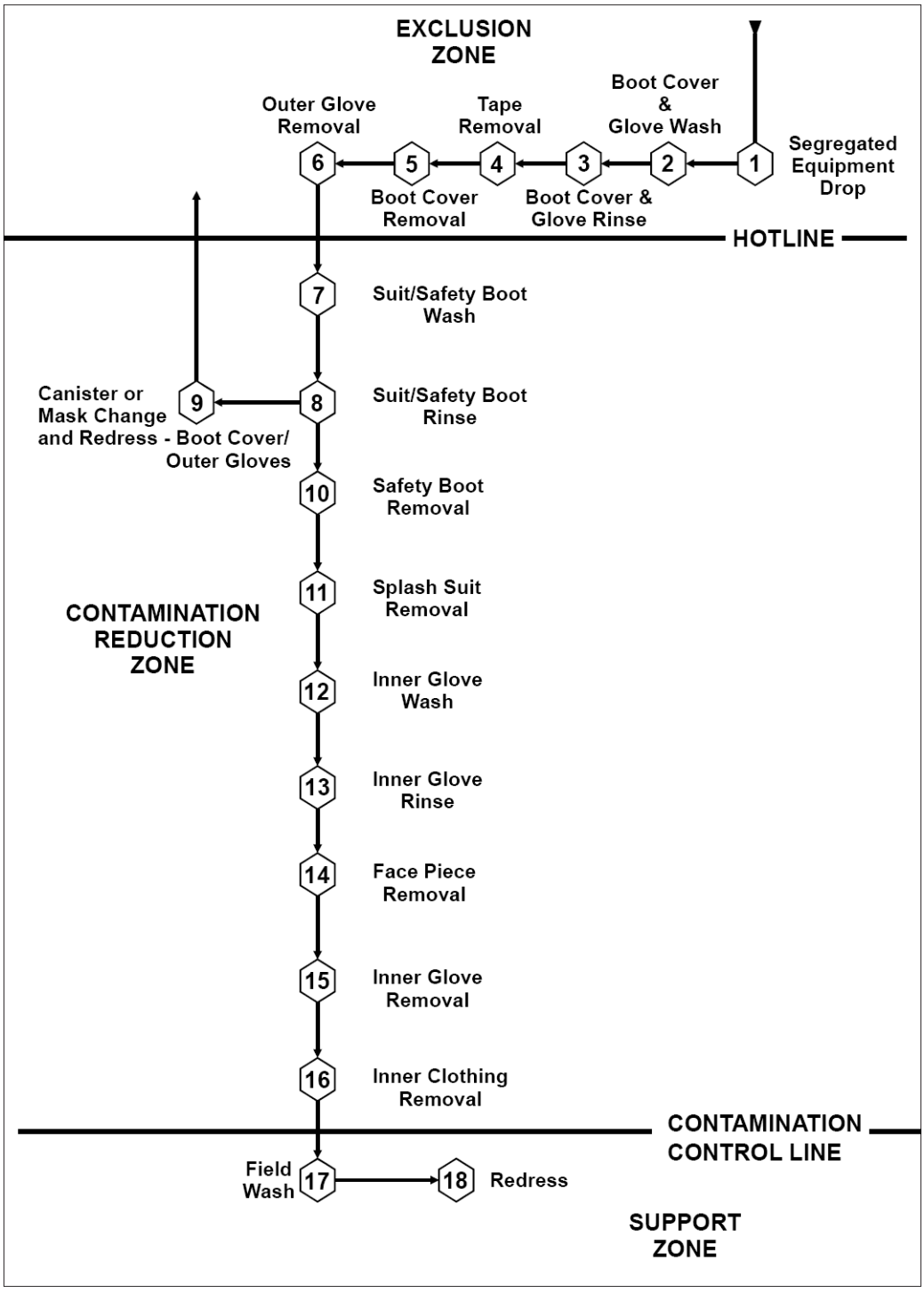
DECONTAMINATION OF PERSONNEL

Table 1. Maximum Measures for Level C Decontamination continued

Station	15:	Inner Glove Removal	15.	Remove inner glove and deposit in lined container.
Station	16:	Inner Clothing Removal	16.	Remove clothing soaked with perspiration and place in lined container. Do not wear inner clothing off-site since there is a possibility that small amounts of contaminants might have been transferred in removing the fully-encapsulating suit.
Station	17:	Field Wash	17.	Shower if highly toxic, skin-corrosive or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available.
Station	18:	Redress	18.	Put on clean clothes.

DECONTAMINATION OF PERSONNEL

Maximum Measures for Level C Decontamination



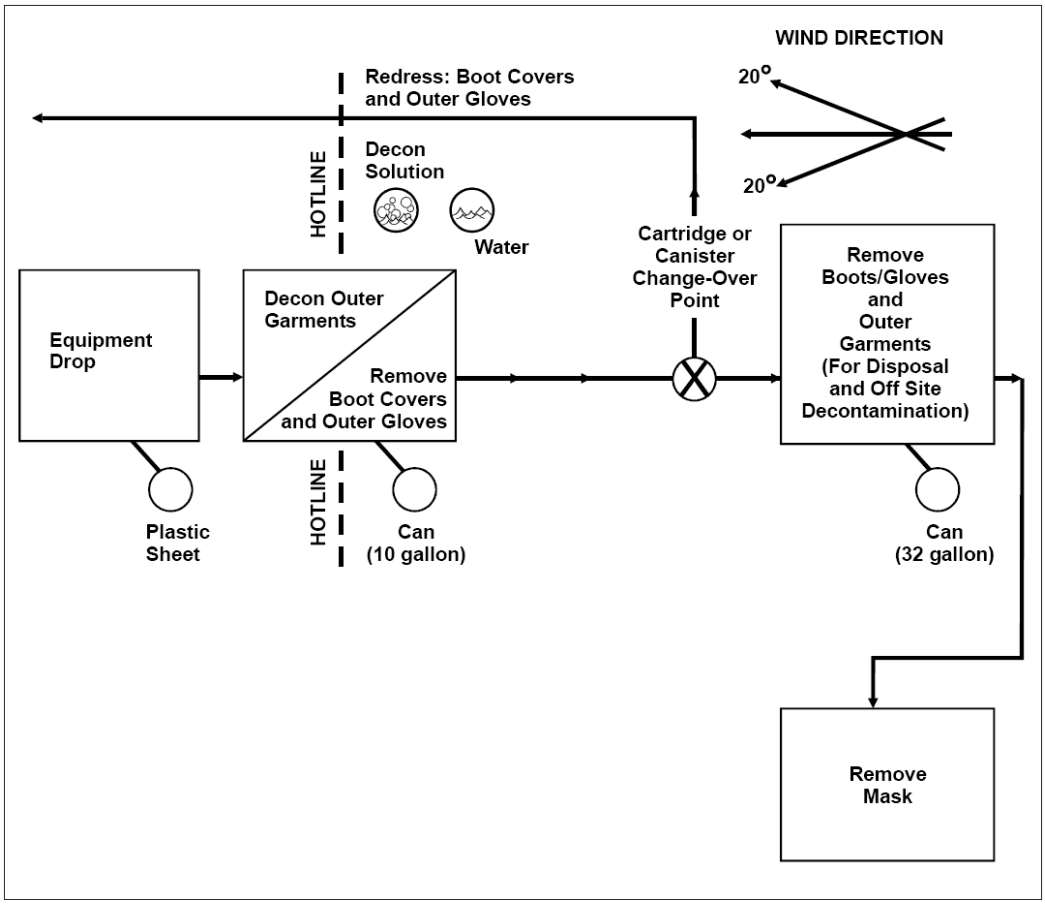
DECONTAMINATION OF PERSONNEL

Table 2. Minimum Measures for Level C Decontamination

Station	1:	Equipment Drop	1.	Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool down station may be set up within this area.
Station	2:	Outer Garment, Boots, and Gloves Wash and Rinse	2.	Scrub outer boots, outer gloves and splash suit with decon solution or detergent water. Rinse off using copious amounts of water.
Station	3:	Outer Boot and Glove Removal	3.	Remove outer boots and gloves. Deposit in container with plastic liner.
Station	4:	Canister or Mask Change	4.	If worker leaves exclusive zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station	5:	Boot, Gloves and Outer Garment Removal	5.	Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station	6:	Face Piece Removal	6.	Facepiece is removed. Avoid touching face with fingers. Facepiece deposited on plastic sheet.
Station	7:	Field Wash	7.	Hands and face are thoroughly washed. Shower as soon as possible.

DECONTAMINATION OF PERSONNEL

Minimum Measures for Level C Decontamination



Author: Meghan Platt, P.E.
Reviewer: Scott Smith, P.E.

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^{o}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

Author: Meghan Platt, P.E.
Reviewer: Scott Smith, P.E.

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 (HNO3) 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).

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 4ºC 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
WATER						
Acid Soluble & Insoluble Sulfide	-----	9030B	Cool to 4 deg C No Headspace	P or G	7 Days	8 oz.
Acidity as CaCO3	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 CaCO3	310.1	2320B	Cool to 4 deg C	P or G	14 Days	100 mL
Ammonia	350.2/.3	4500-NH3 B,E	Cool to 4 deg C, H2SO4 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 0.008% Na2S2O3 if residual chlorine present	G, Vial screw cap with center hole 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	HNO3 to pH<2	P or G	6 Months	100 mL
Calcium- Hardness	200.7	3111B	HNO3 to pH<2	P or G	6 Months	100 mL
Carbamates	531.1	-----	Cool to 4 deg C, 0.08% Na2S2O3 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 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	H2S04 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 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 0.008% Na2S2O3 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 0.008% Na2S2O3 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% Na2S203 if residual chlorine present 0.3 mL/125 mL 15% EDTA if > 0.01 mg/L heavy metals	Sterile P or G	30 Hrs. for Drinking Water 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% Na2S203 if residual chlorine present 0.3 mL/125 mL 15% EDTA if > 0.01 mg/L heavy metals	Sterile P or G	30 Hrs. for Drinking Water 6 Hrs. for Waste Water	125 mL
Fecal Streptococci	-----	9230C	Cool to 4 deg C 0.008% Na2S2O3 if residual chlorine present	Sterile P or G	30 Hrs. for Drinking Water 6 Hrs. for Waste 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 0.008% Na2S2O3 if residual chlorine present 1:1 HCl to pH <2	G, Vial screw cap with center hole Teflon- faced silicone septum	7 days without HCl 14 days with HCl	40 mL
GRO	-----	8015B	1:1 HCl to pH <2, Cool to 4 deg C 0.008% Na2S2O3 if residual chlorine present	G, Vial screw cap with center hole Teflon- faced silicone septum	7 days w/o HCl 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 0.008% Na2S2O3 if residual chlorine present	Sterile P or G	30 Hrs. for Drinking Water 6 Hrs. for Waste 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 extraction 40 days after 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, 353.2, 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 0.008% $Na_2S_2O_3$ 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, H_2SO_4 to pH<2	G	28 Days	500 mL
Pseudomanas Aeruginosa	-----	9213E	Cool to 4 deg C 0.008% $Na_2S_2O_3$ if residual chlorine present	Sterile P or G	30 Hrs. for Drinking Water 6 Hrs. for Waste Water	125 mL
Purgeable Halocarbons	601	8021B	Cool to 4 deg C 0.008% $Na_2S_2O_3$ if residual chlorine present	G, Vial screw cap with center hole Teflon- faced silicone septum	14 Days	40 mL
Radiological	-----	-----	HNO_3 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 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 0.008% $Na_2S_2O_3$ 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-SO_4	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 (SO_3)	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	H2S04 to pH<2 , Cool to 4 deg C	P	28 days	250 mL
Total Coliform	-----	9221D	0.008% Na2S203 if residual chlorine present 0.3 mL/125 mL 15% EDTA if > 0.01 mg/L heavy metals	Sterile P or G	30 Hrs. for Drinking Water 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 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 0.008% Na2S2O3 if residual chlorine present	G, Vial screw cap with center hole Teflon-faced silicone septum	7 days w/o HCl 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 Teflon-faced silicone septum	14 Days	60-120 mL
SOIL						
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 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.
Semivolatile 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.
CLP 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		Na2S203, 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		Na2S203, 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 extration 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 preforming 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 then 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 form 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

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

G. APPENDICES/FORMS:

Not Applicable

END OF SOP

Final Check by C. Burns 10/27/15

Author: Meghan Platt, P.E.
Reviewer: Scott Smith, P.E

UNDERGROUND STORAGE TANK CLOSURE

A. PURPOSE/SCOPE:

The following standard operating procedure (SOP) presents a description of the methods generally employed for the closure of an underground storage tank (UST) and the collection of post-excavation samples. Tanks storing petroleum and hazardous chemicals must meet minimum standards established by the United States Environmental Protection Agency (EPA) and any state-specific governing agency. Field personnel are responsible for ensuring that state-specific standards/guidelines/regulations are followed, where applicable.

Improper handling and storage of petroleum and hazardous chemicals can result in leaks and spills and pose a serious threat to the quality of the environment. Therefore, most states require that those tanks permanently out of service must be emptied of liquid, sludge, and vapors. These tanks must then either be removed or, if left in place, the USTs must be filled with a solid inert material. State agencies typically must be notified 30 days prior to removal or filling.

The UST removal activities will be performed by a contractor qualified to perform tank removal services under the separate contract to the Site Owner.

B. EQUIPMENT/MATERIALS:

The company will supply the heavy equipment and materials needed to remove a UST. The field geologist/engineer will supervise the UST removal activities and conduct the post-excavation sampling. Equipment for documentation of the work and sampling are described in SOPs 101 and

All other equipment required during removal/filling activities is the responsibility of the excavation Contractor.

C. PROCEDURE:

Tank Removal

1. The product piping must be drained back into the tank. If the piping system is pressurized, the functional element check valve will require removal or opening (completely). Use small amounts (e.g., one or two gallons) of water to flush the pipe.
2. Remove all contents from the tank using explosion-proof or air-operated pumps. Ground all pump motors and suction hoses to prevent a buildup of static electricity. If a vacuum truck is used, the area around the truck must be vapor-free. The vacuum vent should be located downwind of the truck and tank.
3. Test the tank vapor space by placing a combustible gas indicator probe into the fill opening of each tank. Collect readings at the bottom, middle, and upper portions of each tank; clearing the instrument after each reading. Readings of 10 percent or less lower explosive limit (LEL) must be obtained before the tank is considered safe. **Note: Combustible gas indicator readings may be misleading where the tank atmosphere contains less than 5 percent by volume oxygen, as in a tank vapor-freed with CO_2, N_2, or other inert gas. In general, readings in oxygen-deficient atmospheres will be high (or safe), however it may be desirable to use an oxygen indicator to assess the oxygen concentration.** It is the Contractor's responsibility to perform all testing and monitoring.

UNDERGROUND STORAGE TANK CLOSURE

4. Prepare to excavate the tank(s). Soil staging areas should be lined with a minimum of 10 millimeter thick polyethylene sheeting as necessary. Coordinate location with Owner.
5. Excavate to the top of the tank and remove soils to expose the upper half of the tank. Remove all tank top equipment including the fill pipe, gauge pipe, product lines and other tank fixtures. Remove each drop tube. Remove all non-product lines, such as vapor recovery lines and vent lines. Cap or plug open ends of lines which are not to be used further.
6. Remove flammable vapors by either displacing the vapor by purging with air or inerting with a gas such as CO_2 or N_2. **Note: the tank atmosphere and the excavation area should be tested regularly for flammable or combustible concentrations until the tank is removed. Explosive atmospheres can regenerate within the tank.**
7. Excavate remaining portion of tank and associated soils. Remove tank from excavation area.
8. Excavation progress and information about the geologic formations encountered shall be recorded by the geologist on the field excavation log or within the field book. The information should include total depth excavated, depths and thickness of strata, problems encountered during excavation, fill materials encountered, visually impacted materials encountered, and water levels.
9. Notify state agency within two (2) hours if a spill (e.g., presence of petroleum impacted soil) is discovered associated with the tank closure.
10. Clean tanks using a high-pressure spray rinse. Collect tank wash water, containerize, characterize and dispose of in accordance with SOP #507. Tanks containing No. 5 or No. 6 fuel oil will require manual cleaning methods for removal of tar and sludge within these tanks. Tanks can be cleaned on-Site or moved to the Contractor's storage yard for cleaning. If the tank is removed from the Site prior to cleaning, it must be transported by a licensed waste transporter.
11. Plug or cap all holes within the tank prior to removal from the Site.
12. Collect a minimum of five (5) soil samples, one from each sidewall and the bottom of the tank excavation area. Depending on the tank capacity, additional samples may be required by the governing agency.
13. If appropriate to the investigation, the air space surrounding the excavation shall be scanned with a FID or PID and Explosimeter during all intrusive activities to determine the absence of VOCs. Results of this air monitoring shall be recorded on the field log or within the field book. Activities shall proceed according to the site HSP if the presence of VOCs is indicated.
14. All residual waste generated during excavation activities shall be packaged, characterized, labeled and disposed off-site in accordance with SOP #507.
15. Note the excavation area, former tank(s) location, sample locations on a site map.

In-Place Abandonment

1. The product piping must be drained back into the tank. If the piping system is pressurized, the functional element check valve will require removal or opening (completely). Use small amounts (e.g., one or two gallons) of water to flush the pipe.

UNDERGROUND STORAGE TANK CLOSURE

2. Remove all contents from the tank using explosion-proof or air-operated pumps. Ground all pump motors and suction hoses to prevent a buildup of static electricity. If a vacuum truck is used, the area around the truck must be vapor-free. The vacuum vent should be located downwind of the truck and tank.

3. Test the tank vapor space by placing a combustible gas indicator probe into the fill opening of each tank. Collect readings at the bottom, middle, and upper portions of each tank; clearing the instrument after each reading. Readings of 10 percent or less lower explosive limit (LEL) must be obtained before the tank is considered safe. **Note: Combustible gas indicator readings may be misleading where the tank atmosphere contains less than 5 percent by volume oxygen, as in a tank vapor-freed with CO_2, N_2, or other inert gas. In general, readings in oxygen-deficient atmospheres will be on the high or safe side, however it may be desirable to use an oxygen indicator to assess the oxygen concentration.** It is the Contractor's responsibility to perform all testing and monitoring.

4. Excavate to the top of the tank and remove soils to expose the upper half of the tank. Remove all tank top equipment including the fill pipe, gauge pipe, product lines and other tank fixtures. Remove each drop tube. Remove non-product lines, such as vapor recovery lines. However, vent lines should remain in-place until the tank is filled. Cap or plug open ends of lines which are not to be used further.

5. Remove flammable vapors by either displacing the vapor by purging with air or inerting with a gas such as CO_2 or N_2. **Note: the tank atmosphere and the excavation area should be tested regularly for flammable or combustible concentrations until the tank is removed. Explosive atmospheres can regenerate within the tank.**

6. Cut one or more large holes in the top of the tank.

7. Clean tank interior using a high-pressure spray rinse and as little water as possible to remove loose scale, corrosion and residual product. Collect tank wash water, containerize, characterize and dispose of in accordance with SOP #507. Tanks containing No. 5 or No. 6 fuel oil will require manual cleaning methods for removal of tar and sludge within these tanks.

8. Visual observe the interior of the tank. If any holes are located, a soil sample from beneath the tank near the hole will be collected to visually observe the presence or absence of petroleum.

9. Notify governing agency within two (2) hours if a spill (e.g., presence of petroleum impacted soil) is discovered associated with the tank closure.

10. Introduce a suitable, solid, inert material (e.g., sand or concrete slurry) through the hole(s) created in Step 6 until the tank is full.

11. Disconnect and remove the vent line.

12. Note the tank condition, tank location, date of abandonment and method of abandonment in the field book/on a site map.

D. QA/QC REQUIREMENTS:

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

UNDERGROUND STORAGE TANK CLOSURE

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.

E. SPECIAL CONDITIONS:

If this work will be bid, refer to the Master Spec for Tank Closures

F. REFERENCES:

ASTM Standard D 1586

New Jersey Department of Environmental Protection (NJDEP) Underground Storage Tanks Regulations: http://www.nj.gov/dep/srp/regs/ust/ustrule.pdf

New York State Department of Environmental Conservation (NYSDEC) DER-10 / Technical Guidance for Site Investigation and Remediation: http://www.dec.ny.gov/docs/remediation_hudson_pdf/der10.pdf

NYSDEC Permanent Closure of Petroleum Tanks: http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbstankclosure.pdf

NYSDEC CP-51 / Soil Cleanup Guidance: http://www.dec.ny.gov/docs/remediation_hudson_pdf/cpsoil.pdf

NYSDEC Index of Standards, Criteria and Guidance (SCGs) for Investigation and Remediation of Inactive Hazardous Waste Disposal Sites: http://www.dec.ny.gov/regulations/61794.html

Pennsylvania Department of Environmental Protection (PADEP) Closure Requirements for Underground Storage Tank Systems: http://www.elibrary.dep.state.pa.us/dsweb/Get/Version-50030/253-4500-601.pdf

Virginia Department of Environmental Quality Tank Guidance and Regulations: http://www.deq.state.va.us/tanks/guidance.html#techmanfiles

G. APPENDICES:

Not Applicable

H. APPENDICES/FORMS:

None

END OF SOP
Final Check by C. Burns 11/19/15

Author: Meghan Platt, P.E.
Reviewer: Scott Smith, P.E.

DRUM/SOIL EXCAVTION AND STOCKPILING

A. PURPOSE/SCOPE:

The following standard operating procedure (SOP) presents a description of the methods generally employed for the excavation and stockpiling of drums and/or impacted soil. Stockpiling/storing of drums containing petroleum and/or hazardous chemicals must meet minimum standards established by the United States Environmental Protection Agency (EPA) and any state-specific governing agency. Field personnel are responsible for ensuring that state-specific standards, guidelines and/or regulations are followed, where applicable.

Improper handling and storage of drums or soil can result in leaks and spills and pose a serious threat to the quality of the environment. Therefore, most states require that drum contents must be characterized, labeled and transported for disposal/recycling within a specific timeframe. In addition, impacted soil is typically required to be placed within bermed containment areas and covered. State agencies typically must be notified if evidence of a spill or release is identified during soil excavation activities.

B. EQUIPMENT/MATERIALS

The drum/soil excavation and stockpiling activities will be performed by a firm qualified to perform excavation services under a separate contract with the Owner/Client. The company will supply the heavy equipment and materials needed to conduct the excavation and stockpiling activities. The field geologist/engineer will supervise the excavation activities and conduct the post-excavation and/or drum characterization sampling.

C. PROCEDURE

SOIL EXCAVATION

1. Establish Site Controls, including, but not limited to the following:
    a. Installation of appropriate sediment and erosion controls
    b. Identification of appropriate work zones
    c. Identification of air monitoring station locations as required to comply with the requirements of the Community Air Monitoring Plan (CAMP)
    d. Construction of containment pads, see Step 4
    e. Construction of decontamination pads.
2. If material to be excavated will be directly loaded into trucks for immediate hauling to the disposal facility conduct pre-excavation sampling and analysis as described below. Excavate the area described within the work plan using visual, olfactory and instrument-based (e.g. PID) soil screening methods. To minimize potential cross-contamination on-Site via tracking and reduce the amount of required decontamination, the following work practices should be implemented:
    a. Efforts will be made to advance the excavation face towards the excavator such that the tracks on the machine do not come into contact with the impacted soils.

DRUM/SOIL EXCAVTION AND STOCKPILING

b. Where possible, all trucks will be loaded adjacent to the excavation. Care will be taken to ensure that impacted soil is not spilled on the sides of the trucks as they are loaded and that the trucks do not drive through contaminated soils. If wet soils are encountered, dry soils will be placed near the rear tailgate of the truck and wetter soils will be placed near the front of the truck. If the soils are saturated, liners will need to be installed in the dump box or the soils will be stabilized prior to loading to avoid drippage out of the truck during the hauling process.

c. Efforts will be made to minimize the amount of equipment and machinery that comes into contact with the impacted soils.

3. Stockpile excavated soils on temporary containment pads within the exclusion zone. The temporary containment pads will be of sufficient size to store up to a minimum of 110 percent of the maximum amount of soil that will be stockpiled prior to re-use or off-site disposal. At a minimum, any soil containment pads will include the following:

   a. A sufficiently large area with accessibility for trucks and construction equipment. The area shall be relatively flat and away from drainage inlets or waterfront areas.

   b. A 10-mil thick polyethylene sheeting liner with a minimum of two-foot wide overlaps between successive rows.

   c. A minimum of a one-foot high soil berm around the perimeter of each pad to control runoff/run-on to and from the stockpiles. Gravel/stone ramps with gentler slopes at locations of ingress and egress for each pad.

   d. When handling saturated soils (e.g. soils below the groundwater table), a minimum of a continuous (no laps unless the seams are sealed/welded) 20-mil thick polyethylene sheeting shall line the containment area and the side berms shall be a minimum of two (2) feet high. The Contractor will be responsible for sizing the containment pad area and berm height to ensure that all water is contained and no water drains onto the Site. The berms must be of sufficient height to contain the soils, any water draining from the material, and still provide sufficient freeboard (a minimum of six (6) inches) for precipitation events. All water on the pad will be collected and handled in accordance with Fluids Management.

   e. Soil stockpiles that will remain in place for more than one (1) week shall be continuously encircled with silt fence.

   f. Hay bales and other erosion and sediment controls shall be installed as needed near catch basins, surface waters, and other discharge points.

   g. Stockpiles shall be kept covered at all times with appropriately anchored tarps. Stockpiles shall be routinely inspected and damaged tarps will be promptly replaced.

   h. Stockpiles shall be maintained at a maximum of 15 feet above surrounding area grades with a maximum slope of 1.5:1 to maintain stability. However, the appropriate slope may vary by material and the contractor performing stockpiling activities shall be responsible for determining the safe allowable slopes for each material stockpiled on Site.

   i. Stockpiles shall be inspected at a minimum once each week and after every storm event. Results of inspections shall be recorded in a logbook and maintained at the Site and available for inspection by Agency personnel upon request.

DRUM/SOIL EXCAVTION AND STOCKPILING

4. Collect waste characterization samples from on-Site stockpiles at the sampling frequency specified by the disposal facility based upon the total volume of material requiring disposal. Typical sampling frequency is one (1) sample per every 1,000 cubic yards (CY) of material requiring disposal at a minimum; however, in no case should the frequency be less than one (1) sample per work area. The sampling program will require the collection of both grab samples and composite samples. Unless otherwise specified by the disposal facility, samples collected for VOC analysis will be discrete grab samples and other analyses will be performed on composite samples. The basic sampling methodology is described in SOP #417.
5. Identify the locations of each soil sample on a map or sketch.
6. Submit samples to a state-certified laboratory, if necessary, for analysis following appropriate chain-of-custody protocols detailed in SOP #105. The specific analytical waste characterization requirements of the waste disposal facility may vary and shall be verified prior to sampling. Typical parameters required for waste disposal characterization include following:

    - Target compound list (TCL) volatile organic compounds (VOCs) by EPA Method 8260.
    - TCL semivolatile organic compounds (SVOCs) by EPA Method 8270.
    - TCL polychlorinated biphenyls (PCBs) by EPA Method 8082.
    - Pesticides by EPA Method 8081.
    - Herbicides by EPA Method 8151.
    - Target Analyte List (TAL) metals and cyanide by EPA Methods 6010/7471.
    - Toxicity Leaching Characteristic Procedure (TCLP) Extraction
    - Hazardous Waste Characteristics as defined under the Resource Conservation and Recovery Act (RCRA), including ignitability, corrosivity, and reactivity.
    - pH via EPA Method 9045
    - Percent Solids via Method 160.3
    - Paint Filter Test via Method 9095
    - Additional analyses as required by the disposal facility.

<u>MATERIALS EXCAVATION & LOAD OUT</u>

1. If field screening processes indicate a change in material is encountered (e.g. change in color, noticeable odors, etc.), the newly encountered material should be stockpiled and characterized separately.
2. If excavation beneath the water table is required, the material will need to be dewatered prior to placement back on-Site or transportation off-site for disposal. Additional measures should be implemented to collect all water on the containment pads for future off-site disposal (e.g. construction of a sump on containment pad).
3. All excavations faces must be covered with a minimum of 10-mil polyethylene sheeting at the end of each work day at a minimum. Additionally, all excavations shall be backfilled within 48-hours of commencement, unless special circumstances require the excavation to be open longer. In such cases, the anticipated duration of the open excavation should be identified to the NYSDEC during the notification process.

DRUM/SOIL EXCAVTION AND STOCKPILING

4. A truck wash/decontamination pad will be operated on-Site. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the activities performed under this section are complete. Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking.
5. The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

MATERIALS TRANSPORT OFF-SITE

The following requirements have been established for all materials being transported off-site:

1. All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations. Haulers will be appropriately licensed and trucks properly registered and placarded. In addition, all haulers will maintain appropriate shipping papers and/or waste manifests (e.g., 6 NYCRR Part 372). Emergency response procedures and emergency telephone numbers will be maintained in all vehicles, and operators will be trained in emergency response procedures.
2. Loaded vehicles will be in compliance with load height and weight regulations.
3. Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).
4. Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers or mesh/open weave type covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.
5. All trucks will be washed prior to leaving the Site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.
6. Truck operators shall comply with all applicable regulations, including, but not limited to 6 NYCRR Subpart 217-3, relative to idling engines.
7. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during intrusive activities.
8. Queuing of trucks will be performed on-Site in order to minimize off-site disturbance.

MATERIAL DISPOSAL OFF-SITE

1. All soil/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State and Federal regulations.

DRUM/SOIL EXCAVTION AND STOCKPILING

2. Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate (i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, etc.). Actual disposal quantities and associated documentation will be reported to the NYSDEC following completion of excavation activities. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

FLUIDS MANAGEMENT

1. All liquids to be removed from the Site, including excavation dewatering and decontamination water, etc. will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering fluid will not be recharged back to the land surface or subsurface of the Site, but will be managed off-site. Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

2. Water collected will be stored in drums or temporary storage tanks (e.g. polyethylene tanks or frac tanks) that are approved and labeled in accordance with United States Department of Transportation (USDOT) requirements.

3. The water collected will be sampled by persons performing the intrusive activity on a frequency of one sample per every ten drums or one sample per every 2,000 gallons of water collected in larger vessels. However, more frequent sampling may be directed by the NYSDEC or the disposal facility (e.g. a local publicly-owned treatment works (POTW)), should observable changes in the water quality be identified in the field. The water samples will be analyzed for parameters required by the selected disposal facility for characterization purposes.

4. Oil-absorbent pads will be deployed on the water surface if sheens or NAPLs are observed in the groundwater within the excavation area to remove product. If absorbent pads are ineffective at removing the product, additional measures will be required to control the product, including, but not limited to the following:

    - Dewatering of the excavation in its entirety, if feasible (preferred method)
    - The use of floating booms with solid curtains
    - The use of pumps and floating oil skimmers
    - The use of vacuum trucks

5. Under no circumstances will the use of any type of dispersant be permitted to control product observed on water surfaces.

DRUM/SOIL EXCAVTION AND STOCKPILING

6. Additionally, appropriate controls will be used to prevent spills and overflows, including but not limited to, monitoring, gauging, quick-close shut-off valves, and secondary containment. All storage containers will be decontaminated following disposal or discharge activities. Any residual sediment in the storage containers will be dewatered/stabilized, if necessary, and disposed of off-site in a similar manner as other materials requiring off-site disposal.

D. QA/QC REQUIREMENTS:

Not Applicable

E. SPECIAL CONDITIONS:

Not Applicable

F. REFERENCES:

Not Applicable

G. APPENDICES/FORMS:

Not Applicable

END OF SOP
Final Check by C. Burns 11/19/15

REMEDIAL CONSTRUCTION OVERSIGHT AND DOCUMENTATION

A. PURPOSE/SCOPE:

This SOP is intended to provide guidance and define the responsibility of CHA personnel engaged in construction observation. The objective of construction observation is to document construction activities for compliance with the contract requirements. Since the duty of CHA personnel on-site will vary based on our contractual obligations to our client, size and complexity of the project, project specification requirements and types of activities being observed, performance of the contractor, etc., it is important that the observer be familiar with:

- CHA's contract with the client
- The contract/agreement between the contractor and client
- Project manual/specifications and drawings
- Project plans and/or work plans
- Site-specific HASP.

Note: *Construction "observation" or "oversight" refers to the action or process of observing something or someone in order to gain information without the higher level of completeness and rigor implied by the term "inspect". The term "inspect" implies a rigorous and complete review of construction relative to what is shown in the contract documents. The industry generally interprets the term "inspector" to imply that this employee has some authority over the contractor to control conformance with plans and specifications. With the exception of work performed under CHATS, CHA typically has no contractual relationship with the contractor performing the work or authority over the contractor, and thus, it is important to refer to our construction phase oversight as "observation" rather than "inspection."*

B. EQUIPMENT/MATERIALS:

Required Equipment:

- Personal protective equipment (PPE) – Level D at a minimum
- Clothing appropriate for weather anticipated
- Field book
- Indelible pens & markers (e.g. Sharpies)
- Clipboard (preferably one that encloses paperwork)
- Field/Construction Observation Reports
- Digital camera
- 25-foot steel measuring tape (preferably in 100ths)

Optional Equipment (based upon project-specific needs):

- Additional PPE (Level C, personal flotation devices, etc.) – Refer to site-specific HASP
- 100', 200', or 300' measuring tapes or measuring wheel
- 6' folding wood ruler (preferably in 100ths)
- Hand held GPS
- Photoionization detector, combustible gas meter, particulate meter, etc.
- Latex/nitrile gloves
- Sampling equipment and containers

REMEDIAL CONSTRUCTION OVERSIGHT AND DOCUMENTATION

- Wooden survey stakes and 3-lb. sledge hammer
- Survey tape/flagging/wire stakes
- Survey tape
- Digital audio recorder
- Computer with remote network access (for long duration projects).

C. GENERAL PROCEDURES/JOB DUTIES:

Electronic File Storage: Wherever practical, the below referenced documentation should be stored electronically and routinely uploaded to the project folders on CHA's server. Binders may be used to store paper documentation when appropriate, but CHA personnel should make a reasonable effort to minimize the amount of paper generated for the project and the amount of files stored at the site due to the potential for damage or loss of such documents.

The CHA construction observer will perform the following tasks:

1. Attend a preconstruction meeting whenever possible. If possible, a field visit to the project site should also be made.
2. Establish and maintain lines of communication between all parties. Establish a chain of command with the CHA PM, the client, the contractor, regulators, etc.
3. File all correspondence in the project folder, including e-mails. Letters received in hard copy only should be scanned in PDF format and stored in the project file as well. All correspondence should be stored with the date first followed by a description of the content to facilitate future searches (e.g. 2015-01-01_CHA to Contractor Re Recent Analytical Results). Conversation Logs and Meeting minutes shall be stored in a similar manner.
4. Monitor that construction work conforms to the provisions of the contract documents and/or project plans (i.e. HASP, QAPP, CAMP, SWPPP, etc.).
5. Prepare daily observation reports and take digital photographs documenting major site activities and observations made. For small, simple projects, complete a **Field Observation Report**. For larger, more complex projects where multiple activities are being observed, a more detailed **Construction Observation Report** should be completed. At a minimum, observation reports will include:

    - Date and weather conditions
    - Name of important visitors
    - Work/activity in progress and location
    - Contractor's means and methods for completing activities
    - Size of contractor's work force and equipment in use
    - Number of hours worked per day for contractor and subcontractor (arrival & departure times)
    - The substance of important conversations with the contractor concerning conduct, progress, changes, test results, interpretations of specifications and all other important details
    - Reporting of any variances made in the field to sampling plans, SOPs or other applicable contract documents
    - Documentation of calibration/maintenance of field instrumentation, field screening observations, samples collected, etc.

REMEDIAL CONSTRUCTION OVERSIGHT AND DOCUMENTATION

6. Maintain digital photographic documentation of all work completed. Sufficient photographs should be taken to depict the location of the activity, the material(s) being placed/installed, the equipment being utilized by the contractor, the means and methods implemented by the contractor, and any issues that may arise.
7. Observe all materials incorporated in the work for compliance with the contract documents and inform the Engineer and contractor of any conflicts.
8. Attend regularly scheduled progress meetings, as appropriate. Prepare meeting minutes and submit to engineer/PM for review. Upon completing any modifications, distribute meeting minutes to the project team.
9. Review project schedules to prepare for upcoming work and anticipate changes or potential conflicts.
10. Computations will be made of quantities of work performed, and materials used on the project by actual field measurements and survey data provided by the Contractor in accordance with the specifications.
11. Track, collect and review all required shop drawings and submittals. Forward to design engineers for review when necessary. Advise the Engineer and Contractor of the commencement of any work requiring a Shop Drawing or sample if the submittal has not been approved by the Engineer.
12. Oversee testing and observation requirements called for in the contract documents. Document that testing required by the contract documents is performed and that commercially manufactured products used on the project are accompanied by numerical test results or a certification from the manufacturer that the material meets applicable standards. QA/QC testing will be provided through the contractor as part of the technical specifications. The contractor will be required to prepare and submit all documentation of both failed and passed QA/QC tests.
13. Review test reports and certifications for conformance with the contract documents. Each test report for material in place should, as a minimum, contain the following:
    - Test performed and dated
    - Applicable standard or project specifications
    - Test location
    - Test result
    - Action taken on failing tests.
14. Maintain a file of all test reports and certifications as provided by the contractor.
15. Inform the contractor in writing, of deficiencies in order that the corrections can be made and retested prior to covering any substandard work with additional material. Document that corrective work and retesting is performed.
16. Coordinate with the contractor the preparation of record or as-built drawings and remind the contractor periodically to collect important record data as the work progresses, particularly for work that will be covered by subsequent tasks.

REMEDIAL CONSTRUCTION OVERSIGHT AND DOCUMENTATION

D. QA/QC REQUIREMENTS:

It is important to read all contract documents and project plans and maintain an understanding of which QA/QC testing will be the responsibility of the contractor versus CHA throughout the duration of the project. QA/QC testing performed by CHA employees (e.g. end point sampling, air monitoring, etc.) shall be completed in accordance with CHA's SOPs. QA/QC testing requirements listed in the project specifications are typically required to be performed by the Contractor and it is often the responsibility of the contractor to retain an independent third party testing agency to meet these testing requirements.

It should be noted that prequalification testing refers to testing results that must be provided to the Engineer for acceptance prior to commencing with a task utilizing the specified material. Conformance testing or field QA/QC testing typically refers to post-installation or placement testing that is completed on-site after the specified material is installed.

E. SPECIAL CONDITIONS:

The field observer must be in frequent communication with the CHA Project Manager or task manager regarding the progress of the project. Circumstances can change quickly on projects and proactive communication can help reduce the potential for larger problems or issues to arise. Depending on the situation, it may become important to record additional information. Examples may include:

1. Detail breakdown of type and number of personnel on-site for each contractor/subcontractor and hours worked by each.
2. Detailed breakdown of heavy equipment on-site and hours each piece of equipment is actually used each day.
3. Material deliveries and quantities.
4. Delays and/or downtime (length of time, people affected, equipment not used, etc.).
5. Detailed weather information (e.g. periodic wind speed and direction throughout day).
6. Length of time spent in upgraded levels of PPE and number of personnel working in exclusion zones.
7. Air monitoring results, dust control issues, air monitoring plan exceedances, etc.
8. Details for erosion and sediment control issues (e.g. tracking onto roadways).
9. Detailed lists of all site visitors (sign in/sign out sheets).

F. REFERENCES:

CHA Total Technical Quality Control Manual, Field Observations Section: http://chanet.cha-llp.com/manual/ttqc/section7/index.cfm

G. APPENDICES/FORMS:

Field Observation Report – for simple, short duration projects.

Construction Observation Report – for complex, longer duration projects.

END OF SOP
Final Check by C. Burns 11/19/2015

APPENDIX B

Field Sampling Plan

FIELD SAMPLING PLAN

Former Coyne Textile Facility
BCP Site #C734144
140 Cortland Avenue
City of Syracuse, New York

CHA Project Number: 33525

Prepared for:

Ranalli/Taylor St., LLC
450 Tracy Street
Syracuse, NY 13204

Prepared by:

One Park Place
300 South State Street, Suite 600
Syracuse, NY 13202
Phone: (315) 471-3920
Fax: (315) 471-3569

May 28, 2019

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TABLES

LIST OF ACRONYMS & ABBREVIATIONS

AOC	Area of Concern
BCP	Brownfield Cleanup Program
BGS	Below Ground Surface
CHA	CHA Consulting, Inc.
ELAP	Environmental Laboratory Approval Program
FSP	Field Sampling Plan
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
IRMWP	Interim Remedial Measure Work Plan
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	Photoionization Detector
PCB	Polychlorinated Biphenyl
QAPP	Quality Assurance Project Plan
SVOC	Semivolatile Organic Compounds
SOP	Standard Operating Procedure
TAL	Target Analyte List
TIC	Tentatively Identified Compounds
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

1.0 INTRODUCTION

This Field Sampling Plan (FSP) has been prepared for the Former Coyne Textile Facility (Site), located at 140 Cortland Avenue in the City of Syracuse, New York, and is to be utilized during the Interim Remedial Measure (IRM) for source removal at the Site. The Site is a part of the New York State Department of Environmental Conservation's (NYSDEC) Brownfield Cleanup Program (BCP). The Site location is shown on Figure 1. A Site layout is provided on Figure 2.

This FSP outlines the protocols which will be followed during the remedial activities and has been prepared as Appendix B to the Interim Remedial Measure Work Plan (IRMWP) for the project. In general, all activities will be performed in accordance with the CHA Consulting, Inc. (CHA) Standard Operating Procedures (SOPs) that are included in Appendix A of the IRMWP.

The following activities will be conducted as part of the remedial activities:

- Waste characterization sampling;
- Removal of underground storage tanks (USTs);
- Excavation of contaminated soil;
- Collection of confirmation soil samples;
- Equipment decontamination and cleaning; and
- Waste handling and transportation.

2.0 GENERAL SAMPLING PROTOCOLS

The sampling approach and rationale for sample collection is described in Table 1. 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 C of the IRMWP. 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 D of the IRMWP.

2.1 SAMPLE DESIGNATION

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 during the Remedial Investigation conducted by CHA in 2018, CHA will start at number 200 on all media types (e.g. SOIL-200) during this IRM.

The following abbreviations will be used to identify media types:

Subsurface Soil……SOIL
Subsurface Soil - Sidewall……..SOIL-SW
Subsurface Soil – Bottom……SOIL-B
Waste Characterization Soils……..SOIL-WC
Blind Duplicate……CHA-001

2.2 SAMPLE HANDLING

A new pair of disposable latex gloves will be used at each location sampled for chemical analyses. Additional glove changes will be undertaken as conditions warrant.

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.

After sample collection, the sample containers will be logged onto a chain of custody record as 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 Service Center located in Syracuse, New York, or coordinate with their courier service.

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

2.3 FIELD DOCUMENTATION

Pertinent field 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 and CHA SOP#903 Remedial Construction Oversight and Documentation. 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, Draeger Tube results)
- 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 REMEDIAL ACTIVITIES

3.1 UST Removal and Excavation of Contaminated Soil

Generally, the remedial action to be completed consists of contaminant source removal from the area of concern (AOC) identified as the former UST area. The following are the anticipated components of the selected remedy:

- If necessary, the single-story portion of the building will be demolished, and the roof will be removed to facilitate access to the USTs with large equipment.
- The USTs will be removed and transported for off-Site disposal.
- Contaminated soil within the AOC will be excavated no deeper than the water table, which is anticipated between 8 and 10 ft below ground surface (bgs).
- Post-excavation samples will be collected along the excavation walls.
- Post-excavation samples will be collected beneath the former USTs.
- The excavation area will be backfilled with clean structural fill material.
- The excavation area will be finished with a mixture of asphalt, concrete slab or vegetative landscape upon completion, thus capping the AOC after source removal.

3.2 Confirmation Sampling

One soil sample from each sidewall of the excavation and a minimum of one soil sample from beneath the UST will be submitted to an off-site New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory for a select set of parameters as described in Table 2 of the QAPP. Confirmation sampling shall be conducted near the bottom of each sidewall. Groundwater is anticipated to be reached at the bottom of the excavation; however, it is assumed that no groundwater samples will be collected as part of this effort. Sample locations should be biased toward the area of the highest contamination identified from visual, olfactory, and photoionic observations.

Soil samples will be analyzed for the presence of volatile organic compounds (VOCs) will be collected using a Terra Core^{TM} sampler or equivalent. The 5-gram plug of soil will be capped and sent to the laboratory where it will be preserved, extracted, and analyzed. The remaining sample volume will be homogenized by the following process:

1. Remove rocks, twigs, leaves and other debris from the sampling device.

2. Place the sample into a stainless-steel bowl and thoroughly mix using a stainless steel spoon.

3. Scrape the sample from the sides, corners and bottom of bowl, roll to the middle of the bowl and mix.

4. Quarter the sample and move to the four corners of the bowl. Each quarter will be individually mixed and rolled to the center of the bowl and then the entire sample will be mixed again.

5. Place the sample into the appropriate glassware required for each of the remaining parameters; semi-volatile organic compounds (SVOCs), target analyte list (TAL) metals, and total polychlorinated biphenyls (PCBs).

3.3 WASTE PRE-CHARACTERIZATION SAMPLING

Soil waste pre-characterization will occur prior to source removal to facilitate live-loading of contaminated soils. One subsurface soil sample will be collected via direct push and be biased towards the most contaminated soils, based on photoionic evidence. The sample will be analyzed for the parameters listed in Table 2 of the QAPP.

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.

4.0 EQUIPMENT DECONTAMINATION

Prior to mobilization, the excavator and any other large equipment brought to the Site shall be thoroughly cleaned to remove oil, grease, mud, and other foreign matter. Upon completion of daily activities and/or upon demobilization from the Site, cleaning will be conducted at a predetermined on-site location. Cleaning of small and large equipment will be accomplished using the procedures outlined in the following sections and in accordance with CHA SOPs.

4.1.1 Small Equipment

For all activities, dedicated sampling equipment is preferred. However, if non-dedicated equipment is used (i.e. stainless-steel spoon), 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 and after 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 excavator and any other large equipment will be operated in a manner such that the tracks will not come into contact with contaminated soil, to the extent feasible. The excavator bucket will require decontamination prior to demobilization from the Site. Decontamination will be conducted by the Contractor.

5.0 INVESTIGATION DERIVED WASTE

It is anticipated that all soil removed from intrusive activities will be live-loaded into trucks with canvas or tarpaulin covers. If the soil is saturated, polyethylene liners will be installed in the truck box to prevent spillage or dripping of liquids from the contaminated soil. If live-loading of soil is not feasible, soil may be stockpiled on polyethylene sheeting and covered, in a predetermined staging area as described in Section 3.3.3 of the IRMWP. Approximately 230 cubic yards of soil are anticipated from these activities.

TABLES

Table 1: Sampling Rationale

Sample ID	Matrix	Sample Depth(s)	Sample Location	Analytical Parameters	Rationale
SOIL-SW-200 – SOIL-SW-203	Sub-Surface Soil, Sidewall Sample	Near the bottom of the excavation	Sidewall of the Former UST AOC	TCL VOCs, TCL SVOCs, TAL Metals, Total PCBs	Documentary sample for contaminant source removal. It is anticipated the contamination will extend past the limits of excavation, but gross contamination shall be removed to the greatest extent feasible.
SOIL-B-200 & SOIL-B-201	Sub-Surface Soil, Bottom Sample	0 to 2 ft below the bottom of the USTs	Bottom of the Former UST AOC	TCL VOCs, TCL SVOCs, TAL Metals, Total PCBs	Documentary sample for contaminant source removal. It is anticipated the contamination will extend past the limits of excavation, but gross contamination shall be removed to the greatest extent feasible.
SOIL-WC-200 – SOIL-WC-201	Sub-Surface Soil	Soil waste pre-characterization, depth of the most contaminated soils	Former UST AOC	TCLP VOCs, TCLP SVOCs, TCLP Metals plus Mercury, TCLP Pesticides, TCLP Herbicides, PCBs, Reactivity, and Corrosivity	Waste characterization samples for disposal of soil during source removal. Live-loading of soils from the excavation is preferred, thus pre-characterizing the soil for the disposal facility is necessary.

APPENDIX C

Quality Assurance Protection Plan

QUALITY ASSURANCE PROJECT PLAN

Former Coyne Textile Facility
BCP Site #C734144
140 Cortland Avenue
City of Syracuse, New York

CHA Project Number: 33525.2001

Prepared for:

Ranalli/Taylor St., LLC
1200 State Fair Boulevard
Syracuse, NY 13209

Prepared by:

One Park Place
300 South State Street, Suite 600
Syracuse, NY 13202
Phone: (315) 471-3920
Fax: (315) 471-3569

May 28, 2019

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LIST OF ACRONYMS & ABBREVIATIONS

AMSL	Above Mean Sea Level
ASP	Analytical Services Protocol
AOC	Area of Concern
BCP	Brownfield Cleanup Program
CHA	CHA Consulting, Inc.
COC	Chain of Custody
DCE	Dichloroethene
DER	Division of Environmental Remediation
ELAP	Environmental Laboratory Approval Program
EPA	Environmental Protection Agency
FSP	Field Sampling Plan
GC	Gas Chromatography
IRM	Interim Remedial Measure
IRMWP	Interim Remedial Measure Work Plan
MS	Mass Spectrometry
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Heath
PID	Photoionization Detector
PCB	Polychlorinated Biphenyls
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RPD	Relative Percent Difference
RI	Remedial Investigation
SVOC	Semivolatile Organic Compound
SCO	Soil Cleanup Objective
SOP	Standard Operating Procedure
TAL	Target Analyte List
TCL	Target Contaminant List
TOGS	Technical and Operational Guidance Series
PCE	Tetrachloroethene
TCLP	Toxicity Characterization Leaching Procedure
TCE	Trichloroethene
UST	Underground Storage Tank
USEPA	United States Environmental Protection Agency
VOA	Volatile Organic Analysis
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 Interim Remedial Measure (IRM) that will be conducted at the Former Coyne Textile Facility Brownfield Cleanup Program (BCP) Site in Syracuse, New York. The scope of work associated with the remedial activities and specific areas of concern that will be addressed are summarized in the Interim Remedial Measures Work Plan (IRMWP).

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 of the IRMWP.

1.1 SITE DESCRIPTION

The Former Coyne Textile Facility is located in an urban area at 140 Cortland Avenue in the City of Syracuse, Onondaga County, New York. The Site limits are generally bounded by commercial buildings to the north, South Salina Street to the east, Tallman Street to the south and South Clinton Street to the west. The Site is identified as two non-contiguous areas, but the focus of the IRMWP is a section of the main laundry facility, as described below:

- The former main laundry facility and offices are known as 140 Cortland Avenue (Tax Map No. 094.-05-06.0) and consist of one parcel of land totaling approximately 1.75 acres. This parcel consists of the currently vacant former laundering facility and offices (approximately 118,500 square feet), sidewalks and limited vegetation. The building is a concrete block building with a slab-on-grade foundation.

The site is currently inactive and is zoned for commercial use. The general area surrounding the Site is highly developed and consists of commercial and industrial facilities. Several rows of multifamily houses are located northwest of the Site.

Based on a review of the 1973 U.S. Geologic Survey Map 7.5-minute Quadrangle for Syracuse West, New York, the Site has an approximate elevation of 390 feet above mean sea level (AMSL) and is relatively flat. The surrounding areas to the east and west slope downward toward Onondaga Creek. Onondaga Creek is located approximately 600 feet west of the Site.

Characterization of the contamination via Phase I, II, and III investigation by GZA GeoEnvironmental in 2014 and the Remedial Investigation by CHA in 2018 indicated a central location of PCE contamination and its breakdown products (TCE, DCE, and vinyl chloride) near the northwest portion of the main building at 140 Cortland Avenue. Widespread volatile organic compound (VOC) and metal contamination is present within the soil and groundwater throughout the site.

The focus of the IRMWP is the Former Underground Storage Tank (UST) Area. The Former UST Area is located in the northwestern portion of the building. A UST containing PCE and Stoddard solvent was identified to be "closed in place" but lacking appropriate closure documentation. Investigation of this area was conducted during the RI and several subsurface soil samples, groundwater samples, and soil vapor samples were collected in this area. Main contaminants of concern include tetrachloroethene (PCE), trichloroethene (TCE), cis 1,2-Dichloroethane (DCE), and vinyl chloride. During May 2019, the concrete floor associated with the Former UST Area was removed to reveal evidence of two, 6-foot diameter tanks and a smaller, approximately 200-gallon, tank. Each of these tanks was filled with what appears to be concrete.

During the RI, PCE was identified within the Former UST Area at concentrations exceeding its respective Part 375 Commercial Soil Cleanup Objective (SCO) in SOIL-116 (460 mg/kg) and lesser concentrations of TCE, DCE, and vinyl chloride in SOIL-116 and SOIL-119. PCE was detected in excess of the Part 375 Commercial SCO throughout this area. Metals (mercury and lead) and total PCBs exceeded the Part 375 Unrestricted SCO in this area but are less than the respective Part 375 Commercial SCOs.

Historical groundwater sampling identified the presence of chlorinated VOC contamination, including PCE, TCE, DCE, and vinyl chloride, in the wells directly adjacent to the Former UST Area. During the RI, Temp-GW001 and the cluster at GW-103 were located within and adjacent to the Former UST Area, respectively. Concentrations of PCE, TCE, DCE, and vinyl chloride, among others, were detected at concentrations exceeding their applicable Technical and Operational Guidance Series (TOGS) 1.1.1 Class GA Ambient Water Quality Standards.

1.2 SCOPE OF WORK

The IRMWP includes source removal from the area of concern (AOC) identified as the Former UST Area. The following are the anticipated components of the selected remedy:

- If necessary, the roof of the single-story portion of the building will be demolished to facilitate access to the USTs with large equipment.
- The USTs will be removed and transported for off-Site disposal.
- Contaminated soil within the AOC will be excavated to a maximum depth of the water table,

which is anticipated between 8 and 10 ft bgs.

- Post-excavation samples will be collected along the excavation bottom and sidewalls.
- The excavation area will be backfilled with clean structural fill material.
- The excavation area will be finished with a mixture of asphalt, concrete or vegetative landscape upon completion.

This QAPP has been prepared in accordance with NYSDEC DER-10 (May 2010) to outline the procedures and protocols that will be utilized collect waste characterization samples prior to UST removal and contaminated soil excavation and collect confirmation samples from the sidewalls of the excavation.

The data derived from the IRMWP will be included in the Construction Completion Report. Source removal is one component of the remedial actions proposed at the Site and will reduce the future migration of contamination.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

The IRMWP activities are being conducted by Ranalli/Taylor St. under the supervision of the Ranalli/Taylor St. Project Manager, who is the prime contact for communication with the NYSDEC. Engineering oversight and coordination of these activities are to be provided by CHA. The CHA Project Manager is responsible for the delivery of CHA services. Resumes for CHA staff providing environmental services are included in Appendix A.

NYSDEC Regulatory Authority

Michael Belveg - NYSDEC Project Manager

- Approve the IRMWP and all appendices, including this QAPP, and any modifications to the project

Ranalli/Taylor St.

James Ranalli – Ranalli/Taylor St. Project Manager

- Responsible for the overall Brownfield Cleanup Program management of the Former Coyne Textile Facility.

CHA

Meghan Platt – CHA Project Manager, Technical Manager/Project Coordinator

- Responsible for following the approved RIWP, 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 Quality Assurance/ Quality Control (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.

Karyn Ehmann - 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.
- Provide field management of sample collection and field QA/QC;
- Responsible for maintenance of the field equipment; and
- 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

Name	Address	Responsibilities
Michael Belveg NYSDEC Project Manager	615 Erie Boulevard West Syracuse, NY 13204 (315) 426-7400 Michael.Belveg@dec.ny.gov	Mr. Belveg will represent the NYSDEC in its review and oversight function, in its financial sponsorship, and as arbiter on technical matters
James Ranalli Ranalli/Taylor St., LLC Owner	1200 State Fair Boulevard Syracuse, NY 13209 (800) 772-1667 jamesranalli@unitedautosupply.com	Mr. Ranalli will represent Ranalli/Taylor St. in the review and oversight of the project, participate in citizen participation activities, and serve as the point of contact for Ranalli/Taylor St.
Meghan Platt CHA Project Manager	300 South State Street Syracuse, NY 13202 (315) 257-7145 meghanplatt@chacompanies.com	Ms. Platt will oversee the project, provide quality control on documents and determinations and mentor the daily task manager.

Name	Address	Responsibilities
Dr. Christopher Burns, P.G. CHA CHA Quality Assurance/ Quality Control Officer	9020 Stony Point Parkway Suite 160 Richmond, VA 23235-4700 (804) 897-0954 ext. 248 cburns@chacompanies.com	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.
Meghan Platt CHA Technical Manager/ Project Coordinator	300 South State Street Syracuse, NY 13202 (315) 257-7145 meghanplatt@chacompanies.com	Ms. Platt 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.
Karyn Ehmann CHA Field Leader & Health and Safety Officer	300 South State Street Syracuse, NY 13202 (315) 257-7250 (office) (585) 721-2402 (cell) kehmann@chacompanies.com	Ms. Ehmann will supervise field investigation activities and will also serve as database manager. Ms. Ehmann will serve as the Health and Safety point of contact for CHA staff.
Candace Fox Alpha Analytical, Inc. Laboratory Project Manager	8 Walkup Drive Westborough, MA 01581 (508) 898-9220	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 10.0 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.

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. 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. Trip blanks will be submitted with each cooler containing aqueous samples to be analyzed for VOCs.

The sampling and analysis program is summarized below 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.

Soil samples will be analyzed for all or some of the following:

- Target compound list (TCL) volatile organic compounds (VOCs);
- TCL semi-volatile organic compounds (TCL SVOCs);
- Perfluoroalkyl Substances (PFAS) via USEPA Method Modified 537;
- 1,4-Dioxane via USEPA Method 8270D;
- Target Analyte List (TAL) metals; and
- Polychlorinated biphenyls (PCBs).

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 as a check on the analytical method's accuracy and precision. Trip blank samples (for VOC determinations only) will be shipped by the laboratory to the Site and back to the laboratory without opening in the field. The trip blank will provide a measure of potential cross-contamination of samples resulting from shipment, handling and/or ambient conditions at the Site.

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 will include the collection and analyses waste characterization and confirmation soil samples. Details regarding specific sampling activities are provided in the IRMWP 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 B of the IRMWP. 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

Matrix (Sample Type)	Type of Sample	Analysis	Parameter/Fraction	Number of Primary Samples	Number of Duplicates/ MS/MSD	Number of Trip Blanks/Field Blanks/Equipment Blanks	Sampling Locations	Minimum Sample Volume/ Container	Sample Preservation	Technical Holding Time
Soil - Waste Pre-Characterization	Subsurface Soil	EPA Method 8260C	TCLP VOCs	2	0/0/0	0/0/0	SOIL-200, SOIL-201	5 grams/40mL Amber VOA	$NaSO_4$, Cool to 4 °C	14 days extract
	Subsurface Soil	EPA Method 8270D	TCLP SVOCs	2	0/0/0	0/0/0	SOIL-200, SOIL-201	4 oz glass wide	Cool to 4ºC	14 days extract
	Subsurface Soil	EPA Method 6010C, 7471B	TCLP Metals, plus Mercury	2	0/0/0	0/0/0	SOIL-200, SOIL-201	8 oz glass wide	Cool to 4ºC	180 days (6010) 28 days (mercury) 14 days (cyanide)
	Subsurface Soil	EPA Method 8082A	PCBs	2	0/0/0	0/0/0	SOIL-200, SOIL-201	4 oz glass wide	Cool to 4ºC	14 days extract
	Subsurface Soil	EPA Method 8081A	TCLP Pesticides	2	0/0/0	0/0/0	SOIL-200, SOIL-201	4 oz. glass wide	Cool to 4ºC	14 days extract
	Subsurface Soil	EPA Method 8151A	TCLP Herbicides	2	0/0/0	0/0/0	SOIL-200, SOIL201	4 oz. glass wide	Cool to 4ºC	14 days extract
Soil - Confirmation Samples	Subsurface Soil	EPA Method 8260C	TCL VOCs	6	0/0/0	0/0/0	Excavation Sidewalls SOIL-SW-200 through SOIL-SW-203 Excavation Bottom SOIL-B-200, SOIL-B-201	5 grams/40mL Amber VOA	Cool to 4ºC	14 days
	Subsurface Soil	EPA Method 8270D	TCL SVOCs	6	0/0/0	0/0/0	Excavation Sidewalls SOIL-SW-200 through SOIL-SW-203 Excavation Bottom SOIL-B-200, SOIL-B-201	8 oz. Amber jar	Cool to 4ºC	14 days
	Subsurface Soil	EPA Method 6010C, 7470A	TAL Metals	6	0/0/0	0/0/0	Excavation Sidewalls SOIL-SW-200 through SOIL-SW-203 Excavation Bottom SOIL-B-200, SOIL-B-201	8 oz. Amber jar	Cool to 4ºC	180 days (6010) 28 days (mercury) 14 days (cyanide)

Matrix (Sample Type)	Type of Sample	Analysis	Parameter/Fraction	Number of Primary Samples	Number of Duplicates/ MS/MSD	Number of Trip Blanks/Field Blanks/Equipment Blanks	Sampling Locations	Minimum Sample Volume/ Container	Sample Preservation	Technical Holding Time
	Subsurface Soil	EPA Method 8082A	Total PCBs	6	0/0/0	0/0/0	Excavation Sidewalls SOIL-SW-200 through SOIL-SW-203 Excavation Bottom SOIL-B-200, SOIL-B-201	4 oz. Amber jar	Cool to 4ºC	14 days
	Subsurface Soil	EPA Method Modified 537	Perfluoroalkyl Substances (PFAS)	3	0/0/0	0/0/0	Excavation Sidewalls SOIL-SW200 through SOIL-SW-201 Excavation Bottom SOIL-B-200	4 oz. amber jar	Cool to 4°C	14 days
	Subsurface Soil	EPA Method 8270D	1,4-Dioxane	3	0/0/0	0/0/0	Excavation Sidewalls SOIL-SW200 through SOIL-SW-201 Excavation Bottom SOIL-B-200	8 oz. amber jar	Cool to 4°C	14 days
Soil - Imported Fill	Imported Fill	EPA Method 8260C	TCL VOCs	4	0/0/0	0/0/0	Stockpile – grab sample	8 oz. amber jar	Cool to 4ºC	14 days
	Imported Fill	EPA Method 8270D	TCL SVOCs	1	0/0/0	0/0/0	Stockpile – composite sample	8 oz. amber jar	Cool to 4ºC	14 days
	Imported Fill	EPA Method 8082	PCBs	1	0/0/0	0/0/0	Stockpile – composite sample	4 oz. amber jar	Cool to 4°C	14 days
	Imported Fill	EPA Method 6010	TAL Metals	1	0/0/0	0/0/0	Stockpile – composite sample	8 oz. amber jar	Cool to 4°C	6 months
	Imported Fill	EPA Method Modified 537	Perfluoroalkyl Substances (PFAS)	1	0/0/0	0/0/0	Stockpile – composite sample	4 oz. amber jar	Cool to 4°C	14 days
	Imported Fill	EPA Method 8270D	1,4-Dioxane	1	0/0/0	0/0/0	Stockpile – composite sample	8 oz. amber jar	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 (±2°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 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) 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 B.

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 soil samples will be in accordance with NYSDEC July 2005 ASP. 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 EQuIS format will be provided to NYSDEC.

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 IRMWP/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 RPD will be calculated as follows:

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

D_1 = matrix spike recovery
D_2 = 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 EPA 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 Staff Resumes

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 - NY, DE, IN, NH, VA

Memberships & Affiliations

National Ground Water Association

Christopher A. Burns, PhD, PG

QA/QC - Principal Scientist/Geologist

Chris has 28 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:

GROUNDWATER SUPPLY & RESOURCE PROTECTION

Town of Vestal, NY Expansion of Water Supply System. Project Manager responsible for identifying best locations to install additional test wells ultimately leading to expansion of one or more of three groundwater well fields. Work included detailed evaluation of local geology and groundwater availability analysis as required by the Susquehanna River Basin Commission.

Gerry Foundation, Inc., Bethel Performing Arts Center, NY. Project Manager responsible for identifying groundwater supply source for new facility. Work included a desktop study to identify potential sources within overburden and fractured bedrock, a fracture-trace study, a surface geophysical survey, exploratory drilling, and pump tests.

Tioga County, NY Industrial Development Agency. Project Manager for development of new water supply for retail distribution center. Included investigation of subsurface stratigraphy, installation of production wells, completion of step drawdown and constant rate pumping tests and water quality testing.

Brian Barr & Germain Racine, Evaluation of Water Budget. Project Manager responsible for developing pre- and post-development water budget for proposed new housing development upgradient of park containing endangered plant species. Work included subsurface investigation to develop site-specific data on groundwater recharge potential and water budget modeling to evaluate changes in recharge, runoff, and evapo-transpiration in post-development condition.

St. Regis Mohawk Tribe, Casino, Environmental Consulting. Project Manager responsible for evaluating potential impact of saltwater impact on domestic water wells. Also evaluated potential yield of aquifer relative to installation of new water supply wells.

New York State Office of General Services, MacCormick Secure Center, Emergency Water System Evaluation & Upgrade. Task manager responsible for providing technical assistance in identifying cause of failure of a water supply well and design and installation of new water supply well. Project required immediate response because of the need to supply water to this youth correctional facility.

McMahon, Kublick, McGinty & Smith, PC, Miller Container Facility, Hydrogeologic Evaluation. Project manager responsible for the evaluation of the effect of contamination from the adjacent industrial site on a City of Fulton wellfield. Project included review of 2-D groundwater flow model prepared by another consultant and making recommendations regarding its accuracy in predicting impacts to the wellfield. Also responsible for evaluation of aquifer yield for potential expansion of the City of Fulton wellfield.

Ridgebury Road, Groundwater Feasibility Study. Project manager responsible for conducting preliminary investigation of potential for groundwater supply in area of proposed development. Evaluated the potential of both overburden and bedrock aquifers through review of available geological information and local well driller's logs. Also used fracture trace analysis to identify potential test well locations in the bedrock.

Red Mill Site, DE, Water Resource Protection Study. Managed investigation of the potential for groundwater recharge on site slated for commercial development through extensive test boring and test pit program.

Broome County, NY, Water Resource Evaluation. Compiled information necessary to create countywide groundwater recharge and aquifer map.

Cortland Water Board, Cortlandville Wellhead Protection. Assisted in development of wellhead protection plan for the Town of Cortlandville over sole source aquifer. Evaluated potential contaminant sources and identified best management practices that included development of new town ordinance.

Village of Salem, New Municipal Water System. (WSD). Project Manager for identifying and developing a new 350 gpm community water system using groundwater production wells. Coordinated with Rural Water hydrogeologists in a team effort to identify the preferred site to avoid under the influence of surface waters and known contaminant areas.

New York State Office of General Services, MacCormick Secure Center - Emergency Water System Evaluation & Upgrade. Task Manager responsible for providing technical assistance in identifying cause of failure of a water supply well and design and installation of new water supply well. Project required immediate response because of the need to supply water to this youth correctional facility.

Greater Rochester International Airport (GRIA). Assisted GRIA with negotiation of a Consent Order relative to the remediation of two former fuel farms at the airport. Provided assistance with the operation, maintenance, and monitoring of two groundwater remediation systems including monthly and quarterly sampling events. Provided evaluation of results to optimize the performance of systems.

SOLID WASTE EXPERIENCE

Seneca Meadows, Inc., NY. Project Manager responsible for numerous projects since 1998 at largest privately owned landfill in NY. Projects include assistance with permits for landfill expansion, highway and bridge improvements, wetland delineation and ecological studies, mined land permits, site landscaping, sewer extension project, and stream restoration project.

City of Albany, NY Department of General Services. Project Manager responsible for post-closure monitoring of the Rapp Road Landfill, the Greater Albany Landfill and the North Albany Demolition Landfill and operational monitoring of the Albany Interim Landfill.

Village of Mount Kisco, NY. Project Manager overseeing weekly inspections of solid waste transfer station owned by Village but operated privately to determine if operators of transfer station were in compliance with solid waste regulations and local laws.

New York State Office of Parks, Recreation & Historic Preservation. Provided technical review of environmental monitoring reports for Youman's Flats, James Baird and Fahnestock State Park Landfills.

Town of Macedon, NY. Project Manager for investigation and closure of former town landfill. Closure investigation defined limit of waste and potential impacts to groundwater. Landfill closure complicated by presence of adjacent wetlands and encroachment of waste on neighboring property. Conducted 5 years of post-closure monitoring and successfully obtained variance to reduce monitoring frequency.

Franklin County, NY Solid Waste Management Authority. Project Manager responsible for completing a part 360 Permit to construct a Construction and Demolition Debris Landfill within the Adirondack Park. Compiled available environmental monitoring data from C&D landfills across NY to predict contaminant concentrations in groundwater.

Towns of Macedon and Perinton, NY. Retained by both adjoining Towns to review Environmental Impact Statement and solid waste management permit application for the High Acres Landfill Expansion operated by Waste Management.

Former Town of Salina Landfill. Project Manager responsible for overseeing investigation and remedial design of 55-acre landfill also designated as a hazardous waste site. Project included a 5 acre footprint reduction, design of both geomembrane and clay caps, design of a groundwater/leachate collection system and an on-site pretreatment building, utility relocations and wetland mitigation.

Town of Brighton, NY. Project Manager responsible for completing a closure investigation of this former municipal landfill. Project included the development of sampling plans, interpretation of groundwater monitoring results, investigation of limit of waste, residential well surveys and preparation of reports to the NYSDEC.

Ulster County Resource Recovery Agency, NY. Supervised site selection study used to identify candidate areas for potential Greenfield site. Designed and supervised implementation of subsurface investigations on multiple sites. Selection criteria included proximity to transportation routes, site topography, site geology, presence of absence of threatened and endangered species, presence or absence of historic sites, and numerous other criteria.

City of Peekskill, NY. Project Manager for investigation of a former city landfill. The investigation included investigation of landfill gas, groundwater quality, surface water quality of adjacent tidal creek, and determination of limit of waste. Also, assisted the client with redevelopment of the site for a commercial tenant.

DuPont Washington Works Facility, WV. Supervised monitoring well installation program collecting soils and hydrogeologic data for closure of the Letart and Dry Run Landfills

Wyeth-Ayerst Pharmaceuticals - Lederle Laboratories, Pearl River, NY. Project Manager responsible for completion of closure investigation of this industrial landfill. Investigation consisted of soil gas survey and an evaluation of groundwater quality data.

CERCLA/RCRA EXPERIENCE

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.

Honeywell International, Inc., 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.

Impact Sports Equipment, Inc., Hevi-Duty Electric Site, Cortland, NY. Project Manager for subsurface investigation of former PCB transformer recycling plant. Investigation included evaluation of soil and groundwater quality and review of PCB cleanup conducted by former owner.

USEPA Region III, Havertown PCB Superfund Site, PA. Project Manager of RI/FS to define nature and extent of contamination in soil and groundwater associated with former wood treatment facility. Investigation focused on transport of several contaminants including PCB, arsenic, and dioxins from vadose zone into fractured rock aquifer. Assisted in design of multi-step treatment process for remediation of both soil and groundwater.

USEPA Region III, Croydon TCE Superfund Site, PA, Remedial Design/Remedial Action. Task Manager responsible for performing capture zone analysis of TCE plume in sand and gravel aquifer. Used pump tests and modeling to calculate number and spacing of extraction wells and rate of extraction.

SUBSURFACE INVESTIGATIONS/REMEDIATION

Aldi Inc., Watertown, NY. Task Manager responsible for completing a Phase I Environmental Site Assessment and Geotechnical Engineering Investigation of an old motel slated for demolition and redevelopment as a grocery store site. Of particular concern from both an environmental and geotechnical standpoint was the placement of a significant amount of fill material on site.

Queri Development Company, LLC, Amos Building ESA. Project Manager for Environmental Assessment and Remediation of site containing historic building in downtown Syracuse slated for re-development. Coordinated remediation with State Historic Preservation Offices

Borough of Wharton, NJ. QA/QC Manager for former leaking underground storage tank site located in the Borough of Wharton, NJ. Responsible for review of groundwater quality data and evaluation of the effectiveness of the existing remedial program.

Onondaga County Dept. of Law, Oncenter Hotel Project. Project Manager for subsurface investigation of parking lot proposed for construction of new hi-rise hotel. Site research indicated site was formerly a gas station. Investigation included determination of extent of soil contamination of investigation of groundwater quality.

Melvin & Melvin LLP, Proposed Hyundai Dealership Phase II ESA. Project Manager for subsurface investigation of former car dealership. Identified contamination and assisted in completing remediation of the site and obtaining site closure within 6-week period.

Westvale Plaza Partnership, Phase II Site Inspection, Westvale, NY. Project manager responsible for completing a Phase II Investigation of a commercial shopping center that was searching for new financing. The site included a former gas station and an operating dry cleaners. The challenge to the project was to complete the investigation within 5 days of receiving the assignment, which was done using expedited laboratory services.

Empire Federal Credit Union, Phase II Site Investigation. Project Manager for Phase II Site Investigation of potential credit union branch location. Former activities on property resulted in presence of contamination. Investigation showed contamination was minor and assisted client in obtaining closure of spill report for the site.

JGB Enterprises, Inc., Phase I & II ESA, Wendy's Restaurant. Project manager responsible for completing a Phase I/Phase II Investigation of a former Wendy's Restaurant. The project was required to be completed within 2 weeks. The investigative techniques included use of temporary groundwater monitoring wells and expedited laboratory services.

Town of Camillus, NY Nine-Mile Creek Aqueduct. Task Manager for evaluation of sediment thickness and sediment quality in former canal that was part of Erie Canal system. Included probes through sediment at 200-foot spacing.

Keycorp, NYS Branch Locations Phase I ESAs. Task manager that was part of team completing Phase I Environmental Site Assessments at 28 Key Bank Branches located throughout New York State. The team was required to complete all 28 assessments within 3 weeks of assignment. Project required multi-office coordination and review of work.

Ahold Financial Services, Tops Market, Rochester, NY. Task manager responsible for completion of Phase I/Phase II Environmental Site Assessment and Geotechnical Engineering Investigation of a commercial site in Rochester, New York. Historical research proved that a deep ravine once existed on site and had subsequently been filled. This information was invaluable in the foundation design for a new grocery store on site.

Aldi Inc., Syracuse, NY - Phase II Environmental Site Investigation. Project Manager for investigation of petroleum contamination at former automobile service center. Used geophysical survey, test pit explorations, geoprobe soil sampling, and permanent well installations to delineate extent of contamination. Offsite delineation of groundwater contamination was required as part of the project. Guided the process through site closure with the NYSDEC.

Virginia Department of Conservation & Recreation - Chippokes State Park. Project Manager for environmental monitoring of spill site at a Virginia State Park. Project includes monthly monitoring of a remediation system and quarterly environmental monitoring.

Impact Sports Equipment, Inc., Hevi-Duty Electric Site, Cortland, NY. Project Manager for subsurface investigation of former PCB transformer recycling plant. Investigation included evaluation of soil and groundwater quality and review of PCB cleanup conducted by former owner.

REM Property Holding, LLC, Kinney Drugs Store, Syracuse, NY. Supervised Phase II Site Investigation of site slated for commercial development. Site identified as former ash landfill. Provided recommendations for site improvements.

Santaro Industries, Inc., Former Amtrak Facility, Syracuse, NY. Project Manager responsible for evaluating environmental concerns at former rail passenger terminal. Investigations documented widespread subsurface contamination, but helped client obtain closure of the site from NYSDEC, based on documentation that the observed contamination originated from an off-site source.

Robert J. Miletsky, Esq., Former Mr. Peanut Site, Scranton, PA. Project Manager for subsurface investigation of former manufacturing plant. Investigation included collecting subsurface soil and groundwater samples and evaluating samples for contamination.

EXPERT WITNESS EXPERIENCE

Steve Simon, Esq. – Review of Investigation Reports. Provided expert review for attorney representing seller of a gas station. Issues focused on past remediation efforts and extent of clean-up and current groundwater conditions.

Hiscock & Barclay LLP, Petroleum Spill Case Support. Provide expert witness support regarding petroleum spill. Work included identification of other potential sources, qualitative analysis of fate and transport of contaminants, review of groundwater flow direction, and identification of data gaps in previous investigations.

Town of Ancram, NY. Retained as expert witness in opposition to proposed gravel mine. Client's concerns focused on potential impacts of gravel mine on nearby wetland and threatened species. Provided testimony at adjudicatory hearing that questioned the applicant's methodology.

Richfield Springs, NY - Case Support. Provided expert review for client selling property regarding investigations conducted by potential buyer's consultants. Specifically reviewed validity of data gathered during the investigations and how interpretation of the data may have detrimentally affected property value.

Town of Perinton, NY - Hess Remediation Plan Review. Project Manager providing assistance to the Town in aid of their desire to take over a contaminated property under the Brownfields Program so that property could be used to locate a long-planned connector road.

Phillips Lytle LLP, Petroleum Spill Case Support. Retained to provide expert witness review of contamination issues from four former underground fuel farms located at the Greater Rochester International Airport. Focused on chronology of spills, types of petroleum products used, and ownership history.

Town of Rindge, NH. Supervised project review of groundwater impacts from proposed expansion of wastewater treatment facility at Franklin Pierce College.

Phillips Lytle LLP, NFWB Sewer Tunnel Evaluation. Project Manager responsible for evaluating sources of 6.1 mgd of groundwater infiltration into sewer system. Project also involved evaluation of potential remedial measures that would be effective at reducing infiltration and developing a cost estimate for treating the excess infiltration over the last 40 years.

McMahon, Kublick, McGinty & Smith, PC, Miller Container Facility - Hydrogeologic Evaluation. Project Manager responsible for the evaluation of the effect of contamination from the adjacent industrial site on a City of Fulton wellfield. Project included review of 2-D groundwater flow model prepared by another consultant and making recommendations regarding its accuracy in predicting impacts to the wellfield. Also responsible for evaluation of aquifer yield for potential expansion of the City of Fulton wellfield.

BROWNFIELDS EXPERIENCE

City of Peekskill, NY Peekskill Landing Brownfields. Project Manager for State Brownfields Project. Site is located along the Hudson River. Working with the City and Scenic Hudson to redevelop the site as multi-use waterfront property.

Erie County, NY Industrial Development Agency, Buffalo Lakeside Commerce Park Brownfield. Responsible for environmental review of redevelopment project where new utilities were being installed on contaminated site. Required staff to implement soil management plan with respect to encountering contaminated soil during excavation for utilities.

City of Glens Falls, NY Brownfield Assessment Demonstration Pilot Program. The City of Glens Falls Brownfield Program involved the completion of Phase I Environmental Site Assessments of multiple sites and comprehensive Phase II investigations of select sites.

Broome County, NY Department of Planning and Economic Development. Project Manager responsible for overseeing site assessments for various sites identified in Broome County as Brownfield sites. Project included redevelopment analysis for former military depot.

Broome County, NY Department of Planning and Economic Development. Provided environmental review of sites within former Endicott-Johnson Spine Brownfield Opportunity Area.

JML Optical Industries, Inc., Rochester, NY. Project Manager for investigation and evaluation of remedial alternatives of former lens manufacturing facility with TCE contamination in the subsurface. Site characterization complicated by contamination from two adjacent sites. Project completed under NYSDEC Brownfields Cleanup Program.

OTHER PROJECTS

College of William & Mary, SPCC Plan Update. Project Manager responsible for updating the campus-side SPCC Plan in accordance with 40 CFR Part 112. The project included a review of their existing SPCC Plan (developed by CHA) and updating the plan to accommodate recent upgrades made to the facility.

State University of New York Upstate Medical University, Multi-Media Environmental Compliance Audit. Reviewer for multi-media compliance audit of entire campus. Audit included evaluation of laboratory facilities, hazardous waste storage areas, heating facilities, etc.

Relevant Publications:

Yancheski, T.B., Burns, C.A., and Charma, J., 1990, *Development with consideration for ground water protection; It can be done:* 1990 Cluster of Conferences, Ground Water Management, Book 1, p. 625-639, National Water Well Association

Burns, C.A., 1992, *The Use of Suction Lysimeters to Determine Contaminant Concentrations in Pore Water:* FOCUS Conference on Eastern Regional Ground Water Issues, p. 371-385, National Ground Water Association

Burns, C.A., and J. Spollen, 2000, *Natural Variation in Arsenic and Iron Concentration in Relation to Water Level Changes:* FOCUS Conference on Eastern Regional Ground Water Issues, National Ground Water Association

Burns, C.A., 2002, *Your Well, Your Aquifer, Actions for 2002:* New York Rural Water Association

Burns, C.A., 2002, *A Pre- and Post-Development Hydrologic Water Budget is Used to Understand Potential Impacts on a Downgradient Threatened Plant Species:* 2002 National Groundwater Association Northeast FOCUS Groundwater Conference.

Burns, C.A. and K. Cowan, 2003, *Nine Years of Environmental Monitoring: Lessons Learned at 3 Unlined Landfills:* Federation of New York Solid Waste Associations.

Williams, C. and C. Burns, 2003, *Local Government Taking the Lead,* New York State Economic Development Council Annual Meeting

Burns, C. A., 2009, *Marcellus Shale Geology 101*, New York Bar Association

Burns, C. A., 2009, *CHA's Path to Sustainability: A Continuing Story,* Capital Region Human Resource Association

Burns, C.A., 2015, *Why it Took Half a Career to Close a Landfill*, Lessons Learned but Not What You Learned in School, Federation of New York Solid Waste Associations.

Continuing Education:

- National Water Well Association, "Design and Analysis of Aquifer Tests" – 1991
- University of Delaware, "Fundamentals of Well Logging" - 1991

- SUNY ESF, “Geographic Information Systems” - 1996
- National Groundwater Association , “Fundamentals of Groundwater Geochemistry” -— 1999
- Advances in Hydrogeologic Characterization of Fractured Bedrock Systems - 2003
- Advances in Pumping and Slug Testing for Improved Site Characterization: New Concepts, Field Methods and Data Analysis Techniques – 2004
- American Institute of Professional Geologists, “Isotopic Geochemistry Symposium” – 2005

Scott M. Smith, PE

Principal Engineer

Scott has 22 years of 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:

BROWNFIELDS

City of Glens Falls, Brownfield Assessment Demonstration Pilot Program. Project Engineer for the evaluation and prioritization of approximately fifty properties for redevelopment within the Warren Street Corridor. Activities included developing an inventory of sites, developing various maps using GIS, community participation meetings/ presentations/workshops, and prioritizing Brownfield parcels of interest. Responsibilities also included the coordination of all Phase II field activities of selected priority sites.

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.

Broome County, NY Department of Planning and Economic Development. Project Engineer assigned to various assignments under this term agreement for site assessments of Broome County Brownfield Sites, including a former military depot and a large former industrial site. One of Mr. Smith's primary responsibilities was developing the building demolition and remedial construction design documents for the former Endicott Forging plant. This project involved management of asbestos materials in the buildings, removal of remaining USTs, management of free product, and installation of a final soil cover system across the site following remediation.

Erie County IDA, Buffalo Lakeside Commerce Park Brownfield. Project Engineer responsible for preparing a soil management plan and air monitoring program to be utilized during construction. As part of the design documents, Mr. Smith also worked with the site engineers to calculate expected groundwater inflow rates into trenches and groundwater management strategies. Mr. Smith was also responsible for directing field oversight activities and preparing a final certification report.

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

Registrations & Certifications

Professional Engineer - VA, PA, NY

Memberships & Affiliations

Air and Waste Management Association

American Society of Civil Engineers

City of Peekskill, Peekskill Landing Brownfield. Project Engineer responsible for overseeing the design team during the preparation of remedial design documents for this Hudson River waterfront project intended for multi-use redevelopment. Mr. Smith also assisted the project team with various construction administration activities, including review of contractor submittals and management of design changes during the remedial activities.

Town of Salina, Salina Landfill Superfund Site. Project Engineer responsible for reviewing the remedial design documents and currently lead engineering overseeing the implementation of the remedial action of a 55-acre inactive hazardous waste landfill. The primary elements of the remedial action include off-site disposal hazardous waste, waste consolidation, a gas venting system, and a combination of clay and geosynthetic Part 360 caps. The project was complicated by numerous utilities bisecting the Site and involvement of multiple agencies.

Utica City Dump, Remedial Investigation/Feasibility Study. Project Engineer assisting in the preparation of a Remedial Investigation and Feasibility Study (RI/FS) for the Utica City Dump under the terms of the New York State Superfund Standby Contract. Specific duties included data analysis from data collected over a two-year period of time and several matrices. Also responsible for evaluating potential leachate collection systems for this 110 acre landfill, including pump stations and gravity systems.

Riverbend Site Redevelopment for Solar City, Buffalo, NY. Lead Environmental Engineer for the construction of a 1.2-million square foot solar panel manufacturing company as part of the redevelopment of an approximately 88-acre parcel that was home to the former Republic Steel. Responsible for preparing a detailed work plan, preparing health and safety plans, negotiating with NYSDEC, providing air monitoring and field screening services during intrusive activities, sampling materials, providing guidance to the contractor on the management of contaminated media, reviewing contractor submittals for compliance with NYSDEC requirements, and preparing SWPPP inspections and more during the redevelopment of the property. Mr. Smith also made recommendations for vapor mitigation systems beneath the building, soil cover and demarcation barrier materials, and assisted in the preparation of SPCC plans for both on-site emergency backup generators and two 115 kV transformers in an adjacent substation.

PHASE I ESA

Monahan Development Corporation, Monahan Development - Phase 1 ESA. Project Manager responsible for reviewing a Phase I Environmental Site Assessment of the former Onondaga Historical Association Museum in downtown Syracuse, New York. The almost 100-year old structured was targeted for redevelopment into high scale apartments and condominiums.

Pyramid Companies, Feasibility Study for a Parking Garage. Project Engineer responsible for preparing a Phase I ESA of ten, approximately 100-year old buildings in Downtown Syracuse, New York as part of the SEQRA evaluation for redevelopment of these parcels for a multi-purpose structure, including retail space, residential units, and a parking garage. Mr. Smith also assisted with the completion of pre-demolition asbestos surveys of all ten buildings completed on an expedited basis.

Gmul Investment Company, Ltd., Hotel Syracuse & Addis Building. Mr. Smith served as Project Manager for this project which involved a Phase I Environmental Assessment of the Hotel Syracuse and included limited asbestos sampling activities.

Best Western Hotel, 670 State Fair Blvd. Phase I ESA. Project engineer responsible for completing a Phase I and II investigations at this proposed hotel facility located adjacent to the New York State Fair Grounds. A subsurface investigation, including the installation of borings and test pits, was completed to verify that the historic releases up-gradient of the Property as well as into the adjacent Ninemile Creek.

Jay Yennock, Phase I ESA. Performed a Phase I Environmental Site Assessment of a former marina and 84-lumber facility located in Cicero, New York. The assessment was completed in accordance with ASTM 1527-00 and within only a three-day period to meet the client schedule. The property was redeveloped for a furniture retail store.

S&R Custom Homes Inc., Camillus PUD. Project Manager responsible for reviewing a Phase I ESA for an approximately 88-acre residential subdivision off Warners Road in the Town of Camillus, New York.

Stonegate Subdivision, Planning & Utility Design. Responsible for managing the completion of a Phase I Environmental Site Assessment for a proposed 109-lot residential development off NYS Route 173 in the Town of Onondaga, New York.

Bentley-Settle Building-Route 175, Construction, Highway & Utility Design. Project Manager responsible for reviewing a Phase I Environmental Site Assessment for a 167-acre property located off of New York State Route 175 in the Town of Onondaga, New York. CHA also assisted the client with the preparation of site plans and a Draft Environmental Impact Statement (DEIS) for this multi-use development, which included single-family detached homes, patio homes, condominiums, commercial areas, and support facilities.

Proposed Hyundai Dealership Phase II ESA. Project Engineer responsible for directing a Phase II subsurface investigation of an approximately two-acre parcel in the City of Syracuse, New York for redevelopment as an automobile dealership. Mr. Smith also completed supplemental investigation to delineate the extents of two petroleum-impacted areas on the site, prepared work plans for the management of contaminated soils excavated at the site, provided construction oversight and coordination during the implementation of the remediation and the site, completed a site closure report, and obtained closure of the spill report from NYSDEC on behalf of the client following completion of the remedial work.

Queri Development Company, LLC, Amos Building ESA. Project Manager responsible for supervising the completion of a Phase I and II Environmental Site Assessments of a six parcel block in downtown Syracuse, New York. Mr. Smith, developed a Remedial Action Work Plan that was prepared to meet HUD requirements and was approved by NYSDEC. Directed and coordinated all remedial work at the site, including the removal of two underground storage tanks, removal of off-site contaminated soils, and backfilling operations. Mr. Smith also prepared a Remedial Action Summary Report to obtain closure of the spill report associated with the site.

Kinney Drugs - Brighton Avenue, Syracuse, NY Site Assessment. Project Engineer responsible for reviewing a combined Phase I & II Environmental Site Assessment of a vacant property in Syracuse, New York. The Phase II involved the installation of several test pits and soil borings to evaluate the subsurface conditions at the property. While bedrock was relatively shallow at parts of the site, two deeper pits were discovered on the site and were believed to be associated with a historical limestone quarry used for manufacturing quicklime at the site. The pits had been filled with a waste ash material that was found to exhibit low metal contamination and little to know organic contamination. As a result, Mr. Smith evaluated encapsulating/capping alternatives to facilitate redevelopment of the property with NYSDEC approval.

Project Engineer responsible for reviewing a combined Phase I & II Environmental Site Assessment of a vacant property off of Brighton Avenue in the City of Syracuse, New York. The Phase II involved the installation of several test pits and soil borings to evaluate the subsurface conditions at the property. The investigation delineated the horizontal and vertical limits of the waste ash material that had been placed on the property. CHA was able to work with the NYSDEC to negotiate a “No Further Action” response and allow the development of the property as a drugstore to move forward.

REMEDIAL DESIGN & CONSTRUCTION EXPERIENCE

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 wells 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.

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 above-ground 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.

DeLaval Property, Poughkeepsie, NY, Environmental Restoration Project. Senior Project Engineer responsible for all technical aspects of this $14.5 million remediation project along the Hudson River waterfront for mixed use redevelopment. The site was impacted by heavy fuel oils that were widespread due to tidal impacts on the water table as well as asbestos. Work included the preparation of an application into the NYSDEC's Environmental Restoration Program, preparation of various work plans, coordination of permitting efforts with NYSDEC and the Army Corps of Engineers, completion of an alternatives analysis to evaluate potential remedies for the site, remedial design and preparation of contract documents, construction administration and coordination of field teams over a three-year construction period, and preparation of a detailed site management plan and a final engineering report to approval by NYSDEC. The certification of completion has been issued to the client and CHA will be responsible for routine site inspections and groundwater monitoring to comply with the requirements of the Site Management Plan.

Virginia Dept. of Conservation & Recreation, Chippokes State Park Remediation & Monitoring. Project Engineer responsible for coordinating the operation and maintenance of a soil vapor extraction system for this petroleum-impacted site, as well as designing modifications to the system to provide more efficient operation and freeze protection of the system. Work also include the preparation of a work plan for conducting monthly monitoring of the system, management of an on-site granular activated carbon system for on-site treatment of condensate, preparation of monitoring reports in accordance with Virginia DEQ requirements, preparation of activity authorization forms and reimbursement claims on behalf of the facility, and the design and preparation of reports for the final closeout of the remedial system upon achieving the project goals.

NYSDEC Standby Consultant Contract, Oversight of Remedial Construction at SMC – Skaneateles Falls Site. Project Engineer responsible for providing project oversight under a NYSDEC standby contract. Mr. Smith worked closely with NYSDEC project managers to ensure compliance with State requirements during remedial construction at this hazardous waste site. Mr. Smith was provided oversight and directed construction activities related to the installation of several subsurface utilities for a newly constructed on-site groundwater treatment plant, the construction of a low temperature thermal desorption plant, and other intrusive tasks, including the removal and overpacking of several buried drums at the site.

SOLID WASTE EXPERIENCE

Town of Salina, NY, Salina Landfill Superfund Site. Project Engineer responsible for reviewing the remedial design documents and currently lead engineering overseeing the implementation of the remedial action of a 55-acre inactive hazardous waste landfill. The primary elements of the remedial action include off-site disposal hazardous waste, waste consolidation, a gas venting system, and a combination of clay and geosynthetic Part 360 caps. The project was complicated by numerous utilities bisecting the Site and involvement of multiple agencies.

Town of Macedon, Landfill Closure Project. Project Engineer responsible for the design of the landfill closure investigation and landfill closure construction documents for capping an approximately 18-acre landfill that was used for municipal solid waste and off-spec film products disposed by a local chemical company. Other tasks included preparation of work plans, post-closure operation and maintenance plans, preparation of variances from current Part 360 regulations for NYSDEC approval, and preparation of reimbursement applications through

a State financial assistance contract. The closure construction was complicated by waste encroachment on adjacent wetlands and private property.

City of Peekskill, Landfill Investigation and Design Project. Project Engineer responsible for developing a work plan and evaluating the results of a Landfill Closure Investigation of 11-acre landfill. Mr. Smith also developed alternative landfill closure documents that incorporated re-use of the property. The design included a leachate collection system, a gas ventilation system, and various capping systems, including a gas/vapor barrier beneath the proposed buildings for the site.

Pocono Downs Casino – Phase II Expansion, Wilkes Barre, PA, Landfill Re-Use. As part of a major expansion at the Mohegan Sun at Pocono Downs Casino, Mr. Smith was the project engineer responsible for developing a remedial design to facilitate the expansion of the casino and get PADEP approval. Mr. Smith designed a capping system that was integral with proposed parking lots, including the combining of proposed light poles and gas vent risers to minimize visual obtrusiveness of the venting system and gas cut-offs in utility trenches to minimize the potential for landfill gas to migration.

Seneca Meadows, Inc., NY. Project Engineer assigned to several projects over the past ten years at the largest privately owned landfill in NY. Assignments have included assistance with relocating utilities to support a major expansion, preparation of a certification report for 4.5-acre leachate collection system, and preparation of various technical documents supporting expansion projects. Mr. Smith also served as an on-site CQA manager part time for a new 18-acre cell at the landfill, including leachate collected and gas venting systems.

HDR, Inc., Utica City Dump, NY Inactive Hazardous Waste Site. Project Engineer assisting in the preparation of a Remedial Investigation and Feasibility Study (RI/FS) for the Utica City Dump under the terms of the New York State Superfund Standby Contract. Specific duties included data analysis from data collected over a two-year period of time and several matrices. Also responsible for evaluating potential leachate collection systems for this 110 acre landfill during the feasibility stage, including both pump stations and gravity systems alternatives.

Putnam County Landfill, NY, Landfill Closure/Reclamation. Mr. Smith was responsible for preparing a remedial investigation of this approximately 5-acre solid waste landfill as well as directing the field activities for junior staff. Mr. Smith was responsible for reviewing the closure design documents and evaluating closing in-place alternatives with the potential for complete reclamation of the landfill.

Ulster County Resource Recovery Agency, NY, Transfer Station. Project engineer responsible for preparing design documents for the construction of a new sub-regional municipal solid waste and recyclables transfer station. The design documents included work plans and site plans, but also included a detailed evaluation of site logistical operations and the flow of waste in support of permitting needs.

Niagara County Refuse Disposal District, Landfills No. 1 & 2 Monitoring. Project Engineer responsible for evaluating groundwater level and water quality data on a quarterly basis for Niagara County Landfills No. 1 & 2. Also responsible for evaluating data for the leachate collections systems at the facility.

Industrial Ceramics, Lima, NY, Landfill Closure. Mr. Smith was the project engineer for the closure of this industrial use landfill. In addition to the preparation of capping design plans and specifications, Mr. Smith was responsible for working with NYSDEC officials to obtain variances to current Part 360 regulations and for coordinating the closure construction activities.

Village of Mount Kisco, Transfer Station Monitoring. Prepared documents to assist field staff in the monitoring of operations at a large transfer station in Mt. Kisco, New York, in accordance with Part 360 regulations. The documents included development a checklist for field staff to review all aspects of compliance or noncompliance at the facility, a phone complaint log to be used for logging resident complaints, and an inspection report template.

VAPOR INTRUSION & INDOOR AIR QUALITY

Garlock Sealing Technologies, Gylon Building Vapor Mitigation System. Project Engineer responsible for designing a vapor mitigation system for a new 80,000 SF manufacturing building installed in an areas with remaining chlorinated solvent contamination. The system included an enlarged cross-section of stone beneath the building slab, a perforated pipe network, a vapor barrier and a blower system. The entire facility was mitigated using a single blower system, which was installed on a skid system and mounted above the main floor to maintain valuable work space.

Island Bay Townhouses, Island Bay, NY, Vapor Mitigation System. Project Engineer responsible for preparing the design drawings and specifications for a sub-slab depressurization system for two, three-unit townhouses in Island Bay, New York. The system included a vapor collection system, a vapor barrier beneath the slab, blower units with noise enclosures, vacuum gauges to ensure proper system operation, and gas detection alarms with battery backup systems in the lower occupied areas. Mr. Smith also coordinated the inspections of the system during construction and prepared a construction certification report for approval by Nassau County officials.

U.S. Property & Fiscal Office for New York – Vapor Mitigation System. Project Engineer responsible for designing a sub-slab depressurization system for a 13,200 square foot pre-fabricated building over residually impacted soils. The system included layout of a piping network to collect any volatilized contaminants and a blower system to actively depressurize the sub-slab. The blower specifications included an explosion-proof design, a silencer to reduce the noise of the system, a knock-out drum to protect the blower from any condensate collected in the system, and several gauges and valves throughout the system to facilitate throttling of the pressure in all portions of the pipe network.

Walgreens Store, Auburn, NY. Mr. Smith prepared plans and specifications for a passive vapor mitigation system at a new Walgreens store that was located at the site of a former gas station with leaking USTs. The system included a network of perforated piping beneath the slab, a series a valves for potential future system throttling, and a vapor barrier system. The riser pipe was equipped with a turbine ventilator that provided system draw with winds as little as 4 MPH. The system was designed so that it could be easily converted to a active sub-slab depressurization system if testing within the structure ever indicated elevator vapor levels.

Carriage House East Apartments, Manlius, NY, Radon Mitigation Systems. Project Engineer responsible for evaluating radon levels at an apartment complex consisting of 30, 6-unit buildings and a mixed use office building. After finding elevated radon levels, Mr. Smith commenced with diagnostic testing at the buildings that would provide information used for the design of the mitigation systems. The project was unique due to the fact that both the slabs and block walls of the buildings were under positive pressure. Post-mitigation testing demonstrated that the mitigation was successful.

Town of Colonie, Marne Road Methane Evaluation and Mitigation. Mr. Smith assisted in the development of a methane gas investigation for a 20-acre portion of a residential subdivision. The investigation included daily indoor air quality monitoring within homes on a daily basis, installation of test borings soil gas survey points and test pits, sampling of seeps and basement sumps, aerial infrared imagery of the site, and radiocarbon dating buried organic material. Specifically responsible for advising team on technical recommendations for proceeding with further investigation as the site characterization evolved, designing methane gas extraction systems for several impacted residences, and preparing conclusions as to the source of the methane in the homes.

REGULATORY COMPLIANCE EXPERIENCE - GENERAL

SUNY Upstate Medical University, Multi-Media Environmental Compliance Audit. Project Engineer assisting in the completion of an Environmental Compliance Audit of the Upstate Medical University, which consisted of a large hospital and approximately 600 research laboratories. Mr. Smith was responsible for the development of a pre-audit questionnaire, completing a facility inspection using a sampling based approach to provide a reasonable and cost-effective approach for assisting compliance for a large number of similar facilities,

summarizing all non-compliance findings, and developing a matrix to assist the client with prioritizing corrective measures at the facility. The facility inspection focused on compliance with the clean air act, the clean water act, solid and hazardous waste regulations, hazardous materials management, regulated medical waste management, petroleum bulk storage, asbestos management, and low-level radioactive waste management.

Vermeer Facility, Fairport, NY Environmental Compliance Audit. Project Engineer responsible for conducting a multi-media environmental compliance audit and a Phase I Environmental Site Assessment for a light industrial facility in Fairport, New York. Reports and findings were provided to the client within a one week timeframe to meet the demands of the client.

Mallinckrodt Baker, Inc., Equipment Emissions Testing. Project Engineer who assisted in the development of a monitoring program for a large chemical plant to comply with 40 CFR Part 60, Subpart VV – Standards of Performance for Equipment Leaks of VOC in Synthetic Organic Manufacturing Industry. Mr. Smith provided recommendations for streamlining the monitoring program and replacement of the labeling system for the monitoring points within the facility given the significant number of monitoring points with the facility.

REGULATORY COMPLIANCE EXPERIENCE – CBS & PBS

Solvents & Petroleum Services, Inc., Compliance & Monitoring. Project Engineer responsible for completing a variety of engineering services over several years for this 6NYCRR Part 373 facility used for temporary storage of both virgin and spent solvents. Tasks have included completion of a Corrective Measures Study to evaluate remedial alternatives for both solvent-related and BTEX-related plumes at the facility, review of periodic groundwater monitoring reports, review of secondary containment systems for hazardous waste storage areas, and providing recommendations for new tank storage areas to comply with current chemical bulk storage regulations. Mr. Smith also assisted in the preparation and completed reviews initial SPR and SPCC documents for a number of SPS facilities in New York and Pennsylvania, which included both chemical bulk storage and petroleum bulk storage facilities.

Hollingsworth & Vose Co., 5-year CBS Tank Inspections, Greenwich, NY. Project Engineer responsible for reviewing 5-year inspection reports for the chemical bulk storage tanks maintained at the Easton and Greenwich Mills facilities for compliance with NYSDEC CBS regulations. Based upon the deficiencies identified, CHA provided the client with a list of recommended modifications and system updates to maintain compliance. CHA has also provided recommendations to the 5-year inspection frequency in some instances due to the remaining life expectancy of some of the CBS tanks.

Sabin Metal Corporation, Spill Prevention Report & CBS Compliance. Project Engineer responsible for preparing and updating the Spill Prevention Report for a precious metal refinery and recovery facility in Scottsville, New York to ensure compliance with NYSDEC Chemical Bulk Storage Regulations, including 6 NYCRR Parts 596 through 599. Mr. Smith was also responsible for completing inspections of the chemical bulk storage tanks and containment systems, advising plant personnel on differentiating between process and storage tanks, and coordinating detailed inspections and replacements of facility tanks.

City of Geneva, NY Marsh Creek WWTP Chemical Bulk Storage Compliance. Project Engineer responsible for conducting a five-year inspection of CBS tanks at a municipal wastewater treatment plant for compliance with NYSDEC regulations. Mr. Smith also reviewed all tank containment systems, fill/transfer containment areas, and piping systems for compliance with NYSDEC CBS regulations. Mr. Smith provided the City a list of recommendations for correcting deficiencies and prepared a certification report to the NYSDEC following correction of the deficiencies.

College of William & Mary, VA SPCC Plan. Project Engineer responsible for preparing a Spill Prevention, Control & Countermeasure (SPCC) plan for the college in accordance with 40 CFR Part 112 and applicable State regulations. The plan including inventorying all bulk storage containers on the campus, spill prediction determinations, evaluating existing secondary containment and leak detection equipment, evaluating oil transfer operations and compatibility of equipment with the products transferred, preparing tank unloading procedures, defining appropriate tank inspection, testing, and record-keeping requirements, specifying

minimum training requirements, describing facility security, and providing a contingency plan for emergency response to spills. The plan is updated on a regular basis to comply with the recent changes in the regulations and to add the additional containers on the college property.

State University of New York at New Paltz, SPCC Plan Preparation. Project Engineer responsible for preparing a Spill Prevention, Control & Countermeasure (SPCC) plan for the college in accordance with 40 CFR Part 112 and applicable State regulations. The project included conducting a comprehensive site audit to inventory all bulk storage containers on the campus, including aboveground and underground storage tanks, emergency backup generator systems, hydraulic reservoirs associated with elevator systems, grease traps, and other containers exceeding the 55-gallon threshold. As part of the project, CHA also prepared a list of deficiencies and areas of non-compliance at the facility to aid the college with prioritizing needs to come into compliance.

T.H. Kinsella, Inc. – Preparation of Multiple SPCC Plans. Mr. Smith was the lead engineer responsible for conducting comprehensive site audits of three large-scale quarry operation facilities and preparing SPCC plans for each. Additionally, Mr. Smith prepared action plans for each facility to assist the owner in required facility modifications to bring them into to compliance with both federal and state regulations.

Essex County Correctional Facility, SPCC Plan. Project Engineer responsible for preparing a SPCC)plan for the proposed Essex County correctional facility in Lewis, New York. The plan included inventorying all proposed bulk storage containers at the facility, spill prediction determinations, making recommendations for secondary containment structures around a storage and truck unloading areas, preparing tank unloading procedures, defining appropriate tank inspection and record-keeping requirements, specifying minimum training requirements, and providing a contingency plan for emergency response to spills.

SITE INVESTIGATION

Proposed Hyundai Dealership Phase II ESA. Project Engineer responsible for directing a Phase II subsurface investigation of an approximately two-acre parcel in the City of Syracuse, New York for redevelopment as an automobile dealership. Mr. Smith also completed supplemental investigation to delineate the extents of two petroleum-impacted areas on the site, prepared work plans for the management of contaminated soils excavated at the site, provided construction oversight and coordination during the implementation of the remediation and the site, completed a site closure report, and obtained closure of the spill report from NYSDEC on behalf of the client following completion of the remedial work.

Queri Development Company, LLC, Amos Building ESA. Project Manager responsible for supervising the completion of a Phase I and II Environmental Site Assessments of a six parcel block in downtown Syracuse, New York. Mr. Smith, developed a Remedial Action Work Plan that was prepared to meet HUD requirements and was approved by NYSDEC. Directed and coordinated all remedial work at the site, including the removal of two underground storage tanks, removal of off-site contaminated soils, and backfilling operations. Mr. Smith also prepared a Remedial Action Summary Report to obtain closure of the spill report associated with the site.

Kinney Drugs - Brighton Avenue, Syracuse, NY Site Assessment. Project Engineer responsible for reviewing a combined Phase I & II Environmental Site Assessment of a vacant property in Syracuse, New York. The Phase II involved the installation of several test pits and soil borings to evaluate the subsurface conditions at the property. While bedrock was relatively shallow at parts of the site, two deeper pits were discovered on the site and were believed to be associated with a historical limestone quarry used for manufacturing quicklime at the site. The pits had been filled with a waste ash material that was found to exhibit low metal contamination and little to know organic contamination. As a result, Mr. Smith evaluated encapsulating/capping alternatives to facilitate redevelopment of the property with NYSDEC approval.

Project Engineer responsible for reviewing a combined Phase I & II Environmental Site Assessment of a vacant property off of Brighton Avenue in the City of Syracuse, New York. The Phase II involved the installation of several test pits and soil borings to evaluate the subsurface conditions at the property. The investigation delineated the horizontal and vertical limits of the waste ash material that had been placed on the property. CHA was able to work with the NYSDEC to negotiate a “No Further Action” response and allow the development

of the property as a drugstore to move forward.

Empire Federal Credit Union, Phase II Site Investigation. Project Engineer responsible for developing a Phase II investigation of an approximately 3-acre parcel in the City of Fulton, New York to determine if historical use of site and adjacent properties had resulted in soil and/or groundwater contamination. The investigation included installation of several borings/monitoring wells across the site and collection of surface soil samples beneath transformers and oily-stained areas. A summary report evaluating the data was prepared along with recommendations for further work at the site prior to redevelopment of the site. Based upon the results of the supplemental investigation, CHA worked with the NYSDEC and the client to determine what action would be required at the site. Based upon CHA's evaluation of the data and the planned use of the property, no remedial action was required by NYSDEC.

Onondaga County Water Authority, OCWA Van Buren Water Tank. Oversight of Remedial Construction at SMC. Project Field Engineer responsible for providing project oversight and construction records to the New York State Department of Environmental Conservation (NYSDEC). Duties included oversight of intrusive construction activities; attendance at weekly progress meetings and informing the NYSDEC project manager of any technical issues; providing detailed construction observation reports including activities for the day, conversations, contamination encountered, unusual circumstances, progress, etc.; review and recommendations for design request change orders, a drum handling plan, and design reports for a Low Temperature Thermal Desorption (LTTD) unit for soil treatment; and providing digital construction photos with a detailed log.

Onondaga County Dept. of Law, Oncenter Hotel SEQR. Project Engineer responsible for completion of a subsurface investigation of a parking lot that is the proposed location of a new hotel in downtown Syracuse. Based upon the results of the initial subsurface soil and groundwater sampling, a series of monitoring wells were installed to further evaluate the potential impact to groundwater quality. A Geoprobe investigation was conducted in area of a former fuel station to further delineate the limits of petroleum contamination at the site. Based upon the results of the subsurface investigation, summary reports were prepared to summarize the results of the field investigation, analytical results, and provide recommendations for further investigation and remedial work at the site. Also responsible for coordinating with subcontractor drilling and laboratory firms to complete the work on weekends when the property was accessible.

The Athenaeum House. Served as Project Manager responsible for reviewing the Phase I & II Environmental Site Assessments for a historical structure (the Athenaeum House) in Skaneateles, New York. The house was targeted for redevelopment into an upper class nursing home facility. The Phase II assessment included a full pre-renovation asbestos and lead-based paint survey and conducting a subsurface soil and groundwater investigation in the vicinity of an abandoned 5,000-gallon underground storage tank once used for the storage of heating oil.

Syracuse Members Services Corp, Federal Credit Union Assessment. Project Engineer responsible for managing the Phase II Environmental Site Investigation conducted at a property in the City of Syracuse, New York. The investigation included the installation of several subsurface soil borings and the installation of four temporary monitoring wells near the corners of the property to facilitate the collection of groundwater samples. Mr. Smith was also responsible for evaluating the analytical results and comparing them to applicable soil and groundwater standards established by the NYSDEC.

Chittenango, Limited UST/Subsurface. Directed field activities during a Phase II Environmental Site Assessment. The subsurface investigation included collection of soil and groundwater samples, determining the location of existing underground storage tanks, and collection of a sludge sample from the abandoned tanks. The investigation also included delineation of the petroleum contamination on the down-gradient side of the underground storage tanks.

Former Mr. Peanut Site Phase II Investigation. Project Engineer responsible for preparing a Phase II subsurface investigation to evaluate the soil and groundwater quality beneath a 1.6-acre site occupied by Planters Nut and Chocolate Company in Pennsylvania. The investigation was developed to provide a screening of the entire site, while the focus of the investigation was along an adjacent industrial parcel where there was suspect disposal of PCB contaminated equipment and former underground storage tanks. The soil and groundwater

analytical results were compared to the PADEP's medium specific concentrations of Pennsylvania's Chapter 250 regulations. The summary report documented CHA's historical research of the site and adjacent properties, field activities, analytical results, and recommendations for further investigation to fully evaluate the subsurface contamination present.

Verizon Wireless, New Telecommunications Facility. Senior Project Engineer responsible for providing emergency management of contaminated soils and groundwater encountered during footer excavation for anew office building. CHA was on-site within two hours of the discovery of the petroleum impacted soils to direct the management of the spill. Specific duties included notifying the NYSDEC of the materials encountered at the site, directing the contractor how to construct temporary staging pads and how to properly manage soils without causing further impact to the environment, arranging analytical services with a local laboratory, preparing a summary report comparing analytical results to NYSDEC cleanup objectives, arranging for the removal of approximately 200 tons of impacted soil, and working with the NYSDEC to obtain closure of the spill report.

Syracuse Hancock International Airport, Terminal Apron Reconstruction Construction Inspection. Project involved establishing a soil management protocol for managing excavated soils during the reconstruction of the terminal apron at the airport. Mr. Smith was responsible for instructing the on-site engineers how to field screen soils for evidence of contamination and how to properly stage and cover soils that required segregation for sampling and potential off-site disposal.

Virginia Dept. of Conservation & Recreation, Chippokes State Park Remediation & Monitoring. Project Engineer responsible for coordinating the operation and maintenance of a soil vapor extraction system for this petroleum-impacted site, as well as designing modifications to the system to provide more efficient operation and freeze protection of the system. Work also include the preparation of a work plan for conducting monthly monitoring of the system, management of an on-site granular activated carbon system for on-site treatment of condensate, preparation of monitoring reports in accordance with Virginia DEQ requirements, preparation of activity authorization forms and reimbursement claims on behalf of the facility, and the design and preparation of reports for the final closeout of the remedial system upon achieving the project goals.

Project Engineer responsible for writing a work plan for conducting monthly monitoring and maintaining a soil-vapor extraction system for a petroleum impacted site within a Virginia State Park. The work plan specified the methods for sampling the groundwater at the site as well as the extraction system exhaust. CHA prepared quarterly monitoring reports in accordance with Virginia DEQ requirements and provided engineering recommendations on the effectiveness of the extraction system. Also coordinated all field activities, provided technical guidance to staff conducting the sampling and performing maintenance on the extraction system, and submitted activity authorization forms and reimbursement claims to the State. Finally, Mr. Smith assisted with the closeout of the monitoring program at this facility, including the removal of the vapor extraction system and carbon treatment drums from the property as well as the proper abandonment of all on-site monitoring wells.

Virginia Dept. of Conservation & Recreation, 2005 Environmental Monitoring. Project Engineer responsible for writing a work plan for conducting monthly monitoring and maintaining a soil-vapor extraction system for a petroleum impacted site within a Virginia State Park. The work plan specified the methods for sampling the groundwater at reports in accordance with Virginia DEQ requirements and provided engineering recommendations on the effectiveness of the extraction system. Also coordinated all field maintenance on the extraction system, and submitted activity authorization forms and reimbursement claims to the State. Finally, Mr. Smith assisted with the closeout of the monitoring program at this facility, including the removal of the vapor extraction system and carbon treatment drums from the property as well as the proper abandonment of all on-site monitoring wells.

Project Engineer responsible for writing a work plan for conducting monthly monitoring and maintaining a soil-vapor extraction system for a petroleum impacted site within a Virginia State Park. The work plan specified the methods for sampling the groundwater at the site as well as the extraction system exhaust. CHA prepared quarterly monitoring reports in accordance with Virginia DEQ requirements and provided engineering recommendations on the effectiveness of the extraction system. Also coordinated all field activities, provided

technical guidance to staff conducting the sampling and performing maintenance on the extraction system, and submitted activity authorization forms and reimbursement claims to the State.

Borough of Wharton, Water System Hydraulic Analysis. Project Engineer responsible for directing the post-remedial action groundwater monitoring at the Borough of Wharton Department of Public Works Highway Garage/Maintenance facility. Responsibilities included coordinating semi-annual groundwater monitoring events, evaluation of analytical data and preparation of Remedial Action Progress Reports (RAPRs), directing the abandonment of two on-site wells and filing notifications with the New Jersey Department of Environmental Protection (NJDEP), and overseeing the installation of two new replacement monitoring wells. As part of the monitoring program, Mr. Smith was also responsible for evaluating the need for further remedial actions at the site and the need to continue the monitoring program.

Town of Penfield, 1589 Penfield Road - Phase II ESA. Project Engineer that directed a Phase II Environmental Site Assessment (subsurface investigation) on a vacant parcel in the Town of Penfield, New York. Although the parcel was vacant, significant fill had been placed on the property along with significant debris, including an empty petroleum storage tank. Subsurface contamination had been conducted on an up-gradient parcel; however, some of the soil excavated as part of the remedial program on the adjacent parcel had never been removed. The investigation included the installation of several subsurface borings, the installation of groundwater monitoring wells, and the collection of surface soil samples beneath the tank and some of the debris. Based on the review of the field and analytical data, minimal impact to the subject site was identified.

Greater Rochester International Airport, Wetland Permitting. Duties included supervising the installation of monitoring wells and collecting water samples after well development; collecting water and sediment samples from a nearby creek at various locations upstream and downstream of the burn pit; collecting surface soil samples; overseeing drilling operations; and collecting soil samples from slit spoon sampling.

Greater Rochester International Airport, Runway 10-28 Safety Area Improvements. Project Engineer responsible for directing field staff activities for conducting a subsurface investigation at a major oil storage facility near the south end of the airport property. Based upon the results of the investigation, Mr. Smith prepared a soil management plan that was implemented during a runway safety improvement construction project. Mr. Smith also provided engineering support services during the construction phase and assisted Monroe County with their negotiations with the NYSDEC with respect to the site-specific remedial cleanup objectives.

New Jersey Transit, Lyndhurst Railroad Station - Final Design. Project Engineer responsible for directing a comprehensive environmental site investigation for the proposed expansion of the existing New Jersey Transit rail station located in Lyndhurst, New Jersey. The investigation included the installation of several soil borings and groundwater monitoring wells to evaluate subsurface soil and groundwater quality. Mr. Smith was responsible for coordinating the work with a drilling subcontractor as well as ensuring that a flag person from New Jersey Transit was on-site during all field activities. Mr. Smith also evaluated the analytical data and assisted in the preparation of a site management plan to be implemented during the redevelopment of the station.

ENVIRONMENTAL SITE ASSESSMENTS

Seneca County Planning Department, Cayuga Seneca Trails Project - Phase I. Completed a Phase I Environmental Site Assessment of an approximately six-mile corridor canal and railroad corridor between the Geneva and Waterloo, New York. In addition to completing the environmental assessment activities, Mr. Smith also reviewed the possible constraints for redeveloping this corridor as a multi-use trail between the Seneca Lake State Park and Waterloo. Mr. Smith identified potential concerns such

Syracuse Medical Realty, LLC, Phase I ESA. Project Engineer responsible for the completion of Phase I Environmental Site Assessments at two medical complexes in Onondaga County within a one-week period to meet the client schedule.

Monahan Development Corporation, Monahan Development - Phase 1 ESA. Project Manager responsible for reviewing a Phase I Environmental Site Assessment of the former Onondaga Historical Association Museum in downtown Syracuse, New York. The almost 100-year old structured was targeted for redevelopment into high scale apartments and condominiums.

Pyramid Companies, Feasibility Study for a Parking Garage. Project Engineer responsible for preparing a Phase I ESA of ten, approximately 100-year old buildings in Downtown Syracuse, New York as part of the SEQRA evaluation for redevelopment of these parcels for a multi-purpose structure, including retail space, residential units, and a parking garage. Mr. Smith also assisted with the completion of pre-demolition asbestos surveys of all ten buildings completed on an expedited basis.

Gmul Investment Company, Ltd., Hotel Syracuse & Addis Building. Mr. Smith served as Project Manager for this project which involved a Phase I Environmental Assessment of the Hotel Syracuse and included limited asbestos sampling activities.

Best Western Hotel, 670 State Fair Blvd. Phase I ESA. Project engineer responsible for completing a Phase I and II investigations at this proposed hotel facility located adjacent to the New York State Fair Grounds. A subsurface investigation, including the installation of borings and test pits, was completed to verify that the historic releases up-gradient of the Property as well as into the adjacent Ninemile Creek.

Jay Yennock, Phase I ESA. Performed a Phase I Environmental Site Assessment of a former marina and 84-lumber facility located in Cicero, New York. The assessment was completed in accordance with ASTM 1527-00 and within only a three-day period to meet the client schedule. The property was redeveloped for a furniture retail store.

S&R Custom Homes Inc., Camillus PUD. Project Manager responsible for reviewing a Phase I ESA for an approximately 88-acre residential subdivision off Warners Road in the Town of Camillus, New York.

Stonegate Subdivision, Planning & Utility Design. Responsible for managing the completion of a Phase I Environmental Site Assessment for a proposed 109-lot residential development off NYS Route 173 in the Town of Onondaga, New York.

Bentley-Settle Building-Route 175, Construction, Highway & Utility Design. Project Manager responsible for reviewing a Phase I Environmental Site Assessment for a 167-acre property located off of New York State Route 175 in the Town of Onondaga, New York. CHA also assisted the client with the preparation of site plans and a Draft Environmental Impact Statement (DEIS) for this multi-use development, which included single-family detached homes, patio homes, condominiums, commercial areas, and support facilities.

Harry L. Rogoff, Geotechnical Engineering/Environmental Investigation. Project Engineer responsible for directing a combined environmental and geotechnical investigation for the potential purchaser of a property in East Syracuse, New York. The purpose of the investigation was to evaluate the structural stability of the fill soils placed on the property as well as investigate for potential environmental concerns related to the presence of fill on the property

Lowe's Home Centers, Inc., Hornell, New York. Project Engineer responsible for completing a Phase I Environmental Site Assessment of a 35-acre parcel located in the Village of North Hornell, New York. The assessment was completed in accordance with client-specific requirements. Additional client requirements included a review of endangered and protected flora/fauna and critical habitats, preparing a wetlands determination and delineation reports, reviewing of historic structures, archeological and cultural resources, searching for nearby municipal and private archeological and cultural resources, searching for nearby municipal and private water supply wells, a PCB survey of on-site equipment, and conducting a lead-based paint and asbestos-containing material surveys for the existing on-site structure as part of the assessment.

Lowe's Home Centers, Inc.,Potsdam, New York. Project Manager responsible for reviewing a Phase I Environmental Site Assessment of four parcels with a total area of approximately 78-acres located in the Town of Potsdam, New York. The assessment was completed in accordance with client-specific requirements,

including a PCB-survey on on-site equipment and completing lead-based paint and asbestos-containing material surveys. Mr. Smith also coordinated a limited Phase II subsurface investigation to evaluate potential for subsurface soil and groundwater contamination in areas of potential risk on the site.

Key Bank National Association, All-Weather Services, Phase I ESA. Project Engineer responsible for completing a Phase I Environmental Site Assessment of two parcels in the Town of Cheektowaga, New York. The site was a former commercial site utilized by a roofing contractor. Three spill reports and a leaking underground storage tank reports had been filed for the site. In addition, Mr. Smith observed numerous drums and containers of hazardous materials on the site, some of which were leaking. Based upon Mr. Smith's estimated costs to complete a Phase II investigation and potential remedial costs, the financial institution made a case to avoid foreclosure on the property due to the potential environmental liability.

Tioga County Dept. of Econ. Devel./Plan., Office Complex Site Selection Services. Project Engineer responsible for evaluating seven potential sites for the new Tioga County Office Complex. The evaluation included evaluation of the size of area usable for development, construction methods necessary for each site, access to the sites, utilities services the site, and potential environmental concerns.

Harris Beach LLP, Phase I ESA. Project Manager for a Phase I Environmental Site Assessment and a Phase II Subsurface Site Investigation at a facility near the Niagara River in North Tonawanda, New York. Mr. Smith was responsible for selecting the locations of the borings and monitoring wells, reviewing historical spill reports associated with the property, coordinating field staff and subcontractors, and reviewing all reports.

Delaware & Lehigh National Heritage Corridor, D&L Trail - Lehigh Towpath Section III. Completed a Phase I Environmental Site Assessment for a seven-mile section of the former Delaware and Lehigh Canal towpath from the City of Bethlehem to the City of Easton. Research was required in several municipality offices and local libraries. The assessment was completed in accordance with ASTM Practice E-1527 and the Pennsylvania Department of Transportation's Publication No. 281, Waste Site Evaluation Procedures Handbook.

Delaware & Lehigh National Heritage Corridor, D&L Trail - Lehigh Towpath Section I. Completed a Phase I Environmental Site Assessment for a seven-mile section of the former Delaware and Lehigh Canal towpath from the Borough of Jim Thorpe to Borough of Parryville. Research was required in several municipality offices and local libraries. The assessment was completed in accordance with ASTM Practice E-1527 and the Pennsylvania Department of Transportation's Publication No. 281, Waste Site Evaluation Procedures Handbook.

Walgreens - Geotech Engineering Services. Mr. Smith was responsible for the review of five Phase I Environmental Site Assessments for a new drugstore chain in Central New York. Mr. Smith also coordinated the completion of pre-demolition asbestos and lead-based paint surveys for the existing structures on the properties selected for redevelopment.

Senior Living Center Site Development, Phase I ESAs. Project Manager responsible for overseeing the preparation of a Phase I Environmental Site Assessment of a two parcels located on State Fair Boulevard in the Town of Geddes, New York. The proposed senior living complex consisted of two primary structures, each housing twenty-four, two-bedroom apartment units, enclosed garages, a recreation building, and a variety of amenities. The property was located in an former industrial dumping area and the assessment revealed that the property was located down-gradient of a site with an open spill report as well as adjacent to an inactive hazardous waste site. Project Manager responsible for reviewing two Phase I Environmental Site Assessments for senior housing complexes located on State Fair Boulevard in the Town of Geddes, New York.

Sprint PCS, Sprint, Phase I ESA. Performed 17 Phase I Environmental Site Assessments and completed several Full Environmental Assessment Forms for proposed telecommunications sites. Duties also included meeting with local municipalities to evaluate engineering concerns such as storm water issues and highway work permits.

General Dynamics Information Technology, Wireless Communication Services. Responsible for the completion of approximately 10 Phase I Environmental Site Assessments prepared for communications tower sites

throughout Central and Western New York. Each report was completed within two weeks of assignment.

General Dynamics Information Technology, Upstate NY AWS sites. Completed approximately 20 Phase I Environmental Site Assessments for telecommunications sites throughout Upstate New York on behalf of General Dynamics. The sites included vacant sites, co-location sites, and roof-top locations. Mr. Smith completed approximately five assessments per week to meet the project schedule of the client.

Staten Island Boat Sales, Phase I Site Assessment. Project Manager responsible for reviewing a Phase I Environmental Site Assessment for three parcels of land associated with the Staten Island Boat Sales facility in Freeport, New York.

WATER RESOURCES

Tioga County Industrial Development Agency, Business Park. Project Engineer involved with the installation of initial test wells and two final production wells for the Town of Nichols municipal water system. Responsible for coordinating the field activities and drilling subcontractors, pump testing activities, and water quality sample collection. Mr. Smith was also responsible for working with the Tioga County Department of Health to evaluate whether or not the wells were under the influence of a surface water and water quality testing requirements and the development of the technical specifications for the production wells. The production wells are part of a 40,000 gallon per day public water supply system that is now utilized to provide a domestic water and fire protection for area residents as well as the newly developed Tioga County Business Park.

Village of Salem, New Municipal Water System. Project Engineer involved with the installation of three production wells for the Village of Salem municipal water system that supplies the Village with 350 gallons per minute of water. The three new production wells were installed as part of a municipal water supply system to replace a number of private residential wells that became contaminated during the flooding of Beaver Brook. Mr. Smith was responsible for directing the installation of the three production wells, the pump testing program, and the collection/evaluation of water quality samples prior to the wells being brought into service.

Pinnacle Mountain Ski Resort Water Supply Well Testing. Project engineer responsible for directing the installation of test water supply well in Roxbury, New Hampshire as part of a source water investigation. The test well was installed at a former ski resort that had been closed in the 1970s due to limited access and a fire. However, CHA was responsible for identifying a water source on the property and evaluating the installation of a new bridge to support the redevelopment of the resort. Two of the test well locations were abandoned at the direction of Mr. Smith based upon the soil conditions encountered at each location. A test well was installed at a third location and a step drawdown test was performed.

Evaluation of Water Budget. Project Engineer assisting in a preparation of a hydrogeological investigation report for a new, 78-acre residential subdivision in Dewitt, New York. The purpose of the investigation to identify subsurface stratigraphy and the specific physical characteristics of the overburden materials to evaluate potential impacts of the development of the site on partitioning of runoff, evapotranspiration, and groundwater recharge. A number of water budget models were used to model changes to the water budget, including the Thornthwaite water balance model, the Penman-Monteith model for evapotranspiration using a computer model called CROPWAT, and the Soil Water Infiltration & Movement (SWIM) Model to simulate water infiltration and movement in soils. The report included a number of recommendations for specific measures to be implemented to minimize impacts under the post-development condition.

Town of Newburgh – Subsurface Investigation (New York). Project Engineer for a subsurface investigation/post-remediation sampling program at the Town's Fleet Maintenance Facility where a former underground storage tank and in-ground hydraulic lift had been removed. Provided project oversight for field work and report preparation and served as liaison between the Town and NYSDEC Regional Spills Engineer.

Carver, Inc. – Subsurface Investigation (New York). Project Engineer for a subsurface investigation related to historical petroleum-based operations at the Riverside Travel Plaza. Provided oversight for the installation of Geoprobe borings, HSA borings, and monitoring wells. Performed the associated soil and groundwater sampling. Performed historical research and extensive document review related to potential impacts from a nearby bulk

petroleum storage facility as well as complex site hydrogeology resulting from a buried stream channel.

Borough of Wharton – DPW Facility Remedial Action (New Jersey). Project Engineer responsible for ongoing monitoring and maintenance activities at the Borough of Wheaton DPW facility located in Wharton, New Jersey. Responsible for the analysis of groundwater monitoring data and annual comprehensive evaluations of the effectiveness of the existing remedial technology at this former leaking underground storage tank site. Responsible for coordinating all field activities, report preparation and acting as liaison between the Borough and the New Jersey Department of Environmental Protection.

GE Energy – Vatrano Road Groundwater Monitoring (New York). Project Engineer responsible for bi-annual environmental groundwater monitoring activities. Responsible for the analysis of groundwater monitoring data and preparation of periodic review reports that evaluate of the effectiveness of the remedial technology previously implemented at this former PCB-contaminated site.

Meadowood Area County Fire Department – Groundwater Monitoring (New Hampshire). Project Engineer responsible for ongoing monitoring and maintenance activities at the Meadowood Area County Fire Department's training facility. Prepared Groundwater Management Permit Application for the client for submittal and approval by New Hampshire Department of Environmental Services. Responsible for the analysis of groundwater monitoring data and annual comprehensive evaluations of monitored natural attenuation. Responsible for coordinating all field activities, report preparation and acting as liaison between the Fire Department and the New Hampshire Department of Environmental Services.

NYS Office of Parks and Recreation – James Baird State Park Hydrogeologic Study (New York). Project Engineer responsible for a comprehensive hydrogeologic investigation to identify an additional water source for the James Baird State Park irrigation system. Responsibilities included completing a review of local and regional geology, well logs, and historical reports, followed by the selection of potential well sites. Coordinated field activities with subcontracted drilling firm and provided oversight for test well installations and well testing activities.

Proposed Sensis Radar Facility – Source Water Investigation (New York). Project Engineer responsible for assisting with a source water investigation to identify a source to meet the water supply demand for the proposed new development. This project included a desktop study to identify a favorable location for the installation of a water supply well as well as the associated installation activities, including well installation, development, water quality and quantity evaluation, and reporting. Assisted in supplemental testing and investigation to address potential water quality issues identified during the initial phase of the project.

New York State Department of Correctional Services – Regulatory Compliance Services (New York).

Project Engineer responsible for providing ongoing petroleum, chemical and air-based compliance services for all of the state's 72 correctional facilities. Worked with a team of scientists to develop a compliance-driven environmental recordkeeping database to ensure that each facility is in compliance with applicable state and federal environmental regulations.

Watervliet Arsenal – Comprehensive Environmental Review (New York). Project Engineer responsible for performing a comprehensive environmental review as part of a project aiming to develop approximately 65 acres of an Army-owned and -operated manufacturing facility.

BBL Development, Inc. – Verona Phase I Environmental Site Assessment (New York). Project Engineer responsible for the completion of a Phase I Environmental Site Assessment in accordance with ASTM standards of a commercial redevelopment site.

SITE DEVELOPMENT

T**ri-Tek Engineering, Proposed NTB, Cheektowaga, NY.** Project Engineer responsible for the development of site design plans from conceptual layout to construction drawings, including demolition plans, site layout, drainage/grading design, utility design, and design of the ingress/egress; review of applicable zoning and local land use regulations to make recommendations to the developer about rezoning issues and procurement of a Special

Use Permit; and obtained utility and non-utility highway work permits from the New York State Department of Transportation.

MUNICIPALITY SUPPORT

Town of Salina, Town Sanitary Sewer and Drainage System Engineering Services. Project Engineer representing the Town's interests in municipal engineering issues. Duties included Town and Planning Board attendance; review of Planning Board Submissions and analyzing engineering and development issues with respect to the Town Code, SEQRA requirements and utilities; field inspection of Town construction projects; review of closed circuit televised sewer inspections; review and approval of contractor's invoices; providing engineering evaluations and recommendations of various emergency and non-emergency situations; providing engineering recommendations to the Town Highway Superintendent on highway and drainage problems; providing engineer's certifications of highway and utility improvements within the Town and recommending acceptance of the facilities by the Town; and responding to resident's concerns.

Continuing Education

- EOS Remediation, LLC, "Principles and Practices of Bioremediation" – 2013
- The Practice of Institute of Engineering, Inc., "Value Engineering of Subsurface Investigations" – 2013
- Air & Waste Management Association, "Plastic 2 Oil" – 2013
- The Practice of Institute of Engineering, Inc., "Geogrids and High Strength Geotextiles for Soil Reinforcement" – 2012
- REGENESIS, "Integrated Site Remediation and Gas Vapor Intrusion" - 2011
- GSE, "Introduction to GSE Geosynthetics." – 2010
- ACEC New York, "Ground Penetrating Radar" – 2010
- National Society of Professional Engineers, "Main Street Brownfield's: Sustainable Development" – 2009
- Lorman Education Services, "Brownfield Development: Methods and Financing Opportunities" – 2008
- American Society of Civil Engineers, "Landfill Stability Series" – 2006
- Center for Economic and Environmental Partnership, Inc., "Brownfields Syracuse" – 2006

Education

SUNY College of Environmental Science and Forestry, NY, B.S. in Forest Engineering

Registrations & Certifications

Professional Engineer - NY

Memberships & Affiliations

Air and Waste Management Association

SUNY ESF Department of Environmental Resources Engineering Advisory Council

Meghan M. Platt, PE

Senior Engineer

Meghan has 19 years of environmental engineering and construction experience. Her experience includes Phase I ESAs, Phase II ESAs, environmental investigations, soil and groundwater remediation and compliance and permitting activities. Ms. Platt's experience also includes water and wastewater treatment system design, construction and operation, maintenance, and monitoring activities. Representative project experience includes:

ENVIRONMENTAL PERMITTING & COMPLIANCE

Empire Archives, Due Diligence Services Related to the Former Sears Building Redevelopment. Environmental Professional responsible for coordinating the preparation of an ASTM compliant Environmental Due Diligence Phase I Environmental Site Assessment of a vacant building in the City of Syracuse.

Alistar Management, LLC, 138 North Genesee St, Utica NY. Environmental Professional responsible for coordinating the preparation of an ASTM compliant Environmental Due Diligence Phase I Environmental Site Assessment of the property.

Costello, Cooney & Fearon, PLLC, Due Diligence of 133 West Seneca Street, Manlius NY. Environmental Professional responsible for coordinating the preparation of an ASTM compliant Environmental Due Diligence Phase I Environmental Site Assessment for the property to assess the potential environmental concerns for the site.

Henrico County - Construction and Supporting A-E Services for Glover Park Phase I. Environmental Professional responsible for coordinating the preparation of an ASTM compliant Environmental Due Diligence Phase I Environmental Site Assessment of the property.

McGuire Development Co., Little Apple Dunkirk Site Due Diligence & Survey. Environmental Professional responsible for coordinating the preparation of an ASTM compliant Environmental Due Diligence Phase I Environmental Site Assessment for the property to assess the potential environmental concerns for the site.

Apex Tool Group, LLC, Cortland Operation EPCRA and SPDES. Environmental Engineer for the facility closure activities of an international tool manufacturer. Provided services including two years of environmental health and safety reporting for the "winding down" of operations, closing permits and regulatory agency communications, liquidation and cleanout of remaining equipment and supplies, hazardous waste management, subsurface environmental assessment of soils and groundwater, and localized environmental remediation.

Finger Lakes Community College - GHG Inventory Update. Lead Environmental Engineer responsible for the preparation of a Greenhouse Gas Inventory for a New York State Community College in support of its participation in the American College and University Presidents' Climate Commitment.

Syracuse Community Hotel Restoration Company LLC, Hotel Syracuse Phase I ESA Update. Environmental engineer for the execution of hazardous materials and environmental assessments, cleanups, abatements and waste disposals associated with the last of Syracuse, New York's "grand hotels" to facilitate the renovation of the historic Hotel Syracuse.

Onondaga County Dept. of Parks and Recreation, NY, East and West Shore Trail Design. Lead Environmental Engineer for the development of Feasibility Studies and Draft Design Reports for a 2.2 mile mixed use recreational trail traveling through USEPA Superfund and NYSDEC Brownfield sites as well as incorporating a pedestrian bridge over a main line rail right of way.

Norfolk Southern Corp., Rutherford Intermodal Facility. Environmental Engineer responsible for the preparation and implementation of a work plan to complete a Clean Fill Determination Study in Pennsylvania in accordance with PADEP rules and regulations.

Chicago Pneumatic, 2010-2011 Annual Operations and Maintenance-Former Chicago Pneumatic Facility. Provided engineering services associated with the preventative maintenance and regulatory compliance of a groundwater treatment system that removes solvent contamination associated with former industrial activities using air stripping technology.

Solvents & Petroleum Service, Inc., RCRA Facility Investigation. Provided engineering services for this 6NYCRR Part 373 facility used for temporary storage of both virgin and spent solvents. Tasks have included the collection of field data

Town of Salina, NY, Salina Landfill Superfund Site. Provided engineering services related to the completion of a Remedial Investigation and Feasibility Study of 55-acre inactive hazardous waste landfill. Investigated the extent of contamination associated with PCBs and solvents and the associated impact on soil, surface waters and ground waters.

Solvents & Petroleum Service, RCRA Facility Investigation. Provided engineering services for this 6NYCRR Part 373 facility used for temporary storage of both virgin and spent solvents. Tasks have included the collection of field data and groundwater samples and the preparation of periodic groundwater monitoring reports.

Solvents & Petroleum Service Spill Prevention Report Update-Fayette Street Facility. Provided engineering services for this 6NYCRR Part 373 facility used for temporary storage of both virgin and spent solvents. Tasks have included the collection of field data and groundwater samples and the preparation of periodic groundwater monitoring reports.

Classic Site Solutions, Inc., Former Sampson Air Force Base Physical Hazard Abatement. Environmental Engineer for the demolition, excavation, removal and appropriate disposal of abandoned structures including an incinerator with contaminated soils and liquids, a pump station and associated equipment, a wastewater treatment plant with buildings and nine process tanks (including digesters, clarifiers, trickling filters with mercury bearings and associated liquid waste). The scope of services included establishing an overall work plan (WP), regulatory impact assessment, environmental protection plan, sampling plan, quality assurance project plan (QAPP) in accordance with the Uniform Federal Policy, activity hazard assessment, accident prevention plan (HASP) in accordance with EM 385-1-1, construction oversight and documentation, and closure reporting.

SITE INVESTIGATION & REMEDIATION

Former Sampson Air Force Base Physical Hazard Abatement, Romulus, NY. Provided engineering services for the demolition, excavation, removal and appropriate disposal of abandoned structures including an incinerator with contaminated soils and liquids, a pump station and associated equipment, a wastewater treatment plant with buildings and nine process tanks (including digesters, clarifiers, trickling filters with mercury bearings and associated liquid waste). The scope of services included establishing an overall work plan (WP), regulatory impact assessment, environmental protection plan, sampling plan, quality assurance project plan (QAPP) in accordance with the Uniform Federal Policy, activity hazard assessment, accident prevention plan (HASP) in accordance with EM 385-1-1, construction oversight and documentation, and closure reporting in compliance with US Corp of Engineers requirements.

City of Auburn, NY, Downtown Brownfield's Program in the City of Auburn Phase. Provided engineering services for 19 properties identified by the USEPA Brownfield Assessment Grant to conduct Phase I ESAs. Sites were ranked based upon RECs and select sites were further assessed through Phase II ESA sampling. Phase II ESA sampling was in accordance with USEPA approved QAPP, SAMP and associated HASPs. Phase II ESA activities included surface and subsurface soil sampling, groundwater sampling, test pitting, indoor air sampling and hazardous building material sampling.

Onondaga County Dept. of Parks and Recreation, NY. Environmental Engineer for the development of Feasibility Studies and Draft Design Reports for a 2.2 mile mixed use recreational trail traveling through USEPA Superfund and NYSDEC Brownfield sites as well as incorporating a pedestrian bridge over a main line rail right of way.

City of Auburn, NY, EPA Brownfield Assessment Grant Program. Environmental Engineer responsible for overseeing the implementation of 19 ASTM Phase I Environmental Site Assessments within the City's EPA Brownfield Program.

Confidential Client, Environmental Services Term Agreement. Environmental Engineer responsible for preparing design documents for an in-situ remediation system, including a thermally enhance soil vapor extraction (SVE) system, a conductive soil heating system, a groundwater extraction system to dewater the treatment zone, and controls for each system. Also responsible for the preparation of construction completion reports initial remedial construction tasks.

United Auto Supply, Former Coyne International Enterprises Site. Lead Environmental Engineer responsible for the preparation and implementation of a Remedial Investigation Work Plan at a former industrial laundering facility within the NYSDEC Brownfield Cleanup Program. The purpose of the investigation was to identify the nature and extent of on-site contamination in soil, groundwater, soil vapor, sub-slab vapor, and indoor air associated with historical site activities. Ms. Platt also prepared a Remedial Investigation Report summarizing these activities along with historical site investigation activities for NYSDEC and NYSDOH-approval. As a result of investigation activities, several Interim Remedial Measures are being prepared to the Agencies for approval.

Costello, Cooney & Fearon, PLLC, Due Diligence of 133 West Seneca Street, Manlius NY. Environmental engineer responsible for overseeing the preparation and implementation of a Phase II Subsurface Investigation work plan to determine the nature and extent of heavy metal contamination at the site.

Santaro Industries, Inc., Environmental Services. Environmental engineer responsible for the implementation of site investigation and remediation activities at a petroleum contaminated site to effectively remediate the site for the issuance of a No Further Action letter by the NYSDEC.

AMERCO Real Estate Company, U-Haul Facility- Utica, NY. Project Environmental Engineer responsible for overseeing the preparation of technical documents including a Soil/Fill Management Work Plan and Community Air Monitoring Plan, in accordance with NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation.

The House of the Good Shepherd, Subsurface Investigation. Lead Environmental Engineer responsible for the implementation of a subsurface investigation to evaluate potential sources of contamination on the project site. Remediation of sources included the excavation and removal of two underground storage tanks and contaminated soil consistent with 6NYCRR Part 360 regulations. Activities resulted in the closure of a spill by the NYSDEC.

Greater Bridgeport Transit Authority:

- *GBT Fuel Tank Evaluation - Phase 1.* Lead Environmental Engineer responsible for the preparation of a subsurface investigation work plan and the implementation of the work plan to evaluate if five existing underground storage tanks and their associated piping had caused a release to soil or groundwater in accordance with the Connecticut Department of Energy and Environmental Protection rules and regulations.
- *Fuel Tank Replacement.* Lead Environmental Engineer responsible for the preparation of a subsurface investigation work plan and the implementation of the work plan to evaluate if five existing underground storage tanks and their associated piping had caused a release to soil or groundwater in accordance with the Connecticut Department of Energy and Environmental Protection rules and regulations.

LPCiminelli, Riverbend Site Redevelopment. Environmental Engineer for the construction of a 1.2-million square foot solar panel manufacturing company as part of the redevelopment of an approximately 88-acre parcel that was home to the former Republic Steel. Responsible for preparing a detailed work plan, preparing health and safety plans, providing air monitoring and field screening services during intrusive activities, sampling materials, reviewing contractor submittals for compliance with NYSDEC requirements, and preparing SWPPP inspections and more during the redevelopment of the property. Ms. Platt also assisted with recommendations for vapor mitigation systems beneath the building, soil cover and demarcation barrier materials and the preparation of SPCC plans for both on-site emergency backup generators and two 115 kV transformers in an adjacent substation.

New York Power Authority, Onsite Project Management for Submarine Cable Replacement Project. Lead Environmental Engineer for the removal and replacement of seven 115kV transmission cables with four approximate 3,000 kcmil submarine cables between New York and Vermont. Responsibilities included the preparation of design documents for the removal of the submarine cables and evaluation of sampling data collected during project implementation.

Town of Salina, NY, Former Town of Salina Landfill Remediation. Environmental Engineer responsible for preparation of the remedial design documents of the remedial action of a 55-acre inactive hazardous waste landfill. The primary elements of the remedial action included off-site disposal of 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 above-ground and subsurface utilities bisecting the Site and involvement of multiple agencies. Ms. Platt also assisted with the preparation of the Final Engineering Report and Site Management Plan for the site.

Widewaters Group, Former GE Farrel Road Site Review of Vapor Intrusion Results and Recommendations Mitigation. Environmental Engineer providing guidance on a sub-slab and indoor air investigation of a building that was part of a state regulated cleanup program associated with volatile organics. Review of summary letters to the NYSDEC which provided the findings from the investigation and evaluated trends related to historical work conducted at the site.

Columbia Development Companies, 67 Howard Street-Remedial Investigation. Environmental Engineer responsible for providing technical guidance on remedial design documents for a sub-slab vapor mitigation system inside an existing building with residual chlorinated solvent contamination. The system included a vapor barrier in areas where the concrete slab was replaced, several extraction points, blower systems equipped with monitoring/alarm systems, etc. Ms. Platt also assisted with the preparation of a Site Management Plan specifying long-term requirements for maintaining the vapor mitigation system as well as an excavation work plan for the management of soils should excavation be required in the future.

TREATMENT SYSTEM OPERATION, MONITORING AND MAINTENANCE

Former Chicago Pneumatic Facility, Utica, NY. Provided engineering services associated with the preventative maintenance and regulatory compliance of a groundwater treatment system that removes solvent contamination associated with former industrial activities using air stripping technology.

GROUNDWATER TREATMENT SYSTEM DESIGN

Confidential Client, Groundwater Treatment System. Environmental Engineer responsible for the implementation of operation, maintenance and monitoring activities for the in-situ remediation system, including a thermally enhance soil vapor extraction (SVE) system, a conductive soil heating system, a groundwater extraction system to dewater the treatment zone, and controls for each system.

PRIOR CHA

SUBSURFACE INVESTIGATIONS/REMEDIATION

Confidential Client, Saratoga Springs, NY. Onsite engineer at a former MGP facility during soil and sediment remediation activities. The project consisted of three locations containing soil and sediment impacted with polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and inorganics. Responsibilities included contractor oversight of remedial activities; conducting immunoassay testing and verification sampling of soil and sediment samples; documenting daily activities; and signing non-hazardous waste manifests for the offsite transportation and disposal of excavated soil and sediment.

Confidential Client, Middleport, NY. Task manager responsible for completing a Phase I Environmental Site Assessment and Geotechnical Engineering Investigation of an old motel slated for demolition and redevelopment as a grocery store site. Of particular concern from both an environmental and geotechnical standpoint was the placement of a significant amount of fill material on site.

Confidential Client, Middleport, NY. Task manager for the construction of migration control trenches at an operating pesticide/herbicide formulating facility. The migration control trenches construction consisted of the installation of three blasted bedrock trenches (~1,000 linear feet), seven new extraction wells and pump houses, and approximately 2,000 linear feet of forcemain piping to the existing water treatment facility. Responsibilities included final contract drawing preparation, coordinating with subcontractors, construction oversight, and system start-up.

Confidential Client, Utica, NY. Provided engineering related serves at a former aeronautical systems facility with PCB-impacted soil. This project included soil investigations, building demolition, and storm sewer replacement activities. Responsibilities included preparing work plans summarizing site Interim Corrective Measures (ICMs); preparing engineering calculations to determine the quantity of materials to be generated during demolition of three onsite buildings and the quantity of materials that could be reused onsite for fill material, transported offsite as a non-regulated waste under the Toxic Substance Control Act (TSCA) or transported offsite as a regulated waste under TSCA; designing a storm sewer replacement associated with the site including the removal and replacement of a portion of the storm sewer and removal of visually impacted soil underlying the storm sewer piping; coordinating with local officials and subcontractors regarding site activities; and providing contractor oversight during storm sewer replacement activities.

Confidential Client, Yorkville, NY. Project manager for a soil investigation and interior building investigation and remedial design at a former PCB transformer repair facility. Investigation included the evaluation of soil and interior building concrete quality. Remedial design activities included soil excavation activities along with interior building cleaning.

GROUNDWATER TREATMENT SYSTEM DESIGN

Confidential Client, Middleport, NY. Task manager responsible for the upgrade of an existing groundwater and surface water treatment facility at an active pesticide and herbicide formulating facility. The objectives of the design upgrades were to increase the treatment system throughput rate from 150 gallons per minute (gpm) to 250 gpm and automate operations. The treatment system was designed to remove volatile organic compounds (VOCs), pesticides, and heavy metals. Upgrades included designing and installing a new low-profile air stripper, ferric chloride addition system, lime addition system, multi-media filter systems, new instrumentation, new pumps, and a central programmable logic controller (PLC) based control system. Responsibilities included final treatment system design and specifications, development of construction documents and subcontractor bid packages and engineering support services during turnkey construction activities.

Confidential Client, Utica, NY. Project engineer for a former manufactured gas plant (MGP) site containing soil and groundwater impacted with MGP waste. This project included: evaluation of remedial alternatives for cleanup of site soil and groundwater. Responsibilities included evaluating the potential to discharge treated water from a temporary water treatment system to the local Publicly Owned Treatment Works (POTW) or via surface water discharge in accordance with local, state, and federal rules and regulations; reviewing and evaluating regulations governing the discharge of treated water from the site via surface water; coordinating with the local POTW to obtain information on potentially discharging treated water from the site to the POTW; coordinating with equipment vendors to obtain information and specifications on equipment capable of treating site water to the discharge limits set forth by the POTW; and designing a temporary onsite water treatment system which included an oil/water separator, bag filters, organo-clay vessel, granular activated carbon vessels, and resin vessels for discharge to the POTW.

TREATMENT SYSTEM OPERATION, MONITORING AND MAINTENANCE

Confidential Client, Lodi/Hawthorne, NJ. Served as the OMM task manager for three remedial treatment systems, which include multi-phase extraction and treatment via catalytic oxidation, air stripping and granular activated carbon adsorption; soil-vapor extraction and treatment via vapor-phase granular activated carbon; and groundwater extraction and treatment via a fixed-bed biological reactor. Onsite OMM activities include daily treatment system operation, monitoring and alarm response, and permit-required sampling. Office OMM activities include permit-required reporting and semi-annual report preparation.

Confidential Client, Paterson, NJ. Task and project manager for a site containing light nonaqueous phase liquid (LNAPL) on the groundwater table. The project involved monitoring onsite wells for the presence of LNAPL and preparing and implementing an LNAPL investigation to delineate the horizontal extent of LNAPL at the site. Tasks conducted during the LNAPL investigation included coordination with the client, subcontractors (including drillers, laboratories, waste disposal vendors, etc), state regulatory agencies and onsite field staff.

Confidential Client, Middleport, NY. OMM task manager for ongoing environmental activities at a 91-acre former pesticide manufacturing facility with a groundwater extraction and treatment system. Site soil, groundwater, surface water, and sediment were historically impacted with inorganic constituents and pesticides. In addition, groundwater is impacted with VOCs. The facility operates a groundwater extraction and treatment system with fractured bedrock trenches. Responsibilities include coordinating with field personnel for sample collection, implementation of preventative maintenance activities, and site inspections; preparing inspection, maintenance and quarterly progress reports; tabulating and evaluating groundwater analytical results; and preparing a site-specific Health and Safety Plan.

Confidential Client, Medina, NY. OMM task manager at a 30-acre inactive waste disposal site with a groundwater extraction and treatment system. Site soils and water are impacted with heavy metals including lead, mercury, and arsenic, as well as a variety of pesticides. Responsibilities included coordinating with field personnel for the collection of surface water, groundwater and treatment system samples and site inspections; preparing quarterly operations and maintenance status reports; and tabulating and evaluating surface water, groundwater and treatment system effluent water samples.

CERCLA/RCRA EXPERIENCE

Former AC Dutton Lumber Yard, Poughkeepsie, NY. Project Engineer responsible for the preparation of a Citizen Participation Plan and Remedial Investigation Work Plan for the offsite investigation and delineation of arsenic, chromium and copper associated with a former wood treatment facility. Investigation media included groundwater, soil and sediment.

T&K Realty, Painted Post, NY. Project Engineer for a former automotive repair facility responsible for the preparation and implementation of a Vapor Intrusion Investigation Work Plan, Interim Remedial Measure (IRM) Work Plan, Vapor Intrusion Summary Report, and Site Characterization Report. IRM activities consisted of the excavation of impacted site sediment and soils.

OIL & GAS EXPERIENCE

Confidential Client, Western Pennsylvania/Southwestern New York. Project engineer responsible for the preparation of NYSDEC and PADEP paperwork/permits associated with plugging operations (e.g., Notice of Intent to Plug and Abandon Wells, Stream Crossing Permits, etc.) and No Further Action letters to USEPA, NYSDEC and/or PADEP for former lease sites once plugging operations are complete. Responsibilities also included reviewing publicly available information such as historical maps and legal documents (e.g., deeds, titles, leases, easements and property mapping) for former lease sites, contacting surface owners to conduct interviews and obtain access agreements, where necessary, and conducting site visits of former leases to observe current site conditions, locate former oil wells and oversee plugging operations, where applicable, in accordance with NYSDEC/PADEP regulations.

Confidential Client, Western Pennsylvania. Project engineer responsible for the preparation of a multi-million dollar cost estimate for the decommissioning and abandonment of oil and gas well fields. Activities included site preparation, sediment and erosion control, plugging and abandonment of active and in-active oil and gas wells, decommissioning of associated facilities/buildings, remediation and site restoration activities. The cost estimate was utilized by the Client to internally secure funds for the project and ultimately lead to the award of the first phase of the project.

Confidential Client, Pennsylvania. Project engineer responsible for the review of existing Spill Prevention Control and Countermeasure (SPCC) Plans for multiple oil well fields throughout Pennsylvania to determine compliance with current regulations. Responsibilities also included site visits, secondary containment calculations and recommendations to bring the oil well fields and SPCC Plans into compliance with current federal and state regulations.

Confidential Client, Eastern US Multi-State. Provided engineering services related to the due diligence investigation on behalf of a Fortune 500 firm's purchase of a regional energy company as part of a multi-billion dollar, multi-state purchase. Responsibilities included evaluating information gathered during the initial phase of the due diligence process to determine if additional investigation activities were warranted, participating in the implementation and evaluation of additional investigation activities and preparing multi-million dollar environmental liability cost estimates.

Confidential Client, Pennsylvania/West Virginia. Project engineer responsible for the preparation of annual summary reports of the quantity and location of former oil transmission lines investigated and decommissioned and contacting and coordinating with contractors regarding decommissioning activities.

REGULATORY COMPLIANCE EXPERIENCE

Tessy Plastics, Baldwinsville, NY. Project manager responsible for the completion of Phase I and Phase II Environmental Site Assessments and in accordance with ASTM standards for the purchase of a warehouse.

Education

SUNY College of Environmental Science and Forestry, NY, B.S. in Environmental Engineering

Registration & Certification

Engineer-in-Training - NY

Certified Professional in Erosion & Sediment Control (In Training)

Samantha J. Miller, EIT, CPESC-IT

Project Engineer

Samantha has seven years' experience providing consulting engineering services for environmental projects. Her experience to date includes performing environmental monitoring, construction inspection services, remediation system operations and maintenance, Phase I and Phase II Environmental Assessments, geotechnical field investigations, SWPPP reports, stormwater inspections, and chemical bulk storage inspections. Representative project experience includes:

ENVIRONMENTAL PERMITTING AND COMPLIANCE

City of Auburn, NY, Downtown Brownfield's Program in the City of Auburn Phase II. Project Engineer for the assessment of 19 properties identified by the USEPA Brownfield Assessment Grant to conduct the Phase I Environmental Site Assessments to identify recognized environmental conditions (RECs) associated with former industrial and manufacturing sites.

Syracuse Community Hotel Restoration Company LLC, Hotel Syracuse Phase I ESA Update. Environmental Engineer responsible for the preparation and submittal of a Phase I Environmental Site Assessment Report in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) that described the site history through various historical documents such as aerial imagery, fire insurance maps, city directories, and interviews with current and previous owners. Performed all field activities such as coordination with subcontractors and consolidation and sampling of various unknown chemicals stored throughout the facility. Analyzed laboratory data to appropriately characterize materials for off-site disposal. Coordinated the removal of two vaulted above-ground storage tanks with the NYSDEC, the subcontractor and the client.

Drake Oil, Phase I ESA. Project Engineer for the identification of potential environmental liabilities at the property by means of a site inspection, records review, and site contact interviews.

Pavia Real Estate Services, Phase I ESA - 109 Genesee St, Oneida, NY - Former Friendly's Restaurant. Project Engineer for the evaluation of the property's environmental conditions and assess the potential liability for contamination present at the property by means of a site inspection, records review, site contact interviews, and consideration of other relevant factors and information.

Reviewed historical documents such as aerial imagery, fire insurance maps, previous Environmental reports, and city directories, performed interviews with current and previous owners, reviewed technical database reports, and searched multiple NYSDEC databases for bulk storage tanks and spills.

Performed technical evaluations based on the document review that resulted in the development of numerous recognized environmental conditions (REC) which typically led to the recommendation of Phase II subsurface investigations. Prepared and submitted multiple Phase I ESAs in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) for good commercial and customary practice for conducting ESAs of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

Pilgrim USA, LLC, Phase I ESA for 41 College Street, Clinton NY. Project Engineer for the evaluation of the property's environmental conditions and assess the potential liability for contamination present at the property by means of a site inspection, records review, site contact interviews, and consideration of other relevant factors and information.

Reviewed historical documents such as aerial imagery, fire insurance maps, previous Environmental reports, and city directories, performed interviews with current and previous owners, reviewed technical database reports, and searched multiple NYSDEC databases for bulk storage tanks and spills.

Performed technical evaluations based on the document review that resulted in the development of numerous recognized environmental conditions (REC) which typically led to the recommendation of Phase II subsurface investigations. Prepared and submitted multiple Phase I ESAs in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) for good commercial and customary practice for conducting ESAs of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

Normandeau Associates, Phase I ESAs for Two Solar Development Sites. Project Engineer for the evaluation of the property's environmental conditions and assess the potential liability for contamination present at the property by means of a site inspection, records review, site contact interviews, and consideration of other relevant factors and information.

Mr. Robert Morris and Ms. Shannon Morris, Phase I ESA-716 James Street. Reviewed historical documents such as aerial imagery, fire insurance maps, previous Environmental reports, and city directories, performed interviews with current and previous owners, reviewed technical database reports, and searched multiple NYSDEC databases for bulk storage tanks and spills.

Performed technical evaluations based on the document review that resulted in the development of numerous recognized environmental conditions (REC) which typically led to the recommendation of Phase II subsurface investigations. Prepared and submitted multiple Phase I ESAs in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) for good commercial and customary practice for conducting ESAs of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

Dormitory Authority of New York State, General Environmental Compliance Assistance. Performed routine sampling events at cooling towers and health institutes for the presence of legionella.

Symphony Tower, LLC, Phase I Environmental Site Assessment Former Hotel Syracuse Tower (Annex), 101-31 East Onondaga Street and 457 S. Salina St. Syracuse, NY. Reviewed historical documents such as aerial imagery, fire insurance maps, previous Environmental reports, and city directories, performed interviews with current and previous owners, reviewed technical database reports, and searched multiple NYSDEC databases for bulk storage tanks and spills.

Performed technical evaluations based on the document review that resulted in the development of numerous recognized environmental conditions (REC) which typically led to the recommendation of Phase II subsurface investigations. Prepared and submitted multiple Phase I ESAs in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) for good commercial and customary practice for conducting ESAs of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

Seneca Meadows, Inc., Investigation of Alternate Leachate (Raw and or Concentrate) Disposal Locations. Assisted in the field design and inspection of the installation of multiple landfill cells at a Seneca Meadows Landfill. Reviewed technical specifications for geomembrane, geocomposite, and installation practices. Prepared technical documentation relating to the inspection of welds, air testing and vacuum testing.

Morgan Acquisitions, Professional Engineering Services for the Proposed Home 2 - 1251 Pittsford-Victor Road, Town of Perinton. Reviewed historical documents such as aerial imagery, fire insurance maps, previous Environmental reports, and city directories, performed interviews with current and previous owners, reviewed technical database reports, and searched multiple NYSDEC databases for bulk storage tanks and spills.

Performed technical evaluations based on the document review that resulted in the development of numerous recognized environmental conditions (REC) which typically led to the recommendation of Phase II subsurface investigations. Prepared and submitted multiple Phase I ESAs in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) for good commercial and customary practice for conducting ESAs of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

Vision Hotels, LLC, Proposed Home 2 119 North Genesee St., Utica NY. Reviewed historical documents such as aerial imagery, fire insurance maps, previous Environmental reports, and city directories, performed interviews with current and previous owners, reviewed technical database reports, and searched multiple NYSDEC databases for bulk storage tanks and spills.

Performed technical evaluations based on the document review that resulted in the development of numerous recognized environmental conditions (REC) which typically led to the recommendation of Phase II subsurface investigations. Prepared and submitted multiple Phase I ESAs in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) for good commercial and customary practice for conducting ESAs of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

North Syracuse Lodging Group LLC, "Hamlin Farm" Site, Town of Clay, NY. Reviewed historical documents such as aerial imagery, fire insurance maps, previous Environmental reports, and city directories, performed interviews with current and previous owners, reviewed technical database reports, and searched multiple NYSDEC databases for bulk storage tanks and spills.

Performed technical evaluations based on the document review that resulted in the development of numerous recognized environmental conditions (REC) which typically led to the recommendation of Phase II subsurface investigations. Prepared and submitted multiple Phase I ESAs in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) for good commercial and customary practice for conducting ESAs of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

McGuire Development Co., Little Apple Dunkirk Site Due Diligence & Survey. Lead Environmental Engineer responsible for the preparation and submittal of a Phase I Environmental Site Assessment Report in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) that described the site history through various historical documents such as aerial imagery, fire insurance maps, city directories, and interviews with current and previous owners. Designed a subsurface environmental investigation to evaluate possible sources of metals and/or petroleum contamination on the project site including borings and temporary groundwater monitoring wells. Performed all field activities, classified soils, screened samples with a photo-ionization detector, collected soil and groundwater samples to submit for laboratory testing to determine levels of contamination. Analyzed laboratory data

and interpreted subsurface information with respect to soil types, groundwater flow direction, and the potential of migration of contamination onto and off of the subject site. Provided recommendations to the client in relation to the environmental risk and cost associated to the site.

Seneca Meadows, Inc., 2015 CQA. Assisted in the field design and inspection of the installation of multiple landfill cells at a Seneca Meadows Landfill. Reviewed technical specifications for geomembrane, geocomposite, and installation practices. Prepared technical documentation relating to the inspection of welds, air testing and vacuum testing.

Gills-02 Inc., Conceptual Phase Services for Retail Development-Proposed Denny's Rome NY. Reviewed historical documents such as aerial imagery, fire insurance maps, previous Environmental reports, and city directories, performed interviews with current and previous owners, reviewed technical database reports, and searched multiple NYSDEC databases for bulk storage tanks and spills.

Performed technical evaluations based on the document review that resulted in the development of numerous recognized environmental conditions (REC) which typically led to the recommendation of Phase II subsurface investigations. Prepared and submitted multiple Phase I ESAs in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) for good commercial and customary practice for conducting ESAs of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

The House of the Good Shepherd, Subsurface Investigation for 131-135 North Genesee Street, Utica NY. Lead field environmental engineer responsible for the design of a subsurface environmental investigation to evaluate the possible sources of contamination on the project site. Performed all field activities, classified soils, screened samples with a photoionization detector, collected soil samples and groundwater samples to submit for laboratory testing to determine levels of contamination. Directed field activities including contractor oversight, coordination with the NYSDEC during the removal of two underground storage tanks and associated spill, removal of contaminated soil observed as the result of the spill, and collected endpoint sampling consistent with 6NYCRR Part 360 regulations. Prepared a letter report to the client of findings during the investigation, and a spill closure letter to NYSDEC.

Town of Salina, NY:

- *Post-Closure Monitoring for the Salina Landfill.* Lead field Environmental Engineer responsible for post-closure monitoring including collecting quarterly groundwater samples within the landfill's monitoring network, site inspections, and quarterly and annual reporting to NYSDEC.
- *Start-Up Assistance for Groundwater Pretreatment Plant - Town of Salina Landfill Closure.* Environmental Engineer responsible for assisting in the startup of a 25,000 gallon-per day landfill leachate pre-treatment plant. Responsibilities included daily troubleshooting, bag filter change-outs, monitoring the performance of the system, performance/compliance sampling, and quarterly discharge reporting.

Solvents & Petroleum Service, Inc., Spill Prevention Report Update-Fayette Street Facility. Provided engineering services for this 6NYCRR Part 373 facility used for temporary storage of both virgin and spent solvents. Tasks included the collection of field data and groundwater samples and assistance in the preparation of periodic groundwater monitoring reports

Town of Salina, NY, Technical Assistance Regarding Potential to Accept Sediments from Lower Ley Creek at Salina Landfill. Environmental Engineer responsible for remediation of a portion of an access road at Salina Landfill that had been impacted by PCB-contaminated creek flooding.

FAGE USA Dairy Industry, Inc., Chemical Bulk Storage Annual Compliance inspections. Assisted in SPCC Plan preparation, tank inspection, and tank removal reporting for a facility containing chemical and petroleum bulk storage. Performed routine site inspections and coordinated with state regulators.

Seneca Meadows, Inc., CQA 2013. Assisted in the field design and inspection of the installation of multiple landfill cells at a Seneca Meadows Landfill. Reviewed technical specifications for geomembrane, geocomposite, and installation practices. Prepared technical documentation relating to the inspection of welds, air testing and vacuum testing.

Home HeadQuarters Inc., NYSHCR Environmental Review for Home HeadQuarters Properties. This project consisted of the environmental assessment of various houses for a HUD-funded, non-profit home renovation company prior to the rehabilitation and new construction of the homes. Engineer assisting in the preparation and execution of a 19-point review for each house including review of thermal explosives in the vicinity and environmental risks associated with the site and surrounding area. Reviewed state and federally regulated materials such as storage tanks, hazardous materials, and storage facilities to assess the hazard relative to the subject site.

Chicago Pneumatic, 2010-2011 Annual Operations and Maintenance-Former Chicago Pneumatic Facility. Environmental Engineer responsible for Operations and Maintenance of a groundwater pump and treat system for the removal VOCs in the groundwater. Responsibilities include bag filter change-outs, monitoring the performance of an existing air stripper, performance/compliance sampling, and monthly discharge reporting.

Town of Macedon, NY, Landfill Post Closure Monitoring. Environmental Engineer responsible for post-closure monitoring including collecting quarterly groundwater and surface water samples within the landfill's monitoring network, completion of perimeter soil gas surveys, and quarterly site inspections.

Solvents & Petroleum Service, Inc., RCRA Facility Investigation. Environmental Engineer responsible for collecting field data, quarterly groundwater sampling events, and assisting with writing the corresponding reports at Solvents and Petroleum Service, Inc, a RCRA facility located in central New York.

SITE INVESTIGATION AND REMEDIATION

Costello, Cooney & Fearon, PLLC, Due Diligence of 133 West Seneca Street, Manlius NY. Environmental Engineer responsible for performing a Phase I Environmental Site Assessment for the property to assess the potential environmental concerns for the site. Performed Phase II Subsurface investigations on the property to determine the nature and extent of heavy metal contamination on the site.

Confidential Client. This project involved the design, construction and operation of a thermally enhanced soil vapor extraction system. Environmental Engineer responsible for assisting with the technical review of project specifications, associated work plan reports, coordination with field staff, and preparation of a Final Engineering Report for NYSDEC regulatory review.

Santaro Industries, Inc., Environmental Services. Lead field environmental engineer responsible for the site investigation and remediation of a petroleum contaminated site. Performed all field activities, coordinated with the client, client's attorneys, and NYSDEC to effectively remediate the site for NYSDEC to issue a No Further Action letter.

AMERCO Real Estate Company, Haul - Utica, NY Facility. Environmental Engineer responsible for the preparation of technical documents including a Soil/Fill Management Work Plan and Community Air Monitoring Plan, in accordance with NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation. Coordinated directly with regulatory officials, the client, the landfill, and the contractor to design Work Plan amendments and a field sampling plan that would adequately address the concerns of all parties involved while maintaining regulatory compliance. Performed all field activities including soil sampling, contractor oversight, and air monitoring.

Apex Tool Group, LLC, Cortland Operation_EPCRA and SPDES. Environmental Engineer responsible for the assistance of closure activities associated with a former tool manufacturing facility during the transition of environmental, health, and safety responsibilities associated with the facility. Prepared technical documents such as the annual hazardous waste reporting to NYSDEC and Toxic Release Inventory reporting to the USEPA. Performed a chemical waste inventory of the facility and coordinated lab packing for appropriate management. Assisted in the design and execution of subsurface investigations to determine the depth and extent of contamination associated with the site.

City of Poughkeepsie, NY, The DeLaval Property. Lead field Environmental Engineer responsible for post-closure monitoring including collecting annual groundwater samples within the former BCP site, site inspections, and annual reporting to NYSDEC.

Confidential Client. Geotechnical Engineering Services for Planned Pipe Rack and RTO. Lead Field Environmental Engineer for the construction of a regenerative thermal oxidizer (RTO) for the Rotterdam Junction Facility. Responsibilities included soil screening, air monitoring, implementation of a health and safety plan, negotiations and discussions with NYSDEC, waste disposal tracking/documentation, and waste characterization and end point sampling.

LPCiminelli, Riverbend Site Redevelopment. Lead Field Environmental Engineer for the construction of a 1.2-million square foot solar panel manufacturing facility as part of the redevelopment of an approximately 88-acre parcel that was once the former Republic Steel. Responsible for assisting in the preparation of a detailed work plan, health and safety plans, and negotiations with NYSDEC. Responsible for developing and implementing a community air monitoring plan, field screening services during intrusive activities, sampling soils, delineating and providing guidance to the contractor on the management of contaminated media and conducting SWPPP inspections during the redevelopment of the property. Designed field changes as necessary when site conditions changed and negotiated with NYSDEC for approval to implement these changes. Prepared a construction completion report which included; historical site information, volume calculations and delineations of areas of contaminated material removed from the site, interpretation of air monitoring data, and an overview of all environmental work completed on the site during construction.

First Columbia LLC, Brownfield Application Albany. Performed calculations and estimates to determine the extent of PCB contamination at a potential brownfield property. The estimates were used to determine the most effective remedy for the site.

New York State Office of General Services, Wyoming Correctional Facility - Water Storage Tank Rehabilitation. Lead Field Environmental Engineer responsible for the preparation and implementation of a field sampling program and health and safety plan regarding soil sampling before and after abatement of a water storage tank at the facility. Coordinated and performed all field work including the identification of areas most likely to be impacted by the work, collection of soil samples, laboratory coordination, and coordination with correctional facility procedures.

Cafua Management Company, Dunkin Donuts. Reviewed historical documents such as aerial imagery, fire insurance maps, previous Environmental reports, and city directories, performed interviews with current and previous owners, reviewed technical database reports, and searched multiple NYSDEC databases for bulk storage tanks and spills.

Performed technical evaluations based on the document review that resulted in the development of numerous recognized environmental conditions (REC) which typically led to the recommendation of Phase II subsurface investigations. Prepared and submitted multiple Phase I ESAs in accordance with the ASTM International 2013 Standard Practice for Environmental Site Assessments (E1527-13) for good commercial and customary practice for conducting ESAs of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

Niagara County Refuse Disposal District, Landfill Groundwater Assessment for Refuse Disposal District. Environmental Engineer responsible for the field work associated with an alternatives analysis and feasibility study to determine the potential sources of groundwater contamination at an unlined landfill. Work included the identification of the thickness of cap materials, location of deficiencies, calculating the volume of waste located outside of the current landfill cap, a cost analysis regarding items of concern, and the evaluation of data to identify contaminant trends over time.

Classic Site Solutions, Inc., Former Sampson Air Force Base Physical Hazard Abatement. Environmental Engineer responsible for construction oversight and documentation during the demolition, excavation, removal and appropriate disposal of abandoned structures including an incinerator with contaminated soils and asbestos debris, a pump station and associated equipment, a wastewater treatment plant with three asbestos contaminated buildings and nine process tanks (including sludge digesters, clarifiers, trickling filters with mercury bearings and associated liquid waste and sludge). Responsibilities included the collection of Waste Characterization and Confirmation samples during all stages of the project and assisting in the Final Closure Report process in compliance with US Corp of Engineers requirements.

Onondaga County Dept. of Parks and Recreation, East and West Shore Trail Design. Environmental Engineer responsible for the assistance in the preparation of a Work Plan to submit for NYSDEC approval consisting of site history, evaluation of historical contamination, and identification of depths to native soil. Prepared a Health and Safety Plan for the investigations, Coordinated field investigation activities including, subcontractors, vendors, laboratories, and field supplies. Performed contaminant specific tests on soil samples collected during field activities.

Confidential Client, Environmental Services Term Agreement. This project involved the design, construction and operation of a thermally enhanced soil vapor extraction system. Environmental Engineer responsible for assisting with the technical review of project specifications, associated work plan reports, coordination with field staff, and preparation of a Final Engineering Report for NYSDEC regulatory review.

Education

Syracuse University, NY, M.S. in Environmental Engineering

State University of New York College at Plattsburgh, B.S. of Environmental Science

W.H. Miner Institute, NY, Applied Environmental Science Program

Registrations & Certifications

Part 107 Certified Commercial Drone Pilot

Institute for Sustainable Infrastructure, Envision Sustainability Professional

Nuclear Density Gauge Operator

ACI, Concrete Field Testing 1

ACI, Concrete Strength Testing Technician

Karyn Ehmann

Assistant Engineer I

Ms. Ehmann is an environmental engineer who has a variety of experience with both site investigation and monitoring projects as well as remedial construction projects. She also has experience with specialized material testing and wetlands delineation that supports a number of CHA environmental projects. Representative project experience includes:

Coyne Textile Brownfield Cleanup Program. Prepared a detailed, site-specific health and safety plan that accompanied a Remedial Investigation Work Plan, approved by NYSDEC. The plan addressed potential exposure to a number of potential site contaminants, but focused on chlorinated solvents as the primary contaminant of concern at the site. Implemented the Remedial Investigation Work Plan as Field Team Leader. Prepared the Remedial Investigation Report, for approval by NYSDEC. Assisting in the design of remedial alternatives for the site.

Town of Salina, NY, Salina Landfill Superfund Site. Assisted in the post-remediation groundwater monitoring program, including coordination with the laboratory and field teams, preparation of field logs and setup of digital tablets for data collection, and summarizing analytical results upon receipt from the laboratory. Also responsible for the preparation of an annual groundwater monitoring report for approval by the NYSDEC.

U-Haul, VCP Site. Oversaw remediation activities and soil removal at the site required to support redevelopment of the property, implemented a community air monitoring plan and maintained all air monitoring data utilizing a cloud-based system, and compiling appendices for a Construction Completion Report.

Eversource, New Hampshire Transmission Line Inspections. Conducted inspections of the transmission lines through approximately 200 miles of right-of-way in northern New Hampshire. Responsible for the completion of inspections through terrain previously considered inaccessible.

Confidential Client. Assisted in the preparation of the Pre-Design Investigation Summary Report and 60% Remedial Design Report, for approval by the NYSDEC. Aided in the design of remedial systems for the corrective measures required at the site. Researched techniques for implementing in-situ soil stabilization (ISSS) to address contamination beneath for the location of a proposed wastewater treatment tank and surrounding areas.

DeLaval Environmental Restoration Project. Assistant Project Engineer responsible for the coordination of on-going groundwater monitoring and annual site inspections at this brownfield site along the Hudson River waterfront. Also, responsible for the preparation of the annual Periodic Review Report summarizing the groundwater monitoring results and condition of the site soil cover system.

Niagara County Refuse Disposal District, C&D Landfill Closure. Processing of shop drawings, compiling of field reports and data, and preparation of a Construction Completion Report associated with the closure of a construction & demolition debris landfill near Lockport, New York. Assisting with the design, submission, and bidding for the next phase of landfill closure which will include the use of a unique closure system.

Tesla Energy, Air Permitting. Assisted with air permit modifications for the Tesla manufacturing hub in Buffalo, New York. Oversaw emergency generator stack testing to achieve compliance with the air permit.

Former Apex Tool Group. Assisted with the groundwater monitoring program, including coordination with the laboratory and field teams, preparation of field logs, and summarizing analytical results upon receipt from the laboratory. Responsible for the preparation and submission of quarterly groundwater monitoring reports for approval by the NYSDEC.

Former Chicago Pneumatic. Operation and maintenance of the groundwater treatment system the former Chicago Pneumatic Facility in Utica, New York. Weekly influent and effluent sampling, inspection, and occasional maintenance of the system.

PRIOR CHA EXPERIENCE

CME Associates, Materials Testing Technician. Ms. Ehmann provided quality assurance to construction managers and engineers through on-site inspections of soil and concrete. She also prepared detailed on-site inspection reports and effectively communicated with clients regarding the results and oversaw entire subgrade preparation for a the expansion of a strip mall.

Clarkson University, Research Assistant. Ms. Ehmann compared methods for analyzing the emerging contaminant siloxane in personal care products and Great Lakes fish homogenate in collaboration with the EPA Great Lakes Fish Monitoring and Surveillance Program. Additional experience includes gas chromatography/mass Spectrometry. She also presented findings at the Symposium on Undergraduate Research Experiences.

PUBLICATIONS

Mason SA, Garneau D, Sutton R, Chu Y, Ehmann K, Barnes J, Fink P,

Papazissmos D, Rogers DL. Microplastic pollution is widely detected in US municipal wastewater treatment plant effluent, Environmental Pollution (2016), http://dx.doi.org/10.1016/j.envpol.2016.08.056.

APPENDIX B

Field Calibration Log

PID Calibration Log

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

APPENDIX D

Health and Safety Plan

HEALTH AND SAFETY PLAN

for

BROWNFIELD CLEANUP PROGRAM
FORMER COYNE TEXTILE FACILITY
SYRACUSE, NEW YORK 13202

CHA Project Number: 33525.2001

Prepared for:

Ranalli/Taylor St., LLC
1200 State Fair Boulevard
Syracuse, NY 13209

Prepared by:

300 S. State Street, Suite 600
Syracuse, New York 13202

June 17, 2019

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LIST OF ACRONYMS

APR	Air Purifying Respirator
AOC	Area of Concern
CPR	Cardiopulmonary Resuscitation
C	Ceiling
CHA	CHA Consulting, Inc.
DCE	Dichloroethene
CFR	Code of Federal Regulations
CAMP	Community Air Monitoring Plan
CRZ	Contaminant Reduction Zone
EZ	Exclusion Zone
FTL	Field Team Leader
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSC	Health and Safety Coordinator
HASP	Health and Safety Plan
IDLH	Immediately Dangerous to Life and Health
IRMWP	Interim Remedial Measure Work Plan
JSA	Job Safety Assessment
LEL	Lower Explosive Limit
mg/m3	milligrams per cubic meter
NIOSH	National Institute for Occupational Safety and Health
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
ppm	parts per million
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
PID	Photoionization Detector
PM	Project Manager
REL	Recommended Exposure Limit
RI	Remedial Investigation
SDS	Safety Data Sheets
SCBA	Self Contained Breathing Apparatus
ST	Short Term

SSO	Site Safety Officer
SCO	Soil Cleanup Objective
TOGS	Technical and Operational Guidance Series
PCE	Tetrachloroethene
TWA	Time Weighted Average
TCE	Trichloroethene
UST	Underground Storage Tank

1.0 INTROCUTION

The following Health and Safety Plan (HASP) has been created for the protection of CHA Consulting, Inc. (CHA) staff conducting remedial activities at the Former Coyne Textile Facility (Site), located at 140 Cortland Avenue in the City of Syracuse, New York. Remedial activities will be performed in accordance with the Interim Remedial Measure Work Plan (IRMWP), which this HASP is appended to as Appendix D. 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 hazards including but not limited to:

- Chemical exposure due to the presence of subsurface contamination in the area of proposed underground storage tanks (USTs) removal and soil excavation
- Slip/Trips/Falls
- Cold Stress
- Fire or ignition of flammable vapors in boring areas
- Excessive noise for certain operations
- Heavy equipment operation
- Environmental and Biological hazards (e.g. insects, plants, ultra-violet 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: Environmental Site Assessments conducted by GZA GeoEnvironmental and the results of the Remedial Investigation (RI) conducted by CHA in 2018. 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 Brownfield hazardous waste 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:
Ronald Rogers
(518) 453-3917 (Office)
(518) 810-8926 (Cell)

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:
Meghan Platt
(315) 257-7145 (Office)
(315) 657-6916 (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:
Karyn Ehmann
(315) 257-7250 (Office)
(585) 721-2402 (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 is, 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:
Karyn Ehmann
(315) 257-7250 (Office)
(585) 721-2402 (Cell)

Title: Work Party

Description: Performs field operations.

Contact:
Karyn Ehmann
(315) 257-7250 (Office)
(585) 721-2402 (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 personal protection equipment (PPE), required air monitoring, decontamination procedures, and worker safety.

Contact:
Ronald Rogers
(518) 453-3917 (Office)
(518) 810-8926 (Cell)

Title: Scientific Advisor

Description: Guides the Project Team Leader in scientific matters.

Contact:
Christopher Burns, Ph.D., PG
(804) 412-8841 (Office)
(804) 822-0406 (Cell)

2.4 AS-NEEDED PERSONNEL

Title: Fire Department

Description: Responds to fires and performs rescues.

Contact:
911

Title: New York State DEC Spill Hotline

Description: Responds to all petroleum and other hazardous releases into the environment, anywhere in New York State.

Contact:
(800) 457-7362

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

3.0 SITE ENTRY

3.1 OBJECTIVES

The CHA non-intrusive objectives of the Site entry are to:

1. Oversee the remedial activities carried out as described in the IRMWP.
2. Document contractor activities.
3. Screen soils and vapors (visual, olfactory, and photoionic) for level of contamination in accordance with the New York State Department of Environmental Conservation (NYSDEC) 6NYCRR Part 360 Soil Cleanup Guidance Objectives.
4. Implement the Community Air Monitoring Plan (CAMP).

The intrusive site activities may include the following:

1. Removal of the concrete floor within the AOC.
2. Removal of the USTs within the AOC.
3. Excavation of contaminated soil.
4. Collection of confirmation samples.
5. Documentation of soil loading into trucks for off-site transport to permitted receiving facilities.
6. Documentation of imported materials.

This HASP has been developed for the protection of CHA employees on the subject site. The subcontracted UST removal company will be responsible for developing a HASP to protect their employees. Modifications to this HASP and its PPE requirements must occur if Site investigations indicate higher levels of contamination than identified in previous investigations.

3.2 SAFETY MEETINGS

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 Appendix A will be utilized to document the daily job Site safety 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;
- Excavation Awareness Training;
- CHA Respiratory Protection Plan;
- Field equipment safety training where applicable; and
- Applicable Job Safety Assessments (JSAs).

Training will have been conducted and certified by CHA in accordance with Occupational Safety and Health Administration (OSHA) regulations.

3.4 MEDICAL SURVEILLANCE

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 CHA personnel assigned to a task have had an annual occupational physical and respiratory fit test, 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

Location mapping has been included in the Figures section of the IRMWP. Figure 1 illustrates the location of the Site and Figure 2 illustrates the AOC. Appended to this HASP is the route to the nearest hospital from the subject Site, included as Figure 1. Anticipated truck routing and loading zone, and zones of work, including the exclusion zone, contaminant reduction zone, and the support zone, are identified on Figure 2.

4.0 SITE CHARACTERIZATION

4.1 SITE DESCRIPTION

The Former Coyne Textile Facility is located in an urban area at 140 Cortland Avenue in the City of Syracuse, Onondaga County, New York. The Site limits are generally bounded by commercial buildings to the north, South Salina Street to the east, Tallman Street to the south and South Clinton Street to the west. The Site is identified as two non-contiguous areas, but the focus of the IRMWP is the main building, described below:

- The former main laundry facility and offices are known as 140 Cortland Avenue (Tax Map No. 094.-05-06.0) and consist of one parcel of land totaling approximately 1.75 acres. This parcel consists of the currently vacant former laundering facility and vacant offices (approximately 118,500 square feet), sidewalks and limited vegetation. The building is a concrete block building with a slab-on-grade foundation.

The Site is currently inactive and zoned for commercial use. The general area surrounding the Site is highly developed and consists of commercial and industrial facilities. Two rows of multifamily houses are located northwest of the Site.

Based on a review of the 1973 U.S. Geologic Survey Map 7.5-minute Quadrangle for Syracuse West, New York, the Site has an approximate elevation of 390 feet above mean sea level and is relatively flat. The surrounding areas to the east and west have a topographic gradient that slopes toward Onondaga Creek, located approximately 600 feet west of the Site.

Characterization of the contamination via Phase I, II, and III investigation by GZA GeoEnvironmental in 2014 and the Remedial Investigation by CHA in 2018 indicated a central location of PCE contamination and its breakdown products (TCE, DCE, and vinyl chloride) near the northwest portion of the main building at 140 Cortland Avenue. Widespread volatile organic compound (VOC) and metal contamination is present within the soil and groundwater throughout the site.

The focus of the IRMWP is the Former UST Area. The Former UST Area is located in the northwestern portion of the building. A UST containing PCE and Stoddard solvent was found to be “closed in place” but lacking appropriate closure documentation. Investigation of this area was

conducted during the RI and several subsurface soil samples, groundwater samples, and soil vapor samples were collected in this area. Main contaminants of concern include tetrachloroethene (PCE), trichloroethene (TCE), cis 1,2-Dichloroethane (DCE), and vinyl chloride. During May 2019, the concrete floor associated with the Former UST Area was removed to reveal evidence of two, 6-foot diameter tanks and a smaller, approximately 200-gallon, tank. Each of these tanks was filled with what appears to be concrete.

During the RI, PCE was identified at concentrations exceeding its respective Part 375 Commercial Soil Cleanup Objective (SCO) in SOIL-116 (460 mg/kg) and lesser concentrations of TCE, DCE, and vinyl chloride in SOIL-116 and SOIL-119. PCE was detected in excess of the Part 375 Commercial SCO throughout this area. Metals (mercury and lead) and total PCBs exceeded the Part 375 Unrestricted SCO in this area but are less than the respective Part 375 Commercial SCOs.

Historical groundwater sampling identified the presence of chlorinated VOC contamination, including PCE, TCE, DCE, and vinyl chloride, in the wells directly adjacent to the Former UST Area. During the RI, Temp-GW001 and the cluster at GW-103 were located within and adjacent to the Former UST Area, respectively. Concentrations of PCE, TCE, DCE, and vinyl chloride, among others, were detected at concentrations exceeding their applicable Technical and Operational Guidance Series (TOGS) 1.1.1 Class GA Ambient Water Quality Standards.

4.2 NEIGHBORING PROPERTIES

The site is bordered by the following:

- **North:** Commercial Buildings, West Taylor Street
- **East:** Commercial Buildings, South Salina Street
- **South:** Commercial Buildings, Tallman Street
- **West:** Commercial Buildings, South Clinton Street

4.3 SITE TOPOGRAPHY

The topography of the site is relatively flat, with an elevation of approximately 390 feet above mean sea level. Onondaga Creek is approximately 600 feet to the west of the site and flows north to Onondaga Lake. The project area is relatively flat, but surface and groundwater movement is generally westward towards Onondaga Creek.

4.4 METEROLOGIC DATA

Time of year work is to be conducted is between June and October. The weather and temperature for that time of year is expected to vary, but warmer temperatures are typically expected this time of year. 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 Field Team Leader may notify the PM and stop work for the day. Information on heat and cold stress are included in Appendix A.

5.0 SITE CONTROL MEASURES

Exclusion Zone (EZ): Will include a 25-foot buffer around the AOC, including the location of the USTs and contaminated soil excavation. The approximately location of the EZ is labelled in red on Figure 2. Hazards within the EZ include inhalation of hazardous vapors, explosive potential, open excavations, excessive noise, slips/trips/falls, contact with heavy equipment, direct contact with contaminated soil or water. Due to the contamination present at the Site, it is anticipated the contractor responsible for removal of the USTs and excavation of contaminated soil will be required to wear Level C PPE. The PPE requirements for Level C are described in Section 9.0.

Continuous air monitoring with a photoionization detector (PID) will be conducted with the assistance of the subcontractor. Additionally, if the PID readings exceed 2.5 ppm in the breathing zone, Draeger ® tubes specific for vinyl chloride, PCE, TCE, and DCE will be used to determine concentrations of individual contaminants. With the assistance of the subcontractor, Draeger ® tubes and appropriate pump will be used in the breathing zone. Results will be reported to the Field Team Leader.

With the assistance of the subcontractor, the excavator will collect soil from each sidewall of the final excavation. Excavation to the top of groundwater is expected, therefore bottom samples will not be collected.

Contamination Reduction Zone (CRZ): Will be established immediately adjacent to the Exclusion Zone and will be utilized for management of soil samples, documentation of contractor activities, decontamination of personnel and equipment, and donning and doffing of PPE. The approximate location of the CRZ is labelled in yellow on Figure 2.

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. Always maintain situational awareness.

Due to the contamination at the Site, full-face air purifying respirators shall be available for all personnel for escape purposes only. CHA personnel will remain in the CRZ to observe activities from a distance, review results of air monitoring within the EZ, and manage soil samples collected within the EZ.

Support Zone: Will include all areas outside the EZ and CRZ. Daily Jobsite Safety Briefings will be conducted in the support zone upon contractor arrival. Contractors and all visitors to the Site will sign in with the Field Team Leader.

Hazards within the support zone include slips/trips/falls, contact with heavy equipment, and other physical hazards associated with the work area and physical setting at the Site.

5.1 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 Briefing before entering the work zone.

6.0 HAZARD EVALUATION

Hazards are generally divided into three categories; 1) exposure to chemicals and hazardous materials, 2) safety/physical hazards, and 3) biological hazards. Chemical and hazards materials are further segregated by their specific compound, exposure threshold, and route of exposure.

All chemical hazards identified for the Site are denser than air, so monitoring will occur near the ground surface. Physical hazards are generally slips/trips/falls, caught in/between moving equipment or parts, traffic and excavations. Biological hazards typically include poisonous plants, wild animals, and insects.

6.1 CHEMICAL HAZARDS

Chemical	OSHA PEL	NIOSH REL	IDLH	Ionization Potential (I.P)	Characteristics	Routes of Exposure	Symptoms of Exposure and Health Effects
Tetrachloroethene (PCE)	TWA 100 ppm C 200 ppm (for 5 mins in any 3-hr period) max peak of 300 ppm	NA, Ca Minimize workplace exposure concentration	150 ppm	9.32 eV	Colorless liquid with a mild chloroform-like odor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema, liver damage; carcinogenic
Trichloroethene (TCE)	TWA 100 ppm C 200 ppm 300 ppm (5 min max in 2-hr period)	NA Ca	1000 ppm	9.45 eV	Colorless liquid (unless dyed blue) with a chloroform-like odor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, skin; headache, visual disturbance; lassitude (weakness, exhaustion); dizziness, tremors, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias; paresthesia; liver injury; carcinogenic
Cis- 1,2-Dichloroethene (DCE)	TWA 200 ppm	TWA 200 pm	1000 ppm	9.65 eV	Colorless, oily liquid with a chloroform-like odor	inhalation, ingestion, skin and/or eye contact	irritation skin; central nervous system depressed; liver, kidney, and lung damage
Vinyl Chloride	TWA 1 ppm C 5 ppm (15-minute)	NA Ca	N/A	10.0 eV	Colorless gas or liquid (below 7°) with a pleasant odor at high concentrations	inhalation, skin and/or eye contact (as a liquid)	lassitude (weakness, exhaustion); abdominal pain, GI bleeding; enlarged liver; pallor or cyan of extremities; liquid: frostbite; carcinogenic
Benzo [a] anthracene	TWA 0.2 mg/m^3	Ca TWA 0.1 mg/m^3	80 mg/ m^3	NA	Black or dark-brown amorphous residue	inhalation, skin and/or eye contact	dermatitis; bronchitis; carcinogenic

Chemical	OSHA PEL	NIOSH REL	IDLH	Ionization Potential (I.P)	Characteristics	Routes of Exposure	Symptoms of Exposure and Health Effects
Benzo [a] pyrene	TWA 0.2 mg/m^3	Ca TWA 0.1 mg/m^3	80 mg/ m^3	NA	Black or dark-brown amorphous residue	inhalation, skin and/or eye contact	dermatitis; bronchitis; carcinogenic
Benzo [b] fluoranthene	TWA 0.2 mg/m^3	Ca TWA 0.1 mg/m^3	80 mg/ m^3	NA	Black or dark-brown amorphous residue	inhalation, skin and/or eye contact	dermatitis; bronchitis; carcinogenic
Benzo [g,h,i] perylene	TWA 0.2 mg/m^3	Ca TWA 0.1 mg/m^3	80 mg/ m^3	NA	Black or dark-brown amorphous residue	inhalation, skin and/or eye contact	dermatitis; bronchitis; carcinogenic
Benzo [k] fluoranthene	TWA 0.2 mg/m^3	Ca TWA 0.1 mg/m^3	80 mg/ m^3	NA	Black or dark-brown amorphous residue	inhalation, skin and/or eye contact	dermatitis; bronchitis; carcinogenic
Indeno [1,2,3-cd] pyrene	TWA 0.2 mg/m^3	Ca TWA 0.1 mg/m^3	80 mg/ m^3	NA	Black or dark-brown amorphous residue	inhalation, skin and/or eye contact	dermatitis; bronchitis; carcinogenic
Lead	TWA 0.05 mg/m³	TWA 0.05 mg/m³	100 mg/ m³	NA	Heavy, ductile, soft and gray solid. Non-combustible in solid form	Inhalation, ingestion, skin and/or eye contact	Lassitude; insomnia; facial pallor; anorexia; weight loss; malnutrition; constipation; abdominal pain; colic; anemia; gingival lead line; tremor; paralysis of the wrist, ankles; encephalopathy; kidney disease; irritation of the eyes; hypertension
Beryllium	TWA 0.0002 mg/m³	Ca C 0.0005 mg/m³	4 mg/ m³	NA	Hard, brittle, gray-white solid. Non-combustible in bulk form, slight explosion hazard in powder/dust form.	Inhalation, skin and/or eye contact	Berylliosis (chronic exposure): anorexia, weight loss, lassitude, chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency, eye irritation, dermatitis

C – Ceiling value
Ca – Potentially Cancerous
IDLH – Immediately Dangerous to Life and Health
NIOSH – National Institute for Occupational Safety and Health
OSHA – Occupational Safety and Health Administration
PEL – Permissible Exposure Limit
REL – Recommended Exposure Limit
ST – Short Term Exposure Limit
TWA – Time Weighted Average

Chemical hazards are significant at this Site. Contamination at the Site is primarily PCE, TCE, DCE, and vinyl chloride. The IRMWP is specifically for the source area of contamination, the Former UST Area. One soil sample in this area was found to have concentrations of 460 mg/kg (PCE), 38.3 mg/kg (TCE), 424 mg/kg (DCE), and 12.3 mg/kg (vinyl chloride). Removal of the USTs and excavation of contaminated soil is anticipated to release significant vapors into the breathing zone. It is anticipated CHA and the contractor conducting the UST removal and contaminated soil excavation will be in Level C PPE while in the exclusion zone. An organic/acid vapor cartridge properly installed on a full-face negative pressure respirator is appropriate for vinyl chloride concentrations in the breathing zone of up to 10 ppm.

6.2 DISPERSION PATHWAYS

The potential exposure mechanism that can transport contaminants 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:

- Inhalation of volatilized contaminants into air;
- Contact with contaminated groundwater or soil;
- 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; and
- 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 will be controlled. The primary effect of visible dust is irritation of the eyes, nose, and throat. While it is not anticipated, visible emissions will 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 intrusive activities;
- Lightly wetting surfaces or applying misters;
- Using chemical or foam dust suppressants (with authorization only); and
- Reducing vehicle speeds.

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

6.3 PHYSICAL HAZARDS

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

- Slip/trip/fall
- Falls from elevated surfaces
- Excavations;
- Heat stress;
- UV radiation;
- Heavy equipment operation;
- Excessive noise;
- Caught in/between moving parts or equipment;
- Lifting (generators, drums, equipment); and
- Traffic – on access roadways at the facility.

6.4 BIOLOGICAL HAZARDS

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

- Ticks, mosquitoes, stinging insects, arachnids, chiggers (allergic reactions and/or infectious diseases that can be transmitted to humans by animals)
- Rodents, snakes, zoonotic diseases (physical contact and/or infectious diseases that can be transmitted to humans by animals)

6.5 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	UST removal and excavation of contaminated soil.	• Hazardous vapors from the volatilization of PCE, TCE, DCE, and vinyl chloride. • Inhalation of organic vapors, dusts, and other airborne particulates. • Skin and/or eye contact with contaminated soil and/or groundwater, decontamination solutions, and sample preservation agents. • Explosion hazard during cleaning and removal of the UST.	• 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. • Avoid walking through puddles and contacting other potential sources of contaminants such as drums. • Keep airborne dust levels to a minimum by wetting down surfaces.
All personnel in Exclusion Zone and Contamination Reduction Zone	Collection of documentary samples, waste disposal samples, and imported clean fill materials.	• Hazardous vapors from the volatilization of PCE, TCE, DCE, and vinyl chloride. • Inhalation of organic vapors, dusts, and other airborne particulates. • Skin and/or eye contact with contaminated soil, decontamination solutions, and sample preservation agents.	• 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. • Avoid walking through puddles and contacting other potential sources of contaminants such as drums. • Keep airborne dust levels to a minimum by wetting down surfaces.
All personnel	All field activities	Slips, trips, & falls	• Wear appropriate work boots. • Avoid slippery surfaces. • Remind field personnel to exercise good housekeeping practices • Be observant of activities around.
All personnel	All field activities	Physical injuries, such as abrasions or cuts	• Use safe work practices • Don proper PPE • Have a first aid kit readily available at site
All personnel	Heavy lifting	Back injuries from lifting	• Practice safe lifting techniques. • Always use a minimum of 2 people for heavy lifts • Lift with legs
All personnel	Cold stress	Exposure to low temperatures associated with working outdoors in variable weather conditions	• Wear warm, dry clothing & layers • Take frequent breaks in warm areas

Affected Personnel	Task/Operation	Hazards	Hazard Control
All personnel	All field activities	Fire (general)	• Identify location of fire extinguisher(s) – contractor sourced • Keep ignition sources away from flammable materials and atmospheres.
All personnel	All field activities	Noise Exposure	• Wear hearing protection if you must shout to hear someone who is standing one foot or less away.
All personnel	All field activities	Contact with heavy equipment and traffic	• Do not stand unnecessarily close to the excavator when it is operating • Do not stand in lanes of traffic. Use cones or barricades to delineate work areas when work within access roads is required. • Wear a hard hat and high visibility clothing • Make eye contact with the operator/drivers
All personnel	All field activities	Security	• Stay alert to all on-site activities • Report suspicious activities to PM and/or Ranalli/Taylor St. LLC
All personnel	All field activities	Ticks	• Avoid unnecessary entry into tall grass and brushy areas. • Wear insect repellents containing DEET or Permethrin. • Wear light colored clothing to easily identify ticks. • Inspect yourself throughout the day and following completion of field activities. • Tuck pants into socks or boots, wear long sleeves and minimize skin exposure.
All personnel	All field activities	Stinging insects (bees, hornets, wasps and yellow jackets)	• Do not agitate nests unless absolutely necessary. • Be aware of holes in the ground within the work area. • Avoid wearing bright or patterned clothing. • Avoid wearing/using scented items (e.g., perfume, cologne, soaps). • Inspect food and drinks prior to consumption. • Use insecticide when necessary.
All personnel	All field activities	Hantavirus	• Avoid dermal contact with rodent droppings.

Affected Personnel	Task/Operation	Hazards	Hazard Control
			• Avoid inhalation of dust that is contaminated with rodent droppings.
All personnel	All field activities	Mosquitos/West Nile Virus	• Eliminate mosquito breeding areas (standing water) at the work site. • Apply insect repellent containing DEET to exposed, unbroken skin per the manufacturer's instructions. • Wear light colored clothing (pants, long sleeved shirts and socks).
All personnel	All field activities	Snakes	• Avoid actions which increase the risk of encountering a snake (e.g., overturning logs, rocks, etc.).
All personnel	All field activities	Rodents	• Avoid contact with rodents and burrowing animals.
All personnel	All field activities	Arachnids	• Avoid actions which increase the risk of encountering arachnids (e.g., overturning logs, placing hands in dark places).
All personnel	All field activities	Physically Damaging Plants (e.g., briars, thistles)	• Remove plants prior to implementing the work activity. • Use briar resistant pants or chaps if working in dense thorny vegetation.
All personnel	All field activities	Poisonous Plants	• Avoid contact with the plant. • Cover arms and hands when working in the vicinity of the plants. • Frequently wash potentially exposed skin. • Treat every surface that may have come in contact with the plant as contaminated.
All personnel	All field activities	UV Exposure	• Cover skin and limit time in sun to extent practical. • Apply sunscreen.

6.6 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.

- PID with 10.6 eV lamp or higher;
- Dräger® pump and colorimetric tubes; and
- 4 gas meter (CO, O_2, H_2S, LEL).

The PID shall be used to detect volatile organic vapors in the ambient air and will be calibrated and setup prior to the start of the days' activities.

Contaminant/Method	Frequency	Action Level	SSO Action
Organic Vapors (Dräger® pump and colorimetric tube specifically for Vinyl Chloride)	Background will be monitored prior to start-up of daily work. Whenever > 2.5 ppm total organic vapor concentration on PID is sustained for 5 minutes.	0.1 ppm up to 0.5 ppm	Continue monitoring every 15 minutes until Draeger ® Tube indicates the concentration is below 0.1 ppm.
		>0.5 ppm	Stop work and notify the PM of the elevated vinyl chloride concentrations. An upgrade in PPE may be required. Notify the PM prior to any PPE change.
Organic Vapors (PID/ Dräger® pump and colorimetric tube specifically for PCE, TCE, and DCE)	Background will be monitored prior to start-up of daily work. Whenever > 2.5 ppm total organic vapor concentration on PID is sustained for 5 minutes.	2.5 ppm up to 12 ppm	Continue monitoring every 15 minutes until the Draeger ® Tube indicates the concentration is below 2.5 ppm.
		>12 ppm	Stop work and notify the PM of the elevated PCE/TCE/DCE concentrations. An upgrade in PPE may be required. Notify the PM prior to any PPE change.
Organic Vapors (PID)	Ongoing throughout excavation activities. Background will be monitored prior to startup of daily work.	12 ppm	Stop work and notify PM of elevated organic vapors.
Lower Explosive Limit (LEL) (4 gas meter)	Ongoing throughout excavation activities.	10% LEL	A 4-gas meter will be utilized to monitor for flammable concentrations of

Contaminant/Method	Frequency	Action Level	SSO Action
	Background will be monitored prior to startup of daily work.		vapor when highly contaminated soils or drums (empty or otherwise) are encountered. Work shall cease and personnel will leave the Exclusion Zone when the LEL reading is 10% or higher (which is equivalent to 0.12% benzene, 0.18% phenol or 0.09% xylene by concentration).

6.7 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 PPE 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 HAZARD COMMUNICATION

In compliance with 29 CFR 1910.1200, hazardous materials brought on site by 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 PPE, 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.

8.0 CONFINED SPACE

During this project CHA personnel will not be permitted to enter a confined space. If a confined space entry becomes necessary, the PM will be notified, this HASP will be revised to outline 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, entrants and attendants will be trained in Confined Space Entry Authorized User training consistent with the applicable regulation.

9.0 PERSONAL PROTECTIVE EQUIPMENT

Level A PPE is 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
General site observation at a distance greater than 50 feet from intrusive activities. • No free product visible • Breathing Zone PID Readings < 2.5 ppm with the 10.6 eV bulb • Chemical specific concentrations (Dräger® pump and colorimetric tubes) below the appropriate Action Level. • <50 mg/m^3 dust • No odors present	D	• Long pants (no shorts) • Hard hat • Safety glasses • Reflective vests or yellow Hi-Visibility shirt • Work boots with safety toe • Hearing protection (where required) • Gloves (as appropriate)
Site Observation or Screening/Sampling Activities within the Contaminant Reduction Zone and the Exclusion Zone • No free product visible • Breathing Zone PID Readings > 2.5 ppm with the 10.6 eV bulb • Chemical specific concentrations (Dräger® pump and colorimetric tubes) above the appropriate Action Level. • >50 mg/m³ dust • Odors noted	C	• Same as D, plus • Full-faced air purifying respirator (APR) with dual particulate-organic/acid vapor cartridges • Protective coveralls (e.g. Tyvek) • Protective outer boot covers • Outer gloves with disposable nitrile or latex inner gloves • Inner polyethylene boot covers with outer latex boot covers • Both inner and outer gloves must be chemically resistant • Flame retardant coveralls under protective coveralls whenever drums or drum carcasses are encountered

10.0 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

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

Level C

- Segregated equipment drop.
- Wash/rinse outer boot cover and gloves.
- Remove tape.
- Remove boot cover.
- Remove outer gloves.
- Deposit disposables in container for proper disposal.
- Remove suit and dispose of in proper container.
- Inner glove wash/rinse.
- Remove air purifying respirator.

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

Level B

- Will not be used at this time.
- If Level B is deemed necessary, this HASP must be updated prior to authorization to continue work.

Level A

- Will not be used at this time.
- If Level A is deemed necessary, this HASP must be updated prior to authorization to continue work.

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 procedures 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 non-dedicated equipment 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.

Decontaminated equipment shall 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, decontaminated sampling equipment shall be wrapped in aluminum foil or placed in a new/clean plastic bag

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 site-specific HASP.

11.0 EMERGENCY PROCEDURES

911 service is available and confirmed at this location; however, emergency services are available at the facility by calling 911. Call 911 immediately for additional emergency response. Only if the 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 Ranalli/Taylor St. LLC 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 additional 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.
- 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 Attachment C.

12.0 EMERGENCY MEDICAL CARE

In general, if emergency care is needed, personnel will call 911**.** Provide any emergency medical service personnel with the appropriate SDS. However, if necessary, transport injured personnel to the nearest hospital using the following directions (map available in Figure 1):

Address: Crouse Hospital
736 Irving Ave
Syracuse, NY 13210

Emergency Room Telephone Number: (315) 470-7111

Directions from site:

1. Head north on Cortland Ave toward S. Salina St.
2. Use any lane to turn left onto S. Salina St.
3. Turn right onto S. Warren St.
4. Turn right at the 1st cross street onto E. Adams St.
5. Turn right onto Irving Ave
6. Your destination is on the right.

12.1 EMERGENCY NOTIFICAITON NUMBERS

Emergency Medical: 911
Fire Dept.: 911
Police Dept.: 911
Department of Emergency Services: 911
Poison Control: (800) 222-1222
CHA Project Manager: Meghan Platt, (315) 257-7145 (Office), (315) 657-6916 (Cell)
CHA Corporate Director of Health and Safety: Ronald Rogers, (518) 453-3917 (Office), (518) 810-8926 (Cell)
CHA Contact: David Ulm, (315) 257-7203 (Office), (315) 439-3899 (Cell)

12.2 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 with tepid water. 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 victim does not have a pulse and if you are currently certified in CPR.

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 will

immediately dial emergency services (i.e. 911).

Use universal precautions such as barrier gloves and shields. 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.

13.0 CERTIFICATIONS

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

Name	Title	Date

14.0 STANDARD OPERATING PROCEDURES

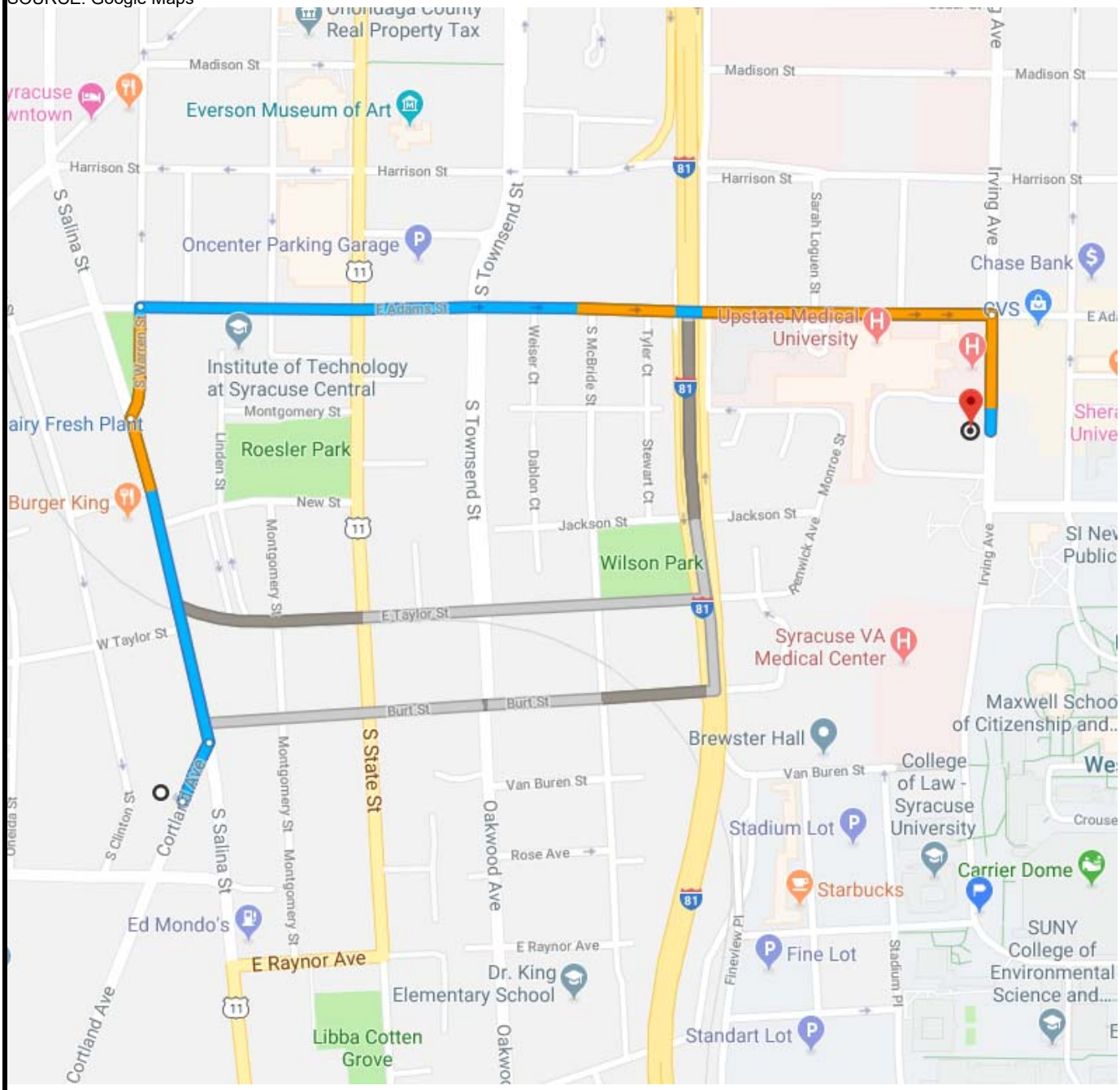
Applicable CHA Standard Operating Procedures (SOPs) are included in Appendix A of the IRMWP. Appended to this HASP are CHA JHAs and OSHA Quick Cards in Appendix A, respiratory protection plan and respirator inspection checklist in Appendix B, and the procedures and paperwork for incident reporting in Appendix C.

15.0 JOB HAZARD ANALYSIS

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

Figures

SOURCE: Google Maps



140 Cortland Ave
Syracuse, NY 13202

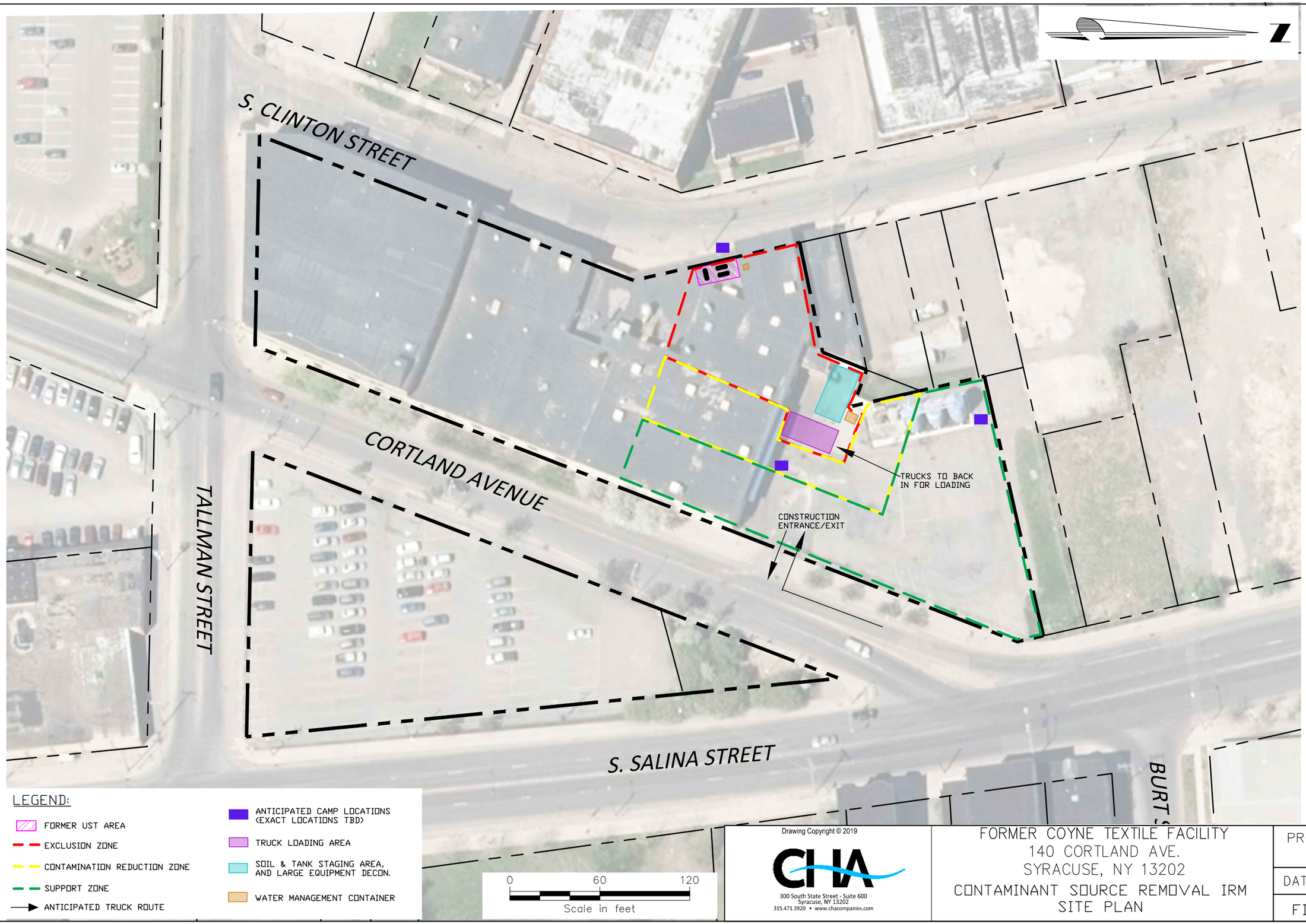
1. Head north on Cortland Ave toward S. Salina St.
2. Turn left onto S. Salina St.
3. Slight right onto S. Warren St.
4. Turn right onto E. Adams St.
5. Turn right onto Irving Ave

Crouse Hospital
Syracuse, NY 13210

CHA ©2016
300 South State Street Suite 600, Syracuse, NY 13202
www.chacompanies.com

NOT TO SCALE | DATE: April 2019

FIGURE 1
DIRECTIONS TO NEAREST HOSPITAL
Former Coyne Textile Facility
City of Syracuse, New York
Onondaga County, New York



CHA
300 South State Street - Suite 600
Syracuse, NY 13202
315.471.3920 • www.chacompanies.com

FORMER COYNE TEXTILE FACILITY
140 CORTLAND AVE.
SYRACUSE, NY 13202
CONTAMINANT SOURCE REMOVAL IRM
SITE PLAN

PROJECT NO. 33525

DATE: 06/2019

FIGURE 5

File: V:\PROJECTS\ANY\K4\33525\CADD_ACAD\ENVP\SOURCE AREA IRMWP\SITE PLAN.DWG
Saved: 6/14/2019 3:12:42 PM Plotted: 6/17/2019 12:39:12 PM Current User: Harrell, Benjamin LastSovedBy: 4187

Attachment A

Daily Jobsite Safety Brief, Job Hazard Analysis, Quick Cards

DAILY JOBSITE SAFETY BRIEF

PROJECT INFORMATION			
Project Name: SI Group East Side Design Activities			**CHA Project No. 32690**
Project Start Date:	**Completion Date:**		**Weather:**
Project Location:			**Project Task:** ***Complete a Site Health & Safety Plan per Task***
Description of Work: ***Be Specific:***			
Key Personnel:			
Responsibilities:	*Project Manager* Keith Cowan	*Field Team Leader*	*Site Safety Officer*

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	☐Yes ☐No	All staff have proper PPE	☐Yes ☐No
Hazards and precautions have been discussed	☐Yes ☐No	Safety Controls in place	☐Yes ☐No

Additional Notes/Comments: _____

Signed: _____ **Date/Time:** _____

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Additional Notes/Comments: _____

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Job Hazard Analysis

Electrical Safety

Task	Hazard Type and Description	Hazard Control
Working around electrical power poles	Potential for electric shock	Electrical installations and maintenance shall only be performed by certified electricians
Working around conduits	Potential for serious burns or injury	Lockout and tagout electrical equipment prior to exposing personnel
Working around electrical panels		All electrical equipment shall have ground fault circuit interrupters (GFCI) or assured equipment grounding. Avoid lifting long dimensional conductors (ducts or pipes) over or around lie electrical. All extension cords shall be free of frays. All receptacles must be mounted and secure prior to use. Panel boxes must be covered to prevent accidental contact with life parts. Portable ladders used for electrical work must have non-conductive side rails. Conductive items of jewelry or clothing shall not be worn unless they are rendered non-conductive by covering, wrapping or other insulating means

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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).
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 limited access to clean drinking water	Giardia	Treat, filter, or boil 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

	Tick bites	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)
	Roughskin Newts	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
	Bee stings	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
Travel movement or work in area with poison oak or poison ivy	Allergic reaction to poison oak/poison ivy plants	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 Tecnu or similar product with cold water to remove oils
Encountering irrigation	Unfriendly encounters with	Do not wear uniforms and carry a

pipes, marijuana plantation, or grow operations	criminal elements	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

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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. 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 contaminates 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 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

		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
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 Back strains, hand injury from probing rod	Review overall terrain and identify surface conditions. Look for ruts, large rocks, and uneven terrain 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, struck0by/caught-between. Ladder safety 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 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. The competent person shall inspect the installation of the protective

		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
Working near the ditch	Falling into eight foot deep trench	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 restrain by tethering workers). Provide a walkway or bridge with standard guardrails if employee must cross over the excavation
Equipment Damage	Excavations left open and unattended near roadways & walkways, equipment roll over hazard, high noise, airborne dust	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.
Working outside	Bad weather (rain, cold/heat, etc..)	If rain and/or lightning starts, stop all activities and allow competent person to advise further regarding safety practices and procedures.
Excavator with grapple attachment	Employees working near building(s) can potentially have a crushing injury and atmospheric hazard. Striking	Keep personnel at a safe distance from the equipment. Monitor atmospheric conditions. Make eye contact with the operator before

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

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Job Hazard Analysis

Heavy Equipment

Task	Hazard Type and Description	Hazard Control
Heavy equipment	Pinch points 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 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 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

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Job Hazard Analysis

Working in/Around Traffic

Task	Hazard Type and Description	Hazard Control
Workers working in/around traffic	Workers getting hit by oncoming traffic because they are not visible to drivers	Wear the appropriate PPE including an **ANSI/Class II** high visibility safety apparel. Employers should make sure their employees are provided with the proper performance class
Workers working with contractors	Contractor workers could be unfamiliar with specific traffic control requirements (spacing requirements, number of traffic control devices required, training of flaggers, etc.) A vehicular or personnel accident could result from this	Ensure those involved with traffic control are familiar with MUTCD (manual of uniform traffic control devices) requirements
Utilizing flagmen to control traffic	Flagmen not trained/ qualified	Flagmen for traffic control must be trained in proper flagging requirements
Making sure the contractor has control over the flow of traffic	Traffic not cooperative in slowing down or driving recklessly	Contact local police department for assistance in patrolling area more frequently, strategic placement of traffic control devices to make drivers feel as if they need to slow down (i.e. creating a narrower approach or path, devices that look like law enforcement, etc.)
Working on the traffic side of trucks	Being struck by an oncoming vehicle	Set up job so all work is done on the ditch side of trucks
Utilizing traffic control devices for controlling traffic	Inadequate traffic control for advance warning of work zone	Ensure traffic control devices meet MUTCD (Manual of Uniform Traffic Control Devices)

		requirements. Use arrow boards. Use the site plan to review traffic details
Working around very heavy traffic	Being struck by traffic	Plan work for low traffic hours if possible. Shut down lanes of traffic if possible
Operating a vehicle in a construction/ heavy traffic area	Striking or being struck by others	Use a spotter when visibility is limited
Setting up equipment near traffic	Backing into workers, vehicles, ditches, oncoming traffic, other property damage	Have someone watch when you back up
Entering/Exiting the job site	Being hit by oncoming traffic	As you are entering site, continue in the direction of traffic, slow down, use flashers or beacon lights well in advance, and pull completely on shoulder, etc. Park vehicles as to not interrupt traffic. Exit vehicle on non-traffic side. If performing data collection and need to continue movement in vehicle, continue to use flashers if not completely stopping. Use beacon lights on larger vehicles. Be sure they are not blocked by equipment (ladders, trailers, etc.). Exit safely by considering all traffic. Use a spotter when backing out if at all possible. Check that all equipment (ladders, trailers) is secure.
Crossing highway on foot, making visual observations, taking photos, taking measurements	Noise Traffic	Use proper warning signage/cones, work facing traffic, frequently observe traffic, plan escape route ahead of time, keep a firm grasp of equipment

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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

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Electrical Safety

Electrical hazards can cause burns, shocks and electrocution (death).

- Assume that all overhead wires are energized at deadly voltages. Never assume that a wire is safe to touch even if it is down or appears to be insulated.
- Never touch a fallen overhead power line. Call the electric utility company to report fallen electrical lines.
- Stay at least 10 feet (3 meters) away from overhead wires during cleanup and other activities. If working at heights or handling long objects, survey the area before starting work for the presence of overhead wires.
- If an overhead wire falls across your vehicle while you are driving, stay inside the vehicle and continue to drive away from the line. If the engine stalls, do not leave your vehicle. Warn people not to touch the vehicle or the wire. Call or ask someone to call the local electric utility company and emergency services.
- Never operate electrical equipment while you are standing in water.
- Never repair electrical cords or equipment unless qualified and authorized.
- Have a qualified electrician inspect electrical equipment that has gotten wet before energizing it.
- If working in damp locations, inspect electric cords and equipment to ensure that they are in good condition and free of defects, and use a ground-fault circuit interrupter (GFCI).
- Always use caution when working near electricity.

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

OSHA 3294-04R-13

OSHA® DATOS RÁPIDOS

Seguridad eléctrica

Los riesgos eléctricos pueden causar quemaduras, choques eléctricos y electrocución (muerte).

- Sepa que probablemente todos los cables aéreos están energizados (vivos) a voltajes fatales. Nunca asuma que se puede tocar un cable de manera segura aún si está fuera de servicio o parece que está aislado.
- Nunca toque una línea de energía eléctrica que se haya caído. Llame a la compañía de servicio eléctrico para reportar líneas eléctricas caídas.
- Manténgase al menos 10 pies (3 metros) alejado de los cables aéreos durante limpiezas y otras actividades. Si está trabajando desde alturas o manejando objetos largos, antes de comenzar a trabajar evalúe el área para detectar la presencia de cables aéreos.
- Si un cable aéreo cae sobre su vehículo cuando esté guiando, manténgase dentro del vehículo y continúe guiando, alejándose del cable. Si el motor de su vehículo se detiene, no salga del vehículo. Adviértale a las personas que no toquen el vehículo o el cable. Llame, o pídale a alguien que llame, a la compañía local de servicio eléctrico y a servicios de emergencia.
- Nunca opere equipos eléctricos mientras esté parado sobre agua.
- Nunca repare cables o equipo eléctrico a menos que esté calificado y autorizado.
- Antes de energizar el equipo eléctrico que se ha mojado, haga que un electricista calificado lo inspeccione.
- Si está trabajando en áreas húmedas, inspeccione los cables y equipo eléctrico para asegurarse que estén en buenas condiciones y sin defectos, y use un interruptor de circuito con pérdida a tierra (GFCI, por sus siglas en inglés).
- Siempre tenga cuidado cuando esté trabajando cerca de electricidad.

Para más información:

OSHA® Administración de Seguridad y Salud Ocupacional
Departamento de Trabajo de los EE. UU.
www.osha.gov (800) 321-OSHA (6742)

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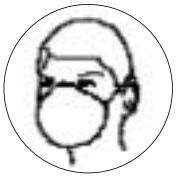
Protect Yourself
Respirators

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.

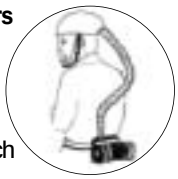


Single-strap dust masks are usually not NIOSH-approved. They must not be used to protect from hazardous atmospheres. However, they may be useful in providing comfort from pollen or other allergens.

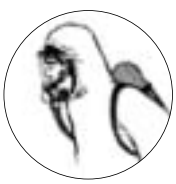
Approved filtering facepieces (dust masks) can be used for dust, mists, welding fumes, etc. They do not provide protection from gases or vapors. DO NOT USE FOR ASBESTOS OR LEAD; instead, select from the respirators below.

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:

OSHA Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA

OSHA 3280-10N-05

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Protecting Workers from Heat Stress

Heat Illness

Exposure to heat can cause illness and death. The most serious heat illness is heat stroke. Other heat illnesses, such as heat exhaustion, heat cramps and heat rash, should also be avoided.

There are precautions your employer should take any time temperatures are high and the job involves physical work.

Risk Factors for Heat Illness

- High temperature and humidity, direct sun exposure, no breeze or wind
- Low liquid intake
- Heavy physical labor
- Waterproof clothing
- No recent exposure to hot workplaces

Symptoms of Heat Exhaustion

- Headache, dizziness, or fainting
- Weakness and wet skin
- Irritability or confusion
- Thirst, nausea, or vomiting

Symptoms of Heat Stroke

- May be confused, unable to think clearly, pass out, collapse, or have seizures (fits)
- May stop sweating

To Prevent Heat Illness, Your Employer Should

- Establish a complete heat illness prevention program.
- Provide training about the hazards leading to heat stress and how to prevent them.
- Provide a lot of cool water to workers close to the work area. At least one pint of water per hour is needed.

U.S. Department of Labor

For more information:

OSHA® Occupational Safety and Health Administration

www.osha.gov (800) 321-OSHA (6742)

OSHA 3154-06R 2014

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- Modify work schedules and arrange frequent rest periods with water breaks in shaded or air-conditioned areas.
- Gradually increase workloads and allow more frequent breaks for workers new to the heat or those that have been away from work to adapt to working in the heat (acclimatization).
- Routinely check workers who are at risk of heat stress due to protective clothing and high temperature.
- Consider protective clothing that provides cooling.

How You Can Protect Yourself and Others

- Know signs/symptoms of heat illnesses; monitor yourself; use a buddy system.
- Block out direct sun and other heat sources.
- Drink plenty of fluids. Drink often and BEFORE you are thirsty. Drink water every 15 minutes.
- Avoid beverages containing alcohol or caffeine.
- Wear lightweight, light colored, loose-fitting clothes.

What to Do When a Worker is Ill from the Heat

- Call a supervisor for help. If the supervisor is not available, call 911.
- Have someone stay with the worker until help arrives.
- Move the worker to a cooler/shaded area.
- Remove outer clothing.
- Fan and mist the worker with water; apply ice (ice bags or ice towels).
- Provide cool drinking water, if able to drink.

IF THE WORKER IS NOT ALERT or seems confused, this may be a heat stroke. CALL 911 IMMEDIATELY and apply ice as soon as possible.

If you have any questions or concerns, call OSHA at 1-800-321-OSHA (6742).

U.S. Department of Labor

For more information:

OSHA® Occupational Safety and Health Administration

www.osha.gov (800) 321-OSHA (6742)

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Protecting Workers from Cold Stress

Cold temperatures and increased wind speed (wind chill) cause heat to leave the body more quickly, putting workers at risk of cold stress. Anyone working in the cold may be at risk, e.g., workers in freezers, outdoor agriculture and construction.

Common Types of Cold Stress

Hypothermia

- Normal body temperature (98.6°F) drops to 95°F or less.
- **Mild Symptoms:** alert but shivering.
- **Moderate to Severe Symptoms:** shivering stops; confusion; slurred speech; heart rate/breathing slow; loss of consciousness; death.

Frostbite

- Body tissues freeze, e.g., hands and feet. Can occur at temperatures above freezing, due to wind chill. May result in amputation.
- **Symptoms**: numbness, reddened skin develops gray/white patches, feels firm/hard, and may blister.

Trench Foot (also known as Immersion Foot)

- Non-freezing injury to the foot, caused by lengthy exposure to wet and cold environment. Can occur at air temperature as high as 60°F, if feet are constantly wet.
- **Symptoms**: redness, swelling, numbness, and blisters.

Risk Factors

- Dressing improperly, wet clothing/skin, and exhaustion.

For Prevention, Your Employer Should:

- Train you on cold stress hazards and prevention.
- Provide engineering controls, e.g., radiant heaters.
- Gradually introduce workers to the cold; monitor workers; schedule breaks in warm areas.

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

OSHA 3156-02R 2014

OSHA® QUICK CARD™

How to Protect Yourself and Others

- Know the symptoms; monitor yourself and co-workers.
- Drink warm, sweetened fluids (no alcohol).
- Dress properly:
  - Layers of loose-fitting, insulating clothes
  - Insulated jacket, gloves, and a hat (waterproof, if necessary)
  - Insulated and waterproof boots

What to Do When a Worker Suffers from Cold Stress

For Hypothermia:

- Call 911 immediately in an emergency.
- To prevent further heat loss:
  - Move the worker to a warm place.
  - Change to dry clothes.
  - Cover the body (including the head and neck) with blankets, and with something to block the cold (e.g., tarp, garbage bag). Do **not** cover the face.
- If medical help is more than 30 minutes away:
  - Give warm, sweetened drinks if alert (no alcohol).
  - Apply heat packs to the armpits, sides of chest, neck, and groin. Call 911 for additional rewarming instructions.

For Frostbite:

- Follow the recommendations "**For Hypothermia**".
- Do not rub the frostbitten area.
- Avoid walking on frostbitten feet.
- Do not apply snow/water. Do not break blisters.
- Loosely cover and protect the area from contact.
- Do not try to rewarm the area unless directed by medical personnel.

For Trench (Immersion) Foot:

- Remove wet shoes/socks; air dry (in warm area); keep affected feet elevated and avoid walking. Get medical attention.

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

OSHA® FactSheet

Trenching and Excavation Safety

Two workers are killed every month in trench collapses. The employer must provide a workplace free of recognized hazards that may cause serious injury or death. The employer must comply with the trenching and excavation requirements of 29 CFR 1926.651 and 1926.652 or comparable OSHA-approved state plan requirements.

An excavation is any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.

Trench (Trench excavation) means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 meters).

Dangers of Trenching and Excavation

Cave-ins pose the greatest risk and are much more likely than other excavation-related accidents to result in worker fatalities. Other potential hazards include falls, falling loads, hazardous atmospheres, and incidents involving mobile equipment. One cubic yard of soil can weigh as much as a car. An unprotected trench is an early grave. Do not enter an unprotected trench.

Trench Safety Measures

Trenches 5 feet (1.5 meters) deep or greater require a protective system unless the excavation is made entirely in stable rock. If less than 5 feet deep, a competent person may determine that a protective system is not required.

Trenches 20 feet (6.1 meters) deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer in accordance with 1926.652(b) and (c).

Competent Person

OSHA standards require that employers inspect trenches daily and as conditions change by a competent person before worker entry to ensure elimination of excavation hazards. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to workers, soil types and protective systems required, and who is authorized to take prompt corrective measures to eliminate these hazards and conditions.

Access and Egress

OSHA standards require safe access and egress to all excavations, including ladders, steps, ramps, or other safe means of exit for employees working in trench excavations 4 feet (1.22 meters) or deeper. These devices must be located within 25 feet (7.6 meters) of all workers.

General Trenching and Excavation Rules

- Keep heavy equipment away from trench edges.
- Identify other sources that might affect trench stability.
- Keep excavated soil (spoils) and other materials at least 2 feet (0.6 meters) from trench edges.
- Know where underground utilities are located before digging.
- Test for atmospheric hazards such as low oxygen, hazardous fumes and toxic gases when > 4 feet deep.
- Inspect trenches at the start of each shift.
- Inspect trenches following a rainstorm or other water intrusion.
- Do not work under suspended or raised loads and materials.
- Inspect trenches after any occurrence that could have changed conditions in the trench.
- Ensure that personnel wear high visibility or other suitable clothing when exposed to vehicular traffic.

Protective Systems

There are different types of protective systems.

Benching means a method of protecting workers from cave-ins by excavating the sides of an

excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels. *Benching cannot be done in Type C soil.*

Sloping involves cutting back the trench wall at an angle inclined away from the excavation.

Shoring requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins.

Shielding protects workers by using trench boxes or other types of supports to prevent soil cave-ins. Designing a protective system can be complex because you must consider many factors: soil classification, depth of cut, water content of soil, changes caused by weather or climate, surcharge loads (e.g., spoil, other materials to be used in the trench) and other operations in the vicinity.

Additional Information

Visit OSHA's Safety and Health Topics web page on trenching and excavation at
www.osha.gov/SLTC/trenchingexcavation/index.html
www.osha.gov/dcsp/statestandard.html

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For assistance, contact us. We can help. It's confidential.

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor
www.osha.gov (800) 321-OSHA (6742)

DOC FS-3476 9/2011

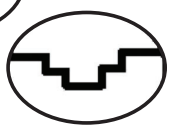
OSHA® QUICK CARD™

Working Safely in Trenches

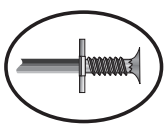
Two workers are killed every month in trench collapses. Each worker in a trench shall be protected from a cave-in by an adequate protective system. Some of the protective systems for trenches are:

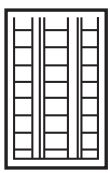
- Sloped for stability; or

- Cut to create stepped benched grades (Type A or B soil only); or

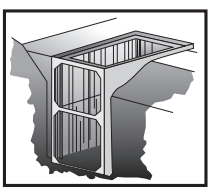


- Supported by a system made with materials such as posts, beams, shores or planking and hydraulic jacks; or

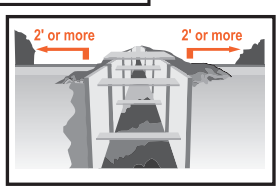




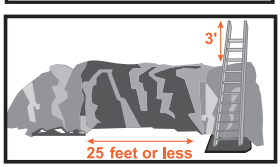
- Shielded by a trench box to protect workers in a trench.



Excavated or other materials and equipment must be at least 2 feet back from the edge of a trench; and



A safe way to exit must be provided within 25 feet of workers in a trench.



A competent person must inspect trenches daily and when conditions change. An unprotected trench is an early grave. Do not enter an unprotected trench.

For more information:

OSHA® Occupational Safety and Health Administration
U.S. Department of Labor
www.osha.gov (800) 321-OSHA (6742)
TTY (887) 889-5627

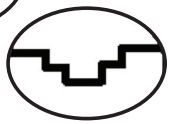
OSHA 3243-09R-11

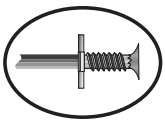
OSHA® DATOS RÁPIDOS

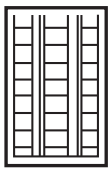
Trabajando de forma segura en zanjas

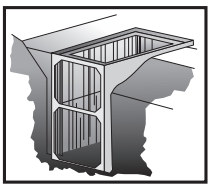
Dos trabajadores mueren cada mes en derrumbes de zanjas. Se utilizará un sistema adecuado para proteger a cada trabajador en una zanja de los derrumbes. Algunos de los sistemas de protección en zanjas son:

- Inclinación para lograr estabilidad, o
- Corte en forma de gradientes escalonados (sólo para el suelo del tipo A o B), o
- Soporte por un sistema hecho con materiales como postes, vigas, puntales o entarimado y gatos hidráulicos, o
- Resguardo en una caja de trinchera para proteger a los trabajadores en la zanja.

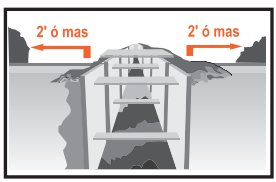








Los materiales excavados o de otro tipo y los equipos deben estar por lo menos a 2 pies hacia atrás del borde de la zanja.



Se deberá ofrecer una vía segura de salida dentro de 25 pies de los trabajadores en una zanja.

Una persona competente debe inspeccionar las zanjas a diario y cuando las condiciones cambien. Una zanja sin protección es una tumba. No entre a una zanja que no está protegida.

Para más información:

OSHA® **Administración de Seguridad y Salud Ocupacional**
Departamento del Trabajo de EE.UU.
www.osha.gov (800) 321-OSHA (6742)

Appendix B
Respiratory Protection Plan Checklist

RESPIRATOR INSPECTION RECORD

(To Be Completed Daily when Respirator is Used)

Name_____ Project_____

Date_____

1. TYPE_____ 2. MODEL_____

3. Half Mask APR ☐ Full Face APR ☐
   SAR ☐ SCBA ☐
   PAPR ☐

4. Respirator Component:	**Defects: NO**	**YES**
A. Facepiece	☐	☐
B. Inhalation/ Exhalation Valve	☐	☐
C. Headbands	☐	☐
D. Cartridge Holder	☐	☐
E. Cartridge/Canister	☐	☐
F. Filter	☐	☐
G. Harness Assembly	☐	☐
H. Hose Assembly	☐	☐
I. Speaking Diaphragm	☐	☐
J. Gaskets	☐	☐
K. Connections	☐	☐

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	☐	_____
Distorted (not flexible)	☐	_____
Cracks/Tears/Holes	☐	_____
Valves not properly inserted	☐	_____
Purifying units damaged	☐	_____
Threads badly worn	☐	_____
Missing gaskets	☐	_____
Other	☐	_____
Inhalation/ Exhalation Valve		
Foreign material	☐	_____
Cracks/Tears/Distortions	☐	_____
Defects in sealing surface	☐	_____
Valve put in facepiece incorrectly	☐	_____
Valve put in valve body incorrectly	☐	_____
Defective/Missing valve cover	☐	_____
Other	☐	_____
Headbands		
Breaks	☐	_____
Loss of elasticity or twists	☐	_____
Buckles in poor condition	☐	_____
Other	☐	_____
Cartridge Holder		
Cracks/Distortions	☐	_____
Other	☐	_____
Cartridge/Canister		
Incorrect cartridge	☐	_____
Used/Seal broken	☐	_____
Expired	☐	_____
Cracks/Dents	☐	_____
Incorrect installation	☐	_____
Loose connections	☐	_____
Thread-crossing in holder	☐	_____
Missing/Worn gaskets	☐	_____
Other	☐	_____
Filter		
Leaks detected	☐	_____
Other	☐	_____
Harness Assembly		
Attachments damaged	☐	_____
Other	☐	_____

Hose Assembly

Material contains cracks/tears	☐	_____
Missing/Defective parts	☐	_____
Other	☐	_____

Speaking Diaphragm

Not working properly	☐	_____
Other	☐	_____

Gaskets

In poor condition	☐	_____
Missing gaskets	☐	_____
Other	☐	_____

Connections

Connections not all firmly sealed	☐	_____
Leaks/Defects	☐	_____
Other	☐	_____

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

cc: Health & Safety
M. Platt

CHA (Your Location) Office

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

1) **<u>If any injury occurs, no matter how minor:</u>**

    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.

<u>(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.)</u>

2) **<u>For any accident, incident, safety hazard or near miss (no injury occurs)</u>**

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

Recommendations for additional contacts:

- Office Leader
- Safety Coordinator

APPENDIX E

Community Air Monitoring Plan / Community and Environmental Response Plan

COMMUNITY AIR MONITORING PLAN AND COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

Former Coyne Textile Facility
BCP Site #C734144
140 Cortland Avenue
City of Syracuse, New York

CHA Project Number: 33525.2001

Prepared for:

Ranalli/Taylor St., LLC
450 Tracy Street
Syracuse, NY 13204

Prepared by:

One Park Place
300 South State Street, Suite 600
Syracuse, NY 13202
Phone: (315) 471-3920
Fax: (315) 471-3569

June 2019

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TABLE OF CONTENTS

LIST OF ACRONYMS & ABBREVIATIONS

AOC	Area of Concern
BCP	Brownfield Cleanup Program
CHA	CHA Consulting, Inc.
CAMP	Community Air Monitoring Plan
CERP	Community and Environmental Response Plan
DER	Division of Remediation
eV	electron volts
g/m3	grams per cubic meter
IRM	Interim Remedial Measure
IRMWP	Interim Remedial Measure Work Plan
mmd	mass median diameter
um	micrometers
mph	miles per hour
mg/m3	milligrams per cubic meter
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PM10	Particulate Matter less than 10 micrometers
ppm	parts per million
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
SDS	Safety Data Sheets
STEL	Short Term Exposure Limit
SSO	Site Safety Officer
SOP	Standard Operating Procedures
UST	Underground Storage Tank
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) and Community Environmental Response Plan (CERP) have been prepared for the Former Coyne Textile Facility (Site), located at 140 Cortland Avenue in the City of Syracuse, New York, and is to be utilized during the Interim Remedial Measure (IRM) for source removal at the Site. The Site is a part of the New York State Department of Environmental Conservation's (NYSDEC) Brownfield Cleanup Program (BCP).

This CAMP/CERP has been prepared in accordance with the NYSDEC and New York State Department of Health (NYSDOH) guidelines to address the potential short-term impacts to the surrounding community and is Appendix E to the Interim Remedial Measure Work Plan (IRMWP) for the source removal in the area of concern (AOC) defined as the former underground storage tank (UST) area. The approximate limits of work are identified on Figure 2 of the IRMWP. This CAMP/CERP provides information to members of the community regarding the procedures in place to protect their health and minimize disturbance caused by the IRM. All work will be conducted in accordance with the NYSDEC approved IRMWP and in accordance with CHA Consulting's (CHA) Standard Operating Procedures (SOPs).

Generally, the IRM will include the following activities.

- Demolition of the one-story section of the building;
- Waste characterization sampling;
- Removal of USTs;
- Excavation of contaminated soil;
- Collection of documentation soil samples;
- Equipment decontamination and cleaning; and
- Waste handling and transportation.

2.0 PUBLIC AND COMMUNITY OUTREACH

A CAMP/CERP has been developed for this IRM in order to address the protection of the public due to the proximity of adjacent occupied properties. If members of the community have questions or concern, the following contact information and documents are provided.

2.1 CONTACT INFORMATION

Project Related Questions
Michael Belveg
NYSDEC Project Manager
315 Erie Boulevard West
Syracuse, New York 13204
(315) 426-7446
Michael.belveg@dec.ny.gov

Project Related Health Questions
Angela Martin
NYSDOH
Corning Tower
Empire State Plaza
Albany, New York 12237
(518) 402-7860
beei@health.ny.gov

2.2 DOCUMENT REPOSITORY

CHA has established a local document repository for Site-related documents. The Site documents are available to the community for review throughout the remedial program at the following location:

New York State Department of Environmental Conservation
Region 7 Headquarters
615 Erie Boulevard West
Syracuse, New York 13204
(315) 426-7400

Onondaga County Public Library
Central Branch
447 S. Salina Street
Syracuse, New York 13202
(315) 435-1900

3.0 PUBLIC PROTECTION MEASURES

3.1 TEMPORARY SECURITY MEASURES

The Contractor will conduct all work within the property boundary. The Site is secured with locked gates or doors at all entrances. If a door is propped open for ventilation purposes, orange construction fencing and appropriate signs will be placed at that location to indicate the area is considered an active construction site and only authorized personnel are allowed to enter. The proposed limits of work are identified on Figure 5 of the IRMWP.

3.2 OFF-SITE TRUCKING ROUTES

Traffic routes and traffic management at the project Site will be utilized when:

- Trucking impacted soil and debris off-Site;
- Importing clean fill to the project Site;
- Contractor access and parking; and,
- Equipment access and storage.

The Contractor will provide traffic control personnel when all trucks are entering or exiting the project Site on Cortland Avenue. Traffic control personnel will also direct traffic as needed upon delivery of equipment, trailers, excavation support materials, etc. To maintain access and lines of sight, the Contractor will arrange for and coordinate with the appropriate local authorities so that on-street parking nearest to the work area is limited throughout the duration of the work.

All roadways utilized by the Contractor during the work will be checked daily for spillage and debris and cleaned to the satisfaction of the Engineer, as necessary.

All transport of materials requiring off-site disposal at a permitted facility will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Loaded vehicles leaving the Site will be appropriately lined, securely covered, manifested, and placarded in accordance with appropriate Federal, State, and local requirements. Material transported by trucks exiting the Site will be secured with tight-fitting plastic covers. Loose-fitting canvas and/or mesh-type truck covers will be prohibited. Trucks will be prohibited from transporting saturated soil. Rather, saturated soil should be placed on a containment pad to facilitate dewatering prior to transport. Upon arrival to the project site, each truck will be visually inspected to verify appropriate permits are in place. When applicable, odorous truckloads of soil will be foamed to control odors. The trucks will also utilize a heavy tarp which will be extended over the cargo area and overlap the sides and rear of the cargo area to prevent soil from becoming airborne during transport. If necessary, vehicles exiting the Site will pass through a decontamination station as described in Section 3.4. Care will be taken to prevent truck tires from coming into contact with contaminated materials to avoid the need for decontamination prior to leaving the Site.

3.3 DECONTAMINATION

Personnel working in the Exclusion Zone (within 25 feet of intrusive Site activities) will be required to enter and exit the work area through the Contamination Reduction Zone. Personnel working within the Exclusion Zone will wear protective equipment including appropriate disposable clothing and respiratory protection and will 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

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

Equipment and vehicles that come into contact with contaminated materials will undergo decontamination procedures in the Contamination Reduction Zone prior to leaving the Site. CHA's field personnel will document in the daily field log any equipment that 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 non-dedicated equipment 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.

Decontaminated equipment shall 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, decontaminated sampling equipment shall be wrapped in aluminum foil or placed in a new/clean plastic bag.

Large Equipment:

The Contractor is responsible for decontamination of large equipment that comes into contact with Site media. Decontamination of heavy construction equipment will be performed by the contractor under the contractor's site-specific HASP.

3.4 WASTE MANAGEMENT

The Contractor is responsible for waste management. It is anticipated that impacted soils removed from the Site will be directly loaded into trucks for shipment to the approved waste facility. The Contractor will schedule trucks in a manner that will minimize the wait time for loading. Vehicles containing excavated soils will be covered with a solid plastic tarpaulin. If necessary, spray-on odor suppressing materials such as Rusmar® Foam may be used to reduce potential volatile organic compound (VOC) emissions or odors during transit.

Wastewater associated with small equipment decontamination may be containerized for waste disposal. If large equipment decontamination is deemed necessary, the wastewater generated will be collected in a Contractor supplied frac-tank and sent off-Site for disposal.

4.0 COMMUNITY AIR MONITORING PLAN

Air monitoring at the Site will be performed during all intrusive activities where there is a potential to come into contact with existing soil/fill in accordance with the NYSDOH Generic CAMP, and Appendix 1A and 1B of DER-10. All air monitoring will be conducted on a real-time basis for particulates (i.e. dust) and organic vapors.

The primary contaminants of concern associated with the Site are solvents, which are VOCs. Particulates and VOCs will be monitored concurrently within a CAMP station containing a DustTrak and photoionization detector (PID), or similar.

Air monitoring readings will be uploaded in real time and made available for review by both the NYSDEC and NYSDOH. Any exceedances that may occur will be addressed and recorded in the field logbook. Air monitoring will be performed at one location upwind and two locations downwind of the designated work area during UST removal and soil excavation. The direction of wind will be monitored daily to determine upwind and downwind location.

Enclosures will be provided for remote air monitoring stations to reduce potential weather-induced performance issues. The enclosures will be located in areas where they are not subject to damage from vehicular traffic and there is minimal potential for tampering in publicly accessible areas. Additionally, all intake ports on the instruments will be equipped with rain guards/shields to minimize the potential for water intrusion.

The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-Site receptors including residences and businesses and on-Site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of demolition and redevelopment construction work activities. Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs and dust to a minimum around the work areas. Supplements to the CAMP may be required depending on the nature of the planned intrusive activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-Site through the air.

"Continuous monitoring" will be required for all ground intrusive activities and during the excavation of contaminated soils. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling.

"Periodic monitoring" will be conducted on excavated material and during soil sampling. Excavated soil will be screened for the presence of VOCs with a handheld PID. Soil may be reused or stockpiled for characterization and off-Site disposal in accordance with the IRMWP.

In order to verify that the fugitive dust and VOC measurements are performed correctly, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial

party to conduct periodic instrument calibration, operator training, daily instrument performance checks, and maintain a record keeping plan.

4.1 FUGITIVE DUST AND PARTICULATE MONITORING, RESPONSE LEVELS, AND ACTIONS

Fugitive dust is described as discrete particles, liquid droplets or solids, which become airborne and contribute to air quality as a nuisance and potential threat to human health and the environment. The following fugitive dust suppression and particulate monitoring program will be employed at the Site during intrusive activities which warrant its use.

1. Reasonable fugitive dust suppression techniques must be employed during all Site activities which may generate fugitive dust.
2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on Site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the placement of clean fill. These control measures are not considered necessary for the placement of clean fill.
3. Particulate monitoring will be performed using real-time particulate monitors and will monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:
    a. Objects to be measured: Dust, mists or aerosols;
    b. Measurement Ranges: 0.001 to 400 mg/m³ (1 to 400,000 µg/m³);
    c. Precision (2-sigma) at constant temperature: +/- 10 g/m³ for one second averaging; and +/- 1.5 g/m³ for sixty second averaging;
    d. Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mass median diameter (mmd)= 2 to 3; g-2.5, as aerosolized);
    e. Resolution: 0.1% of reading or 1g/m³, whichever is larger;
    f. Particle Size Range of Maximum Response: <0.1 to 10 microns (µm);
    g. Total Number of Data Points in Memory: 10,000 or greater;
    h. Logged Data: Each data point with average concentration, time/date and data point number
    i. Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
    j. Alarm Averaging Time (user selectable): real-time (1-60 seconds) or short term exposure limit (STEL) (15 minutes), alarms required. Personnel conducting air monitoring must be immediately notified of any alarms by remote sensors, text messaging, or other similar equipment. Utilizing periodic checks of instrumentation in alarm mode only is not acceptable monitoring practice.
    k. Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
    l. Operating Temperature: 0 to 50˚ C (14 to 122˚ F); and
    m. Operating Humidity: 10 to 99 percent Relative Humidity.

4. Particulate levels will be monitored immediately downwind at the working Site and integrated over a period not to exceed 15 minutes. Consequently, instrumentation shall require necessary averaging hardware to accomplish this task.

5. The action level will be established at 150µg/m³ (15 minutes average). While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150µg/m³, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 µg/m³ above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-Site personnel and implementing additional dust suppression techniques. Should the action level of 150µg/m³ continue to be exceeded work must stop and Project Managers from CHA, NYSDEC, and NYSDOH must be notified. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed.

The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- Wetting equipment and excavation faces;
- Spraying water on buckets during excavation and dumping;
- Hauling materials in properly tarped or watertight containers;
- Restricting vehicle speeds to 10 mph; and
- Covering excavated areas and material after excavation activity ceases.

When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the

dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

4.2 VOLATILE ORGANIC COMPOUND MONITORING, RESPONSE LEVELS, AND ACTIONS

VOCs will be monitored at upwind and downwind locations adjacent to the ground intrusive work area. VOCs will be monitored on a continuous basis, concurrently with fugitive dust monitoring. The monitoring work should be performed using a 10.6 eV PID. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

If the ambient air concentration of total organic vapors at the downwind perimeter of the work area exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

If the organic vapor level is above 25 ppm at the perimeter of the work area; activities must be shutdown. The NYSDEC, NYSDOH, and the CHA Project Manager will be notified of the situation. Emergency Response Contacts identified in the Health and Safety Plan, including the local police and fire departments, may be contacted by CHA.

Air monitoring will be conducted at 15-minute intervals at a 20-foot offset from the exclusion zone. If two successive readings below 25 ppm are measured by the field instrument and documented, the work may resume following the previously described monitoring plan.

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

5.0 EMERGENCY RESPONSE PROCEDURES

911 service is available and confirmed at this location. Call 911 immediately for additional emergency response. 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 Site Safety Officer (SSO) is responsible for contacting the CHA Project Manager who will notify Ranalli/Taylor St. LLC 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 additional 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.
- 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.

In general, if emergency care is needed, personnel will call 911. Provide any emergency medical service personnel with the appropriate safety data sheets (SDS). However, if necessary, transport injured personnel to the nearest hospital using the following directions:

Address: Crouse Hospital
736 Irving Ave
Syracuse, NY 13210

Emergency Room Telephone Number: (315) 470-7111

Directions from site:
1. Head north on Cortland Ave toward S. Salina St.
2. Use any lane to turn left onto S. Salina St.
3. Turn right onto S. Warren St.
4. Turn right at the 1st cross street onto E. Adams St.
5. Turn right onto Irving Ave
6. Your destination is on the right.

Emergency Contact Information

Emergency Medical: 911

Fire Dept.: 911

Police Dept.: 911

Department of Emergency Services: 911

Poison Control: (800) 222-1222

CHA Project Manager: Meghan Platt, (315) 257-7145 (Office), (315) 657-6916 (Cell)

CHA Corporate Director of Health and Safety: Ronald Rogers, (518) 453-3917 (Office), (518) 810-8926 (Cell)

CHA Contact: David Ulm, (315) 257-7203 (Office), (315) 439-3899 (Cell)