Transmittal

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SUBJECT:	Glenwood Container Site, C360154. Copy of RAWP(w/ PE stamp)	TRANSMITTAL ID:	00001
PURPOSE:	For Planning	VIA:	Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
Camila Israel	PS&S	cIsrael@psands.com	

TO

NAME	COMPANY	EMAIL	PHONE
John Spellman		john.spellman@dec.ny.gov	

REMARKS:

Good afternoon John,
As requested and for filling purposes, attached is a copy of the Remedial Action Work Plan, stamped by Janos Szeman, P.E., for the Glenwood Container Site (C360154)

Feel free to call (914-509-8616) or email me (cisrael@psands.com) if you have any questions or need additional information.

Thank you!

Camila Israel
Project Manager

DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	5/12/2020	20190405_C360154 Glenwood Container 2019-10-11 RAWP_FINAL.pdf	

COPIES:

Janos M. Szeman (PS&S)
drfondak@gmail.com
Linda Shaw (Knauf Shaw, LLP)

REMEDIAL ACTION WORK PLAN

-FOR-

Glenwood Container Site

72 Alexander Street
Yonkers, Westchester County, New York

BCP Site #C360154

Prepared for:

Fondak Enterprises, LLC
225 Paddock Street
Watertown, New York 13601

April 5, 2019

Prepared by:

Paulus, Sokolowski and Sartor Engineering, PC
1 Larkin Plaza, 2nd Floor
Yonkers, New York 10701

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FIGURES

TABLES (in text)

APPENDICES

Table 1 – Remedial Action Plan Set (Appendix A)

Site Plan(s)		Date	Revision
RA-01	Existing Site Conditions Plan, Remedial Action Site Plan and SESC, and Site-wide Cover System Plan	October 31, 2018	0
RA-02	Vapor Management System Conceptual Design Plan	October 31, 2018	0
RA-03	General Notes and Typical Details	October 31, 2018	0
A-1	Existing Floor Plan and Demolition Plan	September 13, 2018	0
P-1	Proposed Floor Drain Layout	September 13, 2018	0
SP-1	Proposed Site Plan	November 2, 2018	0
SP-2	General Notes and Legend	September 13, 2018	0

List of Acronyms and Abbreviations

ASTM	American Society for Testing and Materials
AWQS	Ambient Water Quality Standards
BCP	Brownfield Cleanup Program
bgs	Below Ground Surface
BMP	best management practices
CAMP	Community Air Monitoring Plan
CP	Commissioner Policy
CPP	Citizen Participation Plan
CSA	contaminant source area
CY	cubic yards
DER-10	Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation
EC	Engineering Control
EE	Environmental Easement
EDR	Environmental Data Resources, Inc
EOPC	Engineer Opinion of Probable Cost
FER	Final Engineering Report
FONDAK	Fondak Enterprises, LLC
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBM	hazardous building materials assessment
IC	Institutional Control
IRM	Interim Remedial Measures
ISCO	In-Situ Chemical Oxidation
ISS	In-Situ Soil Solidification
MTA	Metropolitan Transit Authority
NYCRR	New York Code, Rules, and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
PPE	Personal Protective Equipment
ppm	parts per million
PS&S	Paulus, Sokolowski and Sartor Engineering, PC
QA/QC	Quality Assurance / Quality Control
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RAA	Remedial Action Alternatives
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RIR	Remedial Investigation Report

List of Acronyms and Abbreviations (cont.)

RRES	Restricted for Residential Use
SCG	Soil Cleanup Guidelines
SCO	Soil Cleanup Objective
SEQRA	State Environmental Quality Review Act
SMP	Site Management Plan
SSDS	Sub-Slab Depressurization System
SVOC	Semi-Volatile Organic Compound
SESC	Soil Erosion & Sediment Control
UST	Underground Storage Tank
VMS	Vapor Management System
VOC	Volatile Organic Compound
Volunteer	Fondak Enterprises, LLC is the Volunteer in the NYSDEC BCP.

ENGINEERING CERTIFICATION

I, Janos M. Szeman, certify that I am currently a New York State registered Professional Engineer as defined in 6 New York Codes, Rules and Regulations (NYCRR) Part 375 and that this Remedial Action 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).

Date: 11 OCTOBER 2019 *Signature:* Janos M. Szeman

EXECUTIVE SUMMARY

On behalf of Fondak Enterprises, LLC (Fondak), Paulus, Sokolowski and Sartor Engineering, PC (PS&S) has prepared this Remedial Alternatives Analysis and Remedial Action Work Plan (RAWP) to present the proposed remedial strategy for the Glenwood Container Site in the City of Yonkers, Westchester County, New York (herein referred to as the "Site"). The Site has been referred to as 72 Alexander Street in previous environmental due diligence reports.

On November 1, 2016, the owner of the Site, Fondak, entered into a Brownfield Cleanup Agreement (BCA), Index No. C360154-07-16, with the New York State Department of Environmental Conservation (NYSDEC) to remediate the site as a Volunteer. The BCA was amended on May 1, 2018 to acknowledge that, through the submission of supplemental data, additional source areas of on-Site contamination were found - justifying receipt of the Brownfield Cleanup Program (BCP) tangible property tax credits pursuant to Tax Law Section 21 - and to document that the Volunteer acquired the Site. The Site is identified under the BCP by the NYSDEC as the Glenwood Container Site and is designated as BCP Site Number C360154. The Site comprises one tax lot (Section 2, Block 2608, Lot 25), with a total area of approximately 0.4 acres. There is one on-Site building structure, which has historically been identified by the address of 72 Alexander Street.

In May 2009, the City of Yonkers adopted a Master Plan, Urban Renewal Plan, and Brownfield Opportunity Area Plan for the entire Alexander Street corridor, indicating the City's desire to re-develop the area into a new mixed-use residential and commercial, transit-oriented neighborhood. Fondak plans to reuse the existing on-Site building structure as a brewery with associated amenities (e.g., eating and drinking). However, since it is still not clear if this reuse will be approved, the planned remedy is restricted residential to leave open the option for this higher reuse development option as described below. Redevelopment plans will be developed after the Site's RA is completed.

In 2011, PS&S performed a Phase I Environmental Site Assessment (ESA) and Phase II Environmental Site Investigation (ESI). The findings of these prior assessment/investigations documented Site-wide environmental impacts which warranted a Remedial Investigation (RI). A Remedial Investigation Work Plan (RIWP) was prepared in August 2017 by PS&S to characterize the nature and extent of contamination in soil, groundwater, and soil vapor at the Site and detailed interim remedial measures (IRM) including the removal of an existing underground storage tank (UST) and a hazardous building materials (HBM) assessment. RIWP activities were conducted in September 2017. The RI results were used to develop this RAWP which presents the proposed RAs in concurrence with NYSDEC and NYSDOH. The completion of the HBM assessment had been postponed from the RI phase and will occur during the RA Phase. An abatement of any HBM identified during the assessment will be completed as part of this RAWP.

This RAWP assesses five separate Remedial Action Alternatives (RAA) (Alternative 1 through 5) that range from no action to a Track 1 complete soil removal down to bedrock. The proposed RA (Alternative 5 detailed in this RAWP) is a Track 4 Site-specific Restricted Residential Use (RRES) soil cleanup objective (SCO). The remedy addresses impacted soil, groundwater and soil vapor at the Site and would achieve Site-specific SCOs acceptable for the proposed reuse of the existing on-Site building structure as a brewery. The proposed RA includes excavation of two contaminant source areas (CSAs), and installation of a Site-wide cover system which includes:

1. The existing approximately 6-inch-thick concrete building slab (repaired and restored following CSA excavations and installation of a new vapor management system (VMS) consisting of a sub-slab depressurization system (SSDS) and vapor barrier, or similar), and;
2. A new minimum 12-inch-thick composite cover system/asphalt pavement parking lot.

The following CSAs identified in Table 3.7.1 below (refer to Section 3.7.1) are proposed for removal by excavation and will be disposed of off-site.

TABLE 3.7.1 - CSA EXCAVATIONS

a	b		c	d	e	f	g	h
CSA EXCAVATION	**SELECTED REMEDY**	**MEDIA**	**CONTAMINANTS**	**AREA (SF)**	**DEPTH OF EXCAVATION (FT BGS)**	**APPROXIMATE SURFACE ELEVATION**	**BOTTOM OF EXCAVATION ELEVATION**	**VOLUME (CY)**
CSA#1	Excavation	Shallow Fill Materials	SVOCs, Metals (Mercury, Lead)	850	6.0	10.01	4.0	189
CSA#2	Excavation	Floor Drain Debris	PCBs, SVOCs, Lead	140	2.0	7.06	4.9	11
			Remedial Action Footprint	**990**		**Remedial Action Volume**		**200**

ACRONYMS SF - Square Feet, FT - Feet, BGS -Below Ground Surface, CY - Cubic Yards

NOTES

(1) In addition to removal of the observed floor drain debris, the two existing floor drain structures and on-Site downgradient piping will be removed and replaced. The area and volume estimates for CSA#2 include removal of the floor drain debris/structures and approximately 70 linear feet of piping (estimated at 2 feet below existing slab surface).

Further details of the two contaminant source areas (CSAs) and installation of a Site-wide cover system (including a vapor management system (VMS) consisting of a sub-slab depressurization system (SSDS) and vapor barrier are shown on the Remedial Action Plan Set provided as Appendix A.

RA excavations will be backfilled with on-Site materials proposed for reuse beneath the Site-wide cover system or import material meeting the lower of the Protection of Groundwater and RRES SCO criteria derived from 6 NYCRR Part 375-6.7(d)(b), also defined as RRES criteria in Appendix 5 of NYSDEC DER-10.
.

The Track 4 Site-specific RRES SCO remedy has been selected based on its short-term and long-term effectiveness, cost effectiveness, ease of implementation, and consistency with planned land use. As detailed above, the Track 4 Site-specific RRES SCO remedy will remove contaminant source areas and mitigate exposure risk to contaminated soil, groundwater and soil vapor through the installation of engineering controls (ECs) (i.e., the proposed Site-wide cover system). Implementation of institutional controls (ICs) are also included as part of the proposed Track 4 Site-specific RRES SCO remedy, which will require the preparation and implementation of a Site Management Plan (SMP) and filing of an Environmental Easement (EE). To the extent the on-Site building is every removed, the SMP will address any future soil excavation requirements.

As presented in Section 6.0, Schedule, Fondak proposes to implement this RAWP starting in December 2018.

1.0 INTRODUCTION

On behalf of Fondak, PS&S has prepared this Remedial Alternatives Analysis (RAA) and Remedial Action Work Plan (RAWP) to present the remedial strategy for the 0.4-acre property located at 72 Alexander Street in the City of Yonkers, Westchester County, New York (the "Site"). This Site is identified under the BCP by NYSDEC as the Glenwood Container Site and is designated as BCP Site Number C360154. This Site has also been referred to in previous environmental reports by the address of 72 Alexander Street.

The RAWP was developed in general accordance with the current NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation issued May 2010 (DER-10).

1.1 Remedial Action Work Plan Organization

The RAWP is organized in accordance with the following sections:

- **Section 1.0** – **Introduction**: This section provides a brief description of the location of the Site, nature and extent of contamination identified during the 2017 RI activities, the objectives of the RAs, and Site constraints affecting the RAs.
- **Section 2.0 – Remedial Alternatives Analysis**: This section evaluates the feasibility of implementing various RAs by area of concern and considers other factors including timeframe, cost and logistical constraints.
- **Section 3.0 – Description of Proposed Remedy**: This section details the proposed RA.
- **Section 4.0 – Property Access and Permits Required**: This section summarizes the Site constraints and outlines the access requirements and permits that will be necessary to implement the proposed RAs.
- **Section 5.0 – Cost Estimate for Preferred Remedy**: This section presents an order of magnitude engineering cost estimate for implementing the preferred remedy.
- **Section 6.0 – RAWP Implementation Schedule**: This section presents a project milestone and notification schedule for implementing the preferred remedy.
- **Section 7.0 – Institutional Controls and Engineering Controls**: This section describes ICs such as the EE that will be placed on the Site, and ECs such as the Site-wide cover system that will be implemented.
- **Section 8.0 – Quality Assurance Project Plan**: This section references the Quality Assurance Project Plan (QAPP) to be used during implementation of the RAs to confirm and verify the integrity of sampling analytical data.
- **Section 9.0 – Health and Safety Plan**: This section references the Health and Safety Plan (HASP) to be used during implementation of the RAs to address worker safety issues.
- **Section 10.0 – Community Air Monitoring Plan**: This section references the Community Air Monitoring Plan (CAMP) to be used during implementation of the RAs to provide guidance on monitoring for community air impacts.
- **Section 11.0 – Citizen Participation Plan**: This section references the Citizen Participation Plan (CPP) which provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the Site.

1.2 Nature and Extent of Contamination

In 2011, PS&S performed a Phase I Environmental Site Assessment (ESA) and Phase II Environmental Site Investigation (ESI). The findings of these assessment/investigations documented Site-wide environmental impacts which warranted an RI. An RI was performed in September 2017 to characterize the nature and extent of contamination in soil, groundwater, and soil vapor at the Site and to complete an interim remedial measure (IRM) to remove an existing underground storage tank (UST). The results of the RI are described in the RIR, dated June 11, 2018. The RI was conducted under NYSDEC oversight. Generally, the RI determined that contamination at the Site is associated with historical fill and prior Site/surrounding area operations. Below is a summary of the RI findings, as presented in the RIR.

Soil

Fill materials were used to raise the elevation of the Site and the surrounding area above the Hudson River elevation in the late 1800s. Fill materials were observed across the entire Site to 20 feet bgs. The fill material is underlain by native Hudson River sediments, a clay confining layer. The RI was developed to further investigate this fill material geologic unit. Based on the results of the RI and previous due diligence investigations, fill materials used to develop the Site generally do not meet all RRES SCOs, primarily due to the presence of metals and SVOCs. Polycyclic aromatic hydrocarbons (PAHs) are the most wide-spread SVOCs detected above RRES SCOs. Lead, mercury, and copper are among the most commonly detected metals above RRES SCOs. Other metals detected at levels above RRES SCOs include arsenic, barium, and cadmium. A localized area of VOCs (specifically benzene, ethylbenzene, and xylene) and naphthalene exceeding the RRES SCOs was also identified in the southeast corner of the Site approximately 14 to 16 feet bgs (directly above the native Hudson River sediments, within the fill material geologic unit).

Floor Drain Debris [1]

The two floor drains located in the interior loading dock area, originally proposed to be removed during IRM activities as detailed in the RIWP, were approved by NYSDEC (on September 13, 2017 via email correspondence) to remain in place as they appeared to be connected to the existing storm sewer system. The two floor drains were observed to contain a build-up of debris which were sampled during the RI and previous due diligence investigations. The 2017 RI floor debris sample results detected various SVOCs, Metals, and PCB exceedances above the NYSDEC RRES SCOs. These exceedances are likely attributable to former industrial Site operations.

Groundwater

The 2017 RI groundwater results reported concentrations of VOCs (chloroform) and Metals above the NYSDEC Ambient Water Quality Standards (AWQS) GA within the fill material above the native Hudson River sediments. Metal exceedances of AWQS GA included iron and manganese. While these exceedances may have been caused by the historic fill, iron and manganese are also naturally occurring metals and chloroform is a common urban VOC contaminant, which will otherwise be addressed based on the proposed soil mitigation system.

[1] Floor drain debris were referred to as "sewer drain debris" in the 2017 RIR.

Soil Vapor

The 2017 soil vapor reported detectable levels of various VOCs, including VOCs listed in the NYSDOH Soil Vapor Decision Matrices (e.g., 1,1,1-trichloroethane, carbon tetrachloride, and tetrachloroethene). When comparing the results to the applicable NYSDOH Decision Matrices, "Mitigate" would be the recommended action for two of the three 2017 RI sample locations.

1.3 Remedial Action Objectives

The remediation action objectives (RAOs) for groundwater, soil, and soil vapor are listed below.

1.3.1 Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

1.3.2 Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

1.3.3 Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

1.4 Proposed Redevelopment Plans

Fondak anticipates reusing and renovating the current building to support future brewery activities. The Site is in the 2009 City of Yonkers Alexander Street Urban Renewal Plan and the Alexander Street Master Plan. These Plans indicate that the City would like the Alexander Street area,

including the Site, to be redeveloped into a new residential, transit-oriented neighborhood. In this regard, the Project is consistent with recent development trends in the area, which reflect the City of Yonkers' goal of redeveloping an underutilized former industrial area for residential and commercial uses. Fondak also anticipates adding a restaurant and or other commercial activities in addition to the planned brewery activities, subject to future zoning approvals. However, to the extent that a commercial reuse of the on-site pre-existing building is not approved, the proposed remediation is designed to accommodate a future restricted residential reuse.

1.5 Description of Site Constraints

Several unique characteristics of the Site and the neighborhood, and its proximity to the Hudson River result in constraints that eliminate the feasibility of Track 1 and Track 2 RAs. Track 1 and Track 2 RAs would require significant excavation below the observed groundwater table and would require the elimination of the existing building, which is planned for reuse.

Moreover, the Site is bordered to the north by the Polychrome East Site (BCP No. C360098), to the west by Alexander Street, an active railway to the east, and an existing one-story-tall industrial building to the south at 62 Alexander Street. Due to these property boundary conditions, Site RA excavation activities must be conducted in a manner that will not destabilize the roadway, adjacent buildings or railway, and are therefore, subject to approval by the New York State Department of Transportation (NYSDOT), the New York Central Railroad Company/Metropolitan Transit Authority (MTA), and the City of Yonkers. Therefore, the cost of support of excavation would be very expensive and would eliminate the on-site building.

Next, public utilities are located in the sidewalk of the Site along Alexander Street. Therefore, excavation activities must be conducted in a manner that will not damage these utilities. Additionally, the location of these utilities would restrict the excavation shoring options and excavation depth.

Finally, the groundwater investigation findings included the observation of tidally influenced, shallow groundwater present at depths of approximately 5 feet to 7 feet bgs (within fill material) across the Site. Further, bedrock is approximately 90 feet bgs at the Site. If excavation activities proceed significantly beyond the observed groundwater depths, extensive dewatering activities would be necessary and must be conducted in a manner that will not destabilize on-Site/adjacent buildings, public roads or utilities. Due to the shallow depth to groundwater, construction dewatering efforts for deep excavations would require a Site-specific, low-permeability hydraulic barrier wall(s) around the excavation and an extensive construction shoring system to minimize the dewatering volume and provide a safe and efficient excavation, to the extent practicable.

In sum, multiple brownfield sites on Alexander Street have only been able to achieve a Track 4 restricted residential remedial level based on these same site constraints and here, the on-site building reuse adds another constraint for implementation of a Track 1 or 2 remedy.

2.0 REMEDIAL ALTERNATIVES ANALYSIS (RAA)

The goal of the RAA study and remedy selection process is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the Site. The RAA process begins by establishing RAOs for the media in which the chemical constituents were found in exceedance of the applicable Soil Cleanup Guidelines (SCGs) (refer to Section 1.3). A remedy is then developed based on the following:

1. Conformance to Standards, Criteria and Guidance Values;
2. Protection of public health and the environment;
3. Short-term effectiveness;
4. Long-term effectiveness and performance;
5. Reduction of toxicity, mobility and/or volume of contaminated materials;
6. Implementability;
7. Cost effectiveness;
8. Community acceptance; and
9. Land use regulations.

2.1 Descriptions of Alternatives

The following is a description of the RAAs to address the impacted media at the Site.

1. Alternative 1 is the "No Action" Alternative.
2. Alternative 2 is for a Track 1 cleanup and involves attainment of NYSDEC Unrestricted Use SCOs by complete soil removal to bedrock.
3. Alternative 3 is for a Track 2 cleanup; where the NYSDEC RRES SCOs would be achieved through mass soil removal down to 15 feet supplemented by ICs.
4. Alternative 4 is for a Track 2 cleanup; where NYSDEC RRES SCOs would be achieved through "In Situ" Remediation supplemented by ICs and ECs
5. Alternative 5 is for a Track 4 cleanup; where NYSDEC RRES SCOs would be achieved through targeted source area soil removal supplemented by ICs and ECs.

Alternative 1 – No Action

Soil - The known VOC, SVOC, PCB, and metal-impacted soil would remain uncontrolled and open to potential surface water transport and infiltration. Soil would be remediated to a limited extent by natural attenuation over a significant period of time and some contaminants would continue to degrade through biological processes.

Groundwater - The known VOC and metals impacts in groundwater would remain uncontrolled and the contaminants would potentially migrate horizontally and vertically. Groundwater would be remediated by natural attenuation over a significant period of time.

Soil Vapor – Soil vapor would be remediated by natural attenuation on a similar timescale to groundwater.

ECs/ICs – None proposed.

Alternative 2 – Complete Soil Removal

Soil – To achieve a Track 1 remedy with Unrestricted Use SCOs, soil excavation would be conducted to bedrock at a total approximate depth of 90 feet across the Site. Material exceeding Track 1 SCOs would be transported and disposed of off-site. Demolition of the existing on-Site building structure would be required, and extensive shoring/sheeting would be required to stabilize adjacent properties and the utility and roadway infrastructure on adjacent properties. In addition, a large construction dewatering program would be required to maintain a dry and safe work area and in support of backfilling activities. Complete soil removal would result in extensive off-site transportation and disposal of impacted material followed by the delivery and controlled placement of compacted backfill. These actions would be extensively time consuming, disruptive to neighboring sites and cost prohibitive. Further, as noted above, the actions would require the demolition of the existing on-Site structure which is planned for reuse. These actions are not technically or economically feasible.

Groundwater – Extensive dewatering activities would be necessary to facilitate soil excavation to a depth of approximately 90 feet for the removal of predominant on-site sources of groundwater contamination at the Site. Any off-site sources, if present, would not be addressed by this remedy. The recovered liquid would either need to be collected for off-site disposal or treated onsite. A large-scale dewatering effort could affect local groundwater flow and could draw contaminants on to the Site.

Soil Vapor – Complete soil excavation to bedrock would remove the predominant, on-site sources of soil vapor contamination at the Site. Any off-site sources, if present, would not be addressed by this remedy.

ECs/ICs – No ECs/ICs would be required if Unrestricted Use SCOs are achieved, unless vapor mitigation was required.

Alternative 3 – Shallow 15 Foot Soil Removal

Soil – To achieve a Track 2 cleanup with RRES SCOs, soil excavation would be conducted for soils with documented exceedances of the RRES SCOs or exhibiting petroleum and nuisance odors. Excavation would be required across the Site to a depth of 15 feet bgs. Excavated material would be transported and disposed of off-site.

Demolition of the existing on-Site building structure would still be required, and moderate to extensive shoring/sheeting would be required to stabilize adjacent properties and the utility and roadway infrastructure on adjacent properties. In addition, a moderate to extensive dewatering program would be required to maintain a dry and safe work area and in support of backfilling activities. Soil removal to 15 feet bgs across the Site would result in extensive off-site transportation and disposal of impacted material followed by the delivery and controlled placement of compacted backfill. These actions would be extensively time consuming, disruptive to neighboring sites and cost prohibitive. Further, as noted above, the actions would require the demolition of the existing on-Site structure which is planned for reuse. These actions are not technically and economically feasible.

Groundwater – Moderate to extensive construction dewatering activities would be necessary to remove soil to a depth of 15 feet bgs which would remove the predominant on-site sources of

groundwater contamination at the Site. Any off-site sources, if present, would not be addressed by this remedy. The recovered liquid would need to either be collected for off-site disposal or treated onsite.

Soil Vapor – Mass soil excavation may remove predominant sources of soil vapor contamination within the fill material at the Site. Any off-site sources, if present, would not be addressed by this remedy.

ECs/ICs – ECs would not be necessary for a Track 2 RRES SCO cleanup unless a vapor management system was required. ICs would be implemented including an EE which would provide details on permitted land and prohibit groundwater use for potable purposes. An SMP would also be prepared to address procedures of future excavations deeper than 15 feet bgs and operation and maintenance of a vapor management system if required.

Alternative 4 – In-Situ Treatment

Soil – To achieve a Track 2 cleanup with RRES SCOs, in-situ treatment alternatives would be implemented in order to remediate SVOC and metals contaminants in the soil. Several in-situ treatment alternatives were considered for remediation, including in-situ soil solidification (ISS) and in-situ chemical oxidation (ISCO). These alternatives are infeasible as stand-alone solutions due to the Site constraints described in detail in Section 1.5. In-situ treatment processes may also interfere with the structural integrity of the existing on-Site building structure and the adjacent MTA railroad property, which is located at a higher elevation adjacent to the Site. In addition, the presence of historical obstructions in the fill materials would interfere with the distribution pathways and/or prevent solidification of the material.

Groundwater – Several in-situ treatment alternatives were considered for remediating the VOC and metal contaminants in the groundwater including injection of chemicals, molasses, and/or ozone. In-situ treatment alternatives would be designed to treat and monitor the groundwater and associated contaminant mass over time. These methods are not always effective for treating PAHs and metals and may require multiple in-situ treatment efforts over time to accomplish the RAOs. Many of these alternatives are infeasible due to the Site constraints described in detail in Section 1.5 including the presence of subsurface debris within the historic fill that would interfere with the distribution pathways as well as the potential extended duration of multiple in-situ treatment efforts over time. Any off-site sources, if present, would not be addressed by this remedy.

Soil Vapor - A VMS consisting of a SSDS and vapor barrier would be installed as a component of the existing concrete slab. The VMS would be a critical component to Alternative 4 for eliminating the exposure to remaining soil vapor contaminants beneath the existing concrete slab.

ECs/ICs– ECs would include a Site-wide soil cover system and a vapor management system until post in-situ treatment monitoring results confirm RRES SCOs have been met. ICs would be implemented including an EE which would provide details on permitted land and prohibit groundwater use for potable purposes. An SMP would also be prepared to address procedures of future in-situ treatment monitoring and operation and maintenance of a vapor management system if required.

Alternative 5 – Source Area Soil Removal

Soil - To achieve a Track 4 Site cleanup, targeted soil removal of CSAs above the observed shallow groundwater table would be implemented. CSAs are identified as having at least one of the following conditions:

A. Grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
B. Soil exceeding the 6 NYCRR Part 371 hazardous criteria for RCRA metals;
C. Soil containing PAHs exceeding 500 ppm;
D. Soil containing PCBs exceeding 1 ppm; or
E. Soil that create a nuisance condition, as defined in CP-51 Section G.

As further detailed in Section 1.5, shallow groundwater is present at depths of approximately 5 feet to 7 feet below grade (within fill material) across the Site. If excavation activities proceed significantly beyond these observed groundwater depths, extensive dewatering activities would be necessary and extensive measures would be required to maintain the structural integrity of the existing on-Site building, adjacent buildings, MTA railroad property, and public roads or utilities. Removal of CSAs above the shallow groundwater table can be accomplished with limited hydraulic control and excavation support system and without an extensive construction dewatering program.

As shown on the Remedial Action Site Plan (refer to RA-01 in Appendix A), the following two CSAs were identified for removal:

1. ***CSA #1***: Excavation of shallow fill materials containing elevated levels of SVOCs, lead, and mercury in the northeast corner of the eastern outdoor area of the Site.

2. ***CSA #2***: Excavation of floor drain debris containing elevated levels of PCBs, SVOCs, and lead located in the interior loading dock area of the on-Site building. In addition to removal of the observed floor drain debris, the two existing floor drain structures and on-Site downgradient piping will also be removed and replaced.

Excavated materials from CSA #1 and CSA #2 would be transported and disposed of off-Site to a NYSDEC-permitted disposal facility. Backfill material placed within CSA #1 and CSA #2 will be in compliance with NYSDEC DER-10 Appendix 5 "Allowable Constituent Levels for Imported Fill or Soil".

Groundwater – If necessary to achieve the final remedial excavation depths outlined in RA-01 Table 1 (refer to Appendix A), dewatering will be conducted to the extent practicable. CSA excavations would remove predominant on-site sources of groundwater contamination at the Site. Any off-site sources, if present, would not be addressed by this remedy.

Soil Vapor – A VMS consisting of a SSDS and vapor barrier would be installed as a component of the existing concrete slab. The VMS would be a critical component to Alternative 5 for achieving RAOs by eliminating the exposure to remaining soil vapor contaminants beneath the existing concrete slab.

ECs/ICs - ECs and ICs will be implemented at the Site for protection of public health and the environment as further discussed below.

ECs - the following two ECs will be constructed at the Site to address exposure to remaining contamination in soils and the potential for vapor intrusion in the building.

1. A Site-wide cover system (e.g., the repaired and restored existing approximately 6-inch-thick concrete building slab and new minimum 12-inch-thick composite cover system/asphalt pavement parking lot), as shown on Site-wide Cover System Plan (refer to RA-01 in Appendix A); and
2. A VMS consisting of a sub-slab depressurization system and vapor barrier (or similar) as shown on the VMS Conceptual Design Plan (refer to RA-02 in Appendix A).

No landscaped areas are currently anticipated; in the event that landscape areas are to be incorporated into the final design a 2-foot-thick soil cover system above a highly visible demarcation barrier will be used. Backfill materials associated with the engineered cover system will be in compliance with NYSDEC DER-10, Appendix 5 "Allowable Constituent Levels for Imported Fill or Soil" for RRES Use.

ICs – ICs would be implemented including an EE which would provide details on permitted land and prohibit groundwater use for potable purposes. An SMP would also be prepared to address procedures for breaching the Site-wide cover system detailed above and operation and maintenance of a vapor management system if required.

Remedial Design/Green Remediation –The major green remediation components of Alternative 5 are as follows:

- Consideration of the long term environmental impacts of treatment technologies and remedy stewardship;
- Reduction of direct and indirect greenhouse gas and other emissions;
- Increases energy efficiency and minimizes use of non-renewable energy;
- Conserves and efficiently manages resources and materials;
- Waste reduction; increased recycling and reuse of materials which would otherwise be considered waste;
- Maximizes habitat value and creates habitat when possible;
- Fostering green and healthy communities and working development of landscapes which balance ecological, economic and social objectives; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2.2 Threshold Criteria

The following evaluation criteria are termed "threshold criteria" and must be satisfied in order to advance a remedial alternative for further review and consideration for selection. Failure of an alternative to comply with either criterion will disqualify an alternative from further consideration

2.2.1 Conformance to Standards, Criteria and Guidance Values

This evaluation addresses conformance to SCGs. In accordance with the NYSDEC BCP objectives, the SCGs that are either directly or generally applicable will be consistently

applied, unless good cause exists why conformity could not be achieved. Good cause exists if any of the following actions are present:

1. The proposed action is only part of a complete program that will conform to such standard or criterion upon completion; or
2. Conformity to such standard or criterion will result in greater risk to the public health or to the environment than alternatives; or
3. Conformity to such standard or criterion is technically impracticable from an engineering perspective; or
4. The program will attain a level of performance that is equivalent to that required by the standard or criterion through the use of another method or approach.

Alternative 1 does not comply with SCGs, since source materials and impacted soil would remain in place and continue to pose a threat to both human health and the environment. Alternative 1 was eliminated from further evaluation because it does not satisfy either of the threshold criteria.

Alternative 2 would comply with the SCGs because the soil/fill exceeding Track 1 SCOs would be removed, however, conformity to such standard is technically and economically impracticable. Complete removal of overburden soil/fill would be technically infeasible due to the Site constraints detailed in Section 1.5. This is also the least green remediation generating significant truck traffic and will have the greatest community long term impact with truck traffic and dust.

Alternatives 3 and 4 would address Site-specific SCGs and would be completed with ICs to address the remaining contaminants in soil, groundwater and soil vapor. However, conformity to such standard or criterion is technically impracticable. Elements of both remedies would be cost prohibitive and technically infeasible due to the Site constraints detailed in Section 1.5. Alternative 3 is also not a green remediation alternative since it will similarly generate significant truck traffic and will have a significant community long term impact with truck traffic and dust.

Alternative 5 would address Site-specific SCGs and would be completed with ICs and ECs to address the remaining contamination in soil, groundwater and soil vapor long term in an economically and technically feasible manner in a short timeframe and will allow for building reuse.

2.2.2 Protection of Public Health and the Environment

This evaluation addresses overall protection of public health and the environment and must be considered with the Site constraints discussed in Section 1.5.

Alternative 2 would provide the highest level of protection to human health and the environment because the soil/fill exceeding Unrestricted Use SCOs would be removed. However, excavation of overburden soil to bedrock would be technically infeasible due to the Site constraints detailed in Section 1.5.

Alternative 3 would provide an adequate level of protection to human health and the environment because contaminated soil would be removed to a minimum depth of 15 feet

bgs. After installation of the Site-wide cover system (i.e., existing concrete slab with a VMS and the asphalt pavement parking lot) there would be no direct contact with the remaining soil contaminants. Groundwater quality may improve with deep, extensive excavations backfilled with clean imported soil and the proposed VMS would mitigate soil vapor contaminants. However, elements of this remedy would be cost prohibitive and technically infeasible due to the Site constraints detailed in Section 1.5.

Alternative 4 would provide an adequate level of protection to human health and the environment because it would reduce contaminant concentrations both above and below the shallow groundwater table. However, the effectiveness of in-situ treatment is not always predictable and varies depending on such factors as geologic conditions, preferential pathways and other engineering considerations. Upon completion of the Site's e Site-wide cover system (i.e., existing concrete slab with a VMS and the asphalt pavement parking lot) there would be no direct contact with the remaining soil contaminants; however, the CSAs may still not be remediated to the full extent required to achieve applicable SCOs. The proposed VMS would mitigate soil vapor contaminants.

Alternative 5 would provide an adequate level of protection to human health and the environment because the most significant CSAs would be removed above the shallow groundwater table and the remaining contamination would be capped to prevent direct exposure. After completion of the Site-wide cover system, there would be no direct contact with the remaining soil contaminants. In addition, the proposed VMS would mitigate soil vapor contaminants and engineered controls will be managed through the EE and SMP and will allow for building reuse.

2.3 Balancing Criteria

The following evaluation criteria are termed "balancing criteria" and are used to compare the positive and negative aspects of each of the Alternatives. These balancing criteria are identified below:

1. Short-term effectiveness (Section 2.3.1);
2. Long-term effectiveness and performance (Section 2.3.2);
3. Reduction of toxicity, mobility and/or volume of contaminated materials (Section 2.3.3);
4. Implementability (Section 2.3.4);
5. Cost effectiveness (Section 2.3.5);
6. Community acceptance (to be reviewed after the remedy has been selected by NYSDEC); and
7. Land use (Section 2.3.6).

2.3.1 Short-term Effectiveness

Alternative 5 would provide the highest level of short-term effectiveness because the anticipated timeframe for completing the remediation is 3 months for Alternative 5. Alternative 3 would take 8 months and would result in significant impacts to the Site and community and would also require building demolition.

Alternatives 2 and 4 (assuming they could be implemented) would provide the lowest level of short-term effectiveness because the anticipated timeframe for completing excavation to bedrock or in-situ treatment is estimated to be several years.

2.3.2 Long-term Effectiveness and Performance

In accordance with BCP objectives, a remedial program that achieves a complete and permanent cleanup of the Site is preferred over a remedial program that does not do so where it is technically and economically feasible to achieve.

Alternative 2 would provide the highest level of long-term effectiveness because the soil/fill exceeding Unrestricted Use SCOs would be removed. However, as noted above, aspects of this remedy are not technically and economically feasible.

Alternatives 3 would provide an adequate level of long-term effectiveness because the remaining part above 15 feet bgs would achieve RRES SCOs. However, as noted above, aspects of this remedy are not technically and economically feasible.

Alternative 4 would provide the lowest level of long-term effectiveness because the reliability of in-situ treatment as the sole remedy is not predictable, may not work on the Site contaminants, and varies depending on factors such as geologic conditions, preferential pathways, subsurface obstructions, and other engineering considerations.

Alternative 5 would provide an adequate level of long-term effectiveness because some of the soil/fill exceeding RRES SCOs would be removed. Some fill material would remain on-Site with exceedances of the RRES SCOs for SVOCs and Metals but would be contained under a Site-wide cover system. Long-term effectiveness would be provided by the maintenance of the ECs and adherence to ICs identified in the EE and SMP.

2.3.3 Reduction of Toxicity, Mobility and/or Volume of Contamination

In accordance with BCP objectives, a remedial program that permanently and significantly reduces the toxicity, mobility and/or volume of contamination is to be preferred over a remedial program that does not do so. The following is the hierarchy of the remedial technologies ranked from the most preferable to the least preferable: destruction, on-Site or off-Site; separation/treatment, on-Site or off-Site; solidification/chemical fixation, on-Site or off-Site; control and isolation, on-Site or off-Site.

Alternative 2 would result in the greatest volume of contamination reduction because soil/fill exceeding Unrestricted Use SCOs would be removed. However, while achieving this goal, other adjacent properties and utilities may be negatively impacted and the on-site building would be destroyed.

Alternative 3 would result in an intermediate volume of contamination reduction because the soil/fill exceeding RRES SCOs would be removed to 15 feet bgs, although some soil exceeding RRES SCOs below 15 feet bgs would remain but the on-Site building would be destroyed.

Alternative 4 could result in either an increase or a decrease in the mobility of the contaminants depending on the type of in-situ treatment considered. For example, chemical oxidation would result in an increase in contaminant mobility whereas soil solidification would result in a decrease. Long-term reduction in mobility and toxicity would be anticipated with this approach; however, as discussed in Section 2.1, utilization of this approach as a standalone solution is likely infeasible due to below grade obstructions and unpredictability of results.

Alternative 5 would result in the least contamination volume reduction as soil/fill with RRES SCO exceedances below the shallow groundwater table would remain. However, some of the soil/fill exceeding the RRES SCOs would be removed above the shallow groundwater table and the mobility of soil vapor contamination would be controlled with a VMS.

2.3.4 Implementability

Alternative 2 is infeasible to implement due to the Site constraints described in Section 1.5. Bedrock is approximately 90 bgs at the Site and an excavation of this depth would damage infrastructure critical to the surrounding area as well as impact the regional hydrology. Alternative 2 would also require demolition of the on-Site structure which is proposed for reuse. Alternative 2 is also administratively infeasible since it is not likely that the required approvals from the adjacent railroad property (MTA), NYSDOT and City of Yonkers would be received since such a deep excavation could subside adjacent infrastructure including the MTA railroad tracks.

Alternatives 3 is also infeasible to implement due to the extent of on-Site historical fill and the anticipated groundwater volumes at the Site which is less than 500 feet from the Hudson River. Sampling conducted as part of the RI in 2015 and 2016 confirmed that the historical fill evident throughout the Site contains exceedances of the RRES SCOs for VOCs, SVOCs, and Metals. To fully implement Alternatives 3, complete excavation and removal of subsurface obstructions at the Site down to the top of the native soils at an observed average depth of 15 feet bgs would be required which is significantly below the groundwater table. This depth is not feasible due to the constraints described in detail in Section 1.5, including the proximity to roadways and railways, and the presence of underground obstructions (utilities, remnant concrete slabs and building foundation materials, and other anomalous features). The on-Site structure would also need to be demolished. Alternatives 3 may also be administratively infeasible since it is not likely that the required approvals from the adjacent railroad property (MTA) would allow for such a deep excavation adjacent to the railroad tracks.

Alternatives 4 may also be infeasible to implement due to the extent of on-Site historical fill and associated below grade obstructions (i.e., utilities, remnant concrete slabs and building foundation materials, and other anomalous features). Reliability of in-situ treatment as the sole remedy is not predictable since it varies depending on factors such as geologic conditions, preferential pathways, subsurface obstructions, and other engineering considerations. In-situ treatment may also destabilize on-Site and adjacent structures. Alternatives 4 may also be administratively infeasible since it is not likely that the required

approvals from the adjacent railroad property (MTA) would allow for treatment activities adjacent to the railroad tracks.

Alternative 5 is the most implementable in the short-term and long-term as discussed above and achieves the NYSDEC protection of human health and the environment requirements. Alternative 5 proposes RAs that are proven remedies and have been successfully implemented in New York State. Alternative 5 also exhibits green remediation principles and techniques. In accordance with NYSDEC DER-31, green remediation principles and techniques would be implemented in the design, implementation, and execution of this remedy. Green remediation is exhibited as part of Alternative 5 and as identified below:

- Alternative 5 reduces the environmental impacts of remediation by limiting truck traffic to and from the Site with targeted CSA soil excavation (as opposed to excavations proposed in Alternative 2 and Alternative 3). The reduction of trucking traffic will:
    - Conserve and efficiently manage resources and materials;
    - Reduce direct and indirect greenhouse gas and other emissions; and
    - Increase energy efficiency and minimize the use of non-renewable energies.
- Reduction of waste by reuse of the existing on-Site building.

Soil removal coupled with ECs will isolate remaining contamination and reduce the mobility and toxicity. ICs would be implemented including an EE referencing ICs and ECs restricting specific land and groundwater usage and requiring maintenance of a Site-wide cover system (including a VMS) in accordance with a SMP while still allowing a restricted residential, commercial or industrial reuse.

2.3.5 Cost Effectiveness

The following Table 2.3.5 presents the RA costs associated with each alternative. The RA cost estimates were developed using present day unit costs for similar remediation projects in downstate New York and professional experience and judgement.

Alternative 1 "No Action" was not considered as an applicable scenario because there would be no further involvement in the Site by the BCP Applicant.

Table 2.3.5 – RA Cost Estimates

Remedial Alternative	Capital Cost	Annualized O&M Cost*	Total Cost
Alternative 2: Attainment of Unrestricted Use SCOs by excavation to full depth of contamination	$10,000,000	$0	$10,000,000
Alternative 3: Attainment of RRES SCOs by excavation to the shallow groundwater table	$4,000,000	$20,000	$4,600,000
Alternative 4: In Situ remediation	$22,000,000	$20,000	$22,600,000
Alternative 5: CSA excavation, Site-wide cover system and VMS	$300,000	$30,000	$1,200,000

*Annualized O&M Cost accrued at present-day value over a 30-year period and added to the Capital Costs to calculate the Total Cost.

2.3.6 Land Use

This evaluation addresses the proposed use of the property. In accordance with BCP objectives, the current, intended, and reasonably anticipated future land use of the Site and its surroundings must be considered in the selection of the remedy for soil remediation, provided NYSDEC determines that there is reasonable certainty associated with such use. In making this determination, NYSDEC considers a variety of factors, listed below, including the consistency of the proposed use for the Site with applicable zoning laws or maps and municipal planning:

1. Current use and historical and/or recent development patterns;
2. Applicable zoning laws and maps;
3. Brownfield opportunity areas as designated in the general municipal law (refer to the below Site-specific Brownfield information);
4. Applicable comprehensive community master plans, local waterfront revitalization plans in accordance with the executive law, or any other applicable land use plan formally adopted by a municipality;
5. Proximity to real property currently used for residential use, and to urban, commercial, industrial, agricultural, and recreational areas;
6. Any written and oral comments submitted by members of the public on the applicant's proposed use as part of citizen participation activities performed by the applicant pursuant to this title;
7. Environmental justice concerns, which for purposes of this title include the extent to which the proposed use may reasonably be expected to cause or increase a disproportionate burden on the community in which the Site is located, including low-income and/or minority communities, or to result in a disproportionate concentration of commercial or industrial uses in what has historically been a mixed-use or residential community;
8. Federal or state land use designations;
9. Population growth patterns and projections;
10. Accessibility to existing infrastructure;
11. Proximity of the Site to important cultural resources, including federal or state historic or heritage sites or Native American religious sites;
12. Natural resources, including proximity of the Site to important federal, state or local natural resources, including waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species;
13. Potential vulnerability of groundwater to contamination that might emanate from the Site, including proximity to wellhead protection and groundwater recharge areas and other areas identified by the department and the state's comprehensive groundwater remediation and protection program established pursuant to title thirty-one of article fifteen of this chapter;
14. Proximity to flood plains;
15. Geography and geology; and
16. Current ICs applicable to the Site.

The redevelopment project is consistent with the goals set forth in the May 2009 City of Yonkers Alexander Street Urban Renewal Plan and the Alexander Street Master Plan. The Project is also consistent with the approved City of Yonkers-designated Brownfield Opportunity Area Plan for the Alexander Street Corridor. The Brownfield Opportunity Area Plan indicates that the City desires the Alexander Street area, including the Site, to be redeveloped into a new residential/commercial transit-oriented neighborhood. In this regard, the Project is consistent with recent development trends in the area, which reflect the City of Yonkers' goal of redeveloping an underutilized former industrial area for residential and commercial uses, including developments such as the Project that will afford public access to the waterfront, as well as proximity to infrastructure.

According to the Yonkers Zoning Ordinance (Chapter43 of the Yonkers City Code), the Site zoning designation is Industrial (I). Currently, industrial zoning allows for use of the Site as a brewery with a limited eating and drinking area. The City of Yonkers and Fondak are currently in the process of a new planning effort, which is anticipated to result in revised commercial zoning for the Site to allow for a full restaurant and direct beer sales. However, if this reuse is not approved, the site can also be redeveloped into a residential reuse similar to all of the other BCP sites that are being redeveloped on Alexander Street.

Alternative 2 would allow for unrestricted use of the Site. This would allow for commercial use of the Site as a brewery or any use (which would obviously be consistent with the City of Yonkers Master Plan Urban Renewal Plan and Yonkers Brownfield Opportunity Area for the Alexander Street Corridor). However, this remedy is infeasible, as discussed above.

Alternative 3, 4 and 5 would allow the Site to be used for restricted residential uses, which includes use for commercial brewing purposes. This is consistent with the City of Yonkers Master Plan Urban Renewal Plan and Yonkers Brownfield Opportunity Area for the Alexander Street Corridor. However, remedies in Alternatives 3 and 4 are infeasible, as discussed above.

2.4 Determination of Proposed Remedy

Alternative 5, which includes CSA excavations with ECs and ICs, has been identified as the proposed remedy for the Site based on its short-term effectiveness, cost effectiveness, implementability and consistency with planned land use. Alternative 5 is the most implementable of the remedies analyzed. It also best exhibits green remediation principles and techniques. In accordance with NYSDEC DER-31 and as detailed in Section 2.3.4, green remediation principles and techniques would be implemented in the design, and execution of this remedy.

The proposed remedial plan involves the following:

- Remedial Design/Green Remediation;
- Excavation of CSAs above the shallow groundwater table (includes removal or cleaning of existing floor drains and associated piping);
- Utility corridor excavations for proposed new utilities and installation of the SSDS component of the VMS;
- Backfilling and grading with NYSDEC approved fill material;
- Capping the Site with a Site-wide cover system: system includes, but is not limited to: the existing approximately 6-inch-thick concrete building slab with a VMS, and a new minimum 12-inch-thick composite cover system/asphalt pavement parking lot;
- Preparing and recording ECs and ICs; and
- Preparing, implementing and maintaining SMP.

Soil removal coupled with ECs will isolate remaining contamination and reduce the mobility and toxicity. ICs would be implemented including an EE referencing ICs and ECs restricting specific land and groundwater usage and requiring maintenance of a Site-wide cover system (including VMS) in accordance with a SMP.

3.0 DESCRIPTION OF PROPOSED REMEDY

The selected remedial approach is Alternative 5, which includes a HBM assessment (postponed from the RI phase) and subsequent abatement of any HBM identified during the assessment, excavation of CSAs located within the shallow fill materials and above the shallow groundwater table (including removal or cleaning of existing floor drains and associated piping), corridor excavation beneath the existing concrete slab for installation of a SSDS (or similar), backfilling CSA/SSDS excavations with imported clean fill materials, and installation of ECs protective of human health and environmental concerns by creating and maintaining a barrier to any potential contaminated material. The ECs includes the existing approximately 6-inch-thick concrete building slab (repaired and restored), a new minimum 12-inch-thick composite cover system/asphalt pavement parking lot, and installation of a VMS.

Redevelopment ICs will also be implemented including an Environmental Easement (EE) restricting permitted land uses and groundwater use and requiring maintenance of a Site-wide cover system (including VMS) in accordance with a SMP.

Remedial activities consist of:

- Pre-Mobilization Activities;
- Mobilization Activities;
- Site Preparation Activities (includes HBM (e.g., lead paint, asbestos) assessment and any necessary abatement/removal);
- Waste classification;
- Excavation of CSAs above the shallow groundwater table (includes removal or cleaning of existing floor drains and associated piping);
- Corridor excavations beneath the existing concrete slab for SSDS (or similar) installation;
- Waste materials handling and disposal;
- Backfilling and grading with NYSDEC approved backfill materials;
- Installation of a Site-wide cover system. System includes, but is not limited to: the existing approximately 6-inch-thick concrete building slab with a VMS, and new minimum 12-inch-thick composite cover system/asphalt pavement parking lot; and
- Compilation of Record Documents (i.e., FER, SMP)

These remedial activities are further detailed in the sections below.

3.1 Pre-Mobilization

Prior to mobilization of equipment and personnel to the Site, the selected remediation contractor (the Contractor) will contact the New York One Call utility locator service. In addition, the Contractor will procure a private utility locating service that will conduct a private utility markout that includes a ground penetrating radar (GPR) survey and utility line locating services.

Any identified overhead/subsurface utilities and/or subsurface obstructions will be field identified, marked onsite and if necessary, added to a scaled Site Plan for reference during RA implementation.

3.2 Mobilization

Site personnel that may come in contact with contaminated material will have the requisite 1910.120 Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) Training and Site-specific training prior to initiation of RA. A Health and Safety Plan (HASP) has been prepared for the planned remedial activities in accordance with the requirements of the OSHA HAZWOPER standard (further detailed in Section 9.0). A copy of the HASP is provided as Appendix B. The Contractor will have the option of adopting this HASP without change or adopting the HASP with amendments. Amendments prepared by the Contractor will be at least as stringent as the HASP provided by PS&S. Any Contractor supplied HASP amendments will be subject to review and approval by Fondak.

Staging areas for materials, construction equipment and excavated material, decontamination areas, and support areas will be identified and approved by Fondak and PS&S prior to performing work. Construction and monitoring equipment will be inspected prior to operation during field work and checked periodically to verify proper performance and perform any necessary repairs. Equipment will be clean prior to delivery.

3.3 Site Preparation

Site preparation activities consist of implementing the soil erosion and sediment control (SESC) measures and construction of the decontamination pad that will be used to remove contaminated material from equipment and transportation vehicles prior to leaving the Site.

3.3.1 Soil Erosion and Sediment Control Measures

Prior to any intrusive activities, SESC measures will be implemented as needed to minimize surface soil in the CSAs from potentially being transported, through wind and/or surface water, to areas outside of the limits of disturbance. These SESC measures will (as detailed on Figure RA-01) consist of (at a minimum) silt fencing and/or hay bales that will be installed as appropriate around the area of disturbance. Further, stockpiles will be covered and secured at the end of each working day.

During RA activities, SESC measures will be inspected and maintained daily by Fondak's Environmental Consultant. Accumulated sediment will be removed from the erosion and sediment controls as needed. Sediment that originates from the excavated area will be added to the stockpile for off-Site disposal.

3.3.2 Decontamination Pad

A decontamination pad will be constructed to adequately facilitate decontamination of the Contractor's largest mobile equipment and to withstand the anticipated traffic loads throughout the duration of the project. The decontamination pad will be constructed to achieve the following minimum 5 requirements:

1. The pad area will be lined with two layers of 40-mil-thick High Density Polyethylene (HDPE) sheeting (thick enough to withstand daily use) and woven geotextile covered with crushed stone in a manner that allows rinsate water to freely

drain. Decontamination water will be pumped into drums or tanks and transported to a properly licensed off-Site facility for disposal.

2. The pad area will be graded for easy entrance and exit for vehicles and equipment;
3. The pad will be able to hold a minimum of 4 inches of standing water at the shallowest point within the containment. It will be sized sufficiently to prevent splashing and spraying from decontamination activities from contacting the surrounding unprotected surfaces;
4. The pad will be kept empty and protected from rainwater when not in use; and
5. The pad will be maintained throughout the duration of the project.

Personnel, tools, equipment, and vehicles coming in contact with contaminated soils, debris and/or wastewater will be decontaminated. A decontamination area for equipment and tools will be set up at a suitable location near the work area.

Decontamination of equipment and personnel will be conducted in temporary contamination reduction zones. The design of these zones will include heavy plastic sheeting and a staging area provided with bermed edges. Water collected in these zones during decontamination of personnel and equipment will be pumped into drums or tanks and transported to a properly licensed off-Site facility for disposal.

3.4 Hazardous Building Materials (HBM) Assessment and Abatement

The completion of the HBM assessment had been postponed from the RI phase and will occur during the RA Phase. An HBM assessment will be performed and followed by an appropriate abatement, if required. Appropriate assessment and abatement documentation will be provided to NYSDEC following completion.

3.5 Waste Characterization

In-situ waste characterization may be conducted prior to the commencement of remedial excavations (detailed in Section 3.7) in order to characterize soils planned for off-site disposal prior to their removal. Waste characterization may also be conducted from stockpiled materials staged for off-site disposal. Waste characterization sampling procedures will be conducted to satisfy the requirements of the proposed disposal facilities detailed in Section 3.8. As discussed in Section 8.0, a QAPP, which outlines the project quality assurance sampling protocols, is provided as Appendix C.

3.6 Shoring/Sheeting

In accordance with OSHA requirements and to achieve the remedial excavation elements of the selected remedy, sheeting/shoring systems may be required. Sheeting systems will also be utilized as needed to protect the roadway, adjacent properties, and/or utilities from destabilization. The Contractor will provide the design for the required excavation sheeting and shoring systems, prepared by a New York State Licensed Professional Engineer and submit this design for the review by Fondak and the NYSDEC. During remedial excavations, the Contractor will provide a representative who complies with the definition of a "Competent Person" under OSHA to inspect the sheeting/shoring systems during installation and on a daily basis. Physical entry into the excavations will be avoided to the extent practicable.

3.7 RA Excavations

The proposed RA includes excavation of CSAs, utility corridors (for SSDS installation), and excavation/re-grading for installation of the composite cover system/asphalt pavement parking lot, an integral component of the Site-wide cover system. The final horizontal and vertical extent of the RA excavations will be documented on the Horizontal Limit and Bottom of Excavations Record of Construction Plan (refer to Section 3.14) that will be prepared in accordance with the NYSDEC DER-10 requirements and will be included in the FER.

3.7.1 CSA Excavations

CSAs are identified as having at least one of the following conditions:

A. Grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
B. Soil exceeding the 6 NYCRR Part 371 hazardous criteria for RCRA metals;
C. Soil containing PAHs exceeding 500 ppm;
D. Soil containing PCBs exceeding 1 ppm; or
E. Soil that create a nuisance condition, as defined in CP-51 Section G.

As shown on the Remedial Action Site Plan (refer to RA-01 in Appendix A), the following two CSAs were identified for removal:

1. ***CSA #1***: Excavation of shallow fill materials containing elevated levels of SVOCs, lead, and mercury in the northeast corner of the eastern outdoor area of the Site.

2. ***CSA #2***: Excavation of floor drain debris containing elevated levels of PCBs, SVOCs, and lead located in the interior loading dock area of the on-Site building. In addition to removal of the observed floor drain debris, the two existing floor drain structures and on-Site downgradient piping will also be removed and replaced.

The anticipated excavation volumes are summarized on the following table.

TABLE 3.7.1 - CSA EXCAVATIONS

a	b		c	d	e	f	g	h
CSA EXCAVATION	**SELECTED REMEDY**	**MEDIA**	**CONTAMINANTS**	**AREA (SF)**	**DEPTH OF EXCAVATION (FT BGS)**	**APPROXIMATE SURFACE ELEVATION**	**BOTTOM OF EXCAVATION ELEVATION**	**VOLUME (CY)**
CSA#1	Excavation	Shallow Fill Materials	SVOCs, Metals (Mercury, Lead)	850	6.0	10.01	4.0	189
CSA#2	Excavation	Floor Drain Debris	PCBs, SVOCs, Lead	140	2.0	7.06	4.9	11
			Remedial Action Footprint	**990**		**Remedial Action Volume**		**200**

ACRONYMS SF - Square Feet, FT - Feet, BGS -Below Ground Surface, CY - Cubic Yards

NOTES

(1) In addition to removal of the observed floor drain debris, the two existing floor drain structures and on-Site downgradient piping will be removed and replaced. The area and volume estimates for CSA#2 include removal of the floor drain debris/structures and approximately 70 linear feet of piping (estimated at 2 feet below existing slab surface).

Soil materials generated from CSA #1 and #2 will be disposed of off-site to a NYSDEC-approved disposal facility as further detailed in Section 3.8.

If grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u), is visually observed to extend beyond the CSA excavation boundaries detailed above and as shown on the Remedial Action Site Plan (refer to RA-01 in Appendix A), then excavation activities will extend horizontally or vertically beyond the boundaries to the extent feasible and in a safe manner. This determination will be made in the field by Fondak's Environmental Consultant in conjunction with NYSDEC and will be based on a combination of visual observations and field screening techniques (e.g., a photoionization detector [PID]).

The maximum horizontal expansion of the excavation will be limited to the Site constraints and the Site boundaries. The maximum vertical expansion of the excavation will be limited to shallow groundwater table. Excavation that has the potential to undermine the existing building or public rights-of-way (i.e., sidewalks, roadways, infrastructure beyond the Site perimeter) will not be implemented.

It is anticipated that in-situ waste characterization sampling will have been completed prior to CSA excavations (refer to Section 3.5), however, additional waste characterization samples may need to be collected from the expansion area to satisfy disposal facility requirements.

Post excavation confirmation sampling for CSA excavations will be conducted in accordance with DER-10 subsection 5.4(b) and analyzed for the contaminants detailed in Table 3.7.1. CSA excavations will be backfilled with materials which meet the criteria requirements detailed in Section 3.9.

Concrete/asphalt debris or any additional C&D materials generated during RA excavations will be managed as discussed in Section 3.8. Subsurface obstructions that will not impact the proposed RA excavation will remain in-place and will not be removed during the RA.

3.7.2 Utility/SSDS Corridor Excavations

Corridor excavations beneath the existing building concrete slab will be conducted for installation of new utilities and concrete footings as further detailed in the Proposed Floor Drain Layout (refer to P-1 in Appendix A). Excavations will range from 2 to 4 feet bgs. To limit disturbance to the existing concrete slab, it is proposed that the utility corridor excavations are utilized, to the extent practicable/necessary, for SSDS installation (or similar). SSDS is a component of the proposed VMS as further detailed in Section 3.10. The conceptual SSDS design is shown on the VMS Conceptual Design Plan and associated typical details (refer to RA-02 in Appendix A). As discussed in Section 3.10, VMS construction design drawings will be submitted to NYSDEC and NYSDOH for review prior to installation.

Should the excavated material from Utility/SSDS Corridor Excavations exhibit signs of gross contamination, as defined in 6 NYCRR Part 375-1.2(u), the material will be segregated and stockpiled on plastic sheeting for waste characterization and future off-site disposal as further detailed in Section 3.8. This determination will be made in the field by

Fondak's Environmental Consultant in conjunction with NYSDEC and will be based on a combination of visual observations and field screening techniques (e.g., a PID).

Non-impacted soil materials excavated from the Utility/SSDS Corridor Excavations may be reused on-site as detailed in Section 3.9 or disposed of off-site as detailed in Section 3.8.

Excavations will be backfilled with materials which meet the criteria requirements detailed in Section 3.9. Any disturbed sections of the existing slab will be repaired and restored as part of the remedial action.

Concrete/asphalt debris or any additional C&D materials generated during RA excavations will be managed as discussed in Section 3.8. Subsurface obstructions that will not impact the proposed RA excavation will remain in-place and will not be removed during the RA.

3.7.3 Asphalt Pavement Parking Lot Installation

To meet final Site grades, an approximate 1-foot excavation beneath the outdoor area existing Site grade will be conducted for installation of the composite cover system/asphalt pavement parking lot, an integral component of the Site-wide cover system (further detailed in Section 3.11).

Should the excess soil materials generated from asphalt pavement parking lot installation exhibit signs of gross contamination, as defined in 6 NYCRR Part 375-1.2(u), the material will be segregated and stockpiled on plastic sheeting for waste characterization and future off-site disposal as further detailed in Section 3.8. This determination will be made in the field by Fondak's Environmental Consultant in conjunction with NYSDEC and will be based on a combination of visual observations and field screening techniques (e.g., a PID).

Non-impacted soil materials excavated from the Utility/SSDS Corridor Excavations may be reused on-site as detailed in Section 3.9 or disposed of off-site as detailed in Section 3.8.

Concrete/asphalt debris or any additional C&D materials generated during RA excavations will be managed as discussed in Section 3.8. Subsurface obstructions that will not impact the proposed RA excavation will remain in-place and will not be removed during the RA.

3.8 Waste Materials Management, Transportation and Disposal

During remedial activities, the Contractor will be required to manage excavated materials and coordinate the transportation and disposal of generated waste streams to approved disposal facilities. The anticipated waste streams include soil, wastewater, C&D debris, miscellaneous debris and personal protective equipment (PPE).

Soil

Soil materials designated for off-site disposal will be characterized (refer to Section 3.5) and pre-approved by a NYSDEC-approved permitted disposal facility. Based on a review of the RI soil sample results, soil materials designated for off-site disposal are not expected to be classified as

hazardous waste (with the exception of the CSA #2 PCB contaminated floor drain debris). Waste characterization will be conducted to satisfy the requirements of the proposed disposal facilities detailed below:

Non-Hazardous Soil Waste Facilities

1. Deep Green of New York
   1106 River Road
   New Windsor, NY 12553
   NYS DEC Permit # 3-3348-00150-00001-0

2. ESMI
   304 Towpath Road\
   Fort Edward, NY 12828
   NYS DEC Permit # 5-5330-00038-000-19

3. Waste Management of Pennsylvania, Inc.
   G.R.O.W.S. North Landfill/Tullytown Resource Recovery Facility Landfill
   1000 Newford Mill Road
   Morrisville, PA 19067
   PA DEP Permit # 101680/101494

4. Bayshore Soil Management, LLC
   75 Crows Mill Road
   Keasbey, NJ 08832
   NJ DEP Permit # CBG110002

It is anticipated that a portion of the CSA #2 floor drain debris will be listed as NYSDEC hazardous waste for PCBs as defined 6 CRR-NY 371.4(e). As noted in 6 CRR-NY 371.4(e), PCB wastes are also regulated by United States Environmental Protection Agency (USEPA) under 40 CFR part 761. Fondak's Environmental Consultant will follow applicable NYSDEC and USEPA protocol for disposal of hazardous floor drain debris and associated piping.

Waste characterization sample results will be presented to the disposal facilities for review and pre-approval prior to off-site transportation and disposal. Disposal facility acceptance letters will be provided to NYSDEC prior to initiating transportation of material for off-site disposal. Following NYSDEC approval, specific disposal manifests or bills of lading for each waste stream load transported off-Site. The completed waste stream disposal manifests/bills of lading as well as the on-Site reuse tickets will be compiled and presented in the FER.

To the extent practicable, excavated soil material proposed for off-site disposal will be direct-loaded into construction vehicles for off-site transportation and disposal. Wastes will be transported in vehicles that will be lined, foamed (as necessary) and covered with an impermeable tarp to prevent spills and/or releases to the environment.

In the event excavated materials must be temporarily stockpiled prior to disposal (e.g., for waste characterization), stockpiles will be constructed to minimize potential cross contamination and maintained in accordance with the Site's SESC measures detailed in Section 3.3.1.

Wastewater

Liquid wastes (e.g., subsurface piping/structure contents, decontamination waters) generated during RA activities are expected to be classified as non-hazardous. It is anticipated that liquid wastes will be placed in 55-gallon drums or similar containers for characterization and off-Site disposal. Waste characterization sampling procedures should be conducted, at a minimum, to satisfy the requirements of the proposed disposal facilities detailed below:

Non-Hazardous Liquid Waste Facilities

1. Clean Water of New York, Inc.
   3249 Richmond Terrace
   Staten Island, NY 10303
   NYSDEC Permit # 2-6401-00065-00001

2. Envirowaste Oil Recovery
   279 Route 6
   Mahopac, NY 10541
   NYSDEC Permit # 3-3720-00155-00003

Excavation dewatering activities are not anticipated, however, in the event that construction dewatering activities are required to support the proposed RA excavation efforts, a construction dewatering program and onsite groundwater management system will be designed and managed in accordance with the applicable state, county and local regulatory requirements.

In the event that the excavation spoils are too wet, a waste management area with appropriate containment and sump will be operated to decant the excess water in the spoils. Decanted wastewater will be collected for characterization and disposal.

Construction and Demolition Debris

Concrete/asphalt debris or any additional C&D materials generated during RA excavations will be segregated from excavated soils, to the extent practicable, and staged for off-Site disposal. The segregated C&D materials will be managed (i.e., through decontamination, size reduction, etc.) as necessary to comply with the acceptance criteria of the approved disposal facility. C&D materials generated are not anticipated to be classified as hazardous and; therefore, will be managed as solid waste.

Personal Protective Equipment (PPE) and Miscellaneous Debris

PPE and miscellaneous debris will be generated at the Site. These materials are not anticipated to be classified as hazardous wastes for disposal and, therefore, must be managed as solid wastes. These materials will be placed within 55-gallon drums or similar containers during the work and will be removed from the Site as soon as is practicable.

3.9 Backfill Criteria Requirements

On-Site soil which is not located within CSA #1 and CSA #2 RA excavations may be reused as on-Site backfill as follows:

1. On-Site soil which does not exceed the Protection of Groundwater and RRES SCOs, for any constituent may be used anywhere beneath, or as a part of, the Site-wide cover system (described in Remedy Element 5), including below the water table; and,
2. On-Site soil which is field-determined as non-impacted but exceeds the lower of the Protection of Groundwater and RRES SCOs may be used beneath the Site-wide cover system and must be placed above the groundwater table.

Backfill material imported to the Site must meet the lower of the Protection of Groundwater and RRES SCO criteria derived from 6 NYCRR Part 375-6.7(d)(1)(ii)(b), also defined as RRES criteria in Appendix 5 of NYSDEC DER-10.

Proposed imported fill material will be sampled and analyzed in accordance with DER-10 Table 5.4(e)10. As discussed in Section 8.0, a QAPP, which outlines the project quality assurance sampling protocols, is provided as Appendix C.

The proposed import volume and representative imported fill compliance samples must be submitted to NYSDEC for review and approval prior to on-Site delivery. The facility name, owner name, street address, and any applicable permits (e.g., NYSDEC mined land permit) pertaining to the proposed backfill source will also be provided to facilitate NYSDEC review.

3.10 Vapor Mitigation System

To mitigate the migration of soil vapors into the building from soil and/or groundwater, a VMS is proposed beneath the existing Site building. The VMS is comprised of the following components:

1. A SSDS installed beneath the existing concrete slab (or similar). As discussed in Section 3.7.2, to limit disturbance to the existing concrete slab, it is proposed that the utility corridor excavations are utilized, to the extent practicable/necessary, for SSDS installation.
2. A vapor barrier installed above the entire existing concrete slab.

The VMS is a component of the Site-wide cover system. The VMS conceptual design is shown on the VMS Conceptual Design Plan and associated typical details (refer to RA-02 in Appendix A).

VMS construction design drawings will be presented to the NYSDEC and NYSDOH in a future post-RAWP design package for review and approval prior to construction.

3.11 Site-Wide Cover System Installation

After RA excavations and backfilling activities are completed, a Site-wide cover system will be installed across the entire Site to limit potential future exposure pathways. The Site-wide cover system components, as outlined below, are shown on the Site-wide Cover System Plan (refer to RA-01 in Appendix A).

1. The existing approximately 6-inch-thick concrete building slab, repaired and restored following CSA excavations and installation of a new VMS consisting of a SSDS and vapor barrier, or similar (refer to RA-02 in Appendix A), and;
2. A new minimum 12-inch-thick composite cover system/asphalt pavement parking lot (refer to RA-03 in Appendix A for typical detail).

No landscaped areas are currently anticipated; in the event that landscape areas are to be incorporated into the final design a 2-foot-thick soil cover system placed over a demarcation layer will be used with the upper 6 inches of soil of sufficient quality to maintain a vegetative layer. Fill materials imported to the Site must comply with the NYSDEC requirements detailed in Section 3.9.

3.12 Demobilization

Once Site restoration activities are complete, remedial demobilization activities will take place. This includes removal of temporary facilities, including decontamination areas, removal of unused materials, removal of soil erosion and sediment control measures, and general housekeeping.

3.13 Compilation of Record Documents

The Fondak's Environmental Engineer of Record will prepare a FER to document the completed RA activities. As part of the FER, Fondak's Environmental Engineer of Record will prepare the following Record of Construction Plans to document the horizontal and vertical limit of the RA activities and installed ECs (i.e., VMS and Site-wide Cover System):

A. Horizontal Limit and Bottom of Excavations Record of Construction Plan;
B. VMS Record of Construction Plan;
C. Final Grade Plan Record of Construction Plan; and
D. Site-wide Cover System Record of Construction Plan.

4.0 PROPERTY ACCESS AND PERMITS REQUIRED

4.1 Property Access Agreements

Fondak and their Engineer will coordinate with the City of Yonkers and existing railroad property owner (MTA) to address existing access easements located on and/or adjacent to the Site. At a minimum, the Site RAs along the eastern Site boundary must be coordinated with MTA.

4.2 Federal, State and Local Permits

Specific NYSDEC and NYSDOH approvals are required as part of the RA presented in this RIR/RAWP. A City of Yonkers Remediation Permit Application will be submitted to the City of Yonkers Building Department prior to the start of remedial activities. In addition, several additional City of Yonkers and Westchester County permits including oversized vehicle permits and right of way parking permits are anticipated to be required for the remedial activities and Site redevelopment. These additional permits will be the responsibility of the Contractor. Also, as discussed above, a work permit may be required from the MTA for Site work within an identified distance from the railroad property line. If excavation dewatering becomes necessary, additional NYSDEC, Westchester County Department of Environmental Facilities and City of Yonkers sewer connection permits may be required.

4.3 Existing Groundwater Use Limitations

Groundwater use at the Site is not permitted for drinking or domestic purposes pursuant to the following applicable local, state and/or federal codes and regulations, which include, but are not limited to, the City of Yonkers Code [Part VI, Fire and Buildings, Chapter 57, Plumbing and Drainage Code, Article VII, Water Supply, § 57-26, Water for drinking or domestic purposes] as well as Chapter 95: Water Supply, which specifically prohibit the use of groundwater for drinking or domestic purposes. Chapters 57 and 95 of the City of Yonkers Code is annotated below.

Chapter 57 Plumbing and Drainage Code, Article VII Water Supply
§ 57-26 Water for drinking or domestic purposes.

A. *All water supply used for drinking purposes or domestic purposes, except bottled water, shall be provided by the public water supply of the City of Yonkers, New York.*
B. *No person shall add chemicals or other substances to the public water supply in any building or structure without first having obtained, in writing, permission from the Director and the Bureau of Water Supply of the City of Yonkers, nor shall any person shut off or discontinue water service except for such temporary interruption as may be necessary while actual repairs or alterations are in process or during temporary emergencies when discontinuance of service is approved by the Director.*
C. *Wells are not permitted for drinking or domestic use and may not be physically connected in any way to the public water supply system of the City of Yonkers.*

Chapter 95: Water Supply
§ 95-8 Water for drinking and domestic purposes.

A. *All water supply used for drinking purposes or domestic purposes, except bottled water, shall be provided by the public water supply of the City of Yonkers, New York.*

5.0 COST ESTIMATE FOR PREFERRED REMEDY

PS&S prepared an engineer's opinion of probable cost (EOPC) for the preferred remedy using current Westchester County, New York construction costs and assumed Site RAs duration (refer to RAWP Section 6.0). The PS&S EOPC for the preferred remedy is approximately $300,000. This does not include the annualized cost associated with the SMP. The annualized cost for the SMP operation, maintenance and reporting efforts is an additional estimated $30,000 per year[2].

[2] Annual SMP costs are present day value costs for the Site engineering controls and institutional controls operation, maintenance and reporting efforts.

6.0 RAWP IMPLEMENTATION SCHEDULE

Fondak has commenced Site preparation activities and plans to implement this RAWP in the following phased approach:

1. Hazardous building materials removal and asbestos abatement (to be completed prior to or during the RA);
2. RA Excavation, backfilling, final grading;
3. Installation of a VMS consisting of a sub-slab depressurization system and vapor barrier, or similar; and
4. Site-wide cover system installation (e.g., repair and restoration of the existing approximately 6-inch-thick concrete building slab and installation of a new minimum 12-inch-thick composite cover system/asphalt pavement parking lot).

6.1 Notification of RAWP Implementation

As discussed, the RA implementation at the Site will commence after the NYSDEC approval of the RAWP. Fondak plans to commence the scope of work detailed above starting in December 2018. The RAWP approach and the anticipated RA Implementation and Construction Schedule are presented in the Table 6.1.

Fondak will notify NYSDEC at least 30 days prior to implementation of the RAs, which will only be conducted following approval of the Final RAWP. The following Table 6.1 presents an outline of the anticipated Site Remedial Actions and associated duration.

Table 6.1 - RA Implementation and Construction Schedule

Remedial Action Activity		Estimated Duration	
1	Hazardous Materials Assessment and Abatement	1	Months
2	RA Excavation, Backfill, and Final Grading	0.5	Months
3	Site-wide Cover System Installation (including VMS installation);	1	Months
TOTAL DURATION (Tasks 1. through 4.)		2.5	Months

7.0 INSTITUTIONAL AND ENGINEERING CONTROLS

ICs and ECs are used together at a Site to confirm that measures taken to reduce contamination and potential human health risks remain in place. ICs are implemented to confirm that ECs stay in place and restrict land use until unrestricted Track 1 SCOs and Protection of Groundwater standards can be achieved.

ICs/ECs will be implemented to sustain the RA objectives over the long term. Minimum long-term operation and maintenance activities are expected once IC/ECs are in place.

The ECs will include a VMS consisting of a sub-slab depressurization system and vapor barrier, or similar; and a Site-wide cover system (e.g., the existing approximately 6-inch-thick concrete building slab and new minimum 12-inch-thick composite cover system/asphalt pavement parking lot. These ECs will restrict surface exposures to any potential contaminated material left in place.

The ICs will be implemented to maintain the ECs during any future Site related construction activities. The EE will limit land use to Restricted Residential, Commercial or Industrial use until Track 1 Unrestricted Use SCOs and Protection of Groundwater standards are achieved. Further, the EE will:

A. Require the remedial party or site owner to complete and submit to the Department a periodic certification of ICs and ECs in accordance with Part 375-1.8 (h)(3);
B. Allow the use and development of the controlled property for restricted residential or commercial use or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
C. Restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or Westchester County DOH (if applicable); and
D. Require compliance with the NYSDEC approved SMP (further described below).

A SMP will be prepared in accordance with the requirements outlined in DER-10 and implemented upon completion of the remedial activities outlined in this RAWP. With implementation, the IC/ECs will be considered protective of human health and environmental concerns by creating and maintaining a barrier to any potential contaminated material and mitigating potential vapor intrusion. As long as these IC/ECs are maintained as described in the future Site SMP, exposure to these materials is considered unlikely. The SMP will include an IC and EC Plan that identifies use restrictions and ECs for the site and details the steps and media-specific requirements necessary to confirm that the required ICs and/or ECs remain in place and effective.

The SMP will also include:

- An Excavation Workplan which details the provisions for management of future excavations in areas of remaining contamination;
- A description of the provisions of the EE including any land use and groundwater use restrictions;
- A provision for evaluation of the potential for soil vapor intrusion for any new buildings developed on the Site, including a provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- A provision for the management and inspection of the identified ECs;

- Maintaining Site access controls and NYSDEC notifications; and
- Steps necessary for the period reviews and certification of the IC and/or ECs.

Lastly, the SMP will include a monitoring plan to assess the performance and effectiveness of the selected remedy. The plan may include, but is not limited to:

- Monitoring of the groundwater;
- Monitoring of vapor mitigation systems installed within the existing building, as required by the IC/ECs as discussed above; and
- A schedule of monitoring frequency of submittals to NYSDEC.

8.0 QUALITY ASSURANCE PROJECT PLAN (QAPP)

The QAPP was developed to address quality assurance control/quality control (QA/QC) issues, document and confirm compliance with the regulatory decisions and statements and to confirm the integrity of analytical data obtained during remedial activities to be performed at the Site. A copy of the QAPP is included in Appendix D. The QAPP describes the QA/QC organization of the Contractor and the allocation of responsibilities for performing QA/QC activities. The QAPP includes detail of the following site remediation aspects:

1. Organization for the performance of the field activities and responsibilities of the personnel performing the work;
2. QA/QC objectives to confirm the integrity of data;
3. Procedures for collecting, handling and tracking environmental samples;
4. Excavation and off-site disposal tracking procedures;
5. Record of Construction Plan minimum requirements;
6. Quality Audits;
7. Preventive measure procedures to confirm the integrity of the data; and
8. Corrective action procedures.

9.0 HEALTH AND SAFETY PLAN

A Site-Specific HASP was prepared in accordance with the requirements of the OSHA HAZWOPER standard and to address worker health and safety for RAs to be implemented at the Site. A copy of the HASP is included in Appendix C. The HASP was prepared to address worker safety issues and well as community impacts according to projected activities to be performed at the Site. The HASP includes:

1. Roles and responsibilities of project team members;
2. A history of the Site and a description of the Site activities;
3. A discussion of the potential chemical, biological and physical hazards at the Site;
4. Activity Hazard Analyses for the various work tasks;
5. A discussion of the requirements and use of PPE;
6. Air monitoring requirements;
7. Establishment of work zones;
8. Medical surveillance procedures and protocols;
9. An Emergency Response Plan; and
10. Requirements for record keeping and tracking.

The Contractor will be required to prepare and implement a HASP that addresses their Site-specific construction activities and constraints.

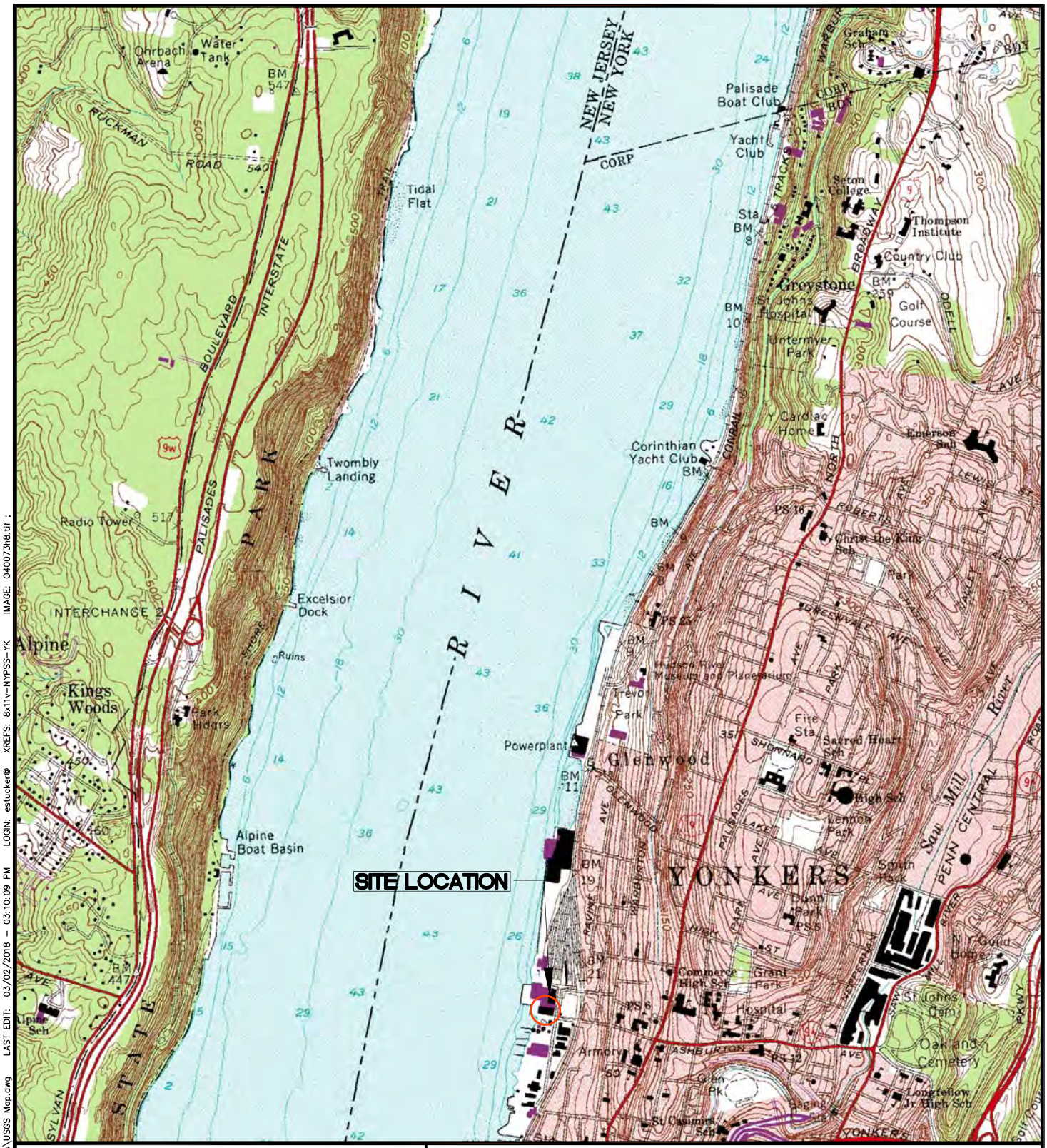
10.0 COMMUNITY AIR MONITORING PLAN

The CAMP was prepared in accordance with Appendix 1A of DER-10. A copy of the CAMP is included in Appendix E. The CAMP includes air monitoring requirements for particulate matter and VOCs, which will be implemented during intrusive remedial activities.

11.0 CITIZEN PARTICIPATION PLAN

A Citizen Participation Plan (CPP) has been developed for the Site. This CPP provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the Site. A copy of the CPP is provided as Appendix F.

FIGURES



PS&S
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PROJECT TITLE

FONDAK ENTERPRISES, LLC
72 ALEXANDER STREET
YONKERS, WESTCHESTER COUNTY, NEW YORK

SHEET TITLE

FIGURE 1
SITE LOCATION MAP
(USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES)

DATE:	03/02/18	DRN. BY:	RP	PROJ. NO.:	05794.0001
SCALE:	NTS	CK'D BY:	CB	SHT. NO.:	1

FILE NAME: P:\05794\0001\DWGs\C-Civil\Figures\USGS Map.dwg LAST EDIT: 03/02/2018 - 03:10:09 PM LOGIN: estucker@ XREFS: 8x11v-NYPSS-YK IMAGE: 040073h8.tif ;

APPENDICES

Appendix A

Education

Energy Utility

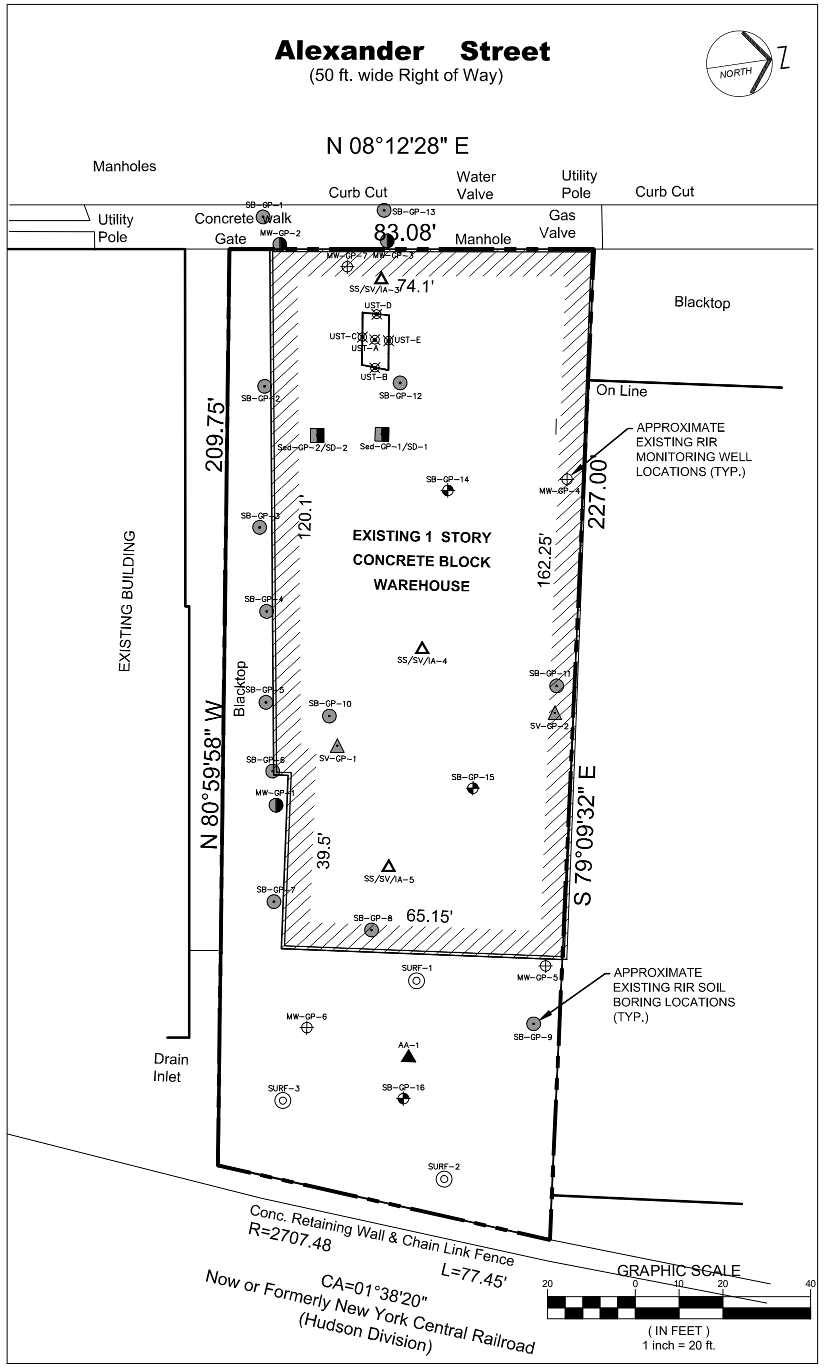
Hospitality

Public Sector

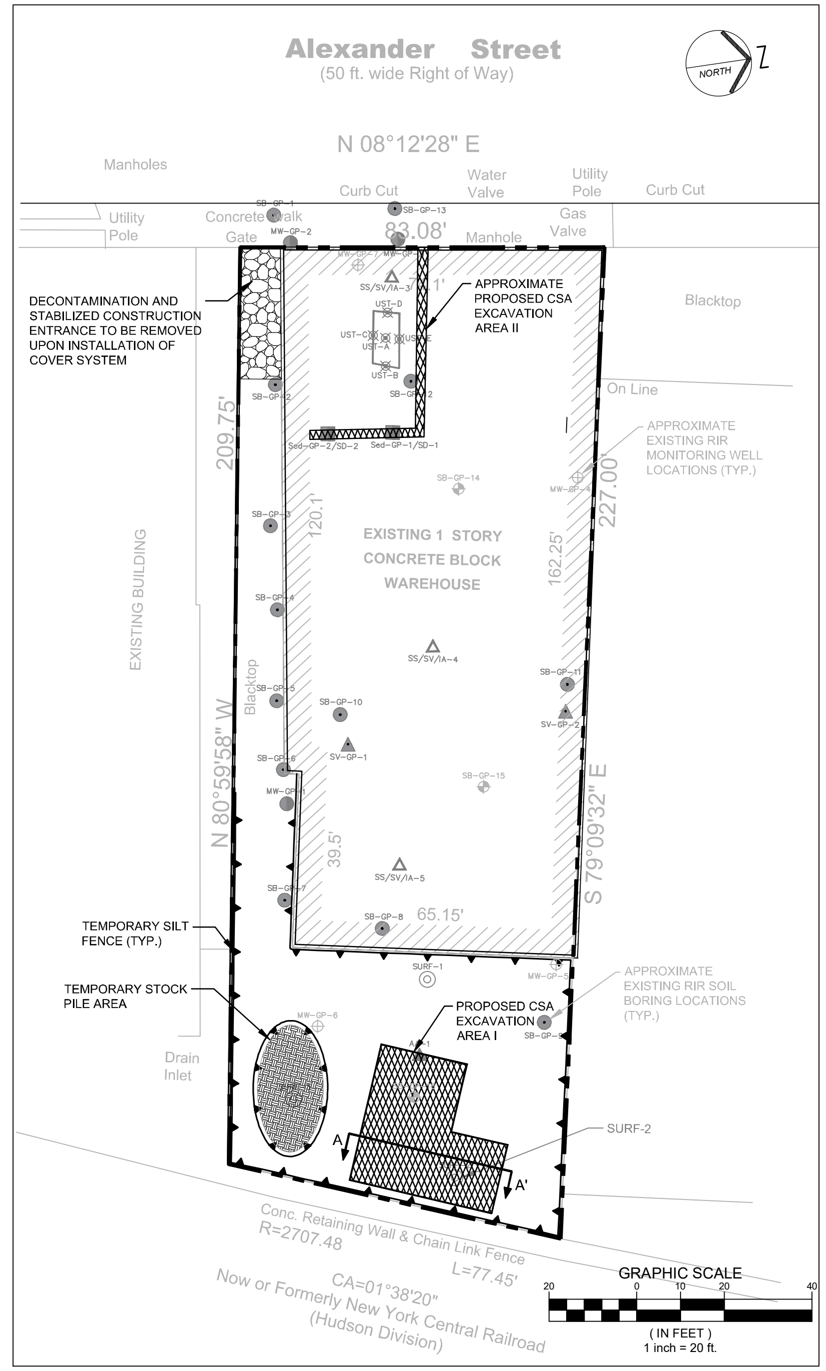
Real Estate

Science & Technology

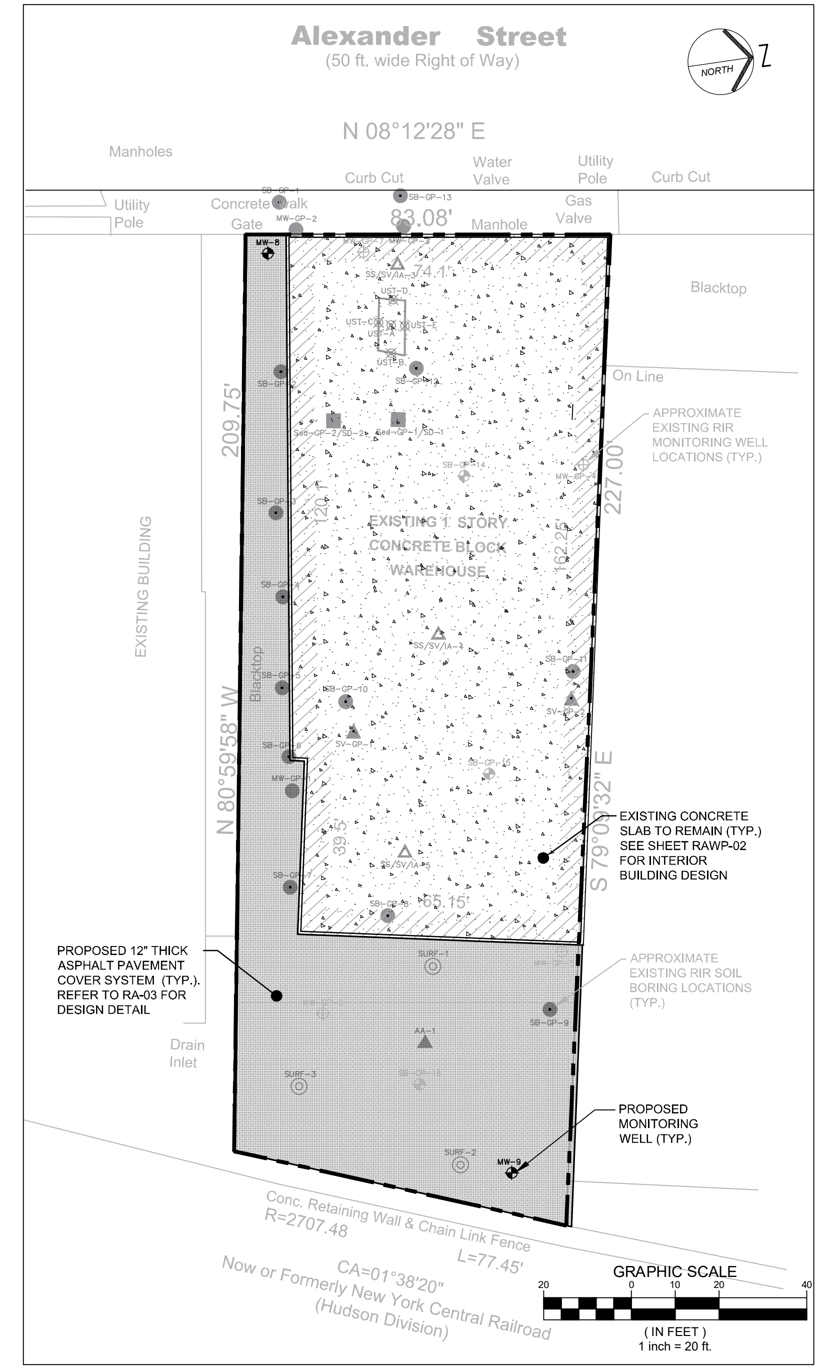
Remedial Action Plan Set



1 EXISTING SITE CONDITIONS PLAN



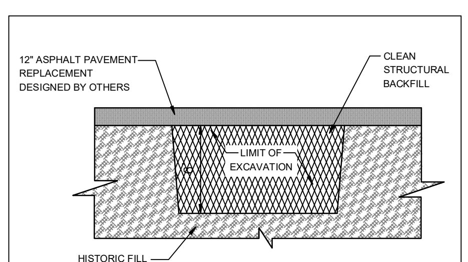
2 REMEDIAL ACTION PLAN AND SOIL EROSION AND SEDIMENT CONTROL



3 SITE WIDE COVER SYSTEM PLAN

LEGEND

- PROPERTY BOUNDARY
- 2011 MONITORING WELL LOCATION
- 2011 SOIL VAPOR INVESTIGATION LOCATION
- 2011 SOIL BORING LOCATION
- 2011/2017 SEWER DEBRIS SAMPLE LOCATION
- 2017 COMBINED SOIL VAPOR, SUB SLAB AND INDOOR AIR SAMPLE LOCATION
- 2017 AMBIENT AIR SAMPLE LOCATION
- 2017 SURFACE SOIL SAMPLE LOCATION
- 2017 SOIL BORING LOCATION
- 2017 MONITORING WELL LOCATION
- 2017 POST-EXCAVATION SOIL SAMPLE LOCATION
- APPROXIMATE UST LOCATION
- CSA EXCAVATION LIMITS
- SILT FENCE
- DECONTAMINATION AND CONSTRUCTION ENTRANCE
- STOCKPILE
- EXISTING CONCRETE SLAB
- ASPHALT PAVEMENT



A CROSS-SECTION A-A'
SCALE: NTS

TABLE 1 - CSA EXCAVATIONS

a	b		c	d	e	f	g	h
CSA EXCAVATION	SELECTED REMEDY	MEDIA	CONTAMINANTS	AREA (SF)	DEPTH OF EXCAVATION (FT BGS)	APPROXIMATE SURFACE ELEVATION	BOTTOM OF EXCAVATION ELEVATION	VOLUME (CY)
CSA#1	Excavation	Shallow Fill Materials	SVOCs, Metals (Mercury, Lead)	850	6.0	10.01	4.0	189
CSA#2	Excavation	Floor Drain Debris	PCBs, SVOCs, Lead	140	2.0	7.06	4.9	11
			Remedial Action Footprint	990		Remedial Action Volume		200

ACRONYMS SF - Square Feet, FT - Feet, BGS -Below Ground Surface, CY - Cubic Yards

NOTES

(1) In addition to removal of the observed floor drain debris, the two existing floor drain structures and on-Site downgradient piping will be removed and replaced. The area and volume estimates for CSA#2 include removal of the floor drain debris/structures and approximately 70 linear feet of piping (estimated at 2 feet below existing slab surface).

LIST OF DRAWINGS

DWG. NO.	DESCRIPTION	DATE	LAST REVISED
RA-01	REMEDIAL ACTION SITE PLAN (1 OF 2)	11/07/2018	
RA-02	REMEDIAL ACTION SITE PLAN (2 OF 2)	11/07/2018	
RA-03	GENERAL NOTES, SESC AND SITE DETAILS	11/07/2018	

REFERENCE AND BASE INFORMATION NOTES

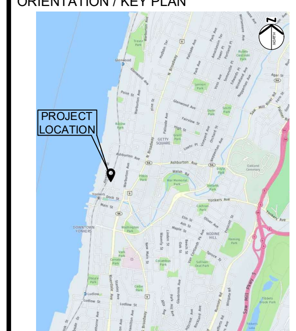
1. ALL PROPOSED WORK SHOWN LIES WITHIN THE CITY OF YONKERS, WESTCHESTER COUNTY, NEW YORK.
2. ALL EXISTING SITE FEATURES SHOWN ARE BASED UPON AN ASSUMED DATUM.
3. EXISTING SITE CONDITIONS SHOWN WERE TAKEN FROM A RECEIVED ELECTRONIC FILE PROVIDED BY NEMERJ DESIGN GROUP ON OCTOBER 13, 2018, TITLED "LOCATION MAP AND GENERAL NOTES", DATED SEPTEMBER 8, 2018.
4. PROPOSED SITE PLAN SHOWN WAS TAKEN FROM A RECEIVED ELECTRONIC FILE PROVIDED BY NEMERJ DESIGN GROUP ON OCTOBER 13, 2018, TITLED "LOCATION MAP AND GENERAL NOTES", DATED SEPTEMBER 8, 2018.
5. 2011 PHASE II ESI BORING LOCATIONS ARE APPROXIMATE AND LOCATED USING EXISTING SITE FEATURES. 2017 IRM AND RI BORING LOCATIONS WERE SURVEYED BY PS&S ENGINEERING IN SEPTEMBER 2017
6. EXCEPT WHERE SPECIFICALLY NOTED, EXISTING FEATURES ARE SHOWN IN HALF TONE AND PROPOSED FEATURES ARE SHOWN IN FULL TONE.

ISSUED FOR REGULATORY REVIEW (10-31-2018)

REV. / ISSUE	DATE	DESCRIPTION

CONSULTANT

ORIENTATION / KEY PLAN



CLIENT

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JANOS M. SZEMAN, P.E.
PROFESSIONAL ENGINEER
STATE OF NEW YORK · JANOS MICHAEL SZEMAN · LICENSED PROFESSIONAL ENGINEER · 84542
SIGNATURE DATE

PROJECT

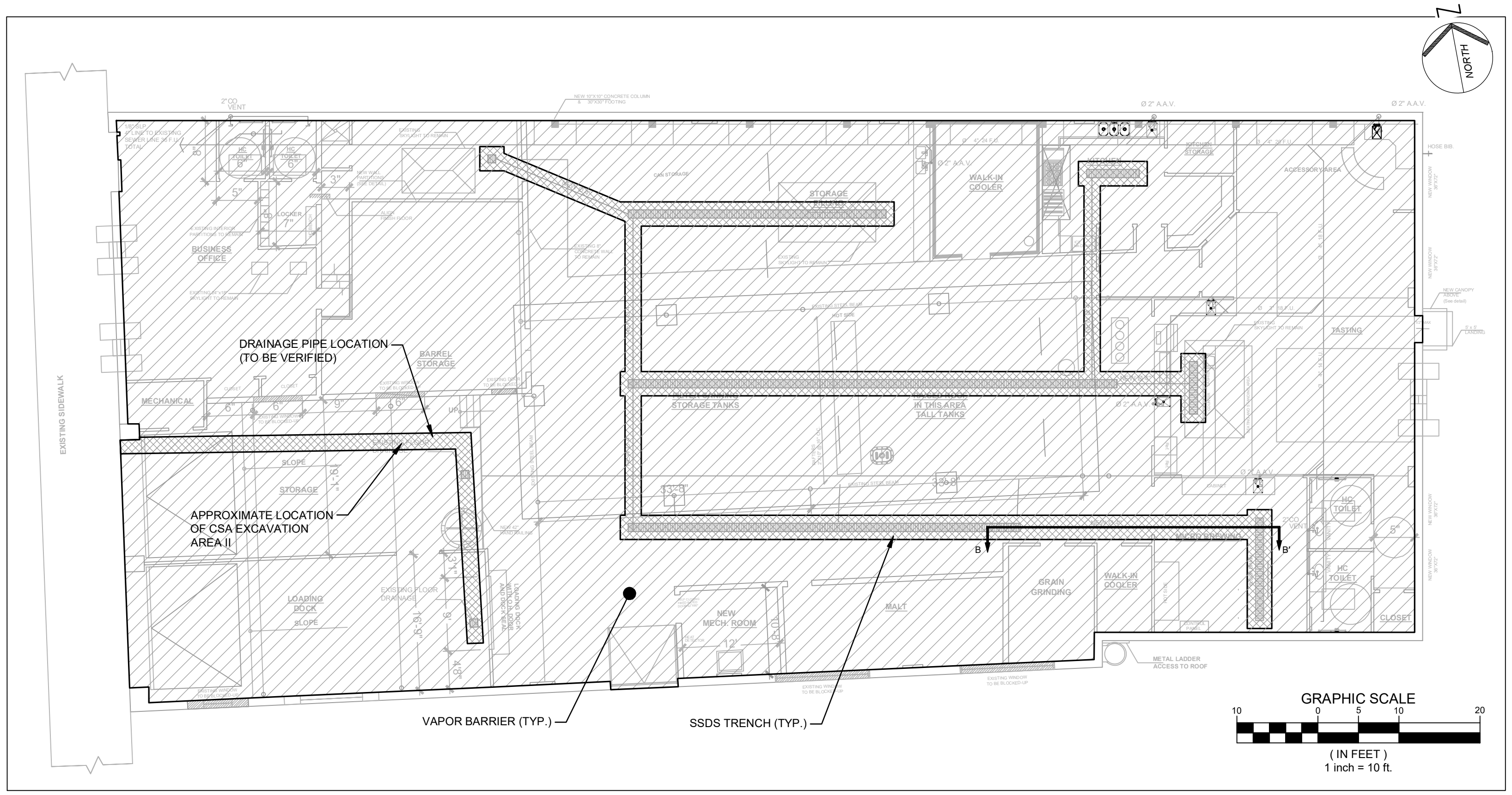
FONDAK ENTERPRISES LLC.

72 ALEXANDER STREET
YONKERS, WESTCHESTER COUNTY, NEW YORK

SHEET TITLE

REMEDIAL ACTION SITE PLAN (1 OF 2)

PROJECT NO.: 06097.0001
SCALE: AS SHOWN
DATE: 10/31/18
DRAWN BY: RE
CHECKED BY: SMP
SHEET 1 OF 3
SHEET NO.
RA-01



4 **VAPOR MANAGEMENT SYSTEM (VMS) CONCEPTUAL DESIGN PLAN**

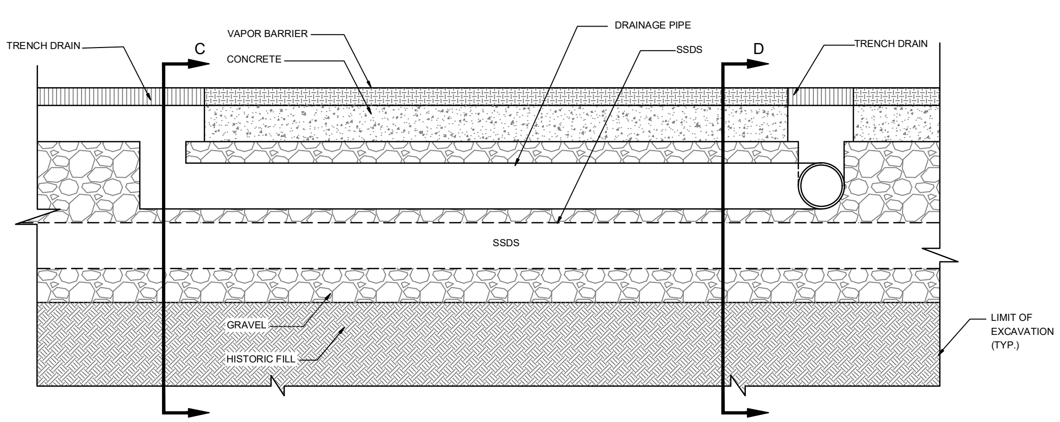
REMEDIAL ACTION NOTES

1. THE CONTRACTOR MUST REFER TO AND COMPLY WITH THE WESTCHESTER COUNTY SOIL AND WATER CONSERVATION DISTRICT APPROVED SOIL EROSION AND SEDIMENT CONTROL (SESC) PLAN SET PREPARED BY EMERJ DESIGN GROUP.
2. THE CONTRACTOR MUST PREPARE, ISSUE AND IMPLEMENT A REMEDIAL ACTION OPERATIONS PLAN THAT COMPLIES WITH THE NOVEMBER 2014 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) DECISION DOCUMENT AND THE JANUARY 20, 2012 NYSDEC BROWNFIELD CLEANUP PROGRAM ACCEPTANCE. THE APRIL 2017 REMEDIAL ACTION WORKPLAN ADDENDUM (RAWPA) AND THE MAY 9, 2017 NYSDEC RAWPA APPROVAL.
3. THE FINAL LOCATION OF THE PROPOSED GROUND WATER MONITORING WELLS WILL BE FIELD DETERMINED BY THE OWNER AND THE ENGINEER AFTER THE REMEDIAL ACTION IS COMPLETED AND PRIOR TO THE INSTALLATION. THE GROUND WATER MONITORING WELLS WILL BE INSTALLED AND INTEGRATED INTO THE PROPOSED REDEVELOPMENT AND MUST BE READILY ACCESSIBLE FOR THE LONG-TERM SITE MANAGEMENT PLAN ACTIVITIES.
4. ALL CONTRACTOR EXCAVATIONS MUST BE DESIGNED, EXCAVATED, AND MAINTAINED IN SUCH A MANNER AS TO PROTECT THE EXITING SURFACE FEATURES, UNDERGROUND UTILITIES AND OVERHEAD UTILITIES.
5. SOKOLOWSKI AND SARTOR ENGINEERING, PC (PS&S) IS THE ENVIRONMENTAL ENGINEER OF RECORD RESPONSIBLE FOR THE PREPARATION, SUBMISSION, AND DOCUMENTATION OF THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) REQUIRED SITE REMEDIAL ACTION REQUIREMENTS. THE DESIGN OF THE REDEVELOPMENT PROJECT ARE THE RESPONSIBILITY OF OTHERS AND THE REUSE OF THE EXISTING BUILDING IS OUTSIDE THE SCOPE OF THESE SITE REMEDIAL ACTIONS.
6. THESE DRAWINGS ARE INTENDED TO SHOW THE NYSDEC REQUIRED SITE REMEDIAL ACTION REQUIREMENTS TO BE PERFORMED ON THE SUBJECT SITE. THE SITE REMEDIAL ACTIONS WILL BE PERFORMED BOTH INSIDE AND OUTSIDE OF THE EXISTING BUILDING. THE SITE REMEDIAL ACTION IDENTIFIED HEREIN AND WITHIN THE EXISTING BUILDING IS PRELIMINARY AND SUBJECT TO THE DETAILED DESIGN TO BE PERFORMED BY THE OTHERS BASED ON THE CONTRACTOR AND ARCHITECT/ENGINEER VERIFICATION OF THE EXISTING CONDITIONS.
7. THE SITE REMEDIAL ACTION WORK IS LIMITED TO THE CONTAMINATED SOURCE AREA (CSA) EXCAVATIONS, VMS INSTALLATIONS, AND SITE WIDE COVER SYSTEM ENGINEERING CONTROLS AS IDENTIFIED IN THIS REMEDIAL WORK PLAN.
8. THE VAPOR MANAGEMENT SYSTEM (VMS) IS REQUIRED UNDER ALL GROUND FLOOR OCCUPIED SPACES OF THE BUILDING, REFER TO THE CURRENT ARCHITECTURAL DRAWINGS. FURTHER, THE VMS VAPOR BARRIER, GEO-SEAL® OR APPROVED EQUAL, WILL BE INSTALLED UNDER THE ENTIRE FOOTPRINT OF THE BUILDING.
9. THE CONTRACTOR MUST ESTABLISH AND MAINTAIN REMEDIAL EXCAVATION SURVEY CONTROL POINTS THROUGHOUT THE REMEDIAL ACTION FIELD ACTIVITIES TO CONFIRM THE HORIZONTAL AND VERTICAL EXTENT OF THE REMEDIAL EXCAVATION.
10. THE CONTRACTOR IS RESPONSIBLE TO DESIGN, PERMIT, CONSTRUCT, AND OPERATE A CONSTRUCTION DEWATERING SYSTEM AT THE SITE, IF REQUIRED. THE CONSTRUCTION DEWATERING SYSTEM MUST COMPLY WITH THE APPLICABLE LOCAL, COUNTY, AND STATE REGULATORY REQUIREMENTS. AT THIS TIME, ON-SITE STORAGE OF CONSTRUCTION DEWATERING WASTEWATER IN FRAC TANKS IS PROPOSED WITH OFF-SITE DISPOSAL AT THE OWNER AND NEW YORK STATE APPROVED WASTEWATER DISPOSAL FACILITY.
11. IN THE EVENT THAT THE CONTRACTOR PROPOSES THE DISCHARGE OF THE CONSTRUCTION DEWATERING SYSTEM THROUGH AN APPROVED DISCHARGE POINT, THE CONTRACTOR WILL BE REQUIRED TO OBTAIN THE NECESSARY PERMITS AND APPROVALS FOR THE REQUIRED DISCHARGE PERMIT. NO CONSTRUCTION DEWATERING DISCHARGE TO THE SURFACE WILL BE ALLOWED.
12. RIOR TO ANY REMEDIATION WORK WITHIN THE BUILDING, ABETMENT AND DISPOSAL OF HAZARDOUS BUILDING MATERIAL WILL BE IN ACCORDANCE WITH SPECIFICATIONS.

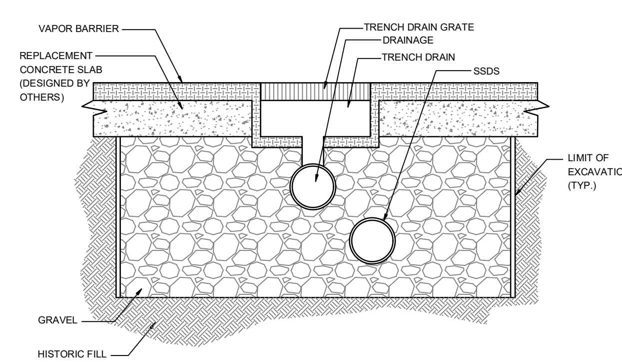
LEGEND

VAPOR BARRIER AREA

SSDS TRENCH



B **CROSS-SECTION B-B**
SCALE: NTS



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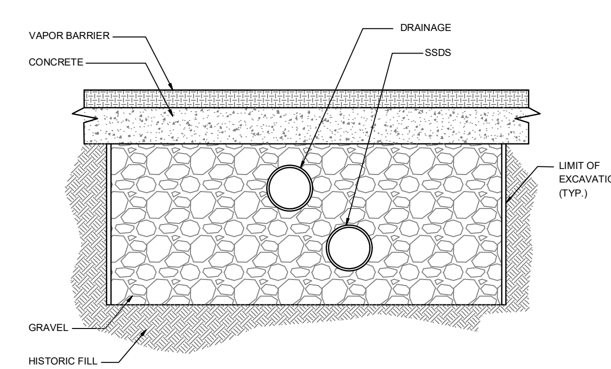
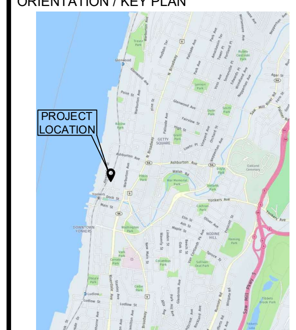


D **CROSS-SECTION D-D**
SCALE: NTS

REV. / ISSUE	DATE	DESCRIPTION

CONSULTANT

ORIENTATION / KEY PLAN



CLIENT

PAULUS, SOKOLOWSKI AND SARTOR ENGINEERING, P.C.
ONE LARKIN PLAZA
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YONKERS, NY 10701
PHONE: (914) 509-8600

JANOS MICHAEL SZEMAN, P.E.
PROFESSIONAL ENGINEER
STATE OF NEW YORK
84542
LICENSED PROFESSIONAL ENGINEER
SIGNATURE DATE

PROJECT

FONDAK ENTERPRISES LLC.

72 ALEXANDER STREET
YONKERS, WESTCHESTER COUNTY, NEW YORK

SHEET TITLE

REMEDIAL ACTION SITE PLAN (2 OF 2)

PROJECT NO.:	06097.0001	DRAWN BY:	RE
SCALE:	AS SHOWN	CHECKED BY:	SMP
DATE:	10/31/18	SHEET	2 OF 3
SHEET NO.	RA-02		

ISSUED FOR REGULATORY REVIEW (10-31-2018)

GENERAL NOTES

1. THE OFFICE OF THE NYSDEC, MUNICIPAL ENGINEER, AND OTHER GOVERNMENTAL AGENCIES OF INTEREST SHALL BE NOTIFIED 7 DAYS IN ADVANCE OF COMMENCEMENT OF CONSTRUCTION OF ANY IMPROVEMENTS UNDER ITS JURISDICTION.
2. ALL PERMITS FOR CONSTRUCTION MUST BE OBTAINED BY THE CONTRACTOR(S) PRIOR TO THE START OF ALL WORK.
3. UNLESS DESIGNATED AS "ISSUED FOR CONSTRUCTION", THESE PLANS ARE NOT INTENDED TO BE USED FOR CONSTRUCTION. THE CONTRACTOR WILL NOTIFY THE DESIGN ENGINEER SO THAT THE PROPER ISSUE OF PLANS CAN BE SUPPLIED.
4. PRIOR TO THE BEGINNING OF CONSTRUCTION ADJACENT TO THE METROPOLITAN TRANSIT AUTHORITY (MTA) , THE CONTRACTOR(S) IS DIRECTED TO CONTACT MTA TO INFORM THEM OF THE CONSTRUCTION ACTIVITIES IN THE VICINITY OF THE NEW YORK CENTRAL RAILROAD.
5. WITHIN TEN (10) DAYS OF NOTICE TO PROCEED, THE CONTRACTOR(S) MUST SUBMIT A DETAILED SCHEDULE OF CONSTRUCTION SEQUENCE.
6. THE CONTRACTOR(S) IS TO FIELD VERIFY EXISTING SITE CONDITIONS AND THE CONTRACTOR MUST ADDRESS ANY POSSIBLE CONSTRUCTION CONFLICTS WITH THE ENGINEER PRIOR TO THE START OF ALL WORK.
7. THESE DRAWINGS CONTAIN DATA INTENDED SPECIFICALLY FOR THE NOTED PROJECT AND CLIENT. THEY ARE NOT INTENDED FOR USE ON EXTENSIONS OF THE PROJECT OR FOR REUSE ON ANY OTHER PROJECT.
8. SUBSTITUTIONS OF PRODUCT SPECIFICATIONS THAT NOTE "OR EQUAL" MUST BE APPROVED BY THE ENGINEER. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO DEMONSTRATE TO THE SATISFACTION OF THE ENGINEER THAT THE SUBSTITUTION IS EQUAL.
9. CONTRACTOR SHALL COORDINATE UTILITY MARK OUTS 72 HOURS PRIOR TO ANY DISTURBANCE.
10. ALL SOIL EROSION CONTROL MEASURES MUST BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION AND ARE SUBJECT TO INSPECTION BY THE LOCAL SOIL CONSERVATION DISTRICT.
11. THE CONTRACTOR SHALL PROVIDE SUCH TEMPORARY DRAINAGE, SOIL EROSION, AND DUST CONTROL MEASURES AS MAY BE DIRECTED BY THE MUNICIPAL ENGINEER OR OTHER AGENCIES OR DEPARTMENTS TO SATISFY ENVIRONMENTAL CONCERNS.
12. THE INSTALLATION OF UTILITIES MUST BE COORDINATED WITH BUILDING IMPROVEMENTS TO ASSURE THE WELL-BEING OF LIFE AND PROPERTY DURING CONSTRUCTION. WATER SERVICE IS A PRIMARY NEED AND MUST BE SCHEDULED ACCORDINGLY. WATER SUPPLY AND HYDRANT CONNECTIONS ARE TO BE ESTABLISHED AS A PRIORITY DURING INITIAL SITE DEVELOPMENT TO ASSURE ADEQUATE WATER FOR FIREFIGHTING DURING ALL PHASES OF CONSTRUCTION.
13. ALL SIGNAGE, STRIPING, PARKING AND TRAFFIC CIRCULATION MARKING SHALL BE PERFORMED IN ACCORDANCE WITH HE MUTCD, AS AMENDED, AS WELL AS NYSDOT STANDARDS.. SAID SIGNS ARE TO BE MAINTAINED UNTIL CONSTRUCTION IS COMPLETED AND APPROVED BY THE APPROPRIATE MUNICIPAL INSPECTION PERSONNEL. NO CONSTRUCTION THAT IN ANY WAY INTERFERES WITH ROADWAY TRAFFIC SHALL COMMENCE UNTIL THE APPROPRIATE CONSTRUCTION WARNING SIGNS ARE INSTALLED AND INSPECTED BY THE MUNICIPAL ENGINEER.
14. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE MUNICIPAL CONSTRUCTION GUIDELINES FOR STREET OPENINGS WITHIN THE PUBLIC RIGHT OF WAY.
15. ALL ROADWAYS ARE TO BE PASSABLE FOR FIRE DEPARTMENT USE DURING CONSTRUCTION. ANY ROADWAY CLOSURE OR RELOCATION SHALL BE COORDINATED BY THE CONTRACTOR WITH THE FIRE DEPARTMENT TO ENSURE ADEQUATE FIRE PROTECTION FOR ALL AREAS AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING WARNING SIGNS, BARRICADES, AND ANY AND ALL SAFETY MEASURES AS MAY BE REQUIRED BY LOCAL CODES, OSHA AND/OR MUTCD.
16. LOCATION OF EXISTING INLETS, CATCH BASINS AND MANHOLES MUST BE FIELD VERIFIED BEFORE WORK MAY COMMENCE. ANY CONFLICTING INFORMATION FROM THAT SHOWN SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER.
17. PRIOR TO ANY SITE DISTURBANCE, ALL WETLANDS AND OR WETLANDS TRANSITION AREA LIMITS SHALL BE CLEARLY IDENTIFIED IN THE FIELD WITH ORANGE SNOW FENCING BY MIRAFI OR APPROVED EQUAL. LOCATE SILT FENCE LINE FIVE (5) FEET UPSTREAM OF PROTECTIVE FENCING AND DOWNSTREAM OF CLEARING LIMITS AS SHOWN. THE CONTRACTOR SHALL VERIFY THAT ALL PERMITS AS MAY BE REQUIRED BY LOCAL, COUNTY, STATE, FEDERAL OR OTHER AGENCIES HAVING JURISDICTION ARE IN HAND AND VALID PRIOR TO COMMENCING WORK.
18. SUBSTITUTIONS OF PROPRIETARY MATERIAL AND/OR PRODUCT SPECIFICATIONS THAT NOTE "OR EQUAL" MUST BE APPROVED BY THE DESIGN ENGINEER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DEMONSTRATE TO THE SATISFACTION OF THE DESIGN ENGINEER THAT THE SUBSTITUTION IS EQUAL.
19. ANY REINFORCING STEEL AND CONCRETE DESIGN MUST BE SUPPLIED, SIGNED & SEALED BY THE PRE-CAST MANUFACTURER OR A REPUTABLE LICENSED STRUCTURAL ENGINEER IN THE STATE OF NEW YORK REPRESENTING THE CONTRACTOR AND SHALL BE INCLUDED IN THE SHOP DRAWING SUBMITTAL SUBJECT TO REVIEW BY PS&S.
20. THE CONTRACTOR SHALL PREPARE AS-BUILT DRAWINGS FOR ALL UNDERGROUND IMPROVEMENTS INSTALLED DURING CONSTRUCTION, ETC. AS-BUILT DRAWINGS MUST BE SIGNED & SEALED BY A NY PROFESSIONAL ENGINEER OR LAND SURVEYOR. THE AS-BUILT SURVEY DRAWINGS MUST COMPLY WITH UTILITY OWNER STANDARDS/REQUIREMENTS. COPIES SHALL BE SUBMITTED TO THE OWNER AND ENGINEER.
21. EXISTING STREET SURFACES AND OTHER SURFACES DISTURBED BY THE CONSTRUCTION OF FACILITIES FOR THIS PROJECT SHALL BE RESTORED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE MUNICIPAL ENGINEER.
22. IT IS NOT THE INTENT OF THESE PLANS TO PROVIDE REINFORCING STEEL AND CONCRETE DESIGNS FOR ANY PRE-CAST OR POURED-IN-PLACE CONCRETE STRUCTURES, OTHER THAN THE REINFORCING STEEL AND CONCRETE DESIGNS SPECIFICALLY NOTED ON THESE PLANS. ANY REINFORCING STEEL AND CONCRETE DESIGN MUST BE SUPPLIED BY THE PRE-CAST MANUFACTURER OR A REPUTABLE LICENSED STRUCTURAL ENGINEER REPRESENTING THE CONTRACTOR.
23. ALL ROADWAYS ARE TO BE PASSIBLE FOR FIRE DEPARTMENT USE DURING CONSTRUCTION. ANY ROADWAY CLOSURE OR RELOCATION SHALL BE COORDINATED BY THE CONTRACTOR WITH THE FIRE DEPARTMENT TO ENSURE ADEQUATE FIRE PROTECTION FOR ALL AREAS AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING WARNING SIGNS, BARRICADES, AND ANY AND ALL SAFETY MEASURES AS MAY BE REQUIRED BY LOCAL CODES, OSHA, AND/OR MUTCD.
24. THE LOCATIONS OF KNOWN UTILITY STRUCTURES AND FACILITIES THAT MAY BE ENCOUNTERED WITHIN AND ADJACENT TO THE LIMITS OF WORK, AS SHOWN, ARE APPROXIMATE. THE ACCURACY AND COMPLETENESS OF THE EXISTING UTILITY STRUCTURES AND FACILITIES INFORMATION IS NOT GUARANTEED BY THE ENGINEER. THE CONTRACTOR(S) IS ADVISED TO VERIFY IN THE FIELD ALL FACTS CONCERNING THE UTILITY LOCATIONS AND OTHER CONSTRUCTION OBSTACLES PRIOR TO CONSTRUCTION. FURTHER, THE CONTRACTOR(S) WILL NOTIFY THE ENGINEER IN WRITING, PRIOR TO CONSTRUCTION, OF ANY DISCREPANCIES WHICH MAY AFFECT PROJECT DESIGN OR SCOPE. PS&S ASSUMES NO LIABILITY FOR ANY UTILITY INFORMATION SHOWN HEREIN.

NOTES ON THE USE OF PLANS

1. UNLESS THESE DRAWINGS ARE SPECIFICALLY DESIGNATED AS "CONSTRUCTION ISSUE," THESE DRAWINGS OR THE IMPROVEMENTS DEPICTED HEREIN SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTORS SHALL NOTIFY THE DESIGN ENGINEER TO OBTAIN CONSTRUCTION DOCUMENTS.
2. ALL DIMENSIONS MUST BE VERIFIED BY THE CONTRACTOR. NOTIFY PAULUS, SOKOLOWSKI AND SARTOR OF ANY CONFLICTS, ERRORS, AMBIGUITIES OR DISCREPANCIES IN THE CONTRACT DRAWINGS OR SPECIFICATIONS BEFORE PROCEEDING WITH CONSTRUCTION.
3. INFORMATION FOR DESIGN LAYOUT IS CONTAINED SOLELY IN THE WRITTEN DIMENSIONS, BEARINGS, AND ANGLES CONTAINED ON THE DRAWINGS. DO NOT SCALE THE DRAWINGS TO DETERMINE DIMENSIONS..
4. THESE CONTRACT DRAWINGS CONTAIN DATA INTENDED SPECIFICALLY FOR THE NOTED PROJECT AND CLIENT. THEY ARE NOT INTENDED FOR USE ON EXTENSIONS OF THIS PROJECT OR FOR REUSE ON ANY OTHER PROJECT. THE COPYING AND/OR MODIFICATION OF THIS DOCUMENT OR ANY OTHER PORTION THEREOF WITHOUT THE WRITTEN PERMISSION OF PAULUS, SOKOLOWSKI, AND SARTOR IS PROHIBITED.
5. THIS DIMENSIONAL INFORMATION IS NOT WARRANTED NOR SHOULD IT BE CONSIDERED AS COMPLETE FOR EVERY ASPECT OF THE LAYOUT. STANDARD PRACTICE REQUIRES THAT THE LAYOUT PERSON CHECK THE DIMENSIONAL DATA CONSISTENCY AND TO MAKE SURVEY CALCULATIONS WHICH ARE CUSTOMARY FOR CONSTRUCTION LAYOUT. IN THE EVENT A QUESTION OR INCONSISTENCY IS DISCOVERED, THE USER SHOULD IMMEDIATELY NOTIFY THE ENGINEER OF RECORD.
6. THE GRAPHICAL INFORMATION CONTAINED IN ELECTRONIC FILES IS INTENDED AS DRAWING DATA ONLY, IT IS NOT INTENDED TO SERVE AS SURVEY LAYOUT DATA.

DEMOLITION NOTES

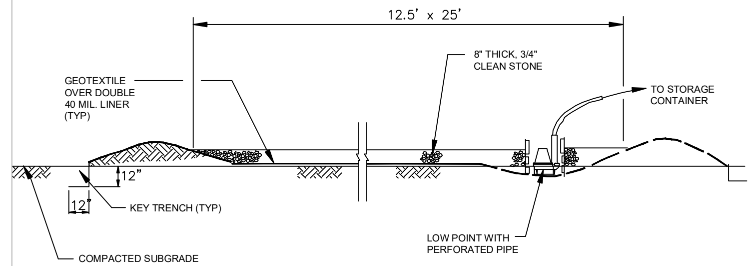
1. PRIOR TO THE START OF GRADING AND CLEARING OPERATIONS, THE CONTRACTOR SHALL INSTALL ORANGE COLORED FENCING ALONG THE LIMITS OF GRADING TO DELINEATE THE PROTECTED NATURAL AREAS FROM DAMAGE.
2. ALL EXISTING STRUCTURES AND UTILITIES NOT INDICATED TO BE REMOVED SHALL BE LOCATED, IDENTIFIED AND PROTECTED FROM DAMAGE THROUGHOUT THE CONSTRUCTION PERIOD. ALL STRUCTURES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE AND TO THE SATISFACTION OF THE OWNER. PROVIDE TEMPORARY SERVICES DURING INTERRUPTIONS TO EXISTING UTILITIES AS ACCEPTABLE TO THE OWNER.
3. ALL TEMPORARY STORAGE EQUIPMENT/DUMPSTERS PROVIDED BY THE CONTRACTOR SHALL BE MAINTAINED PROPERLY AND DISPOSED OF BY THE CONTRACTOR UPON COMPLETION OF THE WORK. LOCATIONS TO BE A MINIMUM OF 15 FEET FROM BUILDINGS AND AS APPROVED BY THE OWNER.
4. ANY UTILITIES NOT SHOWN ON THE PLANS BUT UNCOVERED IN THE FIELD SHALL BE VERIFIED FOR ITS STATUS (ACTIVE OR ABANDONED). THE UTILITIES CONFIRMED ABANDONED SHALL BE COMPLETELY REMOVED (WITHIN THE LIMITS OF THE WORK) AND DISPOSED OF OFF SITE AS PART OF THIS WORK. ANY DISRUPTION TO ACTIVE UTILITIES MUST BE REPAIRED BY THE CONTRACTOR WITHIN 24 HOURS OF THE DISRUPTION AT THE CONTRACTORS EXPENSE AND TO THE SATISFACTION OF THE OWNER.
5. ALL MATERIAL REMOVED SHALL BE SEGREGATED BY MATERIAL TYPE AND DISPOSED OF PER LOCAL, NYSDEC, USEPA AND OTHER APPLICABLE REGULATORY AUTHORITY REGULATIONS.
6. IF HAZARDOUS MATERIALS ARE ENCOUNTERED DURING DEMOLITION, THE CONTRACTOR SHALL IMMEDIATELY STOP WORK AND REPORT SUCH FINDINGS TO THE OWNER'S REPRESENTATIVE WHO WILL ARRANGE FOR TESTING AND BE RESPONSIBLE FOR THE PERFORMANCE OF ANY SERVICES IN CONNECTION WITH IDENTIFYING OR THE REMOVAL OF SUCH MATERIALS.
7. DEWATERING: PREVENT SURFACE WATER AND SUBSURFACE OR GROUND WATER FROM FLOWING INTO EXCAVATIONS AND FROM FLOODING PROJECT SITE AND SURROUNDING AREAS. CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING MEANS AND METHODS NECESSARY TO DEWATER THE PROJECT SITE AND FACILITATE COMPACTION OF BACKFILL AS REQUIRED.
8. DO NOT ALLOW WATER TO ACCUMULATE IN EXCAVATIONS. REMOVE WATER TO PREVENT SOFTENING OF BOTTOMS AND SOIL CHANGES DETRIMENTAL TO STABILITY OF SUBGRADE. PROVIDE AND MAINTAIN PUMPS, WELL POINTS, SUMPS, SUCTION AND DISCHARGE LINES, AND OTHER DEWATERING SYSTEM COMPONENTS NECESSARY TO CONVEY WATER AWAY FROM EXCAVATIONS. DEWATERING SYSTEMS SHALL BE INSTALLED AND OPERATED SUCH THAT UPWARD FLOW OF GROUNDWATER IS PREVENTED AND THE BEARING STRENGTH OF THE SUBGRADE SOILS IS NOT AFFECTED.
9. CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY COVER (CRUSHED STONE, STEEL PLATES OR OTHER MEANS) OVER ALL ACTIVE UNDERGROUND UTILITY PIPING DURING CONSTRUCTION IN ORDER TO PROTECT PIPING WHICH MAY NOT HAVE ENOUGH COVER (BELOW FINISHED GRADE) TO WITHSTAND CONSTRUCTION EQUIPMENT LOAD.
10. BEGINNING OF DEMOLITION/CONSTRUCTION SHALL INDICATE THAT THE CONTRACTOR ACCEPTS THE EXISTING CONDITIONS.
11. TEMPORARY STAGING AREA FOR THE PROPOSED WORK SHALL BE AS DIRECTED BY THE OWNERS REPRESENTATIVE.
12. THE CONTRACTOR SHALL NOTIFY THE OWNERS REPRESENTATIVE, MUNICIPAL ENGINEER, AND NEW YORK ONE CALL AT LEAST 72 HOURS PRIOR TO ANY SITE DISTURBANCE.
13. CONTRACTOR SHALL VERIFY THAT ALL STORM SEWERS LOCATED WITHIN THE PROJECT AREA ARE CLEAN AND FREE OF ANY DEBRIS OR BLOCKAGE. CONTRACTOR SHALL NOTIFY THE OWNERS REPRESENTATIVE IF ANY STORM SEWER REQUIRES CLEANING OR RESTORATION.
14. THE IMPORTED FILL/BACKFILL SOIL SHALL BE SAMPLED IN ACCORDANCE WITH PROJECT SPECIFICATIONS.

EROSION CONTROL MEASURES

1. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE OR IN THEIR PROPER SEQUENCE AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
2. ALL WORK TO BE DONE IN ACCORDANCE WITH CITY AND STATE GUIDELINES FOR URBAN SOIL AND SEDIMENT CONTROL.
3. THE PROPOSED EROSION CONTROL MEASURES SHOWN ON THIS PLAN SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION. ADDITIONAL EROSION CONTROL MAY BE NECESSARY, BASED UPON FIELD CONDITIONS THAT MAY DEVELOP AS CONSTRUCTION PROGRESSES AND AS MAY BE REQUIRED BY THE CITY OF YONKERS, NEW YORK AND THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC). THE FOLLOWING GENERAL CONDITIONS SHALL BE OBSERVED.
   - 3.1. CLEARING AND GRADING SHALL BE SCHEDULED SO AS TO MINIMIZE THE SIZE OF EXPOSED AREAS AND THE LENGTH OF TIME THAT AREAS ARE EXPOSED.
   - 3.2. SEDIMENT SHALL BE TRAPPED ON THE SITE.
4. SEDIMENT BARRIERS (SILT FENCE, HAY BALES OR APPROVED EQUAL) SHALL BE INSTALLED PRIOR TO ANY GRADING WORK ALONG THE LIMITS OF DISTURBANCES AND SHALL BE MAINTAINED FOR THE DURATION OF THE WORK. NO SEDIMENT FROM THE SITE SHALL BE PERMITTED TO WASH ONTO ADJACENT PROPERTIES, WETLANDS OR ROADS.
5. GRADED AND STRIPPED AREAS AND STOCKPILES SHALL BE KEPT STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AS REQUIRED. SEED MIXTURES SHALL BE IN ACCORDANCE WITH SOIL CONSERVATION SERVICE RECOMMENDATIONS.
6. DRAINAGE INLETS INSTALLED AS PART OF THE PROJECT SHALL BE PROTECTED FROM SEDIMENT BUILDUP THROUGH THE USE OF SEDIMENT BARRIERS, SEDIMENT TRAPS, ETC., AS REQUIRED.
7. PROPER MAINTENANCE OF EROSION CONTROL MEASURES IS TO BE PERFORMED AS INDICATED BY PERIODIC INSPECTION AND AFTER HEAVY OR PROLONGED STORMS. MAINTENANCE MEASURES INCLUDE, BUT ARE NOT LIMITED TO, CLEANING OF SEDIMENT BASINS OR TRAPS, CLEANING OF TEMPORARY DRWYELLS, CLEANING OR REPAIR OF SEDIMENT BARRIERS, CLEANING AND REPAIR OF BERMS AND DIVERSIONS AND CLEANING AND REPAIR OF INLET PROTECTION. IF A TEMPORARY DRYWELL CAN NO LONGER RECHARGE STORMWATER, IT SHALL BE REPLACED IMMEDIATELY.
8. APPROPRIATE MEANS SHALL BE USED TO CONTROL DUST DURING CONSTRUCTION. CONTRACTOR MUST OBTAIN A HYDRANT USE PERMIT OR UTILIZE A WATER TRUCK.
9. A STABILIZED CONSTRUCTION ENTRANCE SHALL BE MAINTAINED TO PREVENT SOIL AND LOOSE DEBRIS FROM BEING TRACKED ONTO LOCAL ROADS. THE CONSTRUCTION ENTRANCE SHALL BE MAINTAINED UNTIL THE SITE IS PERMANENTLY STABILIZED.
10. SEDIMENT BARRIERS AND OTHER EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL UPLAND DISTURBED AREAS ARE PERMANENTLY STABILIZED. AFTER PERMANENT STABILIZATION, PAVED AREAS SHALL BE CLEANED AND DRAINAGE SYSTEMS CLEANED AND FLUSHED AS NECESSARY.
11. ALL 1:2 & 1:3 SLOPE AREAS WILL BE PROTECTED AGAINST EROSION DURING CONSTRUCTION AND PERMANENT GROUND COVER SHALL BE SUCH THAT EROSION WILL BE PREVENTED. NECESSARY MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, HAY BALES, SILT FENCE, SILT TRAPS/BASINS, JUTE MESH, HYDROSEEDING, ETC. AND SHALL BE MAINTAINED FOR THE DURATION OF CONSTRUCTION AS WELL AS FOLLOWING THE COMPLETION OF CONSTRUCTION UNTIL SUCH TIME THAT THE PROPOSED PLANTINGS HAVE BECOME ACCLIMATED/ESTABLISHED AS DETERMINED BY THE CITY OF YONKERS..

DETAIL TO BE PROVIDED BY NEMERJ

VII TYPICAL ASPHALT PAVEMENT
SCALE: NTS



I TYPICAL DECONTAMINATION PAD CROSS SECTION
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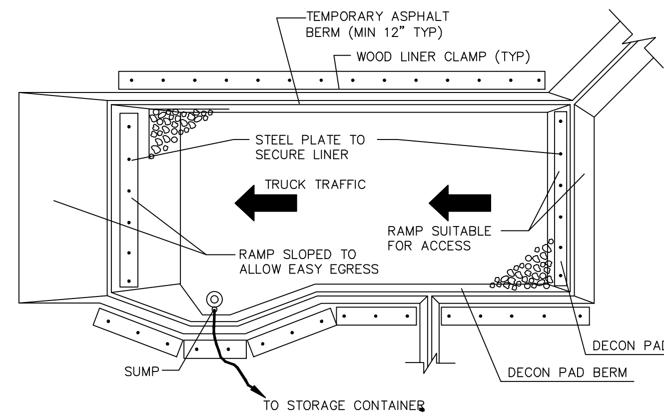
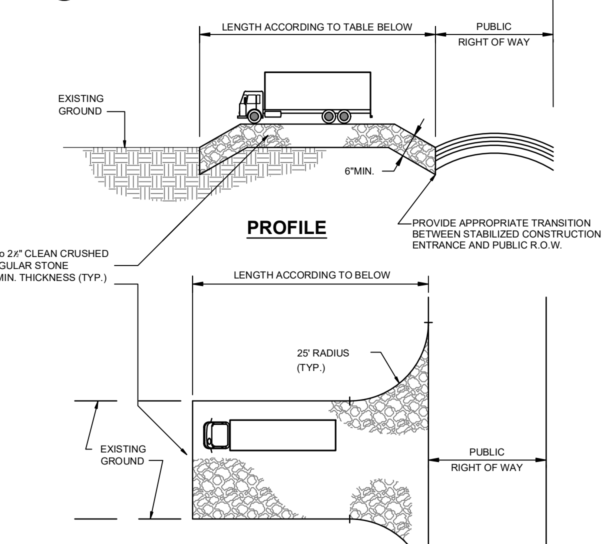


II TYPICAL DECONTAMINATION PAD
SCALE: NTS



DESIGN CRITERIA

STONE SIZE - USE ASTM C-33, SIZE No. 2 (2 1/2 TO 1 1/2") OR 3 (2 to 1"). USE CLEAN CRUSHED ANGULAR STONE. CRUSHED CONCRETE OF SIMILAR SIZE MAY BE SUBSTITUTED BUT WILL REQUIRE MORE FREQUENT UPGRADING AND MAINTENANCE.

THICKNESS- NOT LESS THAN SIX (6) INCHES WITH FILTER FABRIC

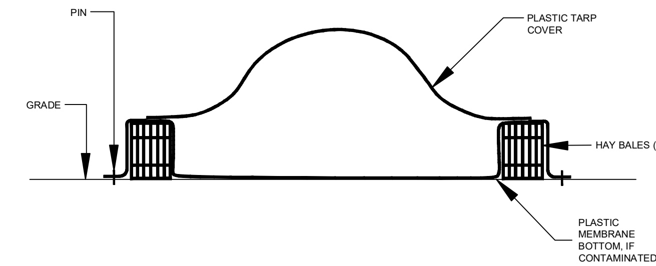
WIDTH- NOT LESS THAN FULL WIDTH OF POINTS OF INGRESS OR EGRESS.

LENGTH- 100 FEET MIN. THESE LENGTHS MAY BE INCREASED WHERE FIELD CONDITIONS DICTATED. STORMWATER FROM UP-SLOPE AREAS SHALL BE DIVERTED AWAY FROM THE STABILIZED PAD. WHERE THE SLOPE OF THE ACCESS ROAD EXCEED 5%, A STABILIZED BASE COURSE OF FINE AGGREGATE BITUMINOUS CONCRETE (FABC) SHALL BE INSTALLED. THE TYPE AND THICKNESS OF THE FABC AND USE OF A DENSE GRADE AGGREGATE SUB-BASE SHALL BE AS PRESCRIBED BY LOCAL MUNICIPAL ORDINANCE OR OTHER GOVERNING AUTHORITY. AT POORLY DRAINED LOCATIONS, SUBSURFACE DRAINAGE GRAVEL FILTER OR GEOTEXTILE SHALL BE INSTALLED BEFORE INSTALLING THE STABILIZED CONSTRUCTION ACCESS.

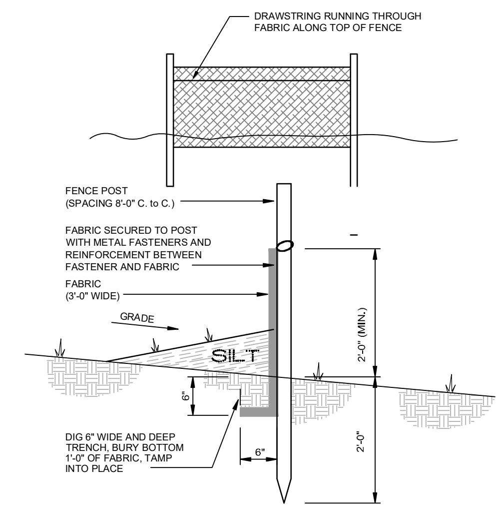
MAINTENANCE

THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO ROADWAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO ROADWAYS (PUBLIC OR PRIVATE) OR OTHER IMPERVIOUS SURFACES MUST BE REMOVED IMMEDIATELY. WHERE ACCUMULATION OF DUST/SEDIMENT IS INADEQUATELY CLEANED OR REMOVED BY CONVENTIONAL METHODS, A POWER BROOM OR STREET SWEEPER WILL BE REQUIRED TO CLEAN PAVED OR IMPERVIOUS SURFACES. ALL OTHER ACCESS POINTS WHICH ARE NOT STABILIZED SHALL BE BLOCKED OFF.

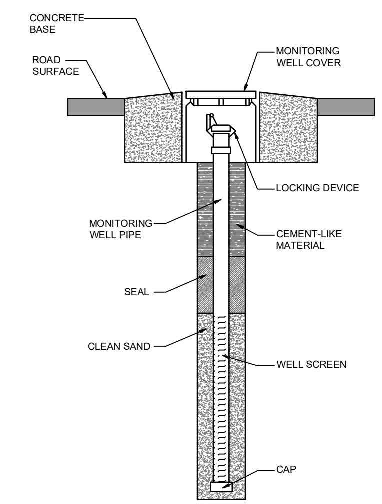
III STABILIZED CONSTRUCTION ENTRANCE
SCALE: NTS



IV TYPICAL SOIL STOCK PILE
SCALE: NTS



V SILT FENCE
SCALE: NTS



VI TYPICAL MONITORING WELL
SCALE: NTS

TABLE 1. LENGTHS OF CONSTRUCTION EXITS ON SLOPING ROADBEDS

	LENGTH OF STONE REQUIRED	
	COARSE GRAINED SOILS	FINE GRAINED SOILS
	50 ft.	100ft.
	100ft.	200ft.
	ENTIRE SURFACE STABILIZED WITH FABC BASE COURSE (NOTE 1)	

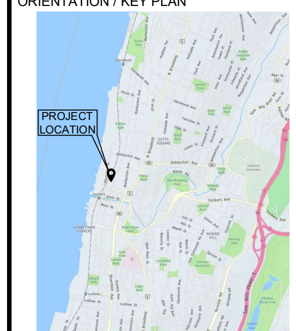
1. AS PRESCRIBED BY LOCAL ORDINANCE OR OTHER GOVERNING AUTHORITY.

ISSUED FOR REGULATORY REVIEW (10-31-2018)

REV. / ISSUE	DATE	DESCRIPTION

CONSULTANT

ORIENTATION / KEY PLAN



CLIENT

PAULUS, SOKOLOWSKI AND SARTOR ENGINEERING, P.C.

ONE LARKIN PLAZA
2ND FLOOR
YONKERS, NY 10701
PHONE: (914) 509-8600

JANOS MICHAEL SZEMAN, P.E.
PROFESSIONAL ENGINEER
STATE OF NEW YORK · JANOS MICHAEL SZEMAN · LICENSED PROFESSIONAL ENGINEER · 84542
SIGNATURE DATE

PROJECT

FONDAK ENTERPRISES LLC.

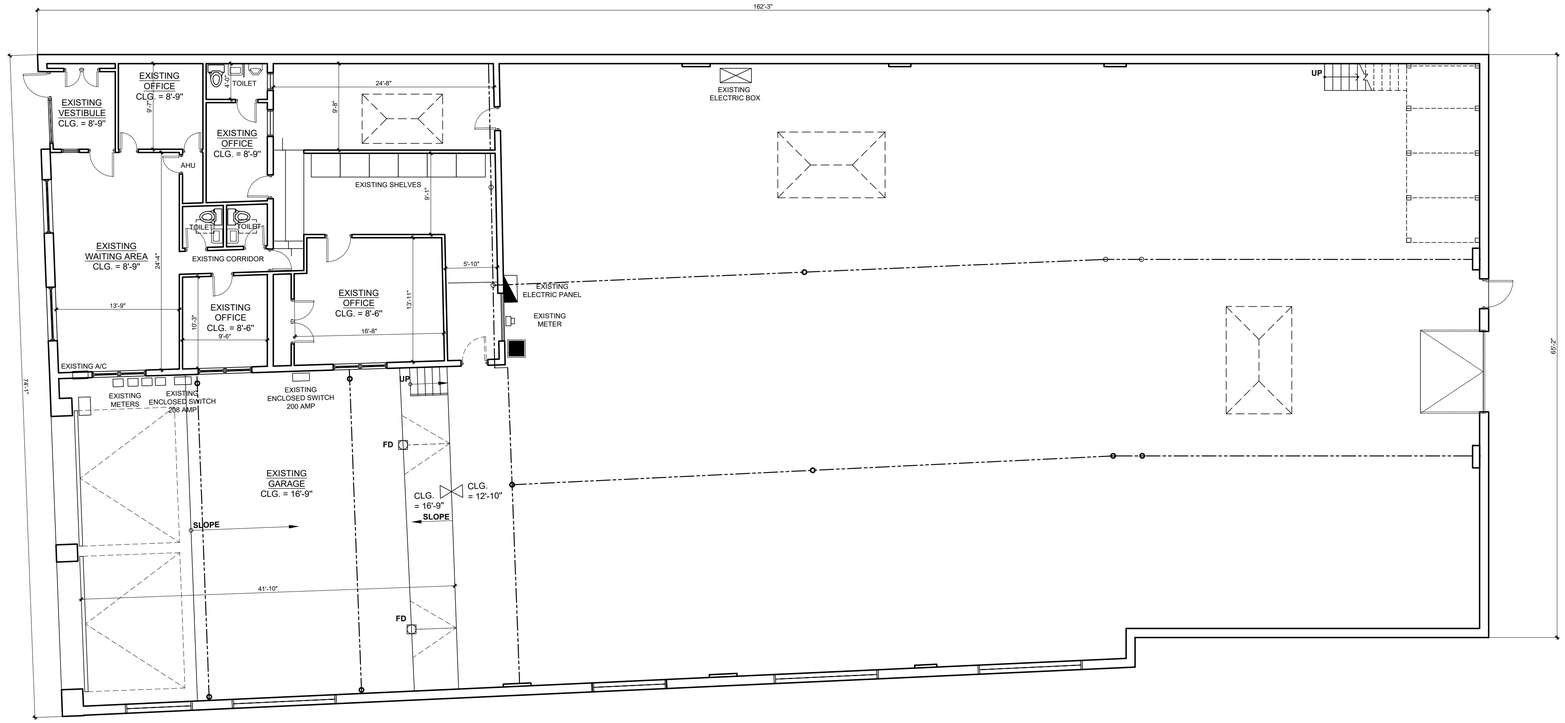
72 ALEXANDER STREET
YONKERS, WESTCHESTER COUNTY, NEW YORK

SHEET TITLE

GENERAL NOTES
SESC AND SITE
DETAILS

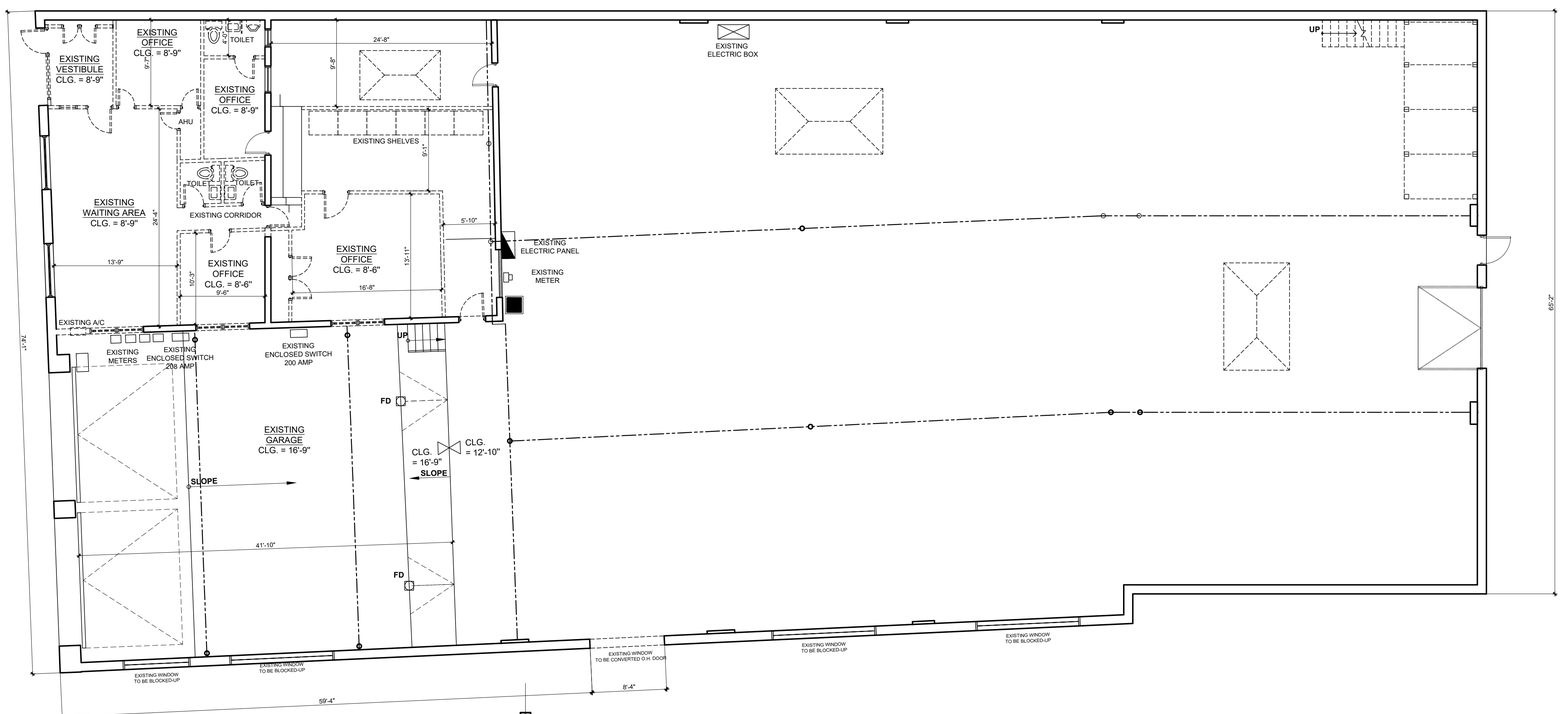
PROJECT NO.:	06097.0001	DRAWN BY:	RE
SCALE:	AS SHOWN	CHECKED BY:	SMP
DATE:	10/31/18	SHEET	3 OF 3

SHEET NO.
RA-03



EXISTING FLOOR PLAN

SCALE 1/8" = 1'-0"



DEMOLITION PLAN

SCALE 1/8" = 1'-0"

DEMOLITION NOTES:

1. THE GENERAL CONTRACTOR SHALL FURNISH ALL LABOR AND MATERIALS AS REQUIRED TO COMPLETE DEMOLITION AND REMOVAL OF ALL ITEMS INDICATED ON THE DRAWINGS AS REQUIRED TO PERFORM ALL CONTRACT WORK OR AS OTHERWISE DIRECTED BY ENGINEER.
2. ALL DEFECTIVE PLASTER AND/OR FINISHED SURFACES ON COLUMNS AND EXISTING WALLS SHALL BE CHOPPED OUT AND/OR PATCHED FREE OF ALL IRREGULARITIES AND SHALL MATCH ADJACENT WALLS IN FINISH AND THICKNESS.
3. ALL WORK DEMOLISHED SHALL BE REMOVED FROM THE PREMISES EXCEPT ITEMS TO BE REUSED OR RETURNED TO THE CLIENT OR AS OTHERWISE DIRECTED.
4. IN ALL AREAS WHERE DEMOLITION REMOVAL OF TILE, TACKLES, PARTITIONS, ETC. CAUSES AN UNEVENNESS IN SLAB. THE CONTRACTOR SHALL PATCH TO LEVEL THE SLAB TO RECEIVE NEW FINISHED FLOORING.
5. ALL EXPOSED LIGHT FIXTURES, WIRING, SWITCHES, AND METAL WIRING, SWITCHES AND ALL MOLDING NOT BEING REUSED SHALL BE REMOVED AND EITHER STORED OR CARTED AWAY BY THE GENERAL CONTRACTOR.
6. THE GENERAL CONTRACTOR SHALL FURNISH A SYSTEM OF TEMPORARY POWER AND LIGHTS THROUGHOUT THE SPACE UNDER CONSTRUCTION AND DEMOLITION AS REQUIRED.
7. THE GENERAL CONTRACTOR SHALL REMOVE TO THE SOURCE CAP AND FLUSH OFF BEHIND FINISH SURFACES ALL PROJECTING PLUMBING, FLOOR, ELECTRICAL/TELEPHONE OUTLETS, AND ALL OTHER PROJECTING ITEMS WHICH ARE BEING ABANDONED. FIRE RATINGS SHALL BE MAINTAINED.
8. ALL EXISTING TO REMAIN, EXISTING RELOCATED, OR NEW ITEMS INSTALLED IN ADDITION TO BEING APPLY AND PROTECTED THROUGHOUT THE PERIOD OF CONSTRUCTION SHALL BE THOROUGHLY CLEANED.
9. UPON COMPLETION OF DEMOLITION WORK, THE GENERAL CONTRACTOR SHALL PROVIDE THAT ALL AREAS BE LEFT BROOM CLEAN.
10. THE GENERAL CONTRACTORS SHALL INSPECT ALL EXISTING SURFACES AND WHERE AS A RESULT OF DEMOLITION, FINISHED SURFACES DO NOT ALIGN, THE EXISTING FINISH SHALL BE CHOPPED AWAY, NEW CORNER BEADS AND STOPS INSTALLED AND SURFACE SMOOTH, FLUSH ALIGNED SURFACE.
11. ALL DEMOLITION IS TO BE PERFORMED IN ACCORDANCE WITH THE BUILDING CODES 2010 ORDINANCE OF THE STATE OF NEW YORK.
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13. ALL DEBRIS AND WAIST MATERIALS TO BE REMOVED FROM JOB SITE IN AN APPROPRIATE CONTAINER AND TRANSPORTED TO A RECYCLING FACILITY.

MERJ DESIGN GROUP
DESIGN - PLANNING & STRUCTURAL ENGINEERING
215 HILLTOP ST. MAHOPAC NY 10541 (845) 628-8089

Project: EXISTING WAREHOUSE BREWERY / TASTING

Drawing Title: EXISTING FLOOR PLAN DEMOLITION PLAN

ISSUES / REVISIONS	
Date	Title

OWNER:

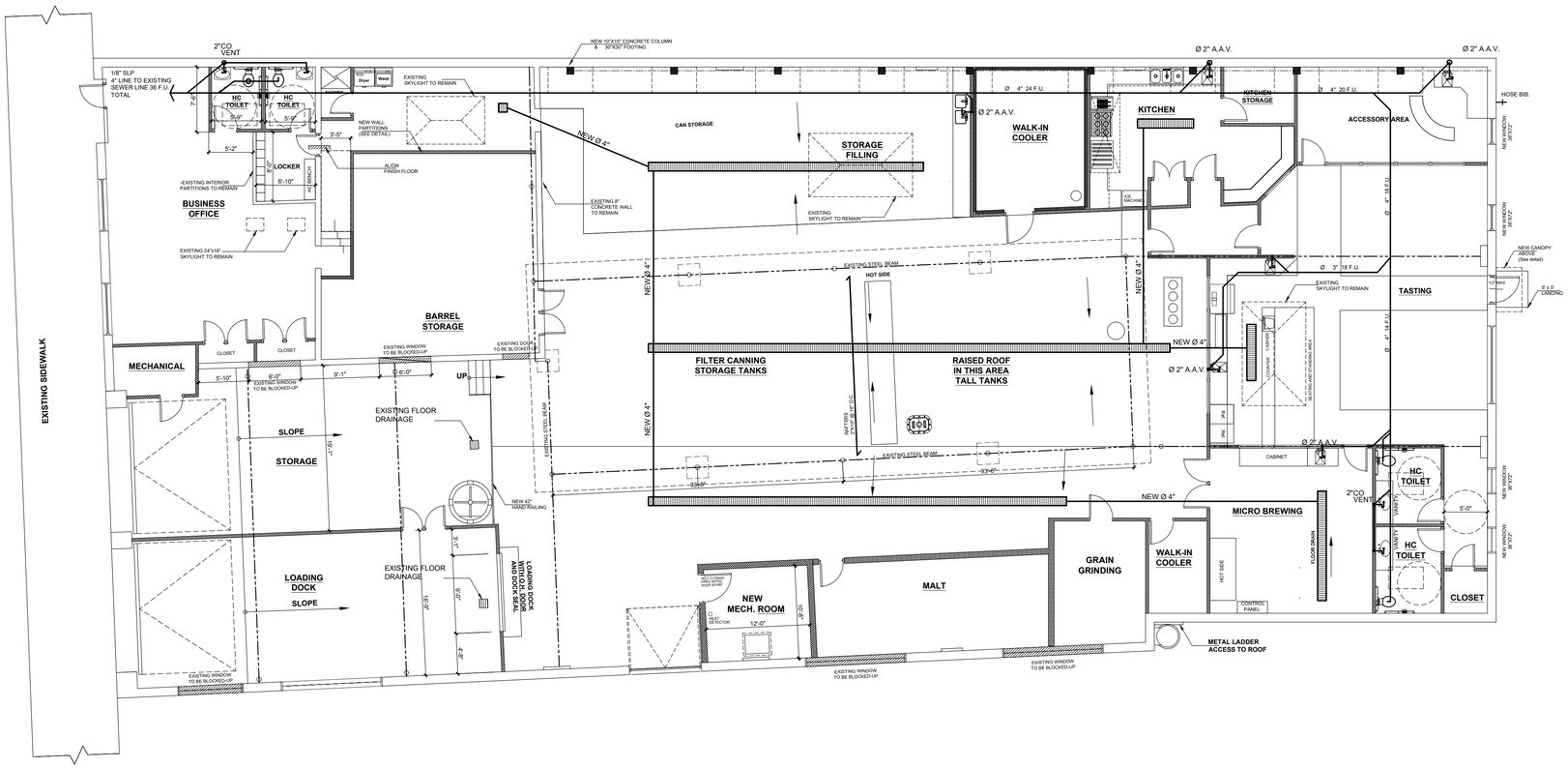
FONDAK ENTERPRISES LLC.
72 Alexander St.
Yonkers, NY 10701

Clkd. By: R.M.	Dwg. By: d.o.t.	Tax Map #

Scale: As Noted

Date: SEP-08-18

Drawing Number: A-1



PROPOSED FLOOR DRAIN LAYOUT

SCALE 1/8" = 1'-0"

DESIGN - PLANNING & STRUCTURAL ENGINEERING

EMERJ DESIGN GROUP

215 HILLTOP ST. MAHOPAC NY 10541 (845) 628-6089

Drawing Title: EXISTING FLOOR PLAN NOTES AND DETAILS

Project: EXISTING WAREHOUSE BREWERY / TASTING

ISSUES / REVISIONS

Date	Title

OWNER:

FONDAK ENTERPRISES LLC.
72 Alexander St.
Yonkers, NY 10701

Chkd. By : R.M.

Dwg. By : d.o.t.

Tax Map #

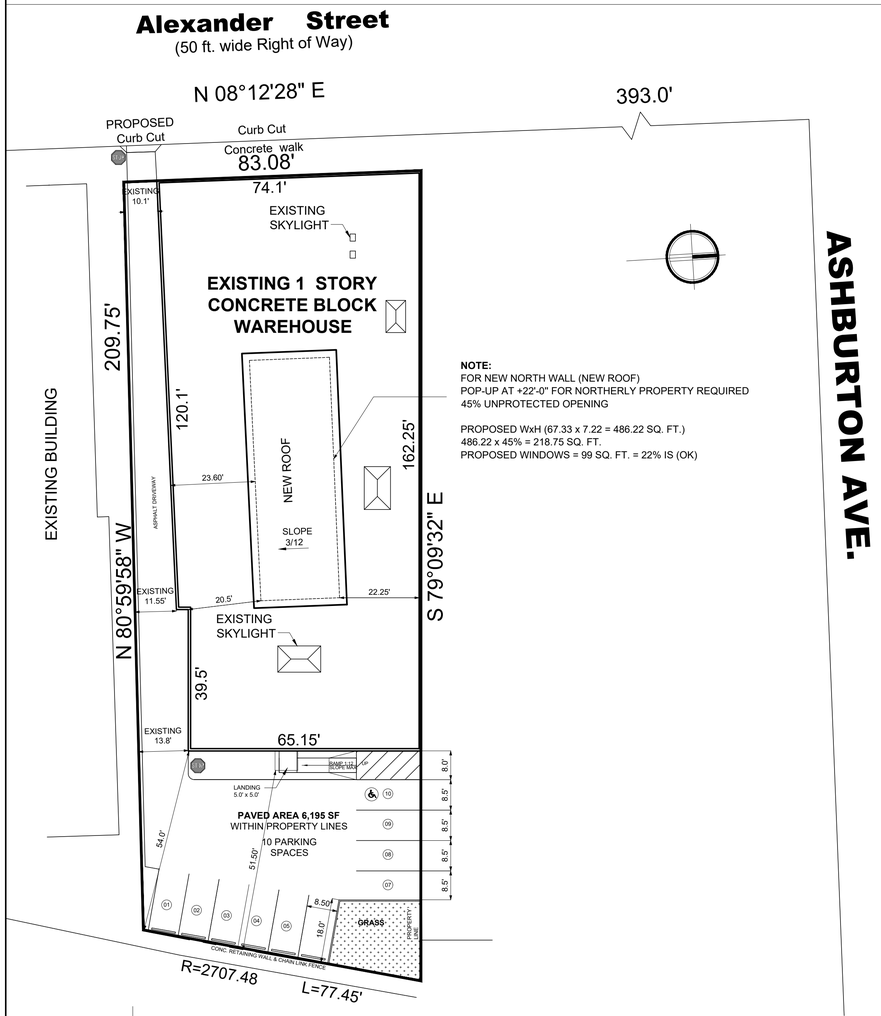
Scale: As Noted

Date: SEP-08-18

Drawing Number: P-1

FONDAK ENTERPRISES LLC.

72 Alexander St,
Yonkers, NY 10701



NOTE:
FOR NEW NORTH WALL (NEW ROOF)
POP-UP AT +22'-0" FOR NORTHERLY PROPERTY REQUIRED
45% UNPROTECTED OPENING

PROPOSED WxH (67.33 x 7.22 = 486.22 SQ. FT.)
486.22 x 45% = 218.75 SQ. FT.
PROPOSED WINDOWS = 99 SQ. FT. = 22% IS (OK)

PROPOSED SITE PLAN

SCALE 1" : 20'

BUILDING CODE SUMMARY

CODE TYPE	MODEL
● BUILDING + STRUCTURAL	2015 IBC INTERNATIONAL BUILDING CODE W/ 2017 NYS SUPPLEMENT
● FIRE CODE	2015 IFC W/ 2017 NYS SUPPLEMENT
● ACCESIBILITY CODE	ICC/ANSI - A117.1 - 2009 EDITION
● MECHANICAL	2015 IMC W/ 2017 NYS SUPPLEMENT
● ELECTRICAL	NFPA-70 2014 EDITION NATIONAL ELECTRIC CODE
● PLUMBING	2015 IPC W/ 2017 NYS SUPPLEMENT
● ENERGY	2015 IECC W/ 2016 NYS SUPPLEMENT
● ZONING	YZO CHAPTER 43

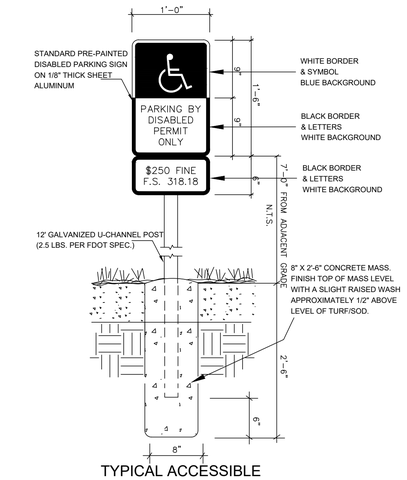
● NOTES:
ALL CODES & AMENDMENTS ADOPTED AND KNOWN AS THE 2015 IBC, 2017 NYS SUPPLEMENT & CITY OF YONKERS ZONING-BUILDING ORDINANCE.

USE GROUP

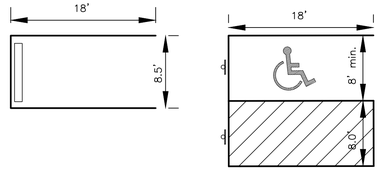
BREWERY/ DISTILLERY, TASTING, STORAGE FOR BREWERY AND DESTILLERY

DRAWING INDEX

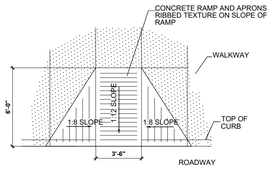
ALWAYS CALL BEFORE YOU DIG
811
NYS CODE RULE 753 DIG SAFELY NEW YORK



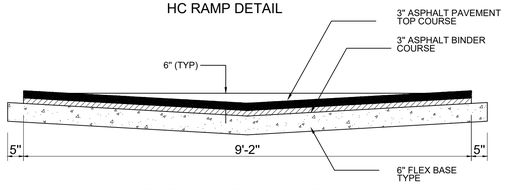
TYPICAL ACCESSIBLE SIGN DETAIL



STANDARD PARKING SPACE



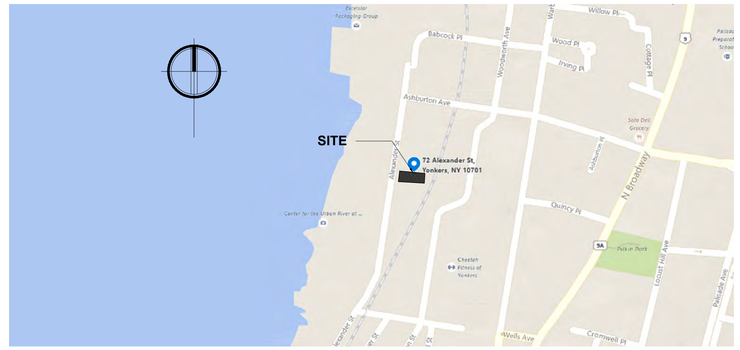
HC RAMP DETAIL



ALLEY PAVING SECTION (ASPHALT)

PROJECT DIRECTORY

NEMERJ Design Group
Anthony Sottile, P.E.
215 Hilltop Street.
Mahopac, NY 10541
T. 845.628.6089



LOCATION MAP

ZONING CHART 72 ALEXANDER ST, YONKERS, NY 10701
(I) INDUSTRIAL DISTRICT

EXISTING USE: VACANT BUILDING

ALL DIMENSIONS AND DESIGNATION OF THESE DRAWINGS TAKEN FROM A SURVEY OF PROPERTY 3-15-2011

PROJECT:
A PROPOSED REHABILITATION OF AN EXISTING WAREHOUSE FOR THE PURPOSE OF THE INSTALLATION A BREWERY AND A DISTILLERY WITH A TASTING AREA AND KITCHEN
By NEMERJ Design Group, **Anthony Sottile, P.E.**

OWNER APPLICANT: Fondak Enterpices LLC
TAX MAP REF. : 2608/25
DISTRICT ZONE : I
BUILDING GROUPS B FOR TASTING
F-1 FOR BREWERY
S-1 FOR STORAGE - BREWERY & TASTING
BUILDING CONSTRUCTION TYPE 3B

DIMENSIONAL REGULATIONS	REQUIRED	EXISTING	PROPOSED	REQUIRED VARIANCES
MIN. LOT AREA	—	17,381 S.F.	17,381 S.F.	
BUILDING AREA		11,224 S.F.	11,224 S.F.	
F.A.R.	7.5	0.65	0.65	
MIN. YARD SET BACKS				
LEFT SIDE (NORTH):	0	0	NO CHANGE	
RIGHT SIDE (SOUTH):	0	10.1'	NO CHANGE	
FRONT (WEST):	—	0	NO CHANGE	
REAR (EAST):	20.0'	54.0'	NO CHANGE	
MAX. BLDG. COVERAGE	75%	EXISTING 65%	NO CHANGE	
MAX. BLDG. HEIGHT	100'	17'-7"	27'-2"	

PARKING CALCULATIONS
CREDIT FOR OLD EXISTING WAREHOUSE IS 11 SPACES

NEW BREWERY IS 1/600SF of GFA=16.5 SPACES; NEW EATING & DRINKING ESTABLISHMENT IS 1/150SF OF GFA=7.3 SPACES FOR A TOTAL OF 23.8 OR 24 SPACES LESS CREDIT OF 11 SPACES PROPERTY NEEDS 13 SPACES/REQUIRED PROVIDING 10 SPACES FOR A VARIANCE REQUIRED OF 3 SPACES.
EXISTING LOT DRIVEWAY WIDTH = 10.1'

NOTE
OWNER WILL PARK (3) CAR IN THE LOADING DOCK WHEN NOT IN USE

LIGHTING CANNOT PROJECT BEYOND THE PROPERTY LINES AND LIGHT POLE HEIGHTS CANNOT EXCEED 20'.

CITY OF YONKERS CODE NOTES

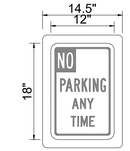
LOADING SPACE: I REQUIRED FOR BREWERY/MICROBREWERY/INDUSTRIAL USE USING 1-EXISTING LOADING DOCK IN FRONT OF BUILDING; NO LOADING SPACE REQUIRED FOR THE EATING AND DRINKING ESTABLISHMENT;

SECTION 43-44B(5): REQUIRES 5' FROM PROPERTY LINES AND 10' FROM BUILDING; PROVIDING 0' FROM PROPERTY LINES AND 8' FROM BUILDING VARIANCES REQUIRED.

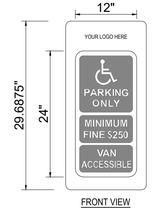
SECTION 43-121D(4) REQUIRES THE TWO-WAY DRIVEWAY WIDTH TO BE 20'-30' IN
WIDTH; WE ARE PROVIDING 20.5' UTILIZING THE SHARED DRIVEWAY WIDTH . 10.1' DRIVEWAY WIDTH FOR THIS PROPERTY ONLY-VARIANCES REQUIRED

SECTION 43-8 MAXIMUM # OF SEATS FOR EATING AND DRINKING ESTABLISHMENT IS 8 SEATS; PROPOSED IS 40 SEATS- VARIANCES REQUIRED.

13.25" X 9"
EXIT SIGN



NO PARKING ANY TIME



FRONT VIEW

SPECIFICATIONS:
SIGN COLOR: WHITE/BLUE
THICKNESS/DEPTH: 1/2"
FRAME COLOR: AVAILABLE IN 18 COLOR COMBOS, CONTACT PUBLIC SAFETY INDUSTRIES FOR INFO.

NOTES:
1. ANY REGULATORY OR CUSTOM SIGN CAN BE MANUFACTURED UPON REQUEST.
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. DO NOT SCALE DRAWING.
4. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
5. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
6. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 5057-016.

12" X 23.5": HANDICAP PARKING ONLY

NEMERJ DESIGN GROUP
DESIGN - PLANNING & STRUCTURAL ENGINEERING
215 HILLTOP ST. MAHOPAC NY 10541 (845) 628-6089

Project: EXISTING WAREHOUSE BREWERY / TASTING

THESE PLANS ARE THE PROPERTY OF NEMERJ Design Group AND ARE NOT TO BE USED IN WHOLE OR IN PART BY PERSONS, ANY PERSON OR CORPORATION USING NEMERJ Design Group PLANS WITHOUT THEIR WRITTEN CONSENT SHALL BE RESPONSIBLE FOR ALL LEGAL COSTS INCLUDING ATTORNEY FEES INCURRED AS A RESULT.

Drawing Title: LOCATION MAP GENERAL NOTES

ISSUES / REVISIONS

Date	Title

OWNER:
FONDAK ENTERPRISES LLC.
72 Alexander St,
Yonkers, NY 10701

Chkd. By : R.M.
Dwg. By : d.o.t.
Tax Map #

Scale: As Noted
Date: NOV-02-18
Drawing Number: SP-1

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13. ALL DEBRIS AND WAIST MATERIALS TO BE REMOVED FROM JOB SITE IN AN APPROPRIATE CONTAINER AND TRANSPORTED TO A RECYCLING FACILITY.

CONCRETE:

A) IT IS THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO MADE SURE THAT THE SOIL BEARING CAPACITY IS 3,000 P.S.F. MINIMUM.
B) POUR CONCRETE FOR FOOTINGS CONTINUOUSLY AND TO FOOTINGS STIFFLY, SIZE AS AND SHOWN ON DRAWINGS. FOOTINGS TO BE REINFORCED WITH (3) #4 RE-BARS AND POURED AT 42" BELOW GRADE AT ALL POINTS EXCEPT WHERE IT BEARS ON ROCK LEDGE #6 RE-BARS TO BE USED TO PIN REINFORCEMENT MAY BE ELIMINATED.
C) CONCRETE FOR FOOTINGS TO DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI IN 28 DAYS SAMPLES FOR STRENGTH TEST OF EA. CLASS OF CONCRETE PHASE EA. DAY, SHALL BE TAKEN NOT LESS THAN ONCE A DAY, NOR LESS THAN ONCE FOR EA. 150 CUBIC YARDS (115 M3), NOR LESS THAN ONCE FOR EA. 5,000 SF (465 M2) OF SURFACE AREA FOR SLABS OR WALLS.
D) FOUNDATION WALLS TO BE CONCRETE BLOCK
E) PROVIDE BITUMASTIC WATERPROOFING OVER 1/2" CEMENT PARGE WITH ANTI-HYDRO ON THE OUTSIDE OF WALL FOUNDATION WALLS. PROVIDE WATERPROOF CEMENT COVE WHERE FOUNDATION WALL MEETS FOOTINGS.
F) INSTALL 4" DIAMETER PVC FOOTING DRAINS WITH MINIMUM 12" GRAVEL.
G) CONCRETE SLABS TO BE TROWEL FINISHED AND REINFORCED WITH 6X6. #10/10 WELDED WIRE MESH POURED OVER 6 MIL VAPOR BARRIER AND 4" GRAVEL.

1. AT OWNER'S OPTION, SUBSTITUTE 12"X12" VINYL TILE FINISH FLOORING MATERIAL.
2. RESTROOM: INSTALL 9 COURSES OF 6"X6" CERAMIC TILE ON BOTTOM HALF OF WALLS, OR ALTERNATIVELY INSTALL F.R.P. SURFACE ON ENTIRE RESTROOM WALLS.
3. 1/2" GYP. BOARD TO BE INSTALLED WITH LONG AXIS HORIZONTAL BOTTOM RUN AT FLOOR LINE SHALL BE FLINTKOTE STA-DRI (TM) OR EQUAL GREEN BOARD FOR MOISTURE PROTECTION.

NOTES:

1. ALL AC AND HEAT UNITS TO BE INSTALL NEW
2. ALL ELECTRICAL WIRING TO BE MC TYPE CABLE (BX WIRING)
3. ALL WALLS IN KITCHEN/ / OVEN & PREPARATION AREA TO BE COVERED W/STAINLESS STEEL PANELS
4. INSTALLATION OF VENTILATION SYSTEM MUST COMPLY WITH NFPA CODE 96 AND LOCAL BUILDING / FIRE DEPT. CODES.
5. EXHAUST DUCTS MUST BE CONSTRUCTED OF NO LESS THAN 16 GA CARBON STEEL.
6. 6) ALL SEAMS , JOINTS & PENETRATIONS SHALL BE CONTINUOUS EXTERNAL WELD AS LIQUID-TIGHT (3-3.1)
7. EMERGENCY GENERATOR TO BE LOCATED ON ELEVATED PLATFORM AT REAR OF BUILDING TOGETHER WITH AC COMPRESSORS
8. ALL GARBAGE TO BE COLLECTED IN GARBAGE BAGS PLACED IN APPROPRIATE CONTAINER AND AND GET READY FOR DISPOSAL IN DUMPSTER GARBAGE RECEPTACLE IN REAR OF BUILDING

GENERAL NOTES:

1. CONTRACTOR OR SUB-CONTRACTOR TO VISIT SITE TO CONFIRM ALL SIZES AND EXAMINE ALL EXISTING CONDITIONS, AND MEASUREMENTS PRIOR TO SUBMITTING A BID. ANY DISCREPANCIES MUST BE REPORTED.
2. CONTRACTOR AND/OR SUB-CONTRACTORS ARE TO PERFORM ALL WORK AS SHOWN IMPLIED OR THAT IS REQUIRED TO PROVIDE A COMPLETE AND FINISHED KEY IN LOCK JOB EVEN IF EACH AND EVERY SPECIFIC ITEM IS NOT SPECIFICALLY CALLED FOR
3. WHILE EVERY ATTEMPT HAS BEEN MADE IN THE PREPARATION OF THESE PLANS TO AVOID MISTAKES THE PREPARER CAN NOT GUARANTEE AGAINST HUMAN ERROR. THE CONTRACTOR ON THE JOB MUST BE CHECK AND CONFIRM ALL DIMENSIONS AND DETAILS AND BE RESPONSIBLE FOR SAME.
4. CODES: ALL WORK AND MATERIALS MUST CONFORM TO THE LOCAL AND STATE BUILDING CODES, NATIONAL BOARD OF FIRE UNDERWRITERS.
5. MATERIALS: SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS. ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE 2016 BUILDING STATE AND LOCAL CODES AND THE GENERALLY ACCEPTED STANDARDS AS LISTED IN THE NY STATE BUILDING CODE.

DESIGN LOADS POUND PER SQ. FOOT:

1. SNOW 20# L.L.
2. WIND LOAD 3-second gust
   WIND FOR S.I.; 0.447 m/s x 110 = 49.17 m/s
   Use 2-1/2" #8 Wood Screws (Fastenings) To Secure Roof

NOTES:

1. ALL ELECTRICAL WIRING @ DEMOLISHED WALLS TO BE REMOVED.
2. EXIT SIGN TO BE ELECT. WIRED POWERED WITH 90 MIN. BATTERY BACKUP.
3. ALL EXIST. OUTLETS, SWITCHES & LIGHTING TO REMAIN ON UNDISTURBED WALLS.
4. ALL EXIST. DIMENSIONS TO BE VERIFY ON SITE
5. ALL NEW ELECTRICAL CABLES TO BE CONNECTED TO NEW ELECTRICAL PANEL.
6. NEW A.C. AND HEATING BY A WESTCHESTER LICENSED COMPANY STRUCTURAL BEARING POINTS AND SUPPORTS MUST BE CONFIRMED ON SITE AT STARTING OF CONSTRUCTION. CONTRACTOR IS TO CONTACT THE ENGINEER TO ARRANGE FOR INSPECTION. CERTAIN CHANGES AND SOME ADDITIONAL SUPPORTS MAYBE REQUIRED AFTER INSPECTION.

GENERAL NOTES

DESIGN:

1- BUILDING CODE- STATE OF NEW YORK RULES AND REGULATIONS, 2015 IBC
   INTERNATIONAL BUILDING CODES
2- GROUND SNOW LOAD Pg - 20 psf
   EXPOSURE FACTOR Ce - 1.0
   LOAD IMPORTANCE FACTOR, Ct - 1.0
   THERMAL FACTOR, Ct - 1.0
   DESIGN ROOF SNOW LOAD - 20 psf + DRIFT
3- BASIC WIND SPEED - 110 mph
   WIND LOAD IMPORTANCE FACTOR, 1- 1.0
   WIND EXPOSURE - C
4- SEISMIC
   PEAK VELOCITY-RELATED ACCELERATION, Av - 0.11
   PEAK ACCELERATION, Aa - 0.12
   SEISMIC HAZARD EXPOSURE GROUP - II
   SEISMIC PERFORMANCE CATEGORY - C
   SOIL PROFILE TYPE - D
   BASIC STRUCTURAL SYSTEM/SEISMIC (RESISTING SYSTEM) - BUILDING FRAME SYSTEM/REINFORCED MASONRY SHEAR WALLS

FOUNDATIONS -
GENERAL:

1. CONTINUOUS FOOTINGS & SPREAD FOOTINGS SHALL BEAR ON SOIL CAPABLE OF SUSTAINING A NET ALLOWABLE BEARING PRESSURE OF 3000 PSF UNDER SERVICE LIVE AND DEAD LOAD.
2. FOOTINGS MAY BE POURED INTO AND EARTH-FORMED TRENCH IF SOIL CONDITIONS PERMIT.
3. ALL BEARING MATERIAL SHALL BE INSPECTED BY THE INDEPENDENT TESTING AGENCY PRIOR TO CONCRETE PLACEMENT. THE INDEPENDENT TESTING AGENCY SHALL BE THE SOLE JUDGE AS TO THE SUITABILITY OF THE BEARING MATERIAL FOOTING ELEVATIONS SHALL BE ADJUSTED AS REQUIRED.
4. BOTTOM OF EXTERIOR FOOTINGS SHALL BE MINIMUM OF 48 INCHES BELOW FINAL GRADE.
5. FOUNDATIONS WALLS THAT RETAIN EARTH SHALL BE BRACED AGAINST BACKFILLING PRESSURES UNTIL FLOOR SLABS AT TOP AND BOTTOM ARE IN PLACE.
6. WHERE FOUNDATIONS WALLS ARE TO HAVE EARTH PLACED ON EACH SIDE, PLACE FILL SIMULTANEOUSLY SO AS TO MAINTAIN A COMMON ELEVATION ON EACH SIDE OF THE WALL.
7. CONCRETE AND REINFORCEMENT STEEL: CONCRETE SHALL CONFORM TO ACI BUILDING CODE (318R- 95) AND SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH AND DENSITY, IN ACCORDANCE WITH THE FOLLOWING:

STRENGTH DENSITY MAX W/C

	PSI	PCF	RATIO
A. INTERIOR SLABS, EXTERIOR SLABS	4000	145	0.45
CURBS, SIDEWALKS	4000	145	0.50
ALL OTHER CONCRETE (U.N.O.)	3000	145	0.55 CONCRETE IN
BUNKER	4000	150	0.45

B. REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60, UNLESS NOTED OTHERWISE.
C. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
D. MINIMUM CONCRETE COVER, UNLESS NOTED OTHERWISE: UNFORMED SURFACE ON CONTACT WITH THE GROUND.

3 IN FORMED SURFACES EXPOSED TO EARTH OR WEATHER.
#6 BARS AND LARGER 2 IN
#5 BARS AND SMALLER 1-1/2 IN
FORMED SURFACES NOT EXPOSED TO EARTH OR WEATHER:
BEAMS, GIRDERS, AND COLUMNS 1-1/2 IN
SLABS, WALLS, AND JOISTS
#11 BARS AND SMALLER 3/4 IN
#14 AND #18 BARS 1-1/2 IN

E. LAP SPLICES SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE, UNLESS NOTED OTHERWISE. WHERE CLASSES ARE NOT CALLED OUT ON DRAWINGS, USE CLASS "B" SPLICES. SPLICES SHALL BE AT LEAST 24 INCHES.

TENSION SPLICES (INCHES) COMPRESSION SPLICES

SIZE	A	B	A	B	(INCHES)
BAR	TOP	BARS	OTHER	BARS	
#3	16	21	12	16	12
#4	21	28	16	21	15
#5	27	35	21	27	19
#6	35	46	27	35	23

COMPRESSION DOWEL EMBEDMENT: 22 BAR DIAMETERS
LAP WELDED WIRE FABRIC ONE SPACING OF CROSS WIRES PLUS 2".

8. BASE PLATES, ANCHOR BOLTS, SUPPORT ANGLES, ETC. BELOW GRADE SHALL BE COVERED WITH A MINIMUM OF 3" OF CONCRETE. REINFORCED MASONRY:
9. REINFORCED MASONRY SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH, fm. OF 1500 PSI. MASONRY UNITS SHALL BE NORMAL WEIGHT BLOCK CONFORMING TO ASTM C90, GRADE N, TYPE 1 AND SHALL HAVE A MINIMUM AREA COMPRESSIVE STRENGTH OF 1900 PSI. MORTAR SHALL CONFORM TO ASTM C270, TYPE S. U.N. AND TYPE N FOR INTERIOR WALLS GROUT SHALL CONFORM TO ASTM C476. GROUT SHALL HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 2000 psi AND MINIMUM OF 115 pcf SLUMP AT POINT OF PLACEMENT SHALL BE 9" +/- 1".
10. REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60, UNLESS NOTED OTHERWISE.
11. CONTINUOUS WIRE REINFORCING (JOINT REINFORCING) SHALL BE GALVANIZED TRUSS OR LADDER TYPE FORMED FROM 9 GAUGE COLD-DRAWN STEEL WIRE COMPLYING WITH ASTM A82. JOINT REINFORCING SHALL BE SPACED AT 16" O.C. VERTICALLY IN ALL MASONRY WALLS.
12. SEE DRAWINGS FOR LOCATIONS OF VERTICAL CONTROL JOINTS. HORIZONTAL BOND BEAM AND LINTEL REINFORCING SHALL BE STOPPED EITHER SIDE OF VERTICAL CONTROL JOINTS.
13. ALL REINFORCED CELLS: BELOW GRADE AND ALL CELLS BELOW FINISH FLOOR SHALL BE GROUTED SOLID.
14. WHEN A FOUNDATION DOWEL DOES NOT LINE UP WITH A VERTICAL BLOCK CORE, IT SHALL NOT BE SLOPED MORE THAN ONE. DOWELS MAY BE GROUTED INTO A CELL IN VERTICAL ALIGNMENT, EVEN THOUGH IT IS IN AN ADJACENT CELL TO THE VERTICAL WALL REINFORCING.
15. REINFORCING STEEL SHALL BE SECURED IN PLACE BEFORE GROUTING STARTS.
16. SPLICED REINFORCING SHALL BE LAPPED 48 BAR DIAMETERS OR 24 INCHES, WHICHEVER IS GREATER, SPLICED BARS SHALL BE WIRED TOGETHER.
17. VERTICAL BARS SHALL BE HELD IN POSITION OT TOP AND BOTTOM AND AT INTERVALS NOT EXCEEDING 200 DIAMETERS OF THE REINFORCING, NOR 10 FEET. BARS SHALL BE IN PLACE PRIOR TO GROUTING.
18. VERTICAL REINFORCING BARS SHALL HAVE A MINIMUM CLEARANCE OF 1/4 OF AN INCH FROM THE MASONRY FOR FINE GROUT AND 1.2 INCH FOR COARSE GROUT.
19. VERTICAL CELLS THAT WILL BE GROUTED SHALL HAVE A VERTICAL ALIGNMENT TO MAINTAIN A CONTINUOUS CELL AREA NOT LESS THAN 3" x 4".
20. GROUTING SHALL BE STOPPED 1-1/2" BELOW THE TOP OF A COURSE SO AS TO FORM A KEY AT THE POUR JOINT.
21. GROUTING OF MASONRY BEAMS OVER OPENINGS SHALL BE DONE IN ONE CONTINUOUS OPERATION.
22. ALL BOLTS, ANCHORS, ETC. INSERTED IN THE WALLS, SHALL BE GROUTED SOLID INTO POSITION.

NOTES:

ALL DOOR HEADERS : RO = 6'-8"
ABOVE SUB-FLOOR
UNLESS OTHERWISE NOTED ON PLANS

ALL WINDOW HEADERS : RO = 6'-8"
ABOVE SUB-FLOOR
UNLESS OTHERWISE NOTED ON PLANS

ALL CLG. JOISTS TO BE 2 X 10
ALL HIP BEAMS TO BE 1-3/4" X 16" L.V.L.
ALL VALLEYS TO BE 1-3/4"x11-7/8" LUMBER
FOR ROOF FRAMING SEE ROOF PLAN

WINDOWS:

A) ALL WINDOWS MUST HAVE INSULATED GLASS AND SUN SCREEN.
B) PROVIDE TEMPERED GLASS WHERE WINDOW IS LESS THAN 18" AWAY FROM FINISHED FLOOR. CATEGORY CLASS II

STRUCTURAL STEEL:

1- STEEL SHALL CONFORM TO THE FOLLOWING GRADES:
ALL CHANNELS, ANGLES, PLATES, ETC. (UNO) A36 (Fy=36)
WF A572 (Fy=50)U.N.
STRUCTURAL TUBE A500 (Fy=46)
STEEL PIPE A53 (Fy=35)
ANCHOR BOLTS A307
BOLTS A325
WELDING ELECTRODES E70XX
THREADED ROD ANCHORS A36
SHEAR STUDS A108
2- ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE AISC CODE OF STANDARD PRACTICE (1986). EXCEPT AS MODIFIED IN THESE NOTES AND PROJECT SPECIFICATIONS.
3- THE STEEL STRUCTURE IS LATERAL UNSTABLE AND IS DEPENDENT UPON DIAPHRAGM ACTION OF THE METAL ROOF DECK AND ATTACHMENT OF THE WALL SYSTEM FOR STABILITY AND FOR RESISTANCE TO WIND AND SEISMIC FORCES. PROVIDE ALL TEMPORARY SUPPORTS REQUIRED FOR STABILITY AND FOR RESISTANCE TO WIND AND SEISMIC FORCES UNTIL THESE ELEMENTS ARE FULLY SECURED TO EACH OTHER AND CAPABLE OF PROVIDING THIS SUPPORT.
4- THE FABRICATOR IS RESPONSIBLE FOR THE DESIGN OF ALL CONNECTIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE SCHEMATIC AND ARE ONLY INTENDED TO SHOW THE RELATIONSHIP OF MEMBERS CONNECTED. CONNECTION DETAILS INDICATED ON THE DRAWINGS SHALL BE INCORPORATED INTO FABRICATOR'S CONNECTION DESIGN. ALL SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY THE FABRICATOR'S ENGINEER WITH THE ENGINEER'S SEAL. ENGINEER'S SEAL MAY BE QUALIFIED (FOR DESIGN OF CONNECTIONS ONLY).
5- ADDITIONAL DESIGN LOADS FROM ROOF EQUIPMENT OR OTHER CONCENTRATED LOADS SHOWN ON THE DRAWINGS SHALL BE CONSIDERED AS COLLATERAL LOADS. THESE LOADS SHALL BE CONSIDERED IN THE WELDING:
1- ALL STRUCTURAL STEEL WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY STANDARD D1.1 LATEST EDITION.
2- ALL STRUCTURAL STEEL WELDING ELECTRODES SHALL CONFORM TO AWS A5.1 OR A5.5 E-70XX.
3- FIELD WELDING SHALL BE SHOWN ON ERECTION DRAWINGS.
4- ALL FIELD FULL PENETRATION WELDS SHALL BE INSPECTED AND TESTED BY A TESTING AGENCY TO BE PAID BY PPCO.
5- ALL EXPOSED WELDED CONNECTIONS SHALL BE GROUND SMOOTH AND SUBJECT TO ARCHITECT APPROVAL. THE CONTRACTOR SHALL SUBMIT WRITTEN PROCEDURE AND DETAILS TO THE ARCHITECT FOR REVIEW PRIOR TO COMMENCING THE WORK.
6- PAINT ALL WELDS WITH RUST INHIBITIVE PAINT.

DISCLAIMER

THE DRAWINGS DO NOT NECESSARILY PROVIDE ALL THE DETAILS TO COVER THE FUNDAMENTALS IN BUILDING CONSTRUCTION. WE ARE COMMISSIONED TO DEVELOP DRAWINGS TO DETERMINE THE OVERALL STRUCTURAL INTEGRITY OF THE BUILDING IN TERMS LOAD BEARING CAPACITY. IT IS THE SOLE RESPONSIBILITY OF THE PROPERTY OWNER AND THE RESPECTIVE CONTRACTOR TO PROPERLY CONSTRUCT THE BUILDING ACCORDING TO ACCEPTABLE INDUSTRY STANDARDS AND NEW YORK STATE CODES. THE CONTRACTORS OR THE PROPERTY OWNER SHOULD ASK FOR WRITTEN CLARIFICATION FROM US WHEN A QUESTION ARISES. THE CONTRACTORS AND THE PROPERTY OWNER ARE SOLELY RESPONSIBLE FOR ANY DEFECTS DUE TO MISINTERPRETATION.

PLUMBING:

A) ALL PLUMBING TO BE IN ACCORDANCE WITH LOCAL CODES AND THE STATE OF NEW YORK PLUMBING CODE.
B) ALL UNDERGROUND WASTE LINES SHALL BE CAST IRON. WASTE LINES ABOVE GROUND MAY BE APPROVED COPPER, COPPER ALLOY, OR PVC PIPE.
C) ALL WATER LINES SHALL BE COPPER OR COPPER ALLOY PIPE.
D) THERE SHALL BE SHUT-OFFS PROVIDED FOR ALL FIXTURES. ALL EXPOSED PIPES IN BATHROOMS TO BE CHROME, BRASS OR GOLD PLATED TO MATCH FAUCETS.
E) PROVIDE AND INSTALL ALL FIXTURE AS MANUFACTURED BY "KOHLER" OR "ELJER" UNLESS OTHERWISE DIRECTED.
F) PROVIDE ALL SUPPLY PIPES, WASTE PIPES,TRAPS, CLEAN OUTS, AND VENTING NECESSARY FOR THE SUCCESSFUL OPERATION OF ALL PLUMBING FIXTURES. A WET PLUMBING TEST SHALL BE COMPLETED SUCCESSFULLY PRIOR TO INSTALLING DRYWALL.
G) PROVIDE WATER LINE WITH SHUT- OFF AND DRAIN CONNECTION FOR ALL APPLIANCES THAT REQUIRED SO.
H) PROVIDE MINIMUM TWO FROST-PROOF HOSE BIBS. UNLESS OTHERWISE DIRECTED.
I) PROVIDE 1" INSULATION IN ALL PIPES IN UNHEATED SPACES SUCH AS CRAWL SPACES, BASEMENT, ATTIC AND OVERHANG FRAMING, ETC.

ROOM FINISH:

A) WALLS AND CEILINGS: ALL ROOMS TO HAVE 1/2" GYPSUM BRD, BATHROOMS 1/2" M. R. GYPSUM BRD, GARAGE 5/8" TYPE "X" GYPSUM BRD.
B) FLOORS: ALL ROOMS TO BE FINISHED AS PER CONTRACT.
C) INTERIOR TRIM: WINDOW AND DOOR CASING AND BASE BOARD TRIM TO BE COLONIAL OR CLAMSHELL.
D) DRYWALL (USG PRODUCTS ONLY): ALL GYPSUM BOARD MUST BE SECURED TO WOOD MEMBERS WITH TWO INCH LONG SCREWS. ALL JOINTS AND NAIL HOLES TO RECEIVE THREE COAT OF TAPE AND SPARCKLE SANDED SMOOTH IN PREPARATION FOR PAINT. ADEQUATE DRYING MUST OCCUR BETWEEN COATS. ALL OUTSIDE CORNERS TO RECEIVE METAL CORNER BEADS.
E) CABINETS AND VANITIES: DETERMINE THE EXACT SIZE ON THE JOB AFTER THE WALLS HAVE BEEN FRAMED.

KEY LEGEND

1. EXISTING STOREFRONT DOORS, TO BE REPLACED.
2. EXISTING (1) HR. FIRE RATED DEMISING WALL (1) LAYERS 5/8" TYPE "X" GYPSUM BOARD APPLIED VERT. TO EA. SD. 3 5/8", 20 GA.
3. INTERIOR PARTITION WITH 5/8" DRYWALL ON 20 GA. 3 5/8" STEEL STUDS @ 16" O.C. 4a. FURR-OUT EXISTING DEMISING WALL W/20 GA. STL. STUDS FOR NEW PLUMBING FIXTURES & LINES.
4. ADA COMPLIANT HANDICAP RESTROOM.

FINISH LEGEND

FLOORING
TI - NEW TILES FLOORING, PROVIDE BY OWNER. GC TO PROVIDE NECESSARY LABOR AND MATERIALS FOR INSTALLATION.
BASEBOARDS
TB - 5" WOOD BASE AS PROVIDED BY OWNER, GC TO PROVIDE NECESSARY LABOR AND MATERIALS FOR INSTALLATION.
CEILINGS
ACT - NEW USG 2'X4'X3/4" REGULAR ACOUSTIC CEILING
WALL
MI - NEW CONCRETE EXTERIOR WALL

MISCELLANEOUS :

1- THESE GENERAL NOTES SUPPLEMENT THE PROJECT SPECIFICATIONS. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2- STRUCTURAL DRAWINGS ARE INTENDED TO BE USED WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL & CIVIL. CONTRACTOR IS RESPONSIBLE FOR COORDINATING SUCH REQUIREMENTS INTO THEIR SHOP DRAWINGS AND CONSTRUCTIONS.
3- NO OPENINGS SHALL BE MADE IN ANY STRUCTURAL MEMBER WITHOUT THE WRITTEN APPROVAL OF THE PROFESSIONAL OF RECORD.
4- NO CHANGE IN SIZE, MATERIAL OR DIMENSION OF STRUCTURAL MEMBERS SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE PROFESSIONAL OF RECORD.
5- OPENINGS 1"-4" AND LESS ON A SIDE ARE GENERALLY NOT SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO ARCHITECTURAL AND MECHANICAL DRAWINGS FOR SUCH OPENINGS.
6- THE CONTRACTOR IS RESPONSIBLE FOR LIMITING THE AMOUNT OF CONSTRUCTION LOAD IMPOSED UPON STRUCTURAL FRAMING. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN CAPACITY OF THE FRAMING AT THE TIME THE LOAD ARE IMPOSED.
7- THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL TEMPORARY BRACING AND/OR SUPPORT THAT MAY BE REQUIRED AS THE RESULT OF THE CONTRACTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES.
8- DO NOT SCALE THESE DRAWINGS, USE DIMENSIONS.
9- CONTRACTOR'S CONSTRUCTION AND/OR ERECTION SEQUENCES SHALL RECOGNIZE AND CONSIDER THE EFFECTS OF THERMAL MOVEMENTS OF STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD.
10- THE CONTRACTOR SHALL INFORM THE PROFESSIONAL OF RECORD IN WRITING OF ANY DEVIATION FROM THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL NOT BE RELIEVED OF THE RESPONSIBILITY OF SUCH DEVIATION BY THE PROFESSIONAL OF RECORD REVIEW OF SHOP DRAWINGS, PRODUCT DATA, ETC., UNLESS THE CONTRACTOR HAS SPECIFICALLY INFORMED THE PROFESSIONAL OF RECORD OF SUCH DEVIATION AT THE TIME OF SUBMISSION, AND THE PROFESSIONAL OF RECORD HAS GIVEN WRITTEN APPROVAL TO THE SPECIFIC DEVIATION.
11-CONNECTION'S OF ALL ITEMS SUPPORTED BY THE STRUCTURE ARE THE RESPONSIBILITY OF THE DISCIPLINES WHO ARE MAKING THESE ATTACHMENTS. THESE ATTACHMENTS SHALL BE DESIGNED TO RESIST ALL GRAVITY, WIND, WIND UPLIFT, SEISMIC, THERMAL LOADS, ETC.
12- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS.
13- UNLESS NOTED, SUBMIT SHOP DRAWINGS OF ALL FABRICATED MATERIALS FOR REVIEW. DESIGN DRAWINGS SHALL NOT BE REPRODUCED FOR USE AS SHOP DRAWINGS. SHOP DRAWINGS WILL NOT BE REVIEWED UNLESS THEY WERE CHECKED. BEAR THE INITIAL OF THE CHECKER AND ARE STAMPED APPROVED BY THE CONTRACTOR.

CONSTRUCTION NOTES:

1. ALL NEW PARTITIONS ARE TO BE CONSTRUCTED WITH METAL STUDS 16 INCHES ON CENTER. STUDS ARE TO BE CARRIED UP TO THE STRUCTURE ABOVE. ALL PARTITIONS ARE TO HAVE RUNNER TRACKS TOP AND BOTTOM AND SHALL BE BRACED AT THE CENTER POINT. STUD SIZES SHALL BE AS SHOWN ON THE PLANS.
2. ALL WORK DEMOLISHED SHALL BE REMOVED FROM THE PREMISES.
3. TOILETS SHALL HAVE CERAMIC TILE FLOORS, UNGLAZED, AND 4 INCHES HIGH CERAMIC TILE COVE BASES. GLAZED. TOILET WALLS SHALL RECEIVE TWO COATS OF OIL BASE, SEMI-GLOSS PAINT. COLOR FOR TILE AND PAINT ARE TO BE SELECTED BY OWNER.
4. ALL CERAMIC TILE IS TO BE SET IN WATERPROOF MASTIC.
5. ALL LUMBER IS TO BE NEW AND GRADE MARKED BEFORE DELIVERY TO THE SIDE.
6. ALL LUMBER TO BE "DRY"

HEATING & PLUMBING

HEATING: THE HEATING SYSTEM WILL BE EXTENDED AS REQUIRED TO NEW AREAS, AS BATHROOM.

HEATING SYSTEM SHALL DE DESIGNED AND GUARANTEED TO MAINTAIN 72° F INDOOR TEMPERATURE WITH 0° F OUTDOOR TEMPERATURE.
PIPING: WATER SUPPLY PIPING TO BE COPPER, PROPERLY SIZED, COMPLETE WITH FIXTURE SHUT-OFF VALVES AND HOSE BULBS.
DRAINAGE AND VENT PIPING SHALL BE COPPER OR CODE APPROVED PVC. DRAINS UNDER THE CONCRETE TO BE CAST IRON. PROVIDE HOOKUP FOR WASHER AND DRYER.

FIXTURES: AS SHOWN ON THE PLANS SHALL BE AMERICAN STANDARD, KOLHER OR EQUAL. ALL EXPOSED FITTING AND PIPE TO BE CHROME PLATED.
ALL PLUMBING FIXTURES TO COMPLY WITH LL 29/89 FOR LOW FIXTURES.
COLD WATER SERVICE -TYPE "K" COPPER. SIZE AS NOTED.
LOW FLOW FIXTURES TO BE PROVIDED TO COMPLY WITH LOCAL LAW 29/89.

SPECIAL INSPECTIONS :

1-
(a) SPECIAL INSPECTOR (SI) SHALL BE RETAINED AND PAID BY 72 Alexander St, BREWERIES/ DISTILLERY, EATING AND DRINKING ESTABLISHMENTS

(b) SPECIAL INSPECTOR SHALL BE FULLY QUALIFIED, APPROVED BY THE BUILDING OFFICIAL, REGISTERED BY APPLICABLE REGISTRATION BOARD IF REQUIRED AND ACCEPTABLE TO NEMERJ.
(c) THE DUTIES OF THE SPECIAL INSPECTOR SHALL INCLUDE, BUT ARE NOT LIMITED TO, VERIFICATION OF CONSTRUCTION QUALITY CONTROL, TESTING COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS, BUILDING CODE REQUIREMENTS, AND CITY OF YONKERS BUILDING DEPARTMENT REQUIREMENTS.
(d) IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE PROPER NOTIFICATION TO THE SPECIAL INSPECTOR AND PROCEED WITH THE CONSTRUCTION ONLY AFTER THE SPECIAL INSPECTOR'S APPROVAL.

2- SPECIAL INSPECTORS SHALL KEEP RECORDS OF ALL INSPECTIONS AND TESTING. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE CODE OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL OF RECORD. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THE DISCREPANCIES ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE CODE OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL OF RECORD. A FINAL REPORT OF INSPECTIONS DOCUMENTING COMPLETION AND COMPLIANCE OF ALL REQUIRED SPECIAL INSPECTIONS AND CORRECTIONS OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS SHALL BE SUBMITTED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY. INTERIM REPORTS SHALL BE SUBMITTED PERIODICALLY WITH MINIMUM FREQUENCY OF TWO WEEKS .

3- SPECIAL INSPECTIONS ARE REQUIRED FOR, BUT NOT LIMITED TO, THE FOLLOWING ACTIVITIES:
(a) VERIFICATION IS REQUIRED FOR PROPER LOCATION OF SLAB-ON-GRADE REINFORCING AND USAGE OF PROPER REINFORCING SUPPORTS.
(b) MASONRY AND REINFORCING.
(c) FOOTING EXCAVATION AND FILL (GEOTECHNICAL ENGINEER CERTIFICATIONS IS REQUIRED PRIOR TO POURING CONCRETE).
(d) ALL FIELD WELDING.
(e) ALL HIGH STRENGTH BOLTING AND ANCHORING SYSTEMS.

4- FAILURE TO NOTIFY THE SPECIAL INSPECTOR MAY RESULT IN CONTRACTOR HAVING TO REMOVE WORK FOR THE PURPOSE OF INSPECTION AT CONTRACTOR'S EXPENSE.
5- PREMATURE NOTIFICATION FOR INSPECTIONS WILL RESULT IN AN ADDITIONAL INSPECTION WITH ALL EXPENSES AND FEES PAID BY THE CONTRACTOR.

STRUCTURAL ENGINEER OF RECORD (SER) SITE VISITS:
1- CONTRACTOR SHALL NOTIFY SPECIAL INSPECTOR FIVE (5) WORKING DAYS PRIOR TO THE FOLLOWING CONSTRUCTION MILESTONES:

(a) SPREAD FOOTING FOUNDATION. AFTER FOUNDATION REINFORCING IS PLACED AND BEFORE POURING CONCRETE AT THE FOUNDATION.
(b) FIRST SLAB-ON-GRADE POUR: AFTER SLAB REINFORCING IS PLACED AND BEFORE POURING CONCRETE.
(c) CONCRETE MASONRY CONSTRUCTION: AFTER REINFORCING IS PLACED IN FIRST LIFT CELLS AND BEFORE CELLS ARE GROUTED.
(d) ROOF STRUCTURE: AFTER STRUCTURE IS ERECTED AND BEFORE INSULATION AND ROOFING IS INSTALLED. CONTRACTOR SHALL ARRANGE A PRE-ROOFING MEETING BEFORE ANY ROOFING WORK IS STARTED.
(e) BUNKER: AFTER STEEL STRUCTURES ARE ERECTED.
(g) PUNCH LIST: AFTER ALL STRUCTURAL ITEMS ARE COMPLETED.
2- FAILURE TO NOTIFY SPECIAL INSPECTOR OF ANY CONSTRUCTION MILESTONE MAY RESULT IN CONTRACTOR HAVING TO REMOVE WORK FOR THE PURPOSE OF REVIEW AT CONTRACTOR'S EXPENSE.
3- NEMERJ WILL ARRANGE SITE VISIT IF NECESSARY, (FEE TO BE DISCUSS) PREMATURE NOTIFICATION FOR SITE VISIT WILL RESULT IN AN ADDITIONAL SITE VISIT WITH ALL EXPENSES AND FEES PAID BY THE CONTRACTOR.

CHAPTER 8 OF THE IBC FOR INTERIOR FINISHES.

803.1.1 INTERİOR WALL AND CEİLİNG FİNİSH MATERİALS

INTERİOR WALL AND CEİLİNG FİNİSH MATERİALS SHALL BE CLASSİFİED İN ACCORDANCE WİTH ASTM E84 OR UL 723. SUCH İNTERİOR FİNİSH MATERİALS SHALL BE GROUPED İN THE FOLLOWİNG CLASSES İN ACCORDANCE WİTH THEİR FLAME SPREAD AND SMOKE-DEVELOPED İNDEXES.
CLASS A: = FLAME SPREAD İNDEX 0-25; SMOKE-DEVELOPED İNDEX 0-450.
CLASS B: = FLAME SPREAD İNDEX 26-75; SMOKE-DEVELOPED İNDEX 0-450.
CLASS C: = FLAME SPREAD İNDEX 76-200; SMOKE-DEVELOPED İNDEX 0-450.
EXCEPTİON: MATERİALS TESTED İN ACCORDANCE WİTH SECTİON 803.1.2.

N. Y. S. 2015 ENERGY CONSERVATION CODE WESTCHESTER COUNTY ZONE 4 A

DESIGN DATA

DEGREE DAYS: 5750° Winter Design Interior Temp. 72°
HEATING DESIGN TEMP: 0° OUTSIDE; 72° F INDOOR

CODE DESIGN APPROACH:

TABLE N112.1.2
ELECTRICAL HEAT + AC UNIT

TABLE 402.1.3	VALUES REQUIRED BY CODE		VALUES PROVIDED
EXTERIOR WALL	U-FACTOR 0.060	R = 20	R = 21
ROOF / CEILING	U-FACTOR 0.026	R = 49	R = 49
SLAB	U-FACTOR 0.047	R = 7.4	R = 7.4
ENTRANCE DOORS	R = 2.5		R = 2.5

TABLE C303.1.3(2)

INFILTRATION:		MANUFACTURER	CODE REQUIRED	VALUE PROVIDED
WINDOWS	U-FACTOR 0.55	ANDERSEN	.050	0.55
SL. GL. DOOR	U-FACTOR 0.55	ANDERSEN	0.50	.0.55

I , ANTHONY SOTTILE, P.E., DO CERTIFY THAT THESE DESIGN AND SPECIFICATIONS COMPLY WITH THE LATEST CALCULATIONS OF THE NEW YORK STATE ENERGY CONSERVATION CODE.

REQUIRED HEATING 2015 IBC INTERNATIONAL BUILDING CODES

EVERY ROOM UNIT SHALL BE PROVIDED WITH HEATING FACILITIES CAPABLE TO MAINTAINING A MIN. ROOM TEMPERATURE OF 68° F AT 3FT. ABOVE THE FLOOR.

CAULKING: PROVIDE CAULKING AROUND ALL DOORS, WINDOWS AND OTHER OPENINGS IN EXTERIOR WALLS

HVAC AND SERVICE IWATER EQUIPMENT: ALL HVAC AND SERVICED WATER EQUIPMENT SHALL COMPLY WITH EFFICIENCY RATINGS REQUIRED BY NYSEC.
SHALL HAVE R-VALUE AS SHOWN FOR GLAZING AND SHALL BE NO MORE THAN 1 % OF TOTAL ROOF AREA, U FACTOR 0.55

PIPE INSULATION: PROVIDE R-3 PIPE INSULATION AT HEATING AND HOT WATER PIPES (N1103.5.3) OUTSIDE OF INSULATED WALL AND AND FLOOR AREAS. PROPOSED R-6

DUCT SYSTEM: INSULATE AND SEAL ALL SUPPLY DUCTS MIN. R-8 FOR 3" Ø AND GREATER AND R-6 FOR LESS THAN 3" Ø SUPPLY AND RETURN DUCTS R-6 (N1103.3.1)
WINDOWS: ALL COMPONENTS MUST MEET OR EXCEED BUILDING ENVELOPE REQUIREMENTS.

CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA (Effective 10/03/2016)

LOCATION: City of YONKERS Zip Code 10704

	WIND DESIGN					SUBJECT TO DAMAGE FROM							
GROUND SNOW LOAD	SPEED (MPH)	TOPO EFFECTS	SPECIAL WIND REGION	WIND BORNE DEBRIS ZONE	SEISMIC DESIGN CATEGORY (RCNY Only)	WEATHERING	FROST LINE DEPTH	TERMITE	CLIMATE ZONE	ICE BARRIER UNDERLAYMENT REQD.	FLOOD HAZARDS	AIR FREEZING INDEX	MEAN ANNUAL TEMP
20	WIND REGION 110 MPH	NO	YES	NO	C	SEVERE	42"	MODERATE TO HEAVY	4A	YES	NO	2000	51.6

DESIGN - PLANNING & STRUCTURAL ENGINEERING
NEMERJ
DESIGN GROUP
215 HILLTOP ST. MAHOPAC NY 10541 (845) 628-6089

Drawing Title: LOCATION MAP GENERAL NOTES

Project: EXISTING WAREHOUSE BREWERY / TASTING

ISSUES / REVISIONS	
Date	Title

OWNER: FONDAK ENTERPRISES LLC.
72 Alexander St,
Yonkers, NY 10701

Chkd. By : R.M.
Dwg. By : d.o.t.
Tax Map #
Scale: As Noted
Date: SEP-08-18
Drawing Number: SP-2

Appendix B

Education
Energy Utility
Hospitality
Public Sector
Real Estate
Science & Technology

Site-Specific Health and Safety Plan

SITE SPECIFIC HEALTH & SAFETY PLAN

- FOR -

Glenwood Container Site

72 Alexander Street
Yonkers, Westchester County, New York

BCP Site #C360154

Prepared for:

Fondak Enterprises, LLC
225 Paddock Street
Watertown, New York 13601

November 2018

Prepared by:

PAULUS, SOKOLOWSKI AND SARTOR ENGINEERING, PC
One Larkin Plaza, 2nd Floor,
Yonkers, New York 10701

Table of Contents

NOTE: PS&S SOP's 1, 13, 16, 17, 19, 20, and 23 are not applicable to the remedial investigation efforts.

1.0 GENERAL

1.1. Introduction

This Site-Specific Health and Safety Plan (HASP) has been developed as part of the Remedial Action Work Plan (RAWP) of the Site located at 72 Alexander Street, located in the City of Yonkers, Westchester County, New York (Site). The purpose of this HASP is to ensure that precautions are taken to protect project personnel, the public and the environment.

This HASP addresses the environmental activities of this project and must be reevaluated should project conditions change. This HASP only covers potential hazards associated with potential contamination on- site.

The scope of this project includes remedial activities which include excavation and disposal of contaminant source areas (CSA) as further defined in the RAWP. Work activities will be guided by the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations as outlined in 29 CFR 1910.120 and 1926.65.

Although there is a low probability of personnel exposure to health hazards exceeding the OSHA Permissible Exposure Limit (PEL), the procedures and protocols in this plan have been established to ensure that a mechanism is in place to protect personnel in the event that hazards from site contamination are encountered during the project. Compliance with this HASP is required from authorized PS&S project personnel, project support personnel and visitors who enter the work areas of this project.

The content of this HASP may change or undergo revision in accordance with field monitoring results, modifications to the technical scope of work, or additional information made available to health and safety (H&S) personnel. Any proposed changes must also be reviewed and approved by designated PS&S personnel.

1.2 Personnel

Engineering and Construction Personnel are defined as follows:

Field Technician

The Field Technician will be on-site for site activities. He/she will obtain and review applicable health and safety documents for site personnel and contract personnel. He/she has stop-work authorization, which he/she will execute upon determination of an imminent safety hazard, emergency situation, or other potentially dangerous situation, such as extreme weather conditions. Authorization to proceed with work will be issued by the PS&S Field Technician after such action. The Field Technician is responsible for performing air monitoring of the work areas. He/she will confirm that the level of personal protection by the workers follows those dictated by the action levels set in Table 5.2.

Subcontractors

Subcontract labor personnel will perform soil excavation/backfill activities in areas with potential contamination. Labor personnel are responsible for adhering to the requirements of this HASP and following the direction of the Field Technician. Laborer personnel have stop work authority and must report any potentially unsafe condition to their Supervisor and the Health and Safety Officer.

1.3 Emergency Phone Numbers

Emergency Phone numbers are listed below. Local hospital information and driving directions are located in Exhibit A.

Emergency Phone Numbers:

Fire Department	911 or (914) 377-7500
Police Department	911 or (914) 377-7900
Hospital St. Johns Riverside Hospital 2 Park Avenue, Yonkers, NY 10703	**911**
NY One-Call	**811**
NYSDEC Spill Hotline	800-457-7362
National Response Center (NRC) for Oil/Chemical Spills	800-424-8802
PS&S Office Manager (Janos Szeman)	Office (732) 584-0437 Mobile (732) 245-7164
PS&S Field Technical and Health & Safety Point (Scott Caporizzo)	Office (914) 226-3722 Mobile (203) 252-4015

2.0 SITE AND PROJECT DESCRIPTION

2.1 Site Physical Location

The project site is located at 72 Alexander Street, Yonkers, Westchester County, New York.

2.2 Scope of Work

The scope of work includes soil excavation activities in areas with potential contamination backfill of excavated areas, installation of groundwater monitoring wells and a final engineered cover system. Work will be conducted with oversight from a qualified environmental professional and subject to New York State Department of Environmental Conservation (NYSDEC) oversight. Air monitoring as defined in Section 6 of this HASP will be conducted during intrusive work.

Upon completion of the tasks the scope of work will include site cleanup activities such as the removal of trash,equipment breakdown, material, tools, etc., and police work areas.

- **Site Preparation**: The project area and temporary workspace will be clear and free of obstruction. Equipment and pedestrian travel areas will be delineated and designated with barriers and signs.
- **Geophysical Survey:** If necessary, a geophysical survey will be conducted prior to field activities to confirm the observed mark-outs in the vicinity of the proposed subsurface exploration locations. The geophysical survey will identify utilities, physical obstructions, and other anomalies within a minimum ten-foot radius of the proposed excavation locations.
- **Soil Excavation:** Heavy equipment will be used to excavate soil. Material removed will be managed as detailed in the RAWP which direct load out of soils and staging materials for reuse.
- **Soil Screening:** Soil excavated will be screened with instrumentation photoionization detector (PID) as further detailed in the RAWP. The samples will be packaged for shipping to the selected analytical laboratory for determination of specific soil contaminants.
- **Soil Sampling:** Confirmation sidewall samples will be collected from several excavations as further detailed in the RAWP.
- **Groundwater Monitoring Well Installation:** Two groundwater monitoring wells must be installed on site and sampled.
- **Site Restoration:** After excavation and grading is completed, the engineered cover system will be installed across the entire site, including the installation of a vapor mitigation system as a component of the existing building.

3.0 HAZARD ASSESSMENT

3.1 Task Specific Hazard Assessment

The following is a general discussion of the hazards that may be encountered on site. Barricades will be set up to protect workers. Site control will be enforced, and only authorized personnel will be permitted in the work area.

At this site, potential exposure to contamination is dependent principally on the type of work activity being undertaken. Air monitoring will be performed to determine the potential for exposure to on-site personnel during project activities. The air monitoring program and action levels are outlined in Section 5.

This plan has established categories of work tasks based on worker exposure potential to site hazards.

Non-Contact -Work activities that have little or no reasonable potential for contact or exposure to hazardous site contaminants.

Contact -Work activities that have some reasonable potential for contact or exposure to hazardous site contaminants.

3.1.1 Non-Contact Personnel

Project Activities - It is anticipated that the following activities require minimal contact and should not result in contact with contaminated soil / groundwater or materials used for decontamination. These activities should not require additional H&S considerations beyond those H&S practices already in place for this type of construction project. These tasks may include site preparation and project administration.

While potential exposure to hazardous materials or vapors is not anticipated during these activities, operations will be evaluated during the project and monitored as necessary. Access to the work zone is limited to Project Personnel, Project Support Personnel, and Authorized Visitors. Initially, exclusion zones will not be established for such activities. However, exclusion zones will be established if visual evidence of contamination is observed, and/or instrument readings exceeding the action levels detailed in Section 5 are encountered.

In the event that contaminated materials are encountered, project personnel involved in such areas (contact or non-contact) must meet the training requirements as defined in this HASP.

3.1.2 Contact Personnel

Project Activities – Contact with physical and chemical hazards

It is anticipated that personnel working in the following activities have some potential to come into contact with physical and chemical hazards present at the site.

The activities with a potential for contact with chemical hazards may include:

- Soil excavation
- Groundwater monitoring well installation
- Soil screening
- Sample preparation and collection
- Equipment breakdown procedures.
- Personnel Decontamination

These activities will be evaluated and monitored by the Supervisor and his/her designee.

A variety of potential hazards exist with any drilling project; these include:

- Heavy Equipment
- Entanglement
- Buried Utilities
- Falling Objects / Overhead hazards
- Noise
- Slips / Trips / Falls
- Weather Hazards

A hazard analysis was developed for the work activities that involved potential exposure to contamination at the site (contact work). The analysis was based on the potential for the contact regardless of the contaminant concentrations.

Project tasks include:

- **Heavy Equipment Use:** Equipment operators must be trained in the operation of the equipment they will be using. Additional requirements include the following:
  - Areas for heavy equipment use will be delineated by physical barriers to prevent unauthorized pedestrian and/or vehicular traffic from entering the area.
  - Equipment is to be operated in the areas designated for equipment use. Heavy equipment shall not be operated in pedestrian areas.
  - Equipment must be observed prior to use to confirm proper equipment

operation as well as functional safety features. If any worn parts and/or unsafe conditions exist, the operator will document each incident, and the equipment will be removed from service until repairs can be made.
- All equipment will have functioning back up alarms and will be equipped with ABC fire extinguishers and first aid kits.
- Equipment operators must make initial eye contact with personnel working in the vicinity.
- Hearing protection may be required for personnel working around heavy equipment. If it is necessary to raise your voice to be heard by someone within 3 feet – hearing protection devices must be used.

- **Soil Excavation:** Equipment operators must be trained in the operation of the equipment they will be using. Additional requirements include the following:
- Underground utilities will be marked out in accordance with applicable laws and regulations
- Proper PPE will be worn during all drilling operations.
- The use of ANSI certified hard hats and safety glasses greatly reduce potential hazards associated with flying debris. Hard hats provide head protection from falling objects or being struck by overhead parts and equipment.
- Steel-toed boots or shoes are required to protect feet from falling/crushing objects.
- Drip pans and sorbent pads will be placed under equipment where common leaks or hose line breaks may occur.

- **Soil Screening / Sample Preparation:** The soil samples will be screened using direct read instrumentation and prepared for return to the subcontracted laboratory or for shipping to a third-party laboratory.
- Air monitoring action levels are detailed in Section 5.2. Personal protective equipment (PPE) requirements will be followed as outlined in that section.
- Chemical protective gloves will be used when handling potentially contaminated soil, or when collecting groundwater samples.
- Good personal hygiene practices will be followed. Personnel will not eat, drink, or smoke in the work area or while wearing chemical protective clothing or gloves.

Good work practices and personal protective equipment (PPE) will be utilized to minimize the potential for contamination to personnel. In the event that hazardous contamination is encountered, project personnel involved in such areas will stop work until further instructions from the Supervisor or designee. Exclusion Zones will be established if visual evidence of contamination is observed, and/or instrument readings exceed the action levels detailed in Section 7.

Potential unacceptable exposure to contaminated soil or water is not anticipated however, the operations will be evaluated and monitored as necessary. In the event

that unexpected contaminated materials are encountered, project personnel involved in such areas will stop work until further instructions from the Supervisor. Exclusion Zones will be established if visual evidence of contamination is observed, and/or instrument readings exceed the action levels detailed in Section 7.

This HASP assumes that buried drums, underground storage tanks or radiological waste will not be encountered during the work activities at this site. If such waste is found or suspected, project personnel will cease work activities and contact the PS&S Project Manager.

3.2 Weather Hazards

If severe weather occurs that may affect the safety of site workers, the Field Technician will stop work and move personnel to a safe location. The Field Technician will allow operations to resume when weather conditions improve, or they deem appropriate.

3.2.1 Thunderstorms

More than one half of lightning deaths occur after a thunderstorm has passed. In the event of a thunderstorm, PS&S will follow the NOAA 30-30 rule. The first "30" represents 30 seconds. If the time between the flash of lightning and the thunder is 30 seconds or less, the lightning is close enough to hit you. Personnel must seek shelter immediately. The second "30" stands for 30 minutes. After the last flash of lightning, personnel must wait 30 minutes before leaving the shelter.

3.2.2 Heat and Cold Stress

Depending on the time of year and weather conditions, cold or heat stress present special problems to unprotected workers. The Supervisor will be in continuous contact with workers exposed to weather extremes and document that the heat or cold stress programs are implemented. Workers will take adequate appropriate rest breaks and drink adequate amounts of cold or hot liquids.

The use of Personal Protective Clothing can increase heat-related health risks. Work/rest schedules may be altered based on the existing weather conditions encountered and the level of personal protection being utilized by on-site personnel.

Heat stress prevention may be achieved by:

1. Modifying work/rest schedules according to site conditions and personnel monitoring.
2. Providing shelter and shade during breaks.
3. Requiring workers to remove PPE during breaks.
4. Maintaining fluids by drinking water or electrolyte drinks ('Gatorade', 'Glaceau Vitamin Water', etc.)
5. Training site personnel to recognize the effects of heat stress.
6. Acclimatizing workers for warm weather work (American Conference of Governmental Industrial Hygienists (ACGIH) recommendations for heat stress)

Cold stress prevention will focus on:

1. Modifying work/rest schedules according to site conditions and personnel monitoring.
2. Providing shelter and heat during breaks.
3. Requiring workers to warm feet & hands during breaks.
4. Wearing layers of clothing to put on or take off as body warmth and moisture fluctuates
5. Maintaining fluids by drinking water or electrolyte drinks ('Gatorade')
6. Training site personnel to recognize the effects of cold stress.

3.2.3 Wind

Excessive wind may pose a potential health threat through the wind chill effect. Proper clothing and outer garments should be worn during cold weather periods and exposed skin will be minimized during extreme cold and windy weather. The PS&S Field Technician will use current temperature and wind speed measurements and assess wind chill factors at the start of the day, middle of shift, and end of shift. The Supervisor will make appropriate thermal protection recommendations.

Additionally, wind speed can affect stability of equipment and material on-site. The effects of wind on the tarps covering soil piles and other operations will be evaluated during the shift.

3.3 Heavy Equipment (Noise, Traffic)

3.3.1 Noise

Excessive noise may be a problem during certain activities on site, such as sawing, concrete busting, the use of machinery or powered hand tools. If necessary, as designated by the Supervisor, when expected noise or sustained noise levels exceed 85dBA, the use of earplugs or other hearing protection equipment with a NRR of 25 or greater will be mandatory for personnel use in the immediate area.

As a rule, the noise level is excessive if it is necessary to shout to be heard at a distance of three feet.

3.3.2 Traffic

Project personnel shall be required to wear safety vests or reflective clothing when working on or adjacent to railroad tracks or roadways and must comply with applicable rules and regulations for working around heavy equipment and trains.

Project employees must be aware of vehicular activity on site. Large construction vehicles and equipment offer limited visibility for the driver/operator and limited reaction to sudden hazards. Care must be given to alerting drivers or pedestrians to moving machinery.

3.4 Biological Hazards

The location of the Site is such that biological hazards may be present. The biological hazards that may be present include, but are not limited to:

- Ticks
- Stinging/biting insects
- Small animals

All employees with the potential to contact the fauna indicated above should be cautious when working in areas that may support these types of hazards. The PS&S Field Technician will assess suspect areas and warn workers when there is a possibility of contact with these items.

3.5 Fall Hazards

The potential for slipping, tripping and falling will be present as it is at most work sites. Workers should be aware of their surroundings as they are performing the project activities. Equipment should be located away from transit thoroughfares and active working areas. Severe trip hazards will be identified in site meetings and demarcated by flags or caution tape.

3.6 Confined Space Entry

Permit Required Confined Space (PRCS) is not expected during this operation. If an entry is required into a PRCS (as defined by 29 CFR Part 1910.146) the Supervisor will be responsible for implementation of the standard procedures for confined space operations, which includes permit entry system, pre-entry

monitoring, and a buddy system according to the requirements of the PS&S Corporate Health and Safety Program.

3.7 Chemical Hazards

Please refer to Exhibit 3, which identifies chemicals that may be potentially encountered at this site. Table 1 within this exhibit provides the PM_{10} Action Levels and Table 2 within this exhibit provides the TVOC Action Levels.

Routes of Exposure:

Inhalation – Exposure controlled using dust control measures (i.e. – no visible dust allowed). Vapor exposure will be monitored using direct read instrumentation. If the action level is exceeded (Table 5.2), work will stop and appropriate protective measures taken.

Ingestion – Use good personal hygiene practices. Wear gloves when working in contaminated areas.

Absorption – Use good personal hygiene practices. Wear disposable gloves to keep clean. Use Good personal hygiene practices prior to eating or drinking.

4.0 WORK CLOTHING AND LEVELS OF PERSONNEL PROTECTION

Personal protection for this project is detailed in Table 4.1 and will include:

- Work clothing
- Work shoes
- Safety glasses
- High-Visibility vests or reflective clothing
- Nitrile gloves (for soil/groundwater sampling)

Good Work Practices

Good Work Practices are employed by workers in areas where there is a potential for some contamination. Good Work Practices include:

1. Keep dust levels to a minimum.
2. Use Good personal hygiene practices.
3. Use Good personal hygiene practices prior to eating, drinking and smoking.
4. Use work gloves to minimize dirt on hands.
5. Wear work coveralls, or disposable coveralls, to minimize dirt on clothing.
6. Keep dirty clothes, shoes, tools, etc. away from personal areas such as cars and homes.

Table 4-1. Personal Protection Levels

Task	Head	Eye/Face	Feet	Hands	Body	Hearing	Respirator
Mobilization/Demobilization							
Mobilization/ Demobilization of equipment and supplies	Hard Hat	Safety Glasses	Steel Toed Boots	Leather work gloves (as needed)	Work Clothing	Ear Plugs as needed	None (dust mask if desired)
Remedial Action Activities							
Soil Excavation Groundwater Sampling Engineered Cover System Installation	Hard Hat	Safety Glasses	Steel Toed Boots, chemical-protective overboots (if needed)	Nitrile gloves, Leather work gloves (as needed)	Work Clothing – **no loose clothing or jewelry**	Ear Plugs as needed	None initially; dust mask if dusty conditions exist; FF APR (if action levels are exceeded)
Site Restoration	Hard Hat	Safety Glasses	Steel Toed Boots	Leather work gloves (as needed)	Work Clothing; hi visibility clothing or vest	Ear Plugs as needed	None (dust mask if desired)

5.0 MONITORING PROCEDURES

5.1 Monitoring During Site Operations

A Photoionization Detector (PID) will be used to monitor the areas where intrusive activities will be conducted.

Based on the previous investigations and the tasks to be performed, the Supervisor will perform monitoring in the work area during excavation activities. Table 5-1 shows the type of instruments that can be used for different contaminants.

Table 5-1. Air Monitoring Instrumentation

Air Monitoring Instrument Name	Acronym	Contaminant(s) Monitored
Photoionization Detector	PID	Organic Vapors (for soil screening to detect the presence of volatile organic chemicals)

5.2 Action Level Criteria

A summary of the action levels to be used, action required and the types of instrumentation which maybe utilized at the discretion of the Supervisor is presented in Table 5-2.

Table 5-2. Suggested Action Levels and Action Level Exceedance Response

Monitoring Instrumentation	Monitoring Location	Action Level	Site Action
PID	Breathing Zone	>1.0 ppm above background (15 minutes sustained)	Stop work, withdraw from work area and discontinue work at the location until contaminants can be evaluated.

6.0 TRAINING

6.1 Basic Training Required

Prior to working on the project site, each employee must have completed Hazard Communication training.

An initial site briefing will also be provided on-site by the Supervisor or a designee for Project Personnel and Project Support Personnel prior to initial entry onto the site. The site briefing will include a review of the SSHASP and site-specific training.

7.0 MEDICAL SURVEILLANCE

There are no medical surveillance requirements above those required by this HASP. Employees exhibiting signs or symptoms of potential exposure will be referred to the company's medical provider for appropriate medical follow-up. If any employee is required to wear a respirator, such use must be approved by a licensed health care provider for respirator use as defined in the OSHA Respiratory Standard 29 CFR 1910.134.

8.0 COMMUNICATIONS

A means of communication will be provided at this project site. This may include two-way radios, portable telephones, or existing nearby telephones. Project personnel will be informed of the communication procedures during site briefings.

9.0 DECONTAMINATION PROCEDURES

All personnel and equipment that have been potentially exposed to contamination shall be decontaminated to avoid the possible spread of contamination.

9.1 Personnel Decontamination

Portable wash-up materials, apparatus and/or facility, or disposable cleaning wipes will be provided. Personnel working at the site must wash their hands and faces prior to eating, drinking or smoking and practice good personal hygiene. Potable water will be available at the site.

Disposable PPE will be collected and disposed of in a drum or large plastic bag.

9.2 Equipment Decontamination

Equipment cleanup will take place in the designated decontamination area. The equipment decontamination area will be lined with an impermeable barrier. Waste water generated during the cleanup process will be collected, containerized and sent for proper disposal.

Instruments will be cleaned whenever they have come into contact with soil or dust. Instrument cleanup will occur in the same area for personnel cleanup and will consist of the removal of any dust or soil from the surface of the instruments.

10.0 DISPOSAL PROCEDURES

Any waste material generated during the course of the project shall be characterized for proper disposal.

11.0 EMERGENCY PLAN

Emergency situations can be characterized as a fire or explosion, an environmental release, business interruption, or accident or injury to the field personnel. Emergency situations must be reported immediately to the Supervisor or their designee.

Emergency phone numbers are listed in Section 1.3 of this Health and Safety Plan. Written hospital directions and an accompanying map can be found in Exhibit A.

12.0 RECORDKEEPING

The Field Technician or designee will maintain health and safety information records for the site within the onsite trailer.

13.0 AUTHORIZATIONS

The Supervisor or a designee must approve personnel authorized to enter the project work zones at the site. Authorization will involve completion of appropriate training courses and medical examination requirements as outlined by this HASP, as well as the signature of the individual on the Acknowledgement Form recognizing a complete understanding of this HASP.

Corporate Health and Safety Program & Procedures Manual

APPENDIX A – HEALTH AND SAFETY CHECKLIST

Project # 05794-0001 Project Name: Former Glenwood Container

Location: 72 Alexander Street, City of Yonkers, New York

Project Manager: Janos M. Szeman

Other Personnel Assigned: Scott Caporizzo: Camila Israel

Estimated Duration: 2 months

Site Emergency Action Plan

Emergency Coordinator on site: Scott Caporizzo
Emergency number: (203) 252 - 4015

Emergency signal: Car Horn Blast/ Vocal Orders
Evacuation assembly point: Main Entrance on Alexander Avenue

Emergency Medical Facility Address:
St. Johns Riverside Hospital, 2 Park Avenue, Yonkers, NY 10703

Map and directions should be attached

Task Hazard Analysis: (Asterisk indicates those that apply)

∗ General
Hazards Severe Weather – Heat – Cold - Insects – Poisonous Plants – Animals – Noise – Violence
Controls Heat Stress Program – Cold Prevention Program – Insect Repellent – Hearing Protection – Security/Escort – Buddy System

∗ Construction Sites
Hazards Falling/flying material - Struck by equipment/vehicles – Scaffold – Ladders – Man-lifts – Walking surfaces /slips/trips/falls – Electrical hazards
Controls Visibility vest - Competent Person – Ladder inspection program – Man lift operator – Overhead clearance

Working on Roofs (unfinished structures)
Hazards Radio Frequency Exposure – Falls – Storms/Wind – Electrical Hazards
Control RF Gauge – Fall Arrest System – Fall Protection Plan – Weather Checks – Backpacks for Equipment – Clearance to Electric Lines

Work on Roadways/Highway
Hazards Traffic – Struck by Equipment/Vehicle
Controls Visibility Vest – Flagman – Barriers – Cones - Escort

Work on Railroad Tracks/Sidings
Hazards Struck by Train – Flying Objects – Uneven Walking Surfaces
Controls Hardhats – Boots – Visibility Vest – Flagman - Notify Railroad Companies – Rail Safety Training

***Trenching and Excavation**
Hazards Collapse - Falling Material – Struck by Equipment – Underground Utilities - Falls
Control ***Do Not Enter Unless Trained*** – Competent Person Inspections – Access (ladders) – Shoring/benching/trench support - Hardhat – Boots – Visibility Vest – Call before you dig

Waterfront or Bridgework
Hazards Falling into Water – Slips – Falls – Drowning - Hypothermia
Controls Life Preserver – Personal Flotation Device – Boots – Fall Arrest System – Guardrails – Safety Nets – Fall Protection Program – Cold Stress Procedures – Rescue Boat

Aerial Lift Operation
Hazards Falls from Heights – Overhead Hazards – Electrical Hazards – Severe Weather/wind – Uneven surfaces
Controls Assess Surroundings/Surfaces – Fall Arrest System – Weather Reports

Unfinished Structure Interiors
Hazards Floor Openings – Wall Openings – Unguarded Fall Hazards – Trips/Falls Debris/Unfinished floor surfaces – Open Wiring (electrical hazard) – Poor Lighting – Falling Material from overhead work – Scaffolding – Air contaminants from gas/diesel powered equipment (generators, compressors, etc.)
Controls Fall Protection – Fall Arrest System – Boots – Hard Hat – Lighting – Ventilation/Air Monitoring

∗ Hazardous Waste/Materials (non-regulated site)
Hazards Hazardous Materials – Dust – Chemical Spill/Release
Controls Respirator – Dust Mask – Chemical Gloves – Disposal – Emergency Plan

SOPs to be used on this project:

#1 Confined Space Entry Program
∗ #2 Hazard Communications
∗ #3 Respiratory Protection Program
#4 Trenching & Excavations
∗ #5 Fall Prevention and Protection
∗ #6 Personal Protective Equipment
#7 Roadway and Traffic Safety
∗#8 Hazardous Field Conditions
∗#9 Work Related Injuries and Illnesses
#10 Hand and/or Power Tools
∗ #12 Hearing Conservation
∗ #14 Multi-Employer Site Safety
∗ #15 Vehicle Safety
#17 Radiation Safety
∗#18 Heat and Cold Stress
#19 Working Over or Near Water
∗#21 Bloodborne Pathogens
#22 Electrical Substation Safety
#23 Aerial Lift/Manlift Safety
∗ Other: #11

NOTE: unlisted SOPs do not apply to field activities

Completed by:_____ Date: _____

Reviewed by Field Personnel

Name and Signature	Date

Reviewed by Field Personnel

Name and Signature	Date

APPENDIX B – FIELD INSPECTION CHECKLIST
(Applies only to operations where PS&S Personnel are exposed)

Date:_____Completed by: _____

Job #_____Job Name _____

Project Manager_____

Other Assigned Personnel _____

	Administrative	**YES**	**N/A**	**NO**
1.	H&S Checklist or Site Specific HASP completed and available			
2.	Employees trained to conduct assigned tasks			
3.	Applicable SOPs understood			
4.	Medical Surveillance is completed.			
5.	OSHA postings and logs posted or available			
6.	Competent person(s) assigned by contractor where required			
7.	Documented site inspections conducted by contractor on a regular basis			
	Personal Protection Equipment	**YES**	**N/A**	**NO**
8.	Eye and face protection worn by workers exposed to potential eye or face injury			
9.	Hearing protective devices worn by workers where required			
10.	Foot protection worn where required			
11.	Hand protection in use where necessary			
12.	Hard hats serviceable and worn by employees and visitors			
13.	Respirators properly stored and worn. APR cartridges appropriate for the hazard			
14.	Briefly describe PPE in use:			
	Emergencies	**YES**	**N/A**	**NO**
15.	Emergency evacuation plan posted and/or communicated to site personnel			
16.	First aid kit provided, properly stocked			

17.	Emergency telephone numbers posted			
18.	Spill kit available, including PPE			
19.	Emergency exits and routes kept free of trip and slip hazard, free of obstructions			
	General Site Safety (only items that cause hazards to PS&S employees)	**YES**	**N/A**	**NO**
20.	Materials stacked and stored properly, Nails removed from lumber			
21.	Passageways and access points clear and free of obstructions			
22.	Adequate illumination in work areas and access points			
23.	Toilet and hand washing facilities available. Trash removed in a regular basis			
24.	Potable water labeled and available. Drinking cups available			
25.	Hazardous Materials labeled and properly stored			
26.	Heavy equipment operated at a safe speed			
Electrical (only if personnel are using power tools/equipment)		**YES**	**N/A**	**NO**
27.	GFCI usage throughout the jobsite, or Assured Equipment Grounding Conductor Program			
28.	Construction rated conductors, prongs intact, and protected from damage			
29.	Portable generators grounded per NEC requirements			
30.	Temporary lighting and site electricity wired on separate circuits			
31.	Electrical panels labeled. Completely enclosed, free of debris			
32.	Are terminal boxes equipped with required covers? Circuits labeled?			
33.	Temporary lighting protected from damage			
Fire Prevention (only if personnel are using or exposed to flammable liquids)		**YES**	**N/A**	**NO**
34.	ABC Fire extinguishers available, readily accessible and inspected (monthly, annual)			
35.	Flammable liquids stored in safety cans			
36.	Flammable materials stored away from electrical panels			
37.	Fuel tanks grounded. Grounding and bonding used when transferring contents			
Ladders (only if personnel are using ladders for access on site)		**YES**	**N/A**	**NO**
38.	Ladders secured. Extend 3 feet above the edge of the landing			

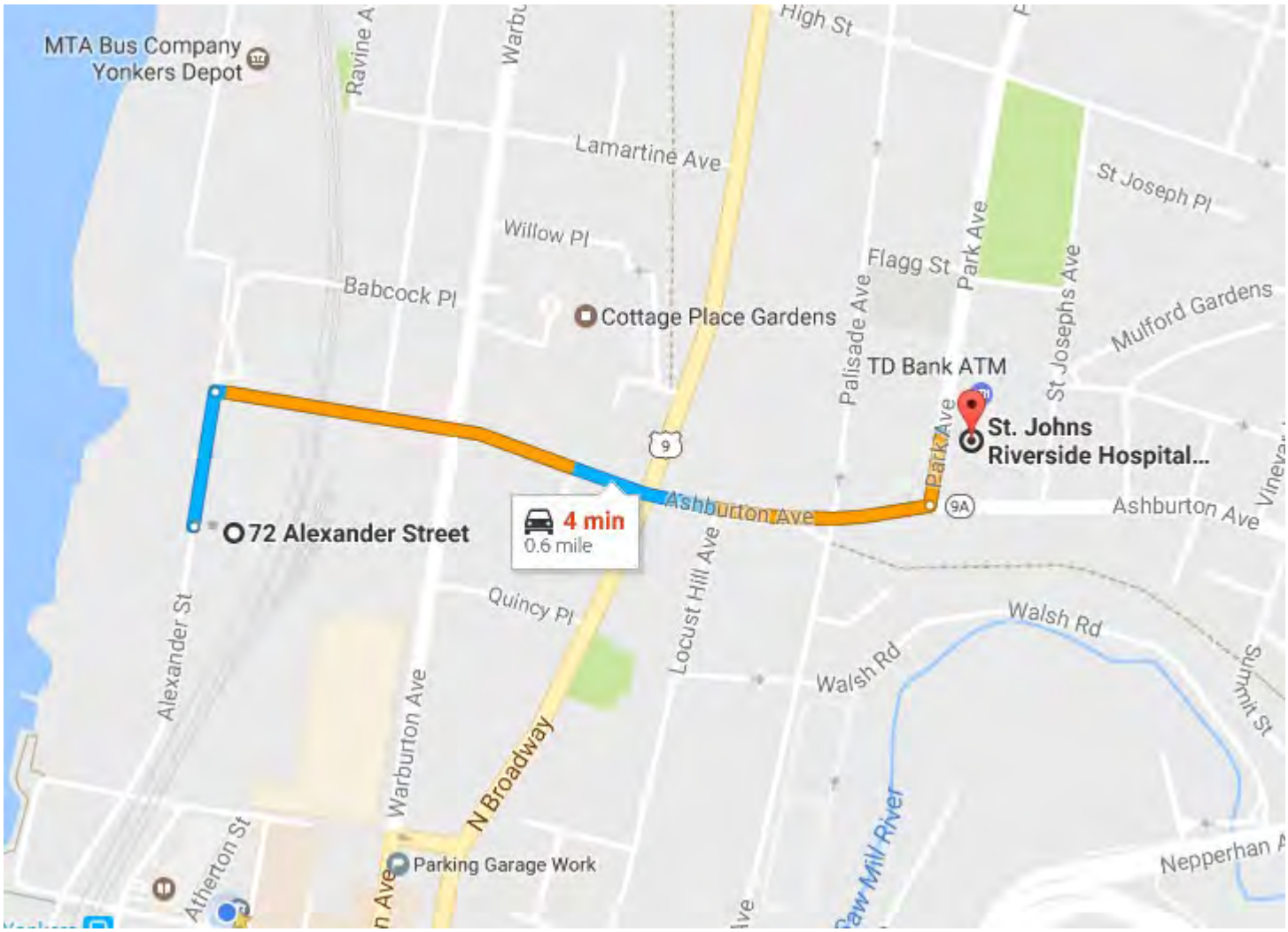
39.	Properly placed (4:1 ratio). Protected from accidental displacement			
40.	Free of damage. Capable of handling intended weight			
41.	Safe landings			
Tools (only if personnel are using tools)		**YES**	**N/A**	**NO**
42.	UL rated three prong or double insulated. Cords free of damage			
43.	Used in accordance with the manufacturer's intended purpose			
44.	Equipment guards installed			
45.	Air connections secured. Compressed air for cleaning limited to 30 PSI			
46.	Wet cutting equipment available or in use when cutting concrete			
47.	Cutting and grinding disks RPM rating is less than or equal to rating of the tool			
48.	Grinder disks ring tested and guards adequately spaced			
49.	Tools free of cracks, splinters and mushroomed heads. Handles properly attached to the tool			
50.	Proper tool used for the job. Neatly stored, safely carried			
Fall Protection (only if personnel are exposed to fall hazards)		**YES**	**N/A**	**NO**
51.	Anchorage secured to a structural member or capable of supporting 5,000 lbs of force			
52.	Anchorage placed above the user, not shared with other devices (i.e. lifting blocks)			
53.	Free of damage			
54.	Connections rated for fall protection. Double snap hooks			
55.	System deployment distance less than the distance to the ground			
56.	Conventional fall protection systems employed near wall openings, edges and open holes			
57.	Fall protection systems in use when working above 6 feet from a surface			
58.	Full body harness snug and properly connected			
59.	Working surface structural stability and falling object protection			
60.	Top rail of guardrail capable of handling 200 lbs of force. Midrail and toeboard installed			
61.	Full railing in place, free of gaps. Toprail 42" (+/- 3"), midrail between toprail and surface, and toeboard)			
Scaffolding (only if personnel are accessing scaffold)		**YES**	**N/A**	**NO**

62.	Plum, alike components used. Damaged components removed. Mudsills connected to scaffold			
63.	Adequate access provided			
64.	Fully railed (above 10 feet from a lower level). Railing adequate for the type of scaffold			
65.	Working levels fully planked. Planking not bowing or cracking. OSHA-rated planking in use			
66.	Erected away from electrical lines and not in use during inclement weather (unless authorized by CP)			
67.	Adequate plank spacing and overlap; between the scaffold and the structure			
68.	Scaffolds not used to stored materials overnight			
69.	Assembled and dismantled under the supervision of a competent person			
Excavation and Trenching (only if personnel must enter or work adjacent to excavations and/or trenches)		**YES**	**N/A**	**NO**
70.	Employees protected from cave-ins & loose rock/soil that could roll into the excavation			
71.	Spoils, materials & equipment set back at least 2 feet from the edge of the excavation			
72.	One call. Utility locations identified and precautions taken to ensure contact does not occur			
73.	Precautions taken to protect employees from water accumulation. Hoses braced from tipping			
74.	Surface water or runoff diverted /controlled to prevent accumulation in the excavation			
75.	Air in the excavation tested for oxygen deficiency, combustibles, other contaminants			
76.	Exit (i.e. ladder, sloped wall) no further than 25 feet from ANY employee			
77.	Combustion engines outside of excavation.			
78.	Excavation inspected and deemed safe by construction Competent Person			
Roadway and Traffic Safety (only if personnel must work on or adjacent to active roadways)		**YES**	**N/A**	**NO**
79.	ANSI approved reflective vests/jackets worn when working near vehicular traffic			
80.	Traffic control plan has established by construction contractor, reviewed with employees			
81.	Traffic control devices meet MUTCD specifications			
82.	Traffic control zones established and properly divided/marked			
Working Over or Near Water (only if personnel work over or near water)		**YES**	**N/A**	**NO**
83.	US Coast Guard-approved personal flotation device (PFD) worn			

84.	PFD in good condition			
85.	Water rescue devices (ring or throw buoy) available			
86.	Approved means to board watercraft provided			
Radiation Safety (only if personnel use equipment that contain radioactive materials or produce radiation)		**YES**	**N/A**	**NO**
87.	Shipping papers are readily accessible during transportation			
88.	Gauges handled properly, protected from damage, under control of user, with source material shielded when not in active use			
89.	Gauges transported in closed, doubly locked containers, secured against movement and theft			
90.	Gauges properly secured when not in use			
91.	Dosimetry badges worn properly (if personal dosimetry is required)			

COMMENTS/CORRECTIONS	
Please write the item number on the box on the left. Write a comment and the action taken on non-compliant areas.	

APPENDIX C – HOSPITAL LOCATION MAP



APPENDIX E – DAILY TAILGATE SAFETY MEETING FORM

SMALL GROUP FORMAT – SINGLE AND MULTIPLE DAYS
PROJECT NAME AND NUMBER: _____

Date: _____ Time: _____ Presenter: _____

Safety topics/items discussed:

_____
_____
_____

Site personnel in attendance:

Print Name	Signature	Company

Date: _____ Time: _____ Presenter: _____

Safety topics/items discussed:

_____
_____
_____

Site personnel in attendance:

Print Name	**Signature**	**Company**

Date: _____ Time: _____ Presenter: _____

Safety topics/items discussed:

_____
_____
_____

Site personnel in attendance:

Print Name	**Signature**	**Company**

SOP #2
Hazard Communication

Created: 7-20-2011
Revised: 9-17-2014

TABLE OF CONTENTS

1.0 PURPOSE

To provide guidance for the implementation of a comprehensive Hazard Communication program that effectively communicates the chemical hazards that may be encountered at PS&S field and office locations. This SOP does not apply to hazardous waste of any type.

2.0 SCOPE

This program applies to PS&S locations and the operations of PS&S employees at field sites where hazardous chemicals are used. This SOP does not address hazardous waste or samples of soil/water that may contain hazardous waste or chemical contaminants.

3.0 DEFINITIONS

Affected Employees – An employee who may be exposed to hazardous chemicals under normal operating conditions or in an emergency

Chemical – Any substance, or mixture of substances.

Chemical Manufacturer – An employer with a workplace where chemical(s) are produced for use or distribution.

Chemical Name – The scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name that will clearly identify the chemical for the purpose of conducting a hazard classification.

Classification – To identify the relevant data regarding the hazards of a chemical; review those data to ascertain the hazards associated with the chemical; and decide whether the chemical will be classified as hazardous according to the definition of hazardous chemical. In addition, classification for health and physical hazards includes the determination of the degree of hazard, by comparing the data with the criteria for health and physical hazards.

Common Name – Any designation such as a trade name, brand name, generic name, code name or code number that is used to identify a chemical and that is not its chemical name.

Container – Any bag, barrel, bottle, box, can, cylinder, drum, carton, or storage tank.

Hazard Category – The division of criteria within each hazard class, e.g., oral acute toxicity and flammable liquids include four hazard categories. These categories compare hazard severity within a hazard class and should not be taken as a comparison of hazard categories.

Hazard Class – The nature of the physical or health hazards, e.g., flammable solid, carcinogen, oral acute toxicity.

Hazard not otherwise classified (HNOC) – An adverse physical or health effect identified through evaluation of scientific evidence during the classification process that does not meet the specified criteria for the physical and health hazard classes in GHS.

Hazard Statement – A statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard.

Hazardous Chemical – Any chemical which is classified as a physical hazard or a health hazard.

Health Hazard – A chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard. Health Hazards apply to chemicals that are:

- Carcinogens
- Toxic or highly toxic agents
- Reproductive toxins
- Irritants
- Corrosives
- Sensitizers
- Hepatotoxins (liver toxins)
- Nephrotoxins (kidney toxins)
- Neurotoxins
- Agents that act on the hematopoietic system (blood forming system)
- Agents that damage the lungs, skin, eyes or mucus membranes.

Hazard Warning – Any words, pictures, accepted symbols or any combination thereof appearing on a label or other appropriate form of warning sign that conveys the hazard(s) of chemical(s) in the container.

Material Safety Data Sheet (MSDS) – A written or printed document that lists chemical, physical and toxicological information about a specific chemical.

Personal Protective Equipment (PPE) – Equipment that, when selected and used properly, provides protection from a specific chemical(s) and reduces an individual's exposure to that chemical.

Permissible Exposure Limit (PEL) – The airborne concentration of a chemical to which an employee may be exposed without the use of controls. PELs are published and enforced by OSHA.

Physical Hazard – A chemical that is classified as posing one of the following hazardous effects: explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid or gas); self- reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; or in contact with water emits flammable gas. Safety Data Sheet (SDS) – A written or

printed GHS-compliant document that lists chemical, physical, and toxicological information about a specific hazardous chemical. (new terminology for MSDS)

Threshold Limit Value (TLV) – The airborne concentration of a chemical to which it is believed that an employee may be exposed for 8 hours per day for the duration of a working lifetime and experience no irreversible health effects. These exposure limits are reviewed and published annually by the American Conference of Governmental Industrial Hygienists (ACGIH). They are not regulatory limits, but are acknowledged as best practice in industry since they are current.

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is responsible for the periodic review and update of the Hazard Communication program.

Human Resources (HR) – HR is responsible for the maintenance of training records.

Department Managers (DM) – The DM is responsible for the overall implementation of this Hazard Communication program within the offices and field operations under their control. The DM is responsible for providing appropriate personnel and resources so that operations can be conducted in a safe manner. The DM will designate an individual to assume the role of the Chemical Hazard Communication Officer (CHCO).

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO/DSO is responsible for making appropriate training and PPE available for employees who are potentially exposed to hazardous chemicals.

Chemical Hazard Communication Officer (CHCO) – The CHCO is responsible for the maintenance and updating of the chemical inventory, MSDS/SDS, and labeling of hazardous chemicals purchased or used by PS&S employees. The CHCO is responsible for obtaining and reviewing new hazardous chemicals purchased by PS&S to determine if additional control measures may be needed.

Purchasing/Receiving – The purchasing/receiving department/personnel are responsible for forwarding the MSDS/SDS received with any chemical shipment to the CHCO, as well as the appropriate PM and GSO/DSO. Receiving personnel will check incoming shipments of hazardous chemicals for appropriate labeling.

Project Manager (PM) or Site Representative (SR) – The PM or SR is responsible for maintaining and updating a site-specific chemical inventory list; verifying that container labeling at their sites is adequate; obtaining missing MSDS/SDSs; maintaining MSDS/SDSs or access to MSDS/SDSs (CD, online, or faxed); and notifying PS&S personnel of the hazards associated with specific chemicals to which they may be exposed. The PM or SR will also request information from the appropriate parties (contractors, general contractor, and owner) regarding any additional hazardous chemicals that may be on the site where PS&S employees may become exposed.

Employees – All employees are responsible for:

- Complying with this Hazard Communication program
- Observing label warnings
- Adhering to established safety procedures
- Reporting any unlabeled or unknown chemical containers to the PM or SR as soon as possible
- Not removing or defacing labels on hazardous chemicals

5.1 UPDATED OSHA HAZARD COMMUNICATION STANDARD (HAZCOM)

In 2012, the OSHA 1910.1200 Hazard Communications (HazCom) standard was updated to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The purpose of the revision was to improve the quality and consistency of hazard information in the workplace and to provide more easily understandable information on the appropriate and safe handing and use of hazardous chemicals. Major changes included:

- Hazard Classifications: The definitions of some health and physical hazards have been changed to align with GHS definitions.
- Label Requirements: Labels require a signal word, pictogram, hazard statement, and precautionary statement for each hazard class and category.
- Safety Data Sheets (SDS): SDSs will replace MSDSs. SDSs have specific formatting requirements to provide consistency of presentation of important safety information.
- Information and Training: Employees must be trained on the changes to the Hazard Communication standard and any changes to the hazard categories listed on new SDSs for previously used chemicals.

OSHA also established deadlines for implementing the changes in the Hazard Communications standard.

Deadlines for Complying with Revised OSHA Hazard Communication Standard		
Deadline	**Requirement(s)**	**Who**
December 1, 2013	Train employees on the new label elements and SDS format.	Employers
June 1, 2015 December 1, 2015	Comply with all modified provisions of this final rule, exception: Distributors may ship products labeled by manufacturers under the old system until December 1, 2015.	Chemical manufacturers, importers, distributors and employers
June 1, 2016	Update alternative workplace labeling and hazard communication program as necessary, and provide additional employee training for newly identified physical or health hazards.	Employers

During the transition period, it is acceptable to comply with the requirements of the original standard, the revised standard, or both. This SOP provides information and guidance on requirements of both the original and revised standards at this time.

6.0 HAZARD ASSESSMENT AND DETERMINATION

Hazard assessment of chemicals used by PS&S are made by the suppliers and manufacturers of these chemicals and communicated through the manufacturer's MSDS/SDS. PS&S relies on the information provided in these MSDS/SDS for implementation of this program.

7.0 SAFE WORK PRACTICES

- Do not underestimate the risk
- Minimize chemical exposures
- Provide adequate ventilation
- Appropriate Personal Protective Equipment (PPE) and equipment , must be worn/used by employees handling chemicals, please refer to SOP#6 for more information on PPE
- Working alone with chemicals is not recommended
- Confine long hair and loose clothing
- Sturdy, enclosed shoes must be worn in areas where chemicals are handled. Open-toe footwear is not permitted.
- When working with flammable chemicals, be certain that there are no sources of ignition near enough to cause a fire or explosion in the event of a vapor release or spill. Also properly ground containers before transferring flammable liquids from one container to another
- Use equipment and glassware only for the designed purpose
- Avoid inhalation of chemicals. Do not "sniff" to test chemicals
- Do not apply cosmetics, eat, drink, smoke or store foods or beverages where chemicals are used or stored.

8.0 CHEMICAL INVENTORY LIST

A site-specific list of hazardous chemicals will be maintained by the PM. Individual field locations will maintain a list of hazardous chemicals attached to the H&S Checklist or included with the site-specific HASP. The Chemical Inventory List will contain, at a minimum, the following:

- Product names

- Hazardous components
- Manufacturer's identification
- Location used

New chemicals will be added to the list when received. Please refer to Appendix B for the Chemical Inventory List.

9.1 LABELS

9.2 Incoming Products

Purchasing/receiving personnel will inspect products arriving from chemical manufacturers and/or distributors to verify that:

- The labels and warnings are appropriate, legible, in English, and prominently displayed on each container
- The existing labels have not been removed or defaced.

The PM or SR must be notified if a container arrives without a label; the label is illegible; or the label does not identify the chemical, the name and address of the manufacturer or list hazard warnings. The container may either be returned to the distributor, or an appropriate label will be attached by the PM or SR. The container must not be moved or used until the proper label is attached.

Labels must not be defaced or removed from hazardous chemical containers. Containers must be stored to prevent the labels from becoming damaged or worn by weather, chemicals, or physical contact.

9.1.1 GHS Compliant Labeling

To comply with the revised HazCom Standard, chemical containers from manufacturers and importers of hazardous chemicals must be labeled with:

- Product identifier; chemical or common name

- Signal word(s); danger or warning
- Hazard statement(s);
- Pictogram(s) (see Appendix A);
- Precautionary statement(s); and
- Name, address, and telephone number of the manufacturer, importer, or other responsible party.

9.3 Transfer Containers

When a hazardous chemical must be transferred from its original container to a new one, the transfer container must be adequately labeled and must be an appropriate container and compatible for the storage of that specific hazardous chemical. The label will include the chemical name, and appropriate hazard warnings, Chemical Abstract Service (CAS) Number, ingredients if it is a mixture, date prepared and initials of responsible person. The hazard warnings can be pictograms or words, however, pictograms must have red outlines if used.

The only exception to the labeling requirement is in cases where the transfer container will be emptied by the individual who filled the transfer container. This container must remain in the employee's control until it is emptied and may not exceed one shift.

10.1 SAFETY DATA SHEETS

MSDS/SDS for hazardous chemicals being used or stored at each location will be accessible to employees working at that site. The PM is responsible for maintaining MSDS/SDS for field site operations.

Newly received chemical MSDS/SDS should be reviewed by the CHCO, or his/her designee, prior to obtaining the chemical to review any potential severe health or physical hazards. PS&S accepts

the accuracy of the MSDS/SDS provided by the manufacturer or distributor of the hazardous chemical.

MSDS/SDS received from manufacturers and distributors will be maintained by PS&S for a period of 30 years. MSDS/SDS for chemicals no longer in use may be placed in an archives file. Field locations have access to MSDS/SDS by CD, internet, or fax from the PS&S Home Office.

10.2 SDS Required Format and Information

SDSs will have the following format:

- Section 1. Identification
- Section 2. Hazard(s) identification
- Section 3. Composition/information on ingredients
- Section 4. First-aid measures
- Section 5. Fire-fighting measures
- Section 6. Accidental release measures
- Section 7. Handling and storage
- Section 8. Exposure controls/personal protection
- Section 9. Physical and chemical properties
- Section 10. Stability and reactivity
- Section 11. Toxicological information
- Section 12. Ecological information
- Section 13. Disposal considerations
- Section 14. Transport information
- Section 15. Regulatory information
- Section 16. Other information, including date of preparation or last revision

11.0 NON-ROUTINE TASKS

In the event that an employee may be required to perform any non-routine tasks, the employee will be given information about hazardous chemicals involved with such tasks. This information will include:

- Specific chemical hazards
- Protective measures the employee can take
- Measures that PS&S has taken to lessen the hazards including ventilation, respirators, presence

of another employee, and emergency procedures

12.1 CHEMICAL SPILLS

Preplanning for chemical spills should be conducted during the initial safety review of new projects/procedures and the purchase of new chemicals. This review should include:

- Identification of areas subject to hazardous chemical spills
- Population in and adjacent to the area subject to a spill
- Physical and chemical characterization of the chemicals involved and the hazards posed by a spill
- Resources needed to mitigate a spill
- Volume of potential spill
- Expected spill drainage path
- Evacuation or emergency procedures, if needed

12.2 Incidental Chemical Spills

Incidental spills can be safely contained and cleaned by employees in the area who are trained to handle a spill. To reduce any potential employee exposure to spilled chemicals, the following guidelines will be used to determine appropriate personal protective equipment and personnel to safely contain and clean the spill.

- PPE for spill cleanup may include: chemical goggles, chemical resistant apron or coat, and chemical resistant gloves.
- Appropriate neutralization and/or absorption materials should be used to contain, neutralize, and absorb the spill.
- Neutralizing and absorption materials should be picked up after all liquid has been absorbed with non-sparking tools.
- All waste will be disposed of properly.
- Any highly hazardous/toxic chemical/agent in use must be evaluated to determine a maximum quantity for this incidental spill procedure.
- If an employee conducting an incidental spill cleanup begins to exhibit signs or symptoms of exposure to the chemical, the employee must leave the area immediately and call for emergency response assistance.
- Any spill in excess of the guidelines will be considered an emergency response.

13.0 WASTE DISPOSAL

Waste handling, collection and disposal procedures will be conducted in accordance with local, State and Federal regulations. The hazardous waste transport/disposal contractor must be consulted concerning disposal of wastes. Employees

14.1 CHEMICAL STORAGE

The following categories of chemicals should be stored in segregated and labeled areas with adequate ventilation. Chemicals should be stored in cabinets or on shelves with edge protection and in low traffic areas to prevent breakage. Chemicals should be stored below five feet whenever possible. Storage categories are:

- Flammable/combustible liquid
- Compressed gas
- Corrosive liquid – acids and alkalines should be stored separately
- Oxidizing liquid/solid – separate from all other chemicals

14.2 Flammable Liquid Storage

- Appropriate metal flammable storage cabinets are used for storage of flammable chemicals
- Store only mutually compatible chemicals inside the designated cabinet
- Do not store paper, cardboard or other combustible packing material inside cabinets
- Do not overload the cabinet
  - Classes I, II Flammable Liquid Storage Cabinets – volume limit 60 gallons
  - Class III Flammable Liquid Storage Cabinet – volume limit 120 gallons
  - Flammable Liquid Storage Outside Cabinet
    - Class 1A Container – 25 gallons
    - Classes 1B, 1C, II, III Containers – 120 gallons
    - Classes 1B, 1C, II, III Single Portable Tank – 660 gallons

14.3 Compressed Gas Storage

- Compressed gas cylinders must be secured in an upright position.

- When the cylinder is not in use, the regulator must be removed, and the safety valve cap must be installed.
- Cylinders must be labeled as to their contents and should have their status (i.e. full, empty).

15.0 TRAINING

PS&S employees who may be exposed to hazardous chemicals will be trained, as appropriate, regarding the characteristics and safe handling of hazardous chemicals in the workplace. Additionally, all PS&S employees will be provided training regarding the general principles of fire extinguisher use and the hazards involved in incipient stage firefighting. The PS&S Corporate Health and Safety Program includes an integrated training regime for all employees. All employees receive training at the time of hire and annually thereafter for basic health and safety practices in an office work environment.

Employees that work at off-site projects receive additional training to review potential hazards associated with field work. Training will be conducted at the time of initial assignment, prior to assignment of non-routine tasks, and whenever a new hazard or operation is introduced into the workplace. The following information will be provided in the training.

- Requirements of the OSHA Chemical Hazard Communication Standard (29 CFR 1910.1200)
- Location and availability of the PS&S Hazard Communication program.
- Details of the PS&S Hazard Communication program including:
  - An explanation of the labeling system and how to read labels
  - An explanation of the MSDS/SDS and how to obtain and use them
  - The location of hazardous chemicals to which employees may be exposed
  - The name(s) of hazardous chemicals present in the work area including generic, chemical, common, and trade names
  - The physical and chemical properties of hazardous chemicals to which employees may be exposed
  - Definition of terms (e.g. exposure, TLV, PEL, etc.)
  - Short and long term health effects of exposure to the hazardous chemicals
  - Symptoms of over exposure
  - Methods and observations that may be used to detect the presence or release of a hazardous chemical in the workplace (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance, or odor of hazardous chemicals when released)

- Safe handling of hazardous chemicals
- Emergency procedures to follow if exposed to hazardous chemicals
- Appropriate incidental spill procedures
- How to lessen or prevent exposure to hazardous chemicals through safe work practices
- Appropriate personal protective equipment (PPE)

Additional training may be required for those employees who handle or manifest hazardous waste.

16.0 INFORMING CONSTRUCTION AND PS&S CONTRACTORS AND SUBCONTRACTORS

Each PS&S contractor and subcontractor working on a site on which PS&S employees work will be provided the following information as part of their initial contact:

- A list of hazardous chemicals they may encounter while on the site
- How to obtain an MSDS/SDS for the chemicals on the list
- Hazardous chemicals to which they may be exposed
- Measures that may be taken to lessen the possibility of exposure
- Emergency procedures

Construction contractors as well as PS&S subcontractors will provide PS&S with MSDS/SDSs for any hazardous chemicals brought onto PS&S workplaces and must have appropriate labels on all containers.

17.0 RECORDKEEPING

The following records must be maintained:

- The PS&S Hazard Communication SOP
- Chemical Hazard Communication Training employee attendance sheets
- Chemical Inventory List (Appendix B)
- MSDS/SDS

These records will be updated periodically, as needed. The site CHCO is responsible for maintaining the Chemical Inventory List and MSDS/SDSs for that location.

18.0 REFERENCES

OSHA 29 CFR 1910.1200
OSHA 29 CFR 1926.59

APPENDIX A – OSHA HAZARD PICTOGRAMS

Health Hazard  • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	**Flame**  • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	**Exclamation Mark**  • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  • Gases Under Pressure	**Corrosion**  • Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals	**Exploding Bomb**  • Explosives • Self-Reactives • Organic Peroxides
Flame Over Circle  • Oxidizers	**Environment** (Non-Mandatory)  • Aquatic Toxicity	**Skull and Crossbones**  • Acute Toxicity (fatal or toxic)

APPENDIX B – CHEMICAL INVENTORY LIST

CHEMICAL/TRADE NAME	HAZARDOUS COMPONENTS	MANUFACTUER NAME	AMOUNT	LOCATION

SOP #3
Respiratory Protection Program

Created: 7-20-2011
Last Revision Date: 7-17-2014

TABLE OF CONTENTS

1.1 PURPOSE

This guideline provides necessary information to:

1. Establish a Respiratory Protection Program for PS&S employees whose project activities may require the use of a respirator;
2. Define project activities that may require respiratory protection; and,
3. Implement the PS&S Respiratory Protection Program (RPP).

2.1 SCOPE

This guideline applies to PS&S employees whose project activities may require the use of a respirator.

2.2 Permissible Practice

When feasible, employee exposures to a hazardous atmosphere will be controlled by accepted engineering controls. When engineering controls are not feasible or are not effective, appropriate respirators will be used. PS&S will provide employees with respirators suitable for the purpose intended, at no cost to the employee. These respirators will be utilized by employees as defined by the Site-Specific HASP, H&S Checklist, Department Manager (DM), Group and Department Health and Safety Officer (GSO/DSO), Project Manager (PM), or Site Representative (SR) or a designee. A medical evaluation prior to fit-testing will be conducted for each employee; the medical evaluation will be confidential, during normal working hours, convenient, understandable, and the employee given a chance to discuss the results with the physician or licensed health care professional (PLHCP). Employees in the respirator program will participate in annual medical surveillance and respirator fit-testing, implemented in accordance with the PS&S Health and Safety Program.

3.0 DEFINITIONS

Air Purifying Respirator – A respirator which is designed to remove air contaminants (i.e., dust, fumes, mists, gases, vapors, or aerosols) from the ambient air as the air enters the respirator.

Approved Respirator – A respirator which has been tested, found to comply with established performance criteria, and listed as being approved by an authority such as MSHA (Mine Safety and Health Administration) or NIOSH (National Institute of Occupational Safety and Health).

Atmosphere Supplying Respirator – A respirator which supplies the wearer with air from a source independent of the immediate ambient atmosphere. This includes supplied-air respirators and self-contained breathing apparatus (SCBA) units.

End–of-Service Life Indicator (ESLI) – A system that warns the respirator user of the approach of the end of adequate respiratory protection.

Filtering Facepiece (Dust mask) – A negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Immediately Dangerous to Life or Health (IDLH) – An atmospheric concentration of any toxic, corrosive or asphyxiating substance that poses an immediate threat to life or would cause irreversible or adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

Maximum Use Concentration (MUC) – The maximum concentration of an air contaminant in which a particular respirator can be used, based on the respirator's assigned protection factor. The MUC cannot exceed the use limitations specified on the NIOSH/MSHA approval label for the cartridge, canister, or filter.

Negative Pressure Respirator – A respirator in which the air pressure inside the facepiece is negative during inhalation in respect to the ambient air pressure outside the respirator.

Oxygen Deficient Atmosphere – An atmosphere with an oxygen content of less than 19.5% by volume (an IDLH atmosphere).

Permissible Exposure Limit (PEL) – The airborne concentration of a chemical to which an employee may be exposed without the use of controls. PELs are published and enforced by OSHA.

Positive Pressure Respirator – A respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

Powered Air Purifying Respirator – An air purifying respirator which uses a blower to deliver air through the air purifying element to the inlet covering.

Protection Factor – The value regarded, as applicable, for an achievable ratio of average ambient concentration of an air contaminant in a workplace to the average concentration of the contaminant measured inside the respirator facepiece for a specific class of respirators.

Qualitative Fit Test – A pass/fail fit test to assess the adequacy of a respirator fit that relies on the individual's response to the test agent.

Quantitative Fit Test – An assessment of the adequacy of a respirator fit by numerically measuring the amount of leakage into the respirator.

Respirator – Any device worn by an individual and intended to provide the wearer with respiratory protection against inhalation of airborne contaminants or oxygen-deficient air.

Self Contained Breathing Apparatus (SCBA) – An air supplying respirator for which the source of air is carried by the wearer.

Service Life – The period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.

Supplied Air Respirator – A respirator which receives breathable air through an air line or hose from a portable or stationary source of compressed air.

Threshold Limit Value (TLV) – The airborne concentration of a chemical to which it is believed that an employee may be exposed for 8 hours per day for the duration of a working lifetime and experience no irreversible health effects. These exposure limits are reviewed and published annually by the American Conference of Governmental Industrial Hygienists (ACGIH). They are not regulatory limits but are acknowledged as best practice in industry since they are current.

4.0 RESPONSIBILITIES

Respiratory Program Administrator (RPA) – The Respiratory Program Administrator is a designated qualified person who is responsible for administrating and overseeing the respiratory protection program and conducting the required evaluations of program effectiveness (required by 29 CFR 1910.134). PS&S Groups and Departments that require the use of respiratory protection for some tasks will designate a Respiratory Program Administrator to oversee the use of respirators and the implementation of this program. The RPA will also oversee the medical surveillance requirements of this program and confirm that appropriate records be forwarded to PS&S Human Resources (HR) for maintenance. The RPA will schedule annual training and fit

testing and confirm that medical approval has been received. The RPA will conduct annual review of the implementation of this SOP in the applicable units.

Human Resources (HR) – Human Resources is responsible for maintaining medical, fit testing and training records. HR is also responsible for scheduling medical clearance for respirator users.

Corporate Safety Officer (CSO) – The CSO is responsible for periodic review of the guidelines in this RPP.

Department Managers (DM) – The DM is responsible for the overall implementation of this RPP for the employees in their department. The DM is responsible for determining that employees have been trained and medically qualified for respirator use, that facilities are provided for the cleaning and storage of respirators, and that appropriate procedures are used.

Group and Department Health and Safety Officer (GSO/DSO) – The GSO/DSO is responsible for making training and fit testing available to employees who may be required to use respirators. The GSO/DSO will also provide employees with required respiratory protection. The GSO/DSO may also provide guidance and assistance with assessing hazards and determining the necessary resources for controlling those hazards.

Project Manager (PM) or Site Representative (SR) – The PM/SR is responsible for reviewing the on-site use of respirators for proper use and maintenance.

Field Personnel (FP) – FP must use the provided respiratory protection in accordance with this RPP and the training received. The FP must check the facepiece seal each time the respirator is worn. The FP must routinely inspect and clean the respirator as instructed, protect it from damage, and report any malfunctions or problems refer to Appendix D, Respirator Inspection Form.

5.0 RESPIRATOR SELECTION

Respirators certified by the National Institute for Occupational Safety and Health (NIOSH) must be selected and used in compliance with the conditions of its certification. Respirators must be selected on the basis of the respiratory hazard(s) at the site and user factors that affect respirator performance and reliability. Respirator selection criteria include:

- General use conditions, including determination of contaminants, oxygen deficiency, or IDLH atmospheres
- Physical, chemical, and toxicological properties of the contaminant(s)

- Warning properties of the contaminant(s)
- Exposure Limits (PELs, TLVs see definitions in section 3.0)
- Assigned Protection Factors
- Maximum Use Concentrations
- Eye irritation potential
- End of service life determination
- Location of "safe" area
- Duration of respirator use

6.0 RESPIRATOR TRAINING

Employees required to wear respirators must be trained before wearing a respirator. Training must be comprehensive and understandable. It must be performed prior to requiring the employee to use a respirator and ***annually*** thereafter. This training will be included in disciplinary specific training, such as HazWOPER, Asbestos, Lead, etc.

The following, as a minimum, will be included in the training:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
- What are the limitations and capabilities of the respirator
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions
- How to inspect, put on and remove, use, and conduct negative and positive pressure seal checks of the respirator
- What are the procedures for maintenance and storage of the respirator
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators
- The general requirements of the OSHA Respiratory Protection Standard.

7.0 RESPIRATOR FIT TESTING

- Each employee required to wear a respirator will be fit tested using accepted fit test methods as described in 29 CFR 1910.134, Appendix A.
- Qualitative or Quantitative fit testing must be performed prior to initial use of respirators and at least annually thereafter.
- A qualified person must administer fit testing. The person performing the fit testing will provide required documentation of the fit test protocol(s) used and results. The Fit Test Records forms in Appendix C of this SOP should be used.
- Fit tests will be performed using the same make, model and size of respirator to be worn.

- A User Seal Test following Appendix B-1, 1910.134 must be performed immediately after donning and adjusting the respirator, each time a respirator is used.

8.1 RESPIRATOR MAINTENANCE AND CARE

Respirators will be properly maintained and must be in working order. Respirators that are not functioning properly will be removed from use.

8.2 Inspection

Respirators must be inspected by the user a minimum of biannually and will be documented using Appendix D – Respirator Inspection Form.
In addition:

- Routinely used respirators should be inspected before each use and during cleaning
- Emergency use respirators should be inspected after each use.

The inspection must include a check of respirator function, tightness of connections, and the condition of the various parts of the respirator, including a check of the elastomeric parts for pliability.

Respirator Inspection Forms will be sent to the user's direct supervisor. These forms will be maintained for seven (7) years. Supervisors may periodically conduct respirator condition audits using Appendix D to confirm conformance with this SOP.

8.3 Issues During Use

Employees will immediately leave the respirator use area if they suspect their respirator is not functioning properly. Signs of malfunction can include the employee detecting vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece.

Prior to returning to the respirator use area, the employee's respirator will be replaced or repaired/serviced, as appropriate.

Employees will also leave the respirator use area to wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use.

8.4 Cartridge/Filter Changing/Replacement

Filters/cartridges used on air-purifying respirators must be replaced when one of the following occurs:

- Change is scheduled according to cartridge replacement schedule created by the GSO/DSO, PM/SR or a designee (change schedules for respirators should be documented in the site-specific HASP)
- Increase of breathing resistance for particulate cartridges
- Respirator cartridge End-of-service-life indicator shows a change color change
- The employee detects "break-through" during use.

Employees will not change or remove cartridges/filters in the respirator use area. When possible, scheduled replacement of cartridges/filters will be conducted prior to entering the respirator use area/exclusion zone. If replacement is due while the employee is in the respirator use area/exclusion zone, or if the employee experiences any of the situations in the above list, the employee will leave the respirator use area prior to removing the cartridges/filters.

8.5 Cleaning and Disinfecting

Respirators will be properly cleaned and disinfected after each use in accordance with Appendix B-2, 1910.134. The respirators will be cleaned and disinfected at the following intervals:

- Respirators issued for the exclusive use of an employee will be cleaned and disinfected as often as necessary to be maintained in a sanitary condition
- Respirators issued to more than one employee will be cleaned and disinfected before being worn by different individuals
- Respirators maintained for emergency use will be cleaned and disinfected after each use
- Respirators used in fit testing and training will be cleaned and disinfected after each use.

8.4.1 Cleaning Procedure

- Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.
- When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
    - Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,
    - Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F); or,
    - Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
    -
- Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- Components should be hand-dried with a clean lint-free cloth or air-dried.
- Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.
- Test the respirator to verify that all components work properly.

8.6 Repair

Respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired as follows:

- Repairs or adjustments are made only by individuals who have been appropriately trained
- Only manufacturer's NIOSH-approved parts are used
- Repairs are only conducted according to manufacturer recommendations and specifications
- Reducing and admission valves, regulators, and alarms (SCBAs) must be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

8.7 Proper Respirator Storage

Respirators must be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals. They must be stored to prevent deformation of the facepiece and exhalation valve. A cleaned respirator should be kept in a plastic bag and box or hung in a closed locker.

Storage for emergency respirators must comply with the above requirements, plus:

- Be kept accessible to the work area
- Stored in compartments or in covers that are clearly marked as containing emergency respirators
- Stored in accordance with the manufacturer recommendations

9.0 MEDICAL SURVEILLANCE

Employees assigned to tasks requiring the use of respirators will be medically evaluated to determine if they are physically able to wear respirators without posing a physical hazard. These determinations must be made prior to any use, including fit testing, and must be completed by a

physician. In some states a Licensed Health Care Professional (LHCP) other than a physician may conduct the evaluation.

These medical evaluations may be repeated, as deemed appropriate, by the physician or Respiratory Program Administrator or if there are medical reasons to re-evaluate the employee.

The following information must be provided to the physician before a medical determination can be made:

- Type and weight of respirator that is to be used
- Duration and frequency of respirator use
- Expected physical work effort
- Additional protective clothing and equipment to be worn;
- Temperature and humidity extremes that may be encountered
- Written copy of this respiratory protection program

A written recommendation must be obtained from the physician. The recommendation will provide information on any limitations on respirator use. Additional medical evaluations must be provided if any of the following occurs:

- An employee reports medical signs or symptoms that are related to ability to use a respirator
- A LHCP, PM/SR, or the Respirator Program Administrator informs the employer that an employee needs to be reevaluated
- Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation
- A change occurs in workplace conditions that may result in a substantial increase in the physiological burden placed on an employee.

10.1 RECORDKEEPING

Records of employee exposure, monitoring, medical surveillance, training, inspection and maintenance will be maintained in accordance with Section 7.0, Recordkeeping of the PS&S Health and Safety Program Summary.

10.2 Fit Tests

Records of qualitative and/or quantitative fit tests will be maintained until the employee's next fit test. The records must include the name and identification of employee, type of fit test performed, make, model, style, and size of respirator tested, date of fit test, and fit test results. Fit test forms are available in Appendix C of this SOP.

10.3 Respirator Inspection Forms

Respirator Inspection forms will be maintained for seven (7) years by the supervisor of the respirator user.

11.0 PROGRAM EVALUATION

The Respiratory Program Administrator will conduct periodic evaluations of the RPP. The RPP Evaluation Checklist/Questionnaire in Appendix B of this section can be used for this evaluation. The Respiratory Program Administrator should:

- Consult with users to determine program acceptance
- Conduct inspections of respirator use
- Review required records

12.1 SPECIAL CONSIDERATIONS IN RESPIRATOR USE

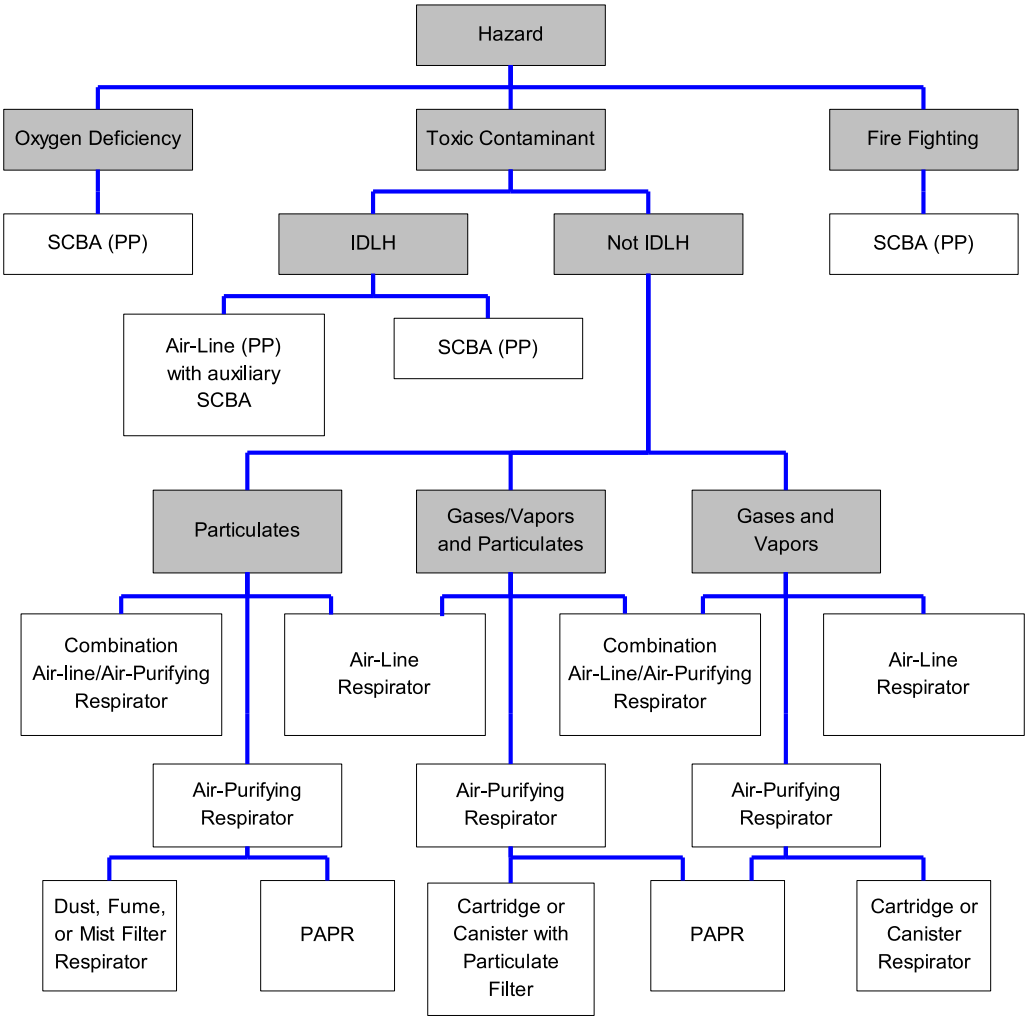
12.2 Facial Hair

Respirators will not be worn when conditions prevent a good respirator facepiece-to-face seal. Persons with facial hair that interferes with the facepiece-to-face seal or the operation of the inhalation or exhalation valves will not be permitted to wear or be fitted with a respirator until such conditions are corrected.

12.3 Corrective Lenses

- Employees with eyeglass temple pieces which interfere with the facepiece-to-face seal of the respirator will not be permitted to wear or be fitted with a respirator until such conditions are corrected.
- If corrective lenses are required, contact lenses or special lens holding devices which do not interfere with the facepiece-to-face seal may be utilized.

APPENDIX A - RESPIRATORY PROTECTION SELECTION DIAGRAM



APPENDIX B - PROGRAM EVALUATION CHECKLIST/QUESTIONNAIRE

RESPIRATOR USE

Employee Name _____
Identification _____
Position _____
Description of Work Activities:
_____
_____
_____

1. What jobs/activities require the use of respiratory protection?

2. Is respiratory protection used every time that it is required?

3. What type of respiratory protection is used?

4. Where is the respiratory protection stored?

5. How is the respiratory protection cleaned and maintained?

6. What was date of the last fit test?

7. When did employee last receive respiratory protection training?

8. Are other employees that are required to use respiratory protection using it properly/effectively?

List any problems/concerns/comments on back of form.

APPENDIX C - FIT TEST RECORDS

QUANTITATIVE FIT TEST RECORD

Name:_____ Respirator Type: _____

I.D. Number:_____ Manufacturer: _____

Test Date:_____ Size: _____

Next Test Due: _____

Fit-Test ***Protocol*** ***Used***:

_____

Test Exercises[1]

Exercise	Fit Factor
Normal Breathing	
Deep Breathing	
Turning Head Side to Side	
Moving Head Up and Down	
Read Rainbow Passage	
Grimace	
Jog in Place or Bend Over and Touch Toes	
Normal Breathing	
	Overall Fit Factor:

Test Administered by: (print name): _____ Date: _____

(signature): _____

[1] All test exercises should be performed for one (1) minute duration, except Grimacing -- which should be performed for 15 seconds.

QUALITATIVE FIT TEST RECORD

Name: _____ Respirator Type: _____

I.D. Number: _____ Manufacturer: _____

Test Date: _____ Size: _____

Next Test Due: _____

Fit-Test Protocol Used: _____

Sensitivity Check Performed? Yes No

Saccharin: 10 20 30 Irritant Smoke: Yes / No

Bitrex: 10 20 30 Isoamyl acetate: Yes / No

Test Exercises[2]

Normal Breathing	Pass	Fail
Deep Breathing	Pass	Fail
Turning Head Side to Side	Pass	Fail
Moving Head Up and Down	Pass	Fail
Read Rainbow Passage	Pass	Fail
Jog in Place or Bend Over and Touch Toes	Pass	Fail
Normal Breathing	Pass	Fail

Test Administered by:

(Print name): _____ Date: _____

(Signature): _____

[2] All test exercises should be performed for one (1) minute duration

APPENDIX D – RESPIRATOR INSPECTION CHECKLIST

Type of Respirator:	**Location:**	
Respirator Issued to:		**Date:**
Types of Hazard:		**In-Service Date:**
Face piece	_____**Cracks, tears, or holes** _____**Face mask distortion** _____**Cracked or loose lenses/face shield**	
Head straps	_____**Breaks or tears** _____**Broken buckles**	
Valves	_____**Residue or dirt** _____**Warped or rippled** _____**Cracks or tears in valve material**	
Filters/Cartridges	_____**Proper cartridge for hazard** _____**Approval designation** _____**Gaskets missing, cracked, dried condition** _____**Cracks or dents in housing**	
Air Supply Systems	_____**Condition of supply hoses** _____**Hose connections** _____**Settings on regulators and valves** _____**SCBA Tank pressure (90%)**	
Rubber/Elastomeric Parts	_____**Pliability** _____**Deterioration – cracks, tears, degradation**	
Inspected by:		**Date:**
Action Taken:		

SOP #4
Trenching & Excavations

Created: 7-20-2011
Last Revision Date: 11-2-2011
Last Revision Date: 7-19-2012

TABLE OF CONTENTS

1.0 PURPOSE

To establish safe operating procedures for PS&S employees working in or near excavation or trenching operations at PS&S field sites.

2.0 SCOPE

Applies to all field locations and activities that may expose PS&S employees to excavation or trenching hazards. While the actual excavation activities will not be conducted by PS&S, employees may still be exposed to the same hazards when required to be in the area of such operations. This SOP is not intended to cover any PS&S contractors or subcontractors or any other contractor, nor will it be used to in any way define the means and methods of the construction contractor's operations.

3.0 DEFINITIONS

Adjacent Area – The horizontal surface area surrounding the excavation, which extends outward from the excavation edge up to a distance that is half the depth of the excavation.

Competent Person – Competent Person is one who is capable of identifying existing and potential hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authority to take corrective action to eliminate or reduce the hazard.

Excavation – Any manmade cavity or depression in the earth's surface, including its sides, walls, or faces, formed by earth removal and producing unsupported earth conditions.

Protective System – Shoring, shielding, sloping or equivalent designed to prevent collapse of the excavation.

Trench – A narrow excavation made below the earth's surface. In general, the depth is greater than the width, but the width of a trench is no greater than 15 feet.

4.0 RESPONSIBILITIES

Contractor Competent Person – The Contractor Competent Person is designated by the excavation contractor and is responsible for identifying the hazards and potential hazards during an excavation activity, including testing to determine soil types, protective systems design requirements,

hazardous atmospheres and daily inspection requirements. They are responsible for inspecting the excavation daily, completing the Excavation Checklist (Appendix A), and prohibiting entrance into unsafe excavations. They are responsible for completing the Soil Analysis Checklist (Appendix B) when soil analysis has been performed to determine the type (s) of soil present in the excavation site. Any deficiencies must be corrected before work can occur inside the excavation. All subcontractors are responsible for providing their own competent person for their own excavation activities. PS&S employees will not assume the Competent Person Role, and will inquire of the Contractor's Competent Person whether entry is safe; if the Contractor Competent Person refuses to advise PS&S, then a PS&S employee may advise only PS&S employees and employees of a PS&S contractor whether it is safe to enter but only if (a) specifically trained to do so and (b) that role is approved, on a case by case basis, by the CSO in writing.

Corporate Safety Officer (CSO) – The CSO is responsible for the periodic review and update of this program.

Human Resources (HR) – HR is responsible for the maintenance of training records.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO and/or DSO is responsible for making available appropriate training and personal protective equipment to conduct operations safely.

Department Manager (DM) – The DM is responsible for the overall implementation of this program. The DM is also responsible for providing appropriate personnel and resources so that operations can be conducted in compliance with this program.

Project Manager (PM) or Site Representative (SR) – The PM or SR is responsible for making sure that the designated competent person for any excavation is on site each day the excavation will be entered by PS&S employees and that the appropriate inspections have been completed. The PM or SR will verify that PS&S personnel entering or working near excavations have been appropriately trained.

Employee – PS&S employees are responsible for knowing the hazards and understanding the consequences of entering an excavation not inspected and approved by a competent person. They must understand and utilize the provided personal protective equipment and exit the excavation if the Competent Person orders evacuation. Employees will not enter excavations unless the task cannot be accomplished from above.

5.1 GUIDELINES

PS&S will use these guidelines for any entry into an excavation for any purpose.

5.2 Hazards Associated with Excavation/Trenching

The principle hazards associated with excavation/trenching are:

- Suffocation, crushing or other injury from falling material.
- Damage/failure of installed underground services and consequent hazards.
- Tripping, slipping or falling.
- Possibility of explosive, flammable, toxic or oxygen-deficient atmosphere in excavation.

5.3 Hazard Controls

- Stairs, ladders or ramps are required for trenches that are greater than 4 feet deep.
- Travel distance to get to a ladder/stair/ramp must be no more than 25 feet.
- The construction contractor's Competent Person should have inspected the excavation each day prior to any entry and should have completed an Excavation Checklist equivalent to the one in Appendix A.
- The construction contractor's Competent Person should have completed a Soil Analysis Checklist (Appendix B) when soil analysis has been performed to determine the type(s) of soil present in the excavation.
- No PS&S employees are permitted underneath loads handled by lifting or digging equipment.
- BEFORE a PS&S employee enters the excavation, PS&S must confirm that the construction contractor's Competent Person has tested the atmosphere in excavations greater than 4 feet deep, as well as ones where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist (such as in excavations in landfill areas or in areas where hazardous chemicals are stored nearby). A four-gas meter should have been used to check for lower explosion limit, CO, H_2S and O_2.
- If necessary to avoid an oxygen deficiency or a hazardous atmosphere, the construction contractor will provide forced ventilation using a standard blower to provide for safe entry based upon the contaminants in the excavation. Validate the efficiency of the ventilation by verifying that the four gas meter is kept in the excavation while employees are inside.
- Water should not be allowed to accumulate within any excavation. The construction contractor should have a portable pump available to dewater the hole prior to personnel entry.
- Spoil piles must be maintained at least two feet from the edge of the excavation.
- In general, PS&S employees should not work alone on potentially hazardous sites such as performing bridge or rooftop inspections, excavations, or certain surveys. The need for a second team member to be available for assistance should be evaluated

by the SR in consultation with the PM or DM.

5.4 Requirements for Protective Systems

Excavations less than 5 feet deep are not required to have protective systems if deemed safe by the construction contractor's Competent Person. Any excavation 5 feet deep or more requires some protective system. Some excavations less than 5 feet deep may still need protection systems in unstable soil conditions.

Protective systems may include benching, sloping, shoring or shielding and may be designed by competent persons using the OSHA tables in 1926 subpart P or may be designed by a registered Professional Engineer (PE). Since there are so many specifications for these systems, it is imperative that a competent person evaluate the excavation.

5.5 Inspections

PS&S must determine that the construction contractor's designated competent person has performed inspections each day before PS&S employees enter the excavation, after every rainstorm, as needed throughout the shift, and as soil conditions change.

The competent person's inspection will include:

- Adequacy of the protective system (*e.g.,* shoring) for the soil classification and the external loads placed on the adjacent area;
- Hazardous atmospheres;
- Potential cave-ins;
- Indications of failure of a protective system;
- Cracks in the ground parallel to the top of the excavation; and
- Whether ladders or other means of access/egress are provided no more than 100 feet apart, with a maximum travel distance of 25 feet for trench excavations greater than 4 feet in depth.

5.6 Entering the Excavation

PS&S employees will **NOT** enter an excavation unless the onsite Competent Person or PM/SR has coordinated with the construction contractor/subcontractor/consultant's Competent Person to verify that the excavation has been inspected and is deemed safe. PS&S employees will **NOT** enter any excavation unless the task cannot be accomplished from above.

5.7 Employee Information and Training

PS&S Construction Awareness training will include hazard recognition associated with entering excavations or trenches and emergency egress procedures.

5.8 Recordkeeping

The construction contractor's Competent Person should maintain copies of available Excavation Checklists and any Soil Analysis Checklists.

6.0 REFERENCES

OSHA Regulations 29 CFR 1926 Subpart P – Excavations

APPENDIX A - EXCAVATION CHECKLIST

(to be completed by a construction contractor's Competent Person)

Site Location:_____

Date:_____ Time:_____ Competent Person:_____

Soil Type (see attached form):_____

Soil classification:_____ Excavation depth:_____ Excavation width:_____

Type of protective system used:_____

(Indicate for each item: Yes – No – or N/A for Not Applicable)

I. General inspection of job site:

A. Excavations, adjacent areas and protective systems inspected by a competent person daily prior to the start of work. _____

B. Competent person has authority to remove employees from the excavation immediately. _____

C. Surface encumbrances removed or supported. _____

D. Employees protected from loose rock or soil that could pose a hazard by falling/rolling into the excavation. _____

E. Hard hats worn by all employees. _____

F. Spoils, materials and equipment set back at least 2' from the edge of the excavation. _____

G. Barriers provided at all remotely located excavations, wells, pits, shafts, etc._____

H. Walkways and bridges over excavations 4' or more in depth are equipped with standard guardrails. _____

I. Class 2 or Class 3 high visibility vests or other highly visible clothing provided and worn by all employees exposed to public vehicular traffic. _____

J. Employees are required to stand away from vehicles being loaded or unloaded_____

K. Warning system established and utilized when mobile equipment is operating near the edge of excavation. _____

L. Employees prohibited from going under suspended loads. _____

M. Employees prohibited from working on the faces of sloped or benched excavations above other employees. _____

N. Utilities:

a. Utility companies contacted and/or utilities located. _____

b. Exact location of utilities marked when approaching the utilities. _____

c. Underground installations protected, supported or removed when excavation is open. _____

II. Means of access and egress:

A. Means of egress no greater than 25' lateral travel distance in excavations 4' or more in depth. _____

B. Ladders used in excavations are secured and extend 3' above the edge of the trench. _____

C. Structural ramps used by employees designed by a competent person. _____

D. Structural ramps used for equipment designed by a registered professional engineer (PE). _____

E. Ramps constructed of materials of uniform thickness cleated together on the bottom, equipped with no-slip surface _____

F. Employees protected from cave-ins when entering or exiting the excavation. _____

III. Wet conditions:

A. Precautions taken to protect employees from the accumulation of water. _____

B. Water removal equipment monitored by a competent person. _____

C. Surface water or runoff diverted or controlled to prevent accumulation in the excavation. _____

D. Inspections made after every rainstorm or other hazard occurrence. _____

IV. Hazardous atmosphere:

A. Atmosphere within the excavation tested where there is a reasonable possibility of an oxygen deficiency, combustible or other harmful containment. _____

B. Adequate precautions taken to protect employee from exposure to an atmosphere containing less than 19.5% oxygen and/or to other hazardous atmospheres. _____

C. Ventilation provided to prevent employee exposure to an atmosphere containing flammable gas in excess of 20% of the lower explosive limit of the gas _____

D. Testing conducted often to verify that the atmosphere remains safe. _____

E. Emergency equipment, such as breathing apparatus, safety harness and line, and basket stretcher readily available where hazardous atmospheres could or do exist.

F. Employees trained to use personal protective and other rescue equipment. _____

G. Safety harness and life line used and individually attended when entering bell bottom or other deep confined excavations. _____

V. Support systems:

A. Materials and/or equipment for support systems selected based on soil analysis, trench depth and expected loads. _____

B. Materials and equipment used for protective systems inspected and in good condition. _____

C. Materials and equipment not in good condition has been removed from service. _____

D. Damaged materials and equipment used for protective systems inspected by a Registered Professional Engineer (RPE) after repairs and before being placed back into service. _____

E. Protective systems installed without exposing employees to the hazards of cave-ins, collapses or from being struck by materials or equipment. _____

F. Members of support system securely fastened to prevent failure. _____

G. Support systems provided to insure stability of adjacent structures, buildings, roadways, sidewalk, walls, etc. _____

H. Excavations below the level of the base or rooting approved by an RPE. _____

I. Removal of support systems progresses from the bottom and members are released slowly as to note and indication of possible failure. _____

J. Backfilling progresses with removal of support system. _____

K. Excavation of material to a level no greater than 2' below the bottom of the support system and only if the system is designed to support the loads calculated for the full depth. _____

L. Shield system placed to prevent lateral movement. _____

M. Employees are prohibited from remaining in shield system during vertical movement. _____

VI. Remarks: _____

_____

_____

Date:_____ Signature:_____

SOP #4 Trenching & Excavations

Weather:_____ Project:_____

Was Dig Safe Contacted: Yes_____No_____

Protective System: Trench Shield (Box)_____
Wood Shoring Sloping_____Other_____

Purpose of Trenching: Drainage_____Water_____
Sewer_____Gas_____Other_____

Were Visual Tests Taken: Yes_____No_____

Type of Soil:_____

Soil Strength:_____

Hazardous Atmosphere Exists: Yes_____No_____if yes, refer to SOP#1 *Confined Space Entry Program*, complete Confined Space Entry Permit. (4 ft. trenches or greater)

Is trenching or excavation exposed to public vehicular traffic (exhaust emission):
Yes_____ No_____if yes, refer to SOP#1 *Confined Space Entry Program*, monitor for

Toxic Gas(es).

Measurement of Trench: Depth_____Length_____Width_____

Is a ladder within 25 feet of travel distance: Yes_____No_____

Is excavated material stored 2 feet or more from edge of the excavation: Yes_____No_____

Are employees exposed to public vehicular traffic: Yes_____No_____
(If yes, visibility vests are required)

Are other utilities protected: Yes_____No_____Not required_____
(Water, sewer, gas or other structures)

Are sewer or natural gas lines exposed: Yes_____No_____(If yes, refer to SOP#1 *Confined Space Entry Program*, Complete Confined Space Entry Permit, monitor for Toxic Gas(es)).

Periodic Inspection: Yes_____No_____Last_____

Did employees receive Training in Excavation: Yes_____No_____

APPENDIX B - SOIL ANALYSIS CHECKLIST

(to be completed by a construction contractor's Competent Person)

This checklist must be completed when soil analysis has been performed to determine the type(s) of soil present in the excavation. A separate analysis must be performed for each layer of soil in excavation walls. A separate analysis must be performed if the excavation (trench) is stretched out over a distance where the type of soil may change.

Site Location:_____

Date:_____Time:_____Competent Person:_____

Where was the sample taken from:_____

Excavation: Depth_____Width_____Length_____

Visual Test

Particle type: Fine-grained (cohesive)_____Course grained (sand or gravel)_____

Water conditions: Wet_____Dry_____Surface water present_____Submerged_____

Previously disturbed soils: Yes_____No_____

Underground utilities: Yes_____No_____If yes, what type?_____

Layered soils: Yes_____No_____ Layered soil dipping into excavation: Yes_____No____

Excavation exposed to vibrations: Yes_____No_____If yes, from what?_____

Crack like openings or spilling observed: Yes_____No_____

Conditions that may create a hazardous atmosphere: Yes_____No_____
If yes, identify condition and source:_____

Surface encumbrances: Yes_____No_____If yes, what type?_____

Work to be performed near public vehicular traffic: Yes_____No_____

Possible confined space exposure: Yes_____No_____

Manual Test

Plasticity: Cohesive_____Non-cohesive_____

Dry strength: Granular (crumbles easily)_____Cohesive (broken with difficulty)_____

Note: The following unconfined strength tests should be performed on undisturbed soils.

Thumb Test used to estimate unconfined compressive strength of cohesive soil:
Test performed: Yes_____No_____

_____Type A – soil indented by thumb with every great effort.

_____Type B – soil indented by thumb with some effort.

_____Type C – soil easily penetrated several inches by thumb with little or no effort. If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.

Penetometer or Shearvane used to estimate unconfined compressive strength of cohesive soil.
Test performed: Yes_____No_____Device used:_____

_____Type A – soil with unconfined compressive strength of greater than 1.5 tsf.

_____Type B – soil with unconfined compressive strength of 0.5 tsf to 1.5 tsf.

_____Type C – soil with unconfined compressive strength of less than 1.5 tsf. If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.

Wet Shaking Test used to determine percentage of granular and cohesive materials.
Compare results to soil textual classification chart to determine soil type.

_____Type A – clay, silty clay, sandy clay, clay loam, and in some cases silty clay loam and sandy clay loam.

_____Type B – angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and in some cases, silty clay loam and sandy clay loam.

_____Type C – granular soil including gravel, sand, and loamy sand.

_____% granular _____% cohesive _____% silt

Note: Type A – no soil is type "A" if: soil is fissured; subjected to vibration: previously disturbed; layered dipping into the excavation on a slope of 4H:1V.

Soil Classification

_____Type A _____Type B _____Type C

Selection of Protective System
(see OSHA 1926 subpart P Appendix F)

_____Sloping (OSHA 1926 subpart P Appendix B) Specify angle_____

_____Timber shoring (OSHA1926 subpart P Appendix C)

_____Aluminum hydraulic shoring (OSHA 1926 subpart P Appendix D)

Note: Although OSHA will accept the above tests in most cases, some states will not. Check your state safety requirements for excavation and trenching regulations

SOP#5
Fall Prevention and Protection

Created: 7-20-2011
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TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this guideline is to protect PS&S personnel from injuries associated with falls from elevations. Protection from fall hazards is achieved using a combination of fall hazard elimination, fall prevention, and personal fall arrest systems.

2.0 SCOPE

This SOP applies to PS&S personnel whenever activities at construction operations expose them to potential fall hazards. This includes all construction on rooftops, working on ladders or elevated equipment, scaffolding, near excavations, or any other area where there is a potential to fall from a height. While it is generally the construction contractor's responsibility to provide required fall protection (except for fall arrest equipment), PS&S employees need to be aware of the requirements and hazards so as to prevent injuries.

This SOP **does not** cover fall hazards associated with non-construction, general industry operations which would include telecommunications operations or surveying on rooftops or other elevated areas where no construction is occurring nor does it address fall hazards associated with building maintenance tasks or working from aerial lifts.

PS&S prohibits its employees from performing the following activities: Climbing towers or rappelling on bridge structures or steep grades or operating machinery without prior approval of the DM or GSO/DSO.

In general, PS&S employees should not work alone on potentially hazardous sites such as performing bridge or rooftop inspections, excavations (if the construction contractor is not present), or certain surveys. The need for a second team member to be available for assistance should be evaluated by the SR in consultation with the PM.

3.0 DEFINITIONS

Access Zone, Designated – An area or space which is defined by a perimeter barrier, erected to warn employees when they approach an unprotected side or edge, and serves to designate areas where work may be performed without additional fall protection.

Aerial Lifts – Mechanical devices such as articulated boom personnel lifts, manlifts, scissor lifts, and bucket trucks used as access to heights.

Anchorage – A secure point of attachment for lifelines, lanyards, or deceleration devices.

Body Harness – Multiple straps that are secured about the wearer in a manner which distributes the fall arrest forces over the thighs, pelvis, waist, chest, and shoulders, with a means for attaching it to other components of a personal fall arrest system.

Body Belt – A device consisting of a belted strap around the waist of the person, this device may only be used as part of a restraint system, not as part of a personal fall arrest system.

Buckle – Any device for holding the body belt or body harness closed.

Connector – A device that is used to couple (connect) parts of the personal fall arrest system and positioning device or anchorage system together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of the system (such as a buckle or D-ring sewn into a body harness).

Competent Person – A competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authority to take prompt corrective action to eliminate or reduce the hazard.

Controlled Access Zone – An area in which certain work may occur without the use of conventional fall protection and access to the zone is controlled.

Dangerous Equipment – Any equipment that, as a result of form or function, may be hazardous to employees who fall onto or into the equipment.

Deceleration Device – Any mechanism, such as a rip-stitch lanyard, tearing or deforming lanyards, or self-retracting lifelines, which serve to slow the fall and reduce the force experienced by an employee during a fall arrest.

Deceleration Distance – The vertical distance a falling person travels, excluding lifeline elongation and free-fall distance, from the point at which the deceleration device begins to operate until the fall is stopped. It is measured as the distance between the location of a person's body harness attachment point at the moment of activation, and the location of the attachment point after the person comes to a complete stop.

Different Level Fall – An accident in which an employee falls below the level on which he/she was standing or walking (e.g. a fall below foot level).

D-Ring – An attachment point(s) on a belt or harness for a device or lanyard.

Fall Elimination – Planning a task or activity that avoids exposure to heights and fall hazards.

Fall Prevention – The provision of same-level barriers, such as guardrails and warning lines, which prevent falls from occurring.

Free Fall – The act of falling prior to activation of the personal fall arrest system.

Free Fall Distance – The vertical distance between the body harness attachment point at the time of a fall and the attachment point at activation of the personal fall arrest system.

Guardrail System – A barrier erected to prevent employees from falling to lower levels.

Hole – A gap or void of two (2) inches or more in its least dimension, in a floor, roof, or other walking/working surface.

Infeasible – It is impossible to perform the work using a conventional fall protection system (i.e. guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.

Lanyard – A flexible line of rope, wire rope, or strap that has a connector at each end for connecting the body harness to a deceleration device, lifeline, or anchor point. A shock- absorbing lanyard has a "built-in" deceleration device.

Leading Edge – The edge of a floor, roof, or framework for a floor or other walking/working surface which changes location as additional floor, roof, or decking is constructed. The leading edge is considered to be an unprotected side and edge during periods when it is not actively and continuously under construction.

Lifeline – A flexible line for connection to an anchor point at one end which hangs vertically (vertical lifeline), or for connection to anchorage's at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Opening – A gap or void 30 inches or more high and 18 inches or more wide, in a wall or partition, through which employees can fall to a lower level.

Personal Fall Arrest System – A system used to arrest an employee in a fall. It consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, or lifeline.

Positioning Device System – A body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free.

Qualified Person – A qualified person is one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to fall prevention.

Rope Grab – A deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest a fall. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

Safety Monitoring System – A safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Self-Retracting Lifeline/Lanyard – A deceleration device containing a drum-wound line that can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which automatically locks the drum and arrests a fall.

Slip – A same level fall caused by inadequate friction between the foot or footwear and the walking/working surface.

Snap Hook – A self-closing connecting device with a gatekeeper latch or similar arrangement that will remain closed until manually opened. Must be double action snap hooks to prevent unintended release.

Toeboard – A low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Unprotected Sides and Edges – Any side or edge (except at entrances to points of access of a walking/working surface, e.g., floor, roof, ramp, or runway) where there is no wall or guardrail system at least 39 inches (1.0 m) high.

Walking/Working Surface – Any surface, whether horizontal or vertical, on which an employee walks or works, including, but not limited to: floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel; but not including: ladders, vehicles, or trailers.

Warning Line System – A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge. Also designates a controlled access zone in which roofing work may take place without the use of guardrail, body belt, or safety net system to protect employees in the area.

Work Area – That portion of a walking/working surface where job duties are being performed.

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is responsible for periodically reviewing and revising this SOP as needed.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO/DSO is responsible for making appropriate training and personal protective equipment (PPE) available

Human Resources (HR) – HR is responsible for the maintenance of training records.

Department Managers (DM) – The DM is responsible for the overall implementation of this program within the operations under their control. The DM is also responsible for providing appropriate resources in personnel and equipment required to complete these operations safely.

Project Manager (PM) and Site Representative (SR) – The PM and/or SR has primary responsibility for communicating the requirements of this program to PS&S employees. The PM and/or SR should be able to identify different types of fall hazard situations associated with the site and determine that the provided fall protection is appropriate. If needed, the PM and/or SR will maintain appropriate fall arrest equipment. He/she will verify that authorized personnel have been appropriately trained on fall protection and correctly use fall protection methods when required. The PM and/or SR will also be responsible for determining that there is a rescue plan in place for any employee who may require rescue after a fall.

Employees – PS&S employees are responsible for complying with the requirements of this program, using appropriate fall protection equipment, and following applicable safety procedures.

5.1 GUIDELINES

Since PS&S is not responsible for the installation of fall protection, much of this information is provided to allow the PM and/or SR to assess the fall protection provided by the construction contractor to protect PS&S employees. If the PM and/or SR identifies deficiencies in the fall protection provided, they will prohibit PS&S employees from accessing the area and will notify the construction contractor and/or client regarding the deficiencies.

5.2 When is Fall Protection Required

The PM/SR or a designee must evaluate the walking/working surfaces to determine whether there is a potential fall hazard. PS&S requires either a guardrail system or

personal fall arrest system in the following circumstances where the employee will be working six (6) feet or higher above a lower level on construction sites:

- Unprotected sides and edges
- Leading edges
- Hoist areas
- Holes, if the hole only creates a tripping hazard a cover should be used
- Open sides of ramps, runways, and other walkways
- Excavations
- Wall openings

Guardrails or personal fall arrest systems are also required at ***any height*** at which an employee is working above dangerous equipment and has the potential to fall into/onto the equipment.

5.3 Fall Protection Systems and Practices

To assess the fall hazards at PS&S field sites and to implement preventive measures, the SR or a designee can use the Fall Hazard Assessment Checklist in Appendix A.

5.2.1 Protection from Falling Objects

When employees are exposed to falling objects, PS&S requires that each employee wear a hardhat. Additional control measures could include:

- Erect toe boards, screens, or guardrail systems to prevent objects from falling from higher levels.
- Barricade the area where the falling object hazard may exist, prohibit employees from entering the area, and keep objects far enough away from the edge on the higher level so that they will not go over the edge.

5.2.2 Guardrail Systems

The top edge of the guardrail must be 42 inches (+ or – 3 inches) above the walking/ working surface. When there is not a wall at least 21 inches high, there must also be a midrail, screen, mesh or intermediate vertical member (not more

than 19 inches apart). Construction and load testing of the guardrail system must be according to the specifications outlined in 29 CFR 1926.502(b). This includes being able to withstand a force of 200 pounds without failure and other strength and construction requirements.

5.2.3 Personal Fall Arrest and Restraint Systems

Personal fall arrest systems usually consist of an anchorage, connectors, body harnesses, deceleration device and lifelines. The system must not allow an employee to free-fall more than six (6) feet or contact a lower level. This also requires an evaluation of the potential height of the fall and may require lanyards that are shorter than 6 feet. The personal fall arrest system must be inspected prior to each use for wear, damage, and other deterioration. The attachment point of the body harness should be in the center of the wearer's back near shoulder level, or above the wearer's head.

A restraint system consists of anchorages, connectors, and body harnesses. The system prevents an employee from being exposed to any fall. The restraint system must be inspected prior to each use for wear, damage, and other deterioration. The attachment points of the body harness can be either at the wearer's hips or at the center of the back near shoulder level. The connector should be the shortest length possible so that the employee cannot fall from the work surface.

The components of a fall arrest system may not be used for hoisting material. Required strengths, tolerances, and testing requirements for personal fall arrest systems are specified in 29 CFR 1926.502(d). Appendix B, Guidelines for Anchor Points, should be used to provide information regarding proper anchors for fall arrest systems.

Note: Body belt use is not permitted as part of a fall arrest or restraint system.

5.2.4 Safety Nets

Safety nets will be installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 30 feet below the working level. When nets are used on bridges, the potential fall area from the walking/working surface to the net will be unobstructed. Safety nets will be installed with sufficient clearance under them to prevent contact with any surface or structures below.

Safety nets will extend outward from the outermost projection of the work surface as follows:

Minimum required horizontal distance of outer edge of net from the edge of the working surface	Vertical distance from working level to horizontal plane of net
Up to 5 feet	8 feet
More than 5 feet up to 10 feet	10 feet
More than 10 feet	13 feet

Drop Test

Safety nets and their installations will be capable of absorbing an impact force equal to that produced by the drop test. Safety nets and safety net installations will be drop-tested at the jobsite after initial installation and before being used as a fall protection system, whenever relocated, after major repair, and at 6-month intervals if left in one place. The drop-test consists of a 400-pound bag of sand, 30 inches in diameter, dropped into the net from the highest walking/working surface where employees are exposed to fall hazards.

Defective nets will not be used. Safety nets must be inspected weekly for wear, damage, and other deterioration. Defective components will be removed from service. Safety nets will be inspected after any occurrence that could affect the integrity of the safety net system (dropped material, storm, etc).

Materials, scrap pieces, equipment, and tools which have fallen into the safety net must be removed as soon as possible and at least before the next work shift.

The maximum size of safety net mesh opening will not exceed 36 square inches nor be longer than 6 inches on any side, and the opening, measured center-to-center of mesh ropes or webbing, will not be longer than 6 inches. All mesh crossings will be secured to prevent enlargement of the mesh opening. Each safety net or section will have a border rope for webbing with a minimum breaking strength of 5,000 pounds. Connections between safety net panels will be as strong as integral net components and will be spaced not more than 6 inches apart.

5.2.5 Lifelines

Horizontal lifelines will be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.

Lanyards and vertical lifelines will have a minimum breaking strength of 5,000 pounds. When vertical lifelines are used, each employee will be attached to a separate lifeline. Lifelines will be protected against being cut or abraded.

On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used to connect to a horizontal lifeline

must be capable of locking in both directions (horizontal and vertical) on the lifeline.

5.2.6 Fall Protection Plan

Where it has been demonstrated that it is infeasible or creates a greater hazard to use conventional fall protection as described in section 5.2 (i.e. during leading edge work), a Fall Protection Plan (FPP) can to be used. FPP must be prepared and implemented to meet the requirements of 29 CFR 192.502(k), listed below.

- The FPP must be developed specifically for the site where the work is being performed and must be updated to reflect current conditions.
- A qualified person must approve any changes to the FPP.
- A copy of the FPP and all approved changes must be kept at the job site.
- The SR or a designee must supervise the implementation of the FPP.
- The FPP must document the reasons why conventional fall protection is infeasible or why their use would create a greater hazard.
- The FPP must include a written discussion of other measures taken to reduce or eliminate fall hazards for those employees who are not protected by conventional fall protection systems.
- Where no other measures to reduce or eliminate fall hazards have been implemented, a Safety Monitoring System must be used (see Section 5.2.8 of this SOP).
- The FPP must identify each location where conventional fall protection methods cannot be used. These locations must then be classified as controlled access zones.
- The FPP must identify, by name, the employees who are designated to work in controlled access zones. No other employees may enter controlled access zones.
- In the event of a fall or some other related, serious incident, PS&S will investigate the circumstances to determine if new practices, procedures or training need to be incorporated into the FPP.

5.2.7 Safety Monitoring System

When conventional fall protection systems are not feasible as described in this section, PS&S employees will be protected using a Safety Monitoring System. The safety monitoring system must comply with the following requirements:

- The SR or a designee will monitor the safety of site personnel.
- The SR or a designee will warn the personnel when it appears that they are unaware of a fall hazard or acting in an unsafe manner.
- The SR or a designee will be on the same walking/working surface and within visual sighting distance of the employee being monitored.
- The SR or a designee will be close enough to communicate orally with the employee.
- The SR or a designee will not have other responsibilities that could take the monitor's attention from the monitoring function.
- Any area where a Safety Monitoring System is in use is a controlled access zone.

5.2.8 Inspection Checklists

To verify that each piece of equipment used for fall protection is properly maintained and ready for use, inspections must be performed and documented. An Equipment Inspection Checklist is presented in Appendix C.

5.2.9 Rescue

There must be a plan in place for prompt rescue of employees in the event of a fall or will determine that employees are able to rescue themselves. This plan must include the needed equipment and personnel to affect a rescue. This plan should be documented in the Site-Specific HASP or the H&S Checklist, as appropriate.

6.0 TRAINING REQUIREMENTS

PS&S employees who might be exposed to fall hazards will have adequate training to enable them to recognize the hazards of falling and will train them in the procedures to be followed to minimize these hazards. The training will be part of discipline specific training (i.e. Construction awareness), and will include:

- The nature of fall hazards in the work area.
- Correct procedures for erecting, maintaining, disassembling and inspecting the fall protection systems to be used.
- The use and operation of guardrail systems, personal fall arrest systems, safety nets, warning lines, safety monitoring systems, controlled access zones and other protection.
- The role of each employee in the Safety Monitoring System.
- The limitations on the use of mechanical equipment during work on sloped walking/working surfaces.
- Correct procedures for handling and storage of equipment and materials and erection of overhead protection.
- The roles of employees in the FPP.

Employees should be retrained when:

- Inadequacies in the employee's knowledge or use of fall protection systems or equipment indicate that he/she has not retained the requisite understanding or skill.
- There are changes at the worksite that render previous training obsolete.
- Changes in the types of fall protection systems or equipment used renders previous training obsolete.

7.0 REFERENCES

29 CFR 1926, Subpart M

APPENDIX A - FALL HAZARD ASSESSMENT CHECKLIST

Use the following checklist to identify potential fall hazard situations. If a listed hazard is present, mark "yes" on the checklist and describe the location or locations where the hazard is identified. Attach additional sheets if necessary if there is not enough space on the checklist to note all locations of a particular identified fall hazard. If a listed hazard is not present, mark "no" on the checklist and proceed to the next item.

NOTE: When filling out this checklist, you must consider both ***routine and non-routine tasks***

Potential Fall Hazard	Yes	No	Location(s)
General			
1. Any other walking/working surface with an unprotected side or edge 6 feet or more above a lower level 1926.501(b)(1)			
2. Hoist areas 6 feet or more above a lower level 1926.501(b)(3)			
3. Excavations 6 feet or more in depth			
4. Fall hazards from open pits, tanks, vats, ditches, etc.			
Floor and Wall Openings and Holes			
1. Stairway floor openings			
2. Ladderway floor opening or platform			
3. Hatchway and chute floor openings			
4. Skylight floor openings			
5. Pit and trapdoor floor openings			
6. Manhole floor openings			
7. Temporary floor openings			
8. Floorholes into which persons can accidentally walk			
9. Doors or gates which open directly into a stairway			
10. Wall openings with drops of more than 6 feet			
11. Window wall opening at stairway landings, floors, platforms, or balconies from which there is a drop of more than 6 feet			
12. Temporary wall openings			

Potential Fall Hazard	Yes	No	Location(s)
13. Hazard of material falling			
14. Open-sided platforms 6 feet or more above the adjacent floor or ground level			
15. Runways with open sides 6 feet or more above the floor or ground level			
16. Open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment regardless of heights			
17. Unguarded stairs with four or more risers with no handrail or guardrail 1926.1022			
Fixed Ladders			
1. Ladders of more than 24 feet climb without cage or fall protection			
2. Ladder landings			
3. Landing platforms			
Scaffolding			
1. Scaffolding with open sides more than 10 feet above the ground or the floor			
2. Crawl boards or chicken ladders			
Permit-Required Confined Spaces			
1. Entrance covers removed where an employee could fall into a confined space			
2. Use of tripod and winch to lower employees into confined spaces			

APPENDIX B – GUIDELINES FOR ANCHOR POINTS

An anchor point is a secure point of attachment for a personal fall arrest system. It must be independent from the means supporting or suspending a worker.

Anchor points:

- Must be able to support a weight of at least 5,000 pounds of force for each worker attached;
- Should be located at a height that reduces free fall to 6 feet or less. Factors to consider are deceleration distance (shock absorbing lanyard) and elongation (lanyard stretching); and
- Should be located so that if a free fall occurs, an attached worker will not collide with equipment or structures or contact any lower level.

The lanyard is connected to an anchor point using a self-locking snap hook or to a tie-off strap. The tie-off point should be at or above the D-ring on the back of the worker's harness. This will limit the free fall distance to the length of the lanyard.

Anchoring Planning:

Every anchoring point must pass each of the following nine tests for safe usage:

1. Height
   - Does the anchor-point height reduce free fall to the shortest distance possible?
   - Is the anchor point away from possible collisions with the body or the head?
   - Is the anchor point unaffected by the local environment, or contamination such as paint over-spray?

2. Location
   - Is swing fall reduced to a reasonably safe minimum in order to reduce the potential for collision injury and to allow for self-recovery?
   - Is the anchor point continuous by design (to accomplish the task without intermittent fall hazards)?
   - Is the anchorage reachable, to permit connection without a hazard?

3. Shape
   - Is the anchorage point compatible with the attachment method of the deceleration device? Many shapes are not attachable with snap hooks, including certain eyebolt shapes.
   - Will the likely method of attachment cause damage or failure to the deceleration device? Looping a lanyard around an angle iron could cut the lanyard in a fall.

- Will the likely method of attachment be to a bolt hole? Snap hooks can detach from slotted bolt holes with as little as 2 lb. of steady force.
- Can the attachment method allow sliding-down falls or permit cutting the line?
- Will the attachment method of a lanyard to a flanged edge without closure of the snap hook gate be prohibited?

4. Strength
   - Has the anchor point been identified by a competent person for its intended use?
   - Is the anchor point still reliable after long exposure to the elements, such as salt air?
   - Will a tie-back point prevent any additional free fall if a primary anchor point fails?

5. Usage
   - How many workers can be safely attached to the same common anchor point? This is an engineering question, if the answer is more than one worker.
   - Are the load-bearing suspension line and the lifeline attached to separate support systems?
   - Is tying knots prohibited for providing anchor point attachments? Knots aren't reliable without a strict worker training system and a single method of tying them.
   - Has wrapping a line around a typical structural member such as an I-beam been tested by the company for sufficient strength?
   - Is it prohibited to attach snap hooks to each other or to a lifeline or lanyard? Doing so results in hazards such as roll-out and loss of strength.
   - Will the snap hook be used for attaching to the structure or for pulling loads?
   - Will the method of use cause workers to disconnect themselves at heights because they can't reach their task?

6. Stability
   - Has attachment to the lip of an I-beam flange been prohibited? A snap hook may slip off with an angled pull and cause system failure.
   - Has attaching a lifeline to a projection been prohibited? The lifeline can detach by movement off the end.

7. Independence
   - Are the anchor points independent? The independence of each anchor point from the main work-positioning anchor support is an important principle. Where tripods, building, or structure itself are concerned, it is important to address the kind of failure that would likely produce an injury. Anchor point design should address all predictable scenarios.

8. Protection While Moving
   - If horizontal lifelines are used to allow protected movement, have they been engineered for this purpose? A horizontal line may be intended as a hand line or perimeter cable.

Termination of lines or butting them with mechanical clips can be dangerous under dynamic conditions.

- Do the horizontal lines allow enough sag under the dynamic conditions of a fall to permit the worker to avoid colliding with an obstruction or the ground?
- A horizontal lifeline must be designed by a qualified person.

9. Labeling

Can the anchor point be marked for future recognition and limited specific use? Anchor points for a specific activity should be identified on the Maintenance Job Procedure for that task.

APPENDIX C – EQUIPMENT INSPECTION CHECKLIST

Fall Protection Equipment Inspection Checklist

Inspection Date: _____ **Inspector:** _____

Type	Manufacturer	Model No.	Serial No.
Harness			
Lanyard			
Anchor Strap			
Carabineer			

Inspection of all fall protective equipment must be conducted before and after each use. This checklist is designed to document and verify that all components have been inspected and that no defective or damaged components have been found. Should defective or damaged parts be found the entire piece of fall protective equipment must be removed from service and tagged **"OUT OF SERVICE - DO NOT USE"** until the components can be either repaired or discarded.

Part	Condition	Acceptable	Unacceptable
Personal fall arrest systems (*Harness, buckles, D-rings, straps, keepers, etc.*)	Metal connectors, snap hooks, D-rings etc, must not show signs of damage, including: broken, distorted, sharp edges, burrs, cracks, worn parts, or corrosion. *Note: Make sure all buckles work freely.*		
	The harness and straps must not show signs of damage including: frayed, cut or broken fibers; tears, abrasions, mold, burns, or discoloration, pulled or cut stitches, knots, excessive soiling or paint buildup. *Note: Broken stitches or exposed fall indicator stitching may be an indication the harness has been shock- loaded during a fall and must be discarded.*		
	The harness must have an original label indicating the manufacturers intended load capacity.		
Shock absorbing lanyards	The lanyards must not show signs of damage or stress or shock loading including: rust or staining, chemical or heat damage, or degradation. The lanyard must also have complete and legible labels including the manufacturer name and rated capacity. *Note: Broken stitches or exposed fall indicator stitching may be an indication the harness has been shock loaded in a fall and must be discarded.*		

Horizontal Lifeline Systems

Location: _____

Inspection Date: _____ **Inspector:** _____

Inspection of the horizontal lifeline system must be conducted before and after each use. The checklist is designed to document and verify that all components have been inspected and that no defective or damaged components have been found. Should defective or damaged parts be found, the piece must be removed and replaced with new parts. The damaged or defective piece must be made unusable and discarded. If the wire rope is damaged the entire horizontal lifeline should be tagged **"OUT OF SERVICE - DO NOT USE"**. The inspection of safety harnesses and lanyard must be documented using the Fall Protection Equipment Checklist.

Part	Condition	Acceptable	Unacceptable
Hardware *(Hardware includes: end anchors, links, terminals, brackets and connectors)*	Hardware items must not show signs of damage, including: broken, distorted, sharp edges, burrs, cracks, worn parts, or corrosion.		
Wire Rope	Wire rope must not be damaged, including: six (6) or more broken wires in one rope lay or three (3) or more broken wires in one strand, corrosion, permanent kinks, burn marks, bird caging or exposed core.		

SOP #6

Personal Protective Equipment

Created: 7-20-2011
Last Revision Date: 9/17/14

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1.0 PURPOSE

The purpose of this SOP is to establish guidelines for the selection of personal protective equipment (PPE) for use by PS&S.

2.0 SCOPE

This procedure will be used as a tool for selecting the appropriate PPE for job tasks performed by PS&S personnel.

3.0 DEFINITIONS

Degradation – The loss of or change in the fabric's chemical resistance or physical properties due to exposure to chemicals, use, or ambient conditions (e.g., sunlight).

Penetration – The movement of chemicals through zippers, stitched seams or imperfections (e.g., pinholes) in a protective clothing material.

Permeation – The process by which a chemical dissolves in and/or moves through a protective clothing material on a molecular level.

Personal Protective Equipment (PPE) – Personal Protective Equipment (PPE) is any equipment worn by an individual that is used to protect the individual from a hazard. This includes gloves, respirators, ear plugs, etc.

4.0 RESPONSIBILITIES

Corporate Health & Safety Officer (CSO) – The CSO is responsible for the periodical review of this SOP and updating this procedure as needed.

Human Resources (HR) – HR is responsible for the maintenance of training records.

Department Managers (DM) – The DM is responsible for the overall implementation of this program within the operations under their control. The DM is also responsible for providing appropriate resources in personnel and equipment required to complete these operations safely.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO and/or DSO is responsible for providing appropriate types and amounts of PPE required for

the potential hazards employees may be exposed to during the performance of their job duties. The GSO and/or DSO will make appropriate training available to employees prior to being required to use any PPE. The Project Manager (PM) will assume the responsibilities of the GSO and/or DSO for any PPE that may be required at PS&S field locations.

Project Manager (PM) and/or Site Representative (SR) – The PM and/or SR will use these guidelines in conducting PPE assessments and selecting PPE for job tasks. The PM and/or SR will determine that assigned employees have been provided appropriate training prior to the use of PPE.
Employees – The employee is responsible for properly wearing the appropriate PPE as required by this SOP, H&S Checklist or Site-Specific HASP.

5.1 GUIDELINES

PS&S employees will wear PPE when it is reasonably expected that the use of the equipment would prevent illness and/or injury and when required by contract or regulation. The use of appropriate PPE can save lives and prevent injuries. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory protection, and protective shields and barriers will be used as required and maintained in a sanitary and reliable condition. PS&S will provide PPE at no cost to employees; the use of employee-owned PPE is not allowed.

The use of PPE can create some worker hazards, such as heat stress, physical and psychological stress, impaired vision, mobility, and communication. Therefore, equipment and clothing should be selected that provides an adequate level of protection. Over-protection as well as under-protection can be hazardous and should be avoided.

5.2 Types of PPE

The following types of PPE form the basis of the protective clothing scheme:

- Head Protection. Regulated by 29 CFR 1910.135; specified in ANSI Z89.1, Safety Requirements for Industrial Head Protection. Head protection equipment includes hard hats, hardhat liners, hoods, and protective hair coverings.

- Eye and Face Protection. Regulated by 29 CFR 1910.133(a); specified in ANSI Z87.1, Eye and Face Protection. Eye and face protection equipment includes face shields, safety glasses, splash hoods, goggles, and sweatbands.
- Ear Protection. Regulated by 29 CFR 1910.95; specified in OSHA regulation. Ear protection equipment includes earplugs, canal caps and earmuffs. Please refer to SOP#12 *Hearing Conservation*.
- Foot protection. Regulated by 29 CFR 1910.136; specified in ANSI Z41.1, Safety Toe Footwear. Foot protection equipment includes safety shoes, boots, and overboots.
- Hand (and arm) protection. Not specifically regulated. Hand and arm protection equipment includes inner disposable gloves, overgloves and sleeves.
- Protective clothing. Regulated only in 1910.120 HazWOPER. Protective clothing equipment includes fully encapsulating suits, non-encapsulating suits, aprons, leggings, sleeve protectors, blast and fragmentation suits, radiation contamination protective suits, flame/fire retardant coveralls, flotation gear, high visibility vests and cooling garments.
- Respiratory Protection. Regulated by 1910.134: please see SOP#3 *Respiratory Protection Program* for procedures regarding the use of Respiratory Protection.
- Personal Fall Protection. Regulated by 1926 subpart M: please refer to SOP#5 *Fall Prevention and Protection* for procedures regarding the use of personal fall protection equipment.

5.2.1 Head Protection

Head protection (hardhats) is required where employees may be subject to head injuries from falling of flying or moving objects, from splashing hazardous chemicals and other liquids, from limited electric shock and burns, and from bumps caused by working in limited space where the head may come in contact with equipment or objects or when other individuals are working above them.

- The protective equipment must be appropriately selected for the hazard. Hardhats will be required on any operating construction site.
- The hardhat suspension will be properly installed and maintained in clean and sanitary condition. It will be changed when it shows signs of wear.
- All head protection equipment must meet the standard detailed in the American National Standard for Industrial Head Protection, ANSI Z89.1 - 1997.
- Head protection, when not assigned to an individual, will be sanitized after each use or disposable head covering will be utilized.

- Chinstraps should be used if a person will be stooping over frequently and the hard hat may fall off.

5.2.2 Eye and Face Protection

Eye and/or face protection (safety glasses, goggles, faceshields) will be required where there is a reasonable probability of injury. Eye protection should be worn on any field site where construction operations are in progress and may potentially cause flying objects.

Eye protection equipment referred to includes protection against impact, penetration, molten metal splashes, chemical splashes, dusts, glare, and injurious light radiation (infrared and ultraviolet). It does not include the special protection required to prevent damage from x-rays, gamma rays, and high energy particulate radiation such as alpha, beta, or neutron.

- All eye and face protective equipment must meet the standard established by the Occupational Safety and Health Act as detailed in the American National Standard for Occupational and Educational Eye and Face Protection, ANSI Z87.1 – 1989.
- The protective equipment must be appropriately selected for the hazard. All safety glasses should have side shields.
- Employees requiring correction (prescription) lenses will be provided safety prescriptive glasses with sideshields.
- Visitors on sites where eye protection is required will also be required to wear eye protection.

5.2.3 Foot Protection

Foot protection will be required when there is a reasonable probability of injury that can be prevented by such equipment.

- Safety shoes or boots will meet the specifications of American National Standard for Personal Protection-Protective Footwear, ANSI Z41.1-1999.

The manufacturer of the shoe will stamp the class on the interior, which defines the minimum requirements for compression and impact.

- Specifically constructed shoes may be required for specific work environments. Reinforced soles, inner soles of flexible metal, or steel shanks are to be used for construction work and other work with the potential for protruding hazards.
- Overboots may be required for chemical protection.

5.2.4 Visibility Vests

High visibility vests are required whenever there is a need to be highly visible for vehicle or equipment operators to prevent being hit by moving equipment. These vests should be worn when working on or near highways, streets, railways, or construction sites where heavy moving machinery is operating. High visibility vests should also be worn when working in hunting areas during hunting season. All high visibility vests must meet the specifications of ANSI 107-2004.

- Lime green Class 2 vests are required at all times when working in the field, on job sites, near roadways or near railroads. Lime green Class 3 vests/jackets are required when working near roadways with traffic traveling faster than 50 mph or in other high hazard areas.
- Orange Class 2 vests are preferred when working in wooded and undeveloped areas during hunting season.

5.3 Chemical Protective Clothing

Chemical protective equipment is used to minimize or eliminate chemical contact and make decontamination easier. The proper selection of personal protective equipment (PPE) is important in preventing chemical exposures. The selection depends on the hazardous conditions, cost, availability, compatibility with other equipment and performance. An accurate assessment of all these factors must be made.

5.3.1 Chemical Protection Selection Criteria

The most important factor in selecting chemical resistant PPE is determining the potential chemical exposures. Once the chemical(s) have been identified and the type of work to be performed has been considered the most appropriate clothing can be selected.

Garments are selected for use by their resistance to permeation, degradation, and penetration of the chemical. No material protects against all chemicals or combinations of chemicals, or is an effective barrier to prolonged chemical contact.

Charts are available from most manufacturers indicating the resistance of their products to a wide array of chemicals. Limited permeation data is currently available for chemical mixtures. Chemical mixtures can be significantly more aggressive towards PPE materials than any single chemical.

Selection should be based upon the most hazardous chemicals, potential for skin contact, absorption across the skin, and expected concentrations. Sometimes layering of several different types of protective PPE or PPE laminated of two or more materials affords the best protection.

When selecting chemical protective clothing the following criteria should be evaluated:

- Concentration of the chemical(s)
- Physical State: The physical state of a chemical determines the exposure route and potential toxicity.
- Length of Exposure: The length of time the PPE is exposed to a chemical increases the probability of breakthrough. During permeation testing a pure (100% composition) liquid is placed in direct contact with the PPE material producing a worst-case situation.
- Abrasion: The use of leather gloves, or a heavy apron over regular protective clothing will prevent damage to the PPE and protect against exposures during manual material handling.
- Dexterity

- Ability to Decontaminate/ Disposal
- Climatic Conditions: Protective clothing adds weight, and restricts movement, prevents the natural cooling process, and contributes to heat stress. Some materials act differently when they are very hot or very cold.
- Work Load

6.1 PPE USE

PPE can offer a high degree of protection only if it is used properly.

- The protective equipment must be appropriately selected for the specific hazard.
- PPE should be inspected for wear, tears, and defects before and after each use.
- Chemical protective clothing must be adequately decontaminated after each use.
- All PPE have limitations in performance.
- Management is responsible for providing appropriate PPE with the exception of personal clothing (i.e. safety shoes).
- Employees are responsible for inspecting their own PPE and requesting replacement when necessary or required

6.2 Donning and Doffing

Donning and Doffing PPE is to put on and take off PPE. While it may sound simple, the donning method must prevent damage to the PPE and must result in the PPE being properly worn. Exact doffing procedures for removing PPE must be established, practiced, and followed to prevent damage to PPE, reduce/eliminate a transfer of contaminants to the wearer's body, other employees, and clean areas. PPE must be fitted to each employee.

7.0 WRITTEN HAZARD ASSESSMENT

A written hazard assessment must be prepared for each non-construction related task that requires the use of PPE. PMs are responsible for documenting required hazard assessments for PPE, and

must sign the written hazard assessment. Appendix A and the information contained in this procedure should be used to complete the required hazard assessments.

Employees operating on construction sites are required to wear appropriate PPE based on the hazards. However, a written hazard assessment is not needed to document the selection of PPE. Typical PPE required on a construction site includes hardhat, safety glasses, visibility vest, and safety shoes. Additional PPE may be needed based on the hazards suspected or encountered.

8.0 TRAINING

PS&S training for PPE is conducted as part of discipline specific training. Training will be completed prior to PPE use in a hazardous environment and will be repeated as needed. Employees will demonstrate an understanding of the training provided. At a minimum, the training should include:

- The proper use and maintenance of the selected PPE, including capabilities and limitations
- The nature of the hazards and the consequences of not using the PPE
- The human factors influencing PPE performance
- What tasks require the use of PPE (review relevant written Hazard Assessments)
- Hands on instruction in inspecting, donning, doffing, checking, fitting, and using PPE
- The user's responsibility for decontamination, cleaning, disposal, maintenance, and repair of PPE
- Emergency procedures and self-rescue in the event of PPE failure

Refresher training will be conducted if there are any changes to the equipment, operation, or procedures or an employee demonstrates that they are not using or maintaining the PPE properly.

9.0 INSPECTION OF PPE

PPE should be inspected at the following times.

- Inspection and operational testing of equipment received from the factory or distributor.
- Inspection of equipment as it is issued and before use.
- Inspection after use or training and prior to maintenance.
- After maintenance, decontamination or repair.
- Periodic inspection of stored equipment, especially emergency PPE like spill kits and respirators.

These inspections will vary depending on the type of equipment and the condition. Inspection procedures are usually available from the manufacturer.

Damaged and defective PPE will not be used. Individual identification numbers should be assigned to all reusable PPE and records of inspection should be maintained. Each inspection should record the ID number, date, inspector, and any unusual conditions or findings. Periodic review of these records should be conducted to identify potential improvements in this SOP.

10.0 STORAGE

PPE must be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and abrasion.

- Potentially contaminated clothing should be stored in an area separate from street clothing or "clean" PPE.
- Potentially contaminated clothing should be stored in a well ventilated area.
- Protective clothing should be stored in accordance with manufacturers' recommendations.

11.0 ADDITIONAL CONSIDERATIONS

- In cold temperatures, natural material clothing should be worn under the protective clothing. Protective clothing should be removed prior to allowing a person "to get warm."
- In hot weather, cotton undergarments should be worn to absorb moisture.
- Protective suits should be taped to the boots to prevent anything from entering into the boot. Gloves should be taped also to prevent substances from entering the top of the glove.
- Attention should be paid to atmospheric conditions such as precipitation, temperature, wind direction, wind velocity, and pressure as these affect the behavior of air contaminants or the potential for volatile material becoming airborne.

APPENDIX A - PS&S PERSONAL PROTECTIVE EQUIPMENT HAZARD ASSESSMENT CERTIFICATION

Department:				**Work area:**		
Location/Site:				**Job Task:**		
Hazards to Employee		**Potential Site of Injury**	**Probability of Injury**	**Severity of Injury**	**Risk Assessment Code**	**Personal Protective Equipment Selection**
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
Comments:						
Hazard Assessment and PPE Selection Performed by:					Date:	
Hazard Assessment and PPE Certification Performed by:					Date:	

Severity of Injury		
Class.	**Description**	**Code**
Catastrophic	Irreversible illness or total disability	I
Critical	Temporary disability in excess of 3 months or permanent partial	II
Marginal	Reversible Injury limited to less than 3 months of disability	III
Negligible	First-Aid Treatment Only	IV

Probability of Injury		
Class.	**Description**	**Code**
Frequent	Likely to occur immediately	A
Probable	Probably will occur in time	B
Occasional	Possible to occur in time	C
Remote	Unlikely to occur	D

Probability of Injury						**Risk Category**
Severity of Injury		**A**	**B**	**C**	**D**	
	I	1	1	2	3	High B 1&2
	II	1	2	3	4	Medium B 3
	III	2	3	4	5	Low B 4&5
	IV	3	4	5	5	

PROJECT MANAGER SIGNATURE REQUIRED: _____ DATE: _/ / ____

SOP #7
Roadway and Traffic Safety

Created: 7-20-2011
Last Revision Date: 11-2-2011
Last Revision Date: 7-19-2012

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1.0 PURPOSE

The purpose of this guideline is to protect PS&S employees from hazards from vehicular traffic.

2.0 SCOPE

This SOP applies to all PS&S employees who work at a PS&S field site where they may be exposed to the hazards of vehicular traffic.

3.0 DEFINITIONS

American National Standards Institute (ANSI) – ANSI is the organization that defines standards for equipment construction.

Flagging – This operation consists of one or more personnel equipped with appropriate flag or other device to control traffic. Flaggers should only be used when other traffic control measures are not sufficient.

High-Volume or High-Speed Roadways – These are usually freeways, turnpikes, parkways, expressways, or other roads where the speed limits are over 45 miles per hour (MPH).

K-Rail or Jersey Barrier – These are solid temporary barriers that physically protect workers on roadways from potential vehicular contact. These should be used whenever feasible, especially on high-volume, high-speed roadways.

Manual on Uniform Traffic Control Devices (MUTCD) – The manual written by the United States Department of Transportation (DOT) Federal Highway Administration (FHWA) which describes the devices and procedures that should be used to protect workers who are exposed to hazards of vehicular traffic. This manual is available for viewing on the Internet at http://mutcd.fhwa.dot.gov/.

Tapers – A taper is created using a series of channelizing devices such as traffic cones, barrels, and pavement markings to move traffic into designated travel lanes and away from work areas. The taper provides a slow and defined transition of traffic movement.

Truck-Mounted Crash Cushion (TMCC) or Truck-Mounted Attenuator (TMA) – These are truck-mounted devices used to provide advance warning and a physical barrier from approaching traffic.

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is responsible for periodic review of this program and updating this SOP as needed.

Human Resources (HR) – HR is responsible for maintaining training records.

Department Manager (DM) – The DM is responsible for the overall implementation of this program. The DM is also responsible for providing appropriate personnel and resources so that operations can be conducted in compliance with this program.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO/DSO is responsible for making required training available to employees and for providing required PPE. The GSO/DSO is also responsible for assisting the PM/SR in determining what traffic control procedures should be instituted for field sites to protect PS&S employees where there are roadway hazards.

Project Manager (PM) and Site Representative (SR) – The PM and/or SR has primary responsibility for overseeing and enforcing the requirements of this SOP at the PS&S site. If PS&S personnel will be working in traffic control zones not necessitated by the work of a construction contractor but instead by PS&S activities alone, then it is the PM and/or SR or designee's responsibility to implement the safe work practices below. The PM and/or SR must verify that PS&S employees working on sites with vehicular traffic hazards have been provided appropriate safety training. The PM and/or SR will arrange for police coverage or traffic control when needed. The PM and/or SR will periodically evaluate the field traffic control by completing the Traffic Control Assessment in Appendix B. The PM and/or SR may determine when to recommend that a traffic control contractor or other outside agencies be contacted.

Employees – All PS&S employees are responsible for complying with the requirements of this SOP.

5.0 GUIDELINES

Occupational Safety and Health Administration (OSHA) 29 CFR 1926 contains regulatory requirements for traffic control signs, signals, and barricades. These include 1926.201 through 203. Also referenced is the FHWA (a division of the federal DOT) "Manual on Uniform Traffic Control Devices for Streets and Highways." Some state-OSHA and Department of Transportation plans may have more stringent requirements.

5.1 Planning Ahead

The regulatory or contractual authority having jurisdiction over the location may approve traffic control plans prior to commencing work. Personnel designing, reviewing, and supervising the installation and removal of traffic control zones will be certified as required.

If PS&S personnel will be working in traffic control zones necessitated by the work of a construction contractor, then it is the construction contractor's responsibility to arrange for police coverage, apply for applicable permits or permission from all state, county, township or municipal governments, and develop a traffic control plan as required by the state, county, township or municipal governments, if necessary. In coordination with the local authorities, the construction contractor should determine the time when the traffic volume is typically lowest for the proposed work area and attempt to schedule work during this period. The construction contractor should avoid "rush hour" if at all possible and evaluate the need for police traffic control.

If PS&S personnel will be working in traffic control zones not necessitated by the work of a construction contractor but instead by PS&S activities alone, then it is the PM and/or SR or designee's responsibility to plan ahead as stated above and to implement the safe work practices below.

5.2 Safe Work Practices

Observe applicable requirements of DOT having jurisdiction in the project area. All work will be conducted using appropriate devices as stated in the Manual on Uniform Traffic Control Devices (MUTCD).

Some states require certification of personnel designing, reviewing, or supervising installation and removal of traffic control devices.

- All PS&S personnel working on or adjacent to active roadways or within traffic control zones must wear ANSI approved reflective/high-visibility safety vests/jacket. This requirement applies to all work activities regardless of duration (e.g., survey crews, traffic engineering studies, site walk-through, emergencies, and other short duration operations).
- A traffic control plan should be developed and implemented consistent with anticipated roadway, traffic, and work conditions.
- The traffic control plan should consider factors that influence traffic-related hazards and required controls – sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder, breakdown lane.
- A rigid barrier such as a k-rail or jersey barrier should protect work areas, where feasible (long term work) and is highly recommended on high volume, high speed roadways.
- PS&S personnel should minimize the amount of time that they will have their backs to oncoming traffic. When PS&S personnel must face away from traffic, a lookout should be used. The lookout continually watches approaching traffic for signs of erratic driver behavior and warns workers.
- Vehicles should be parked at least 40 feet away from the work area and traffic on high speed or low visibility roadways. All vehicles within 40 feet of traffic should have a roof-mounted hazard beacon/strobe in operation or other warning device. Road flares may be deployed during short duration operations.
- Either a barrier or shadow vehicle should be positioned a considerable distance before the work area on high speed or low visibility roadways. The vehicle should be equipped with a flashing arrow sign and truck-mounted crash cushion (TMCC) or truck-mounted attenuator (TMA).
- Signs, barricades, channelizing devices, markings, and lighting devices must conform to the standards of the MUTCD.
- Traffic control devices must be inspected continuously to verify that they are adequate to protect the traffic control zone.
- Flagging should only be used when required to control traffic and when all other means of traffic control are inadequate to warn and direct drivers.
- Scheduling traffic controls will be considered including, but not limited to, limited working hours (e.g., avoidance of lane closures on Fridays, weekends, Mondays, or holidays), minimizing work starting and stopping during rush hour on weekdays, and restricting work during special events.
- Personnel must not walk onto or across live, high-volume, or high-speed roadways (e.g., tollways, turnpikes, parkways, expressways).
- In general, PS&S employees should not work alone on potentially hazardous sites such as performing bridge or rooftop inspections, excavations (if the construction contractor is not present), or certain surveys. The need for a second team member to be available for assistance should be evaluated by the SR in consultation with the PM.

5.3 Safety Equipment

PS&S contractors and subcontractors are responsible for providing all safety equipment, including PPE, necessary for their employees. PS&S will only provide safety equipment and PPE for its own employees. Employees may be required to provide some personal clothing items, such as safety shoes. The following safety equipment should be available:

- Safety shoes or boots, hard hats, and safety glasses
- Body protection (such as gloves, coveralls, or Tyvek) when chemical hazards exist
- Hearing protection when working in close proximity to loud equipment and/or vehicular traffic
- PS&S employees working near vehicular traffic ***MUST*** wear ANSI approved reflective vests/jackets. Vests should be chosen based on these factors:
    - **Lime green Class 2** – Required when working within 25 feet of vehicular traffic.
    - **Lime green Class 3** – Required when working within 25 feet of vehicular traffic moving at speeds exceeding 50mph.
- Road flares, reflective triangles, and other temporary, high-visibility warning devices
- Signs, barricades, channelizing devices, markings, and lighting devices that conform to the standards of the MUTCD
- Roof-mountable vehicle hazard beacons/strobes
- Fall protection system when personnel are on a working or walking surface with an unprotected side or edge 6 feet or more above a lower level

5.4 Regulations/Industry Standards

This section is provided to inform the PM and/or SR of established traffic control regulations and industry standards so that he or she may better protect PS&S employees. The implementation of traffic control is usually the responsibility of the contractor, not PS&S. PS&S subcontractors retain control over their practices and are responsible and accountable for their own employees.

This information is provided to the PS&S PM and/or SR for use in (a) evaluating the protection of PS&S's employees under a construction contractor's traffic control plan; and (b) planning and implementing PS&S's own traffic control plan when PS&S

personnel will not be working in traffic control zones necessitated by the work of a construction contractor or others. Each site is different and all roadways may not need all the criteria listed in 5.4.1 thru 5.6 below. Common sense and good judgment will be used by PS&S staff in evaluating needs.

5.4.1 General

- A lane or shoulder must be closed when work is performed within 2 meters (approx. 6.5 feet) of, on, or above a live roadway with heavy traffic.
- Whether to use a particular traffic control configuration at a particular location must be made on the basis of an engineering judgment of the location.
- In lieu of an engineering study, traffic control devices must be placed in general conformance with standard MOT (Maintenance of Traffic) procedures for the jurisdiction in question.
- All traffic control devices used on street and highway construction or maintenance work must conform to the applicable specifications of the MUTCD.
- A traffic control plan, in detail and appropriate to the complexity of the roadway and planned work activity, must be prepared and understood by all responsible parties before the site is occupied.
- Special plan preparation and coordination with transit and other highway agencies, police and other emergency units, utilities, schools, railroads, may be needed to receive input and support for advising motorists of the traffic operation situations.
- Traffic movement and flow should be inhibited or disrupted as little as feasible.
- Supplemental equipment and work activities must not interfere with traffic (for example, temporary light towers must be placed and aimed so as not to create blinding conditions for approaching vehicles; dust and particle generation must not migrate into traffic; cranes must not swing loads over live roadways).
- Drivers (including bicyclists) and pedestrians should be guided in a clear and positive manner while approaching and traversing traffic control zones.

5.4.2 Traffic Control Zones

- The temporary traffic control zone should include the entire section of roadway between the first advance warning sign through the last traffic control device, where traffic returns to its normal path and conditions.

- Temporary traffic control zones can be divided into five areas: advance warning, transition, buffer space, work area, and termination. See Appendix C, Areas in Traffic Control Zones, for additional explanation.
- The advance warning area may vary from a single sign or flashing lights on a vehicle to a series of signs in advance of the temporary traffic control zone transition area.
- The use of speed, roadway conditions, and related driver expectancy (visibility) must be considered to derive advanced warning area sign spacing distance.
- Warning sign spacing in advance of the transition area usually fall within the range of one-half mile to one mile for freeways or expressways, 1,500 feet for most other roadways or open highway conditions, and at least one block for urban streets.
- A transition area should be used to channelize traffic from the normal highway lanes to the path required to move traffic around the work area.
- A buffer area should be used to provide a margin of safety for both traffic and workers.
- The buffer area should be free of equipment, workers, materials, and worker vehicles.
- The length, in feet, of the buffer area should in general be two times the posted speed limit.
- The work area should be that portion of the traffic control zone that contains the work activity and is closed to traffic and set aside for exclusive use by workers, equipment, and materials.
- A termination area should be provided for traffic to clear the work area and return to normal traffic lanes.
- A downstream taper should be placed in the termination area.

5.4.3 Device Installation and Removal

Installation of traffic control devices is not generally within the scope of services provided by PS&S beyond such issues as the placement of traffic cones when performing surveying tasks within unsafe areas, as such, the definition of what should be provided and how it is to be installed should be discussed with the Client/Contractor prior to our occupation of areas deemed unsafe.

- All vehicles used to install and remove traffic control devices and those entering and exiting traffic control zones must be equipped with, and use an approved roof-mounted hazard beacon/strobe.
- Traffic control devices should be installed in the direction of traffic flow starting with the sign or device that is farthest from the work area and progressing as the work area is approached.

- Devices should be removed in the opposite order of installation by staring with the device closest to the work area and continuing away from the area.
- Traffic should be moved out of its normal path through the use of a taper.
- Tapers should be created using a series of channelizing devices such as traffic cones, barrels, and pavement markings.
- The length of taper used to close a lane should be determined by the speed of traffic and the width of the lane to be closed (the lateral distance that traffic is shifted). The general formulas and their criteria for application are shown in Table 1.

Table 1: Formulas for Taper Length

Posted Speed	Formula
40 mph or less	$L = W \times S^2 / 60$
45 mph or over	$L = W \times S$

L = taper length
S = posted speed, or off-peak 86 percentile speed
W = width of lane or offset

- Installation and removal of the taper is the most hazardous period of traffic control operations. If appropriate, arrange for a local police or highway patrol presence, with flashing blue and red lights, at the commencement of taper installation and removal.
- The use of a truck-mounted crash cushion (TMCC) or truck-mounted attenuator (TMA) vehicle should be used to protect personnel installing and removing traffic control devices.
- Workers on foot or on a moving vehicle may place cones. When working from a vehicle, the truck must be equipped with a suitable worker platform and railing.
- Cones must be 18-inch tall, except for high-speed, high-volume or nighttime operations when cones must be 28-inch tall and reflectorized.
- Temporary sign supports should include ballast, such as sandbags, to prevent movement.
- Sequential arrow panels (flashing arrow boards) required for lane closures on multi-lane highways, except during emergencies.
- Concrete or semi-rigid barriers are recommended for long term stationary work areas with exposure to high-speed, high-volume traffic.
- Sand or water-filled plastic barrels, crash cushions, or energy absorbing terminals should be used to protect traffic from hazards such as exposed barrier ends and bridge parapets.
- Changeable message signs (CMS) are recommended for high-speed, high-volume roadways, or work operations that require a high-visible message. The CMS should only be used to supplement or enhance work zone safety and not

to replace required signage. No more than two message panels should be used in any message cycle on CMS.

5.4.4 Flagging

- Flagging should be employed only when all other methods of traffic control are inadequate to warn, direct, or control traffic.
- Only persons who have successfully completed an approved flagging course and who possess current flagging certification can be used as flaggers.
- Except for unusual situations, locate the flagger off the traveled portion of the roadway.
- More than one flagger may be necessary to achieve traffic control in both directions; a means of communication between flaggers must be provided.
- Hand signaling by flaggers should be by use of red flags at least 18 square inches or sign paddles, and red lights in periods of darkness.
- Flaggers must be alert and close enough to warn the crew of erratic motorists, but must not be positioned among the work crew.
- Prior to each traffic control set up, the crew and flaggers must determine an "escape plan" to avoid an errant vehicle.
- All signs indicating the presence of a flagger must be in place prior to commencing work activities.
- All signs indicating the presence of a flagger must be removed or covered when flagging is not actually occurring, such as lunch hours or if operations no longer require flagging.

5.4.5 Inspection and Maintenance

- Temporary traffic control zones should be carefully monitored under varying conditions of traffic volume, light, and weather to verify that traffic control measures are operating effectively and that all devices used are clearly visible, clean, and in good repair.
- Traffic control devices are to be inspected at the beginning of each work shift and periodically throughout the day.
- After a hazard-increasing event, such as a car contacting traffic control devices or high winds or storms, the traffic control devices should be immediately restored to their proper position.
- Damaged traffic control devices or those in poor condition should be removed from service and replaced immediately and before work commences or continues.
- Traffic control devices that use reflected light for illumination should be cleaned and their effectiveness monitored continuously.

5.5 Implementing a Traffic Control Plan

PS&S personnel will not be expected to implement traffic control where diversions of the traffic or work adjacent to high-volume, high-speed roadways occurs. These operations will be conducted by the construction contractor on the job, a traffic control subcontractor or local traffic enforcement agency. However, the PS&S SR is still responsible for evaluating the traffic control provided for the site to protect PS&S employees and requesting assistance if deficiencies are identified that endanger PS&S employees. Appendix A, Criteria for Traffic Control, can assist with this evaluation. See SOP#14 *Multi-Employer Site Safety* if a construction contractor endangers employees of PS&S or PS&S contractors by not following safety measures such as those described below. Refer to Appendix A, Criteria for Traffic Control, for more assistance.

PS&S personnel may be exposed to vehicular traffic hazards on secondary roads, rural, suburban or urban, during field operations. While these conditions may or may not require physical barriers, flaggers, or other traffic control measures, they all require that the employee be aware and control the possible hazards from traffic. Each situation will be different and will need to be addressed individually as part of the H&S Checklist or Site-Specific HASP for the project.

5.6 Traffic Control Evaluation

The Traffic Control Assessment found in Appendix B is provided as a method for periodically verifying compliance with established safe work practices, regulations, and industry standards pertaining to traffic control operations. The Supervisor will use this checklist when PS&S employees are exposed to traffic control hazards.

The DM and CSO will assist the PM and/or SR in resolving any deficiencies identified during the self-assessment.

Copies of these assessments will be maintained in the project file and forwarded to the GSO and/or DSO.

6.0 TRAINING

PS&S employees who anticipate working on projects involving work on or adjacent to active roadways are required to have traffic safety training as part of their discipline specific training. This training is provided to enhance awareness of traffic hazards and the control methods used when work is performed on or near active roadways. This training does not qualify PS&S employees to perform traffic control operations, such as lane closures, or to act as flaggers; these activities require more advanced training.

7.1 REFERENCES

29 CFR 1926.200
Manual on Uniform Traffic Control Devices (MUTCD) - http://mutcd.fhwa.dot.gov

APPENDIX A - CRITERIA FOR TRAFFIC CONTROL

The following criteria are not intended to be all-inclusive, but are provided as a tool to facilitate development and review of subcontractor traffic control procedures. Subcontractors are expected to address the following items in their safety procedures, as the field conditions require.

Minimum Acceptable Criteria for Subcontractor Traffic Control Procedures:

1. Provide the name and qualifications (years and type of experience, training background, state certification) of the individual responsible for designing and supervising traffic control operations.

2. Provide the qualifications (years and type of experience, training background) of personnel working in traffic control zones as flaggers.

3. Provide a list of work areas and activities where traffic control will be required.

4. Provide an inventory (amount and type) of traffic control devices and equipment to be used for traffic control operations (truck-mounted crash cushion or attenuator vehicles, cone trucks, message boards, arrow boards, signage, channeling devices, barriers).

5. Provide a copy of the traffic control plan for the traffic control zones anticipated to be required for this project.

6. Provide a copy of an engineering study of the location for which the traffic control plan was developed.

7. Provide a description of traffic control device inspection criteria or procedures (frequency of inspections and items that are inspected).

8. Describe the arrangements to be made with local police or highway patrol to facilitate traffic control device installation and removal.

APPENDIX B – TRAFFIC CONTROL ASSESSMENT CHECKLIST

This checklist will be used by PS&S personnel at locations where: 1) PS&S employees are exposed to traffic hazards and/or 2) PS&S provides oversight of subcontractor personnel who are exposed to traffic hazards.

PM/SR may consult with subcontractors when completing this checklist but will not direct the means and methods of traffic control operations nor direct the details of corrective actions. Subcontractors will determine how to correct deficiencies, and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) will be corrected immediately or all exposed personnel will be removed from the hazard until corrected.

Project Name: _____ Project No.: _____

Location: _____ PM/SR: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

☐ Evaluate PS&S employee exposure to traffic hazards.

☐ Evaluate a PS&S subcontractor's compliance with traffic control requirements.

Subcontractor's Name: _____

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies will be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

ASSESSMENT ITEM	Yes	No	N/A	N/O
1. SAFE WORK PRACTICES				
1.1. Personnel working on/adjacent to active roadways/in control zones are wearing safety vests.				
1.2. Traffic Control Plan (TCP) is consistent with roadway, traffic, and working conditions.				
1.3. TCP has been approved by regulatory or contractual authority prior to work.				
1.4. TCP considers all factors that may influence traffic-related hazards and controls.				
1.5. Rigid barriers protect work areas.				
1.6. Lookouts are used when applicable.				
1.7. TCP considers all factors that may influence traffic-related hazards and controls.				
1.8. Rigid barriers protect work areas.				
1.9. Lookouts are used when applicable.				
1.10. Vehicles are parked 40 feet away from work zone or are equipped with hazard beacon/strobe.				
1.11. TMCC or TMA vehicle is used where appropriate.				
1.12. All Major traffic control devices conform to MUTCD standards.				
1.13. Traffic control devices are inspected continuously.				
1.14. Flagging is only used when other means of traffic control are inadequate.				
1.15. Additional traffic control zone controls have been implemented.				

ASSESSMENT ITEM	Yes	No	N/A	N/O
2. GENERAL	**Yes**	**No**	**N/A**	**N/O**
2.1. Lane closings are performed when required by this SOP.				
2.2. Traffic control configurations are based on an engineering study of the location.				
2.3. If no study, traffic control is performed with approval of the authority having jurisdiction.				
2.4. TCP has been prepared and understood by all responsible parties prior to work.				
2.5. Special preparation/coordination with external parties has been conducted where applicable.				
2.6. All contractor traffic control devices conform to MUTCD standards.				
2.7. Traffic movement and flow are inhibited or disrupted as little as possible.				
2.8. Supplemental equipment and activities do not interfere with traffic.				
2.9. Drivers and pedestrians are considered when entering and traversing traffic control zone.				
3. TRAFFIC CONTROL ZONES	**Yes**	**No**	**N/A**	**N/O**
3.1. Traffic control zones are divided into the necessary five areas.				
3.2. Advanced warning area is designed based on conditions of speed, roads, and driver needs.				
3.3. Advanced warning signage is spaced according to roadway type and conditions.				
3.4. Transition areas are used to channelize traffic around the work area.				
3.5. Buffer areas are used to provide a margin of safety for traffic and workers.				
3.6. The buffer area is free of equipment, workers, materials, and worker vehicles.				
3.7. The length of the buffer area is two times the posted speed limit in feet.				
3.8. All work is contained in the work area and is closed to all traffic.				
3.9. A termination area is used to return traffic to normal lanes.				
3.10. A downstream taper is installed in the termination area.				
4. DEVICE INSTALLATION AND REMOVAL	**Yes**	**No**	**N/A**	**N/O**
4.1. All vehicles involved with device installation/removal have hazard beacons/strobes.				
4.2. Devices are installed according to the order established by this SOP.				
4.3. Devices are removed in the opposite order of installation.				
4.4. Tapers are used to move traffic out of its normal path.				
4.5. Tapers are created using channeling devices.				
4.6. The length of taper is determined by speed and width of lane to be closed (see formula).				
4.7. Local police or highway patrol assists during taper installation and removal.				
4.8. TMCC/TMA vehicles are used during installation and removal of traffic control devices.				
4.9. Cone trucks are equipped with platforms and railings.				
4.10. Cones are the appropriate height for the specific roadway and are reflectorized.				
4.11. Temporary sign supports are secured to prevent movement.				
4.12. Arrow panels are used on lane closures where required.				
4.13. Concrete barriers are used where required.				
4.14. Barrels, crash cushions, or energy absorbing terminals are used to protect traffic as required.				
4.15. Changeable message signs (CMS) are used as required.				
4.16. CMS are not used to replace required signage.				
4.17. No more than two message panels are used in any message cycle on CMS.				
5. FLAGGING	**Yes**	**No**	**N/A**	**N/O**
5.1. Flagging is used only when other traffic control methods are inadequate.				
5.2. Only approved personnel with current certification are used as flaggers.				
5.3. Flaggers are located off the traveled portion of the roadway.				

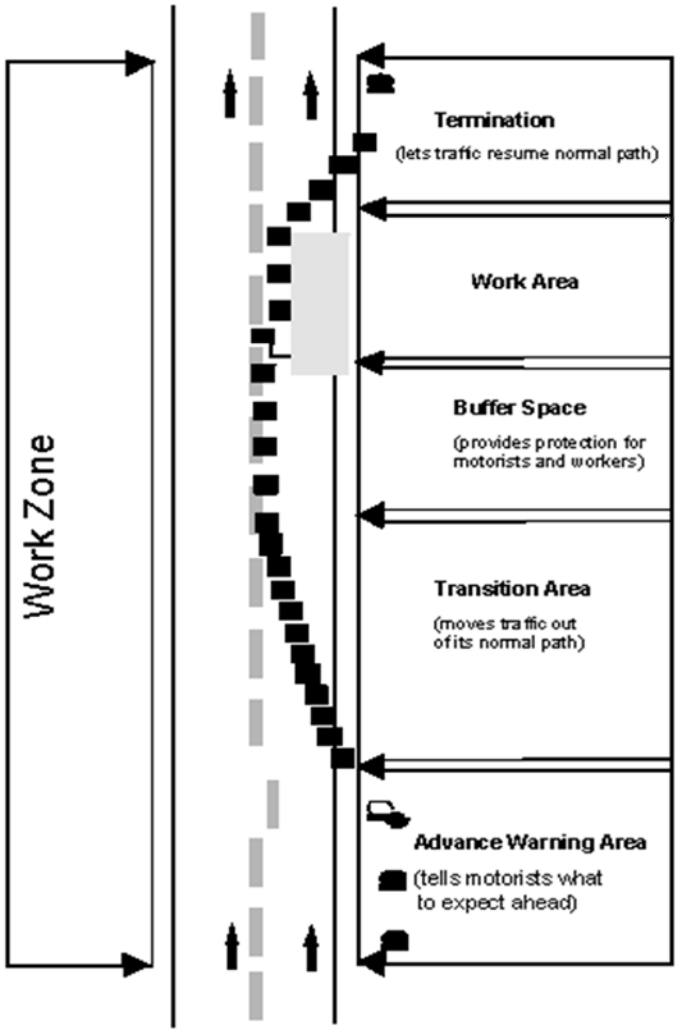
ASSESSMENT ITEM	Yes	No	N/A	N/O
5.4. A communication system is established when more than one flagger is used.				
5.5. Hand signaling by flaggers is by means of red flags, sign paddles, or red lights.				
5.6. Flaggers are alert, positioned to warn work crews, and easily identified from crew.				
5.7. An escape plan is established by crew and flaggers prior to traffic control setup.				
5.8. Signs indicating a flagger is present are used and removed as required.				
6. INSPECTION AND MAINTENANCE	**Yes**	**No**	**N/A**	**N/O**
6.1. Traffic control zones are monitored to determine their effectiveness under varying conditions.				
6.2. Traffic control devices are inspected at the beginning and continuously during work shift.				
6.3. Traffic control devices are restored to their proper position immediately and continuously.				
6.4. Damaged, old, or ineffective devices are removed and replace immediately.				
6.5. Devices using reflected light for illumination are cleaned and monitored continuously.				

REQUIRED CORRECTIVE ACTIONS: Complete this section for each Assessment Items checked "No" or N/O. Deficient items must be corrected in a timely manner.

Item #	Corrective Action Planned/Taken	Date Corrected

Inspector: _____ SR: _____

APPENDIX C - AREAS IN TRAFFIC CONTROL ZONES



SOP #8
Hazardous Field Conditions

Created: 7-20-2011
Revised: 1-24-2014

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this guideline is to provide general reference information regarding various hazardous field conditions not discussed in other PS&S SOPs.

2.0 SCOPE

This SOP applies to PS&S project sites where common hazardous conditions related to fieldwork are encountered. These conditions include biological hazards, walking/working surfaces, ladder safety, weather and railway safety and hunting seasons.

3.0 RESPONSIBILITIES

Corporate Health & Safety Officer (CSO) – The CSO is responsible for periodic review of the guidelines in this SOP

Human Resources (HR) – HR is responsible for maintaining training and medical records.

Department Manager (DM) – The DM is responsible for the overall implementation of this SOP. The DM is also responsible for providing appropriate personnel and resources so that operations can be conducted in compliance with this SOP

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO/DSO is responsible for making appropriate training and equipment available to Field Personnel. The GSO/DSO is responsible for conducting and/or reviewing Field Inspections.

Project Manager (PM) and Site Representative (SR) – The PM and/or SR is responsible for establishing safe work practices for Field Personnel and for managing and monitoring compliance with safety procedures.

Field Personnel (FP) – FP are responsible for observing all general safety guidelines and requirements at PS&S worksites. FP are also responsible for reporting unsafe working conditions to the PM/SR.

4.1 GUIDELINES

4.2 Biological Hazards

Biological hazards may include (see Appendix A for pictures of some of these hazards):

- Insects and arachnids: Bees, wasps, mosquitoes, ticks, venomous spiders
- Blood-borne pathogens: Medical waste, such as syringes, sharps or materials contaminated with human blood or bodily fluids
- Poisonous plants: Poison ivy, oak and sumac
- Fungi or mold: Histoplasmosis
- Animals: Venomous snakes, rodents, wild dogs, bears
- Zoonotic and vector-borne diseases: Rabies, West Nile virus, Lyme disease

PS&S FP will be made aware of the potential for these biological hazards by review of the H&S Checklist for the project and by the PM/SR. PS&S employees should take precautions in areas where such hazards are present, such as wearing appropriate clothing, to prevent contact with insects or plants. Insect repellant should be used to prevent insect bites, especially when entering wetland areas.

All incidents of employee exposure to biological hazards should be reported to the SR or PM and an Incident Report should be completed. Please see SOP#9, *Work Related Injuries and Illnesses* for more information.

4.2.1 Bees and Other Stinging Insects

Bees and other stinging insects can cause significant pain and injury, especially where there are multiple stings or an allergy to the sting. Severe allergies can cause death in minutes if not treated properly.

An employee with a known bee sting allergy should notify the SR and will be required to carry an epinephrine auto injector (EPIpen®) to prevent serious injury if a sting occurs. It will be the responsibility of the Employee and SR to be aware of the proper actions needed in this potential emergency.

Prevention for stings is similar to other insect avoidance:

- Be aware of the area. If a nest is identified, mark it for others.
- Wear light-colored, smooth-finished clothing.
- Avoid perfumed soaps, shampoos, and deodorants.
    - Don't wear cologne or perfume.
    - Avoid bananas and banana-scented toiletries.
- Wear clean clothing and bathe daily. (Sweat may anger bees.)
- Wear clothing to cover as much of the body as possible.
- Avoid flowering plants when possible.
- Remain calm and still if a single stinging insect is flying around. (Swatting at an insect may cause it to sting).
- If attacked by several stinging insects at once, run to get away from them. (When they sting, bees and some other stinging insects release a chemical to attract other bees/stinging insects).
    - Go indoors.
    - A shaded area is better than an open area to get away from the insects.
    - If you are able to physically move out of the area do so, do not to attempt to jump into water. Some insects (particularly Africanized Honey Bees) are known to hover above the water and will continue stinging a person when they surface for air.
- If a bee comes inside your vehicle, stop the car slowly, and open all the windows to allow it to leave.

Basic First Aid for a Sting

- Have someone stay with the worker to be sure that they do not have an allergic reaction.
- Wash the sting site with soap and water.
- Remove the stinger using gauze wiped over the area or by scraping a fingernail over the area.
    - Never squeeze the stinger or use tweezers.
- Apply ice to reduce swelling.

- Do not scratch the sting as this may increase swelling, itching, and risk of infection.

Call 911 or go to a hospital emergency room if the worker is suffering a severe allergic reaction, such as swelling or difficulty breathing, or has had a severe reaction in the past.

4.2.2 Mosquitoes

Mosquito bites are usually considered a simple nuisance. Mosquitoes, however, can act as a vector for diseases. Therefore, precautions should be taken to avoid mosquito bites.

In areas with mosquitoes, personnel should apply insect repellent containing DEET, picaridin, or oil of lemon eucalyptus when working outdoors. Wear long-sleeved clothes and long pants treated with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing. Do not apply repellents containing permethrin directly to exposed skin. If clothing has been treated with insect repellent, there is no need to apply repellent directly to the skin underneath clothing. Avoid being outdoors at dawn, dusk, and in the early evening, which are peak mosquito times.

4.2.3 Ticks

Like mosquitoes, tick bites are not generally dangerous in and of themselves but can transmit a number of dangerous diseases to humans. As such, tick repellent containing diethyltoluamide (DEET >25%) should be used in areas where ticks are likely to be found. Long sleeves and pants are strongly recommended. Pant legs should be tucked into boots. In addition, personnel working in vegetated or wooded areas should conduct a daily, full body search for the presence of ticks. Particular

attention should be paid to the scalp, behind the ears, and other dark warm areas where ticks prefer to feed.

Attached ticks should be removed promptly without crushing, since crushing can squeeze the disease-causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Once removed, clean the area and apply antiseptic.

4.2.4 Spiders

The majority of spiders in the United States are not venomous. There are two species of venomous spiders relatively common throughout the country that could cause serious injury: The black widow spider and the brown recluse spider.

Symptoms of venomous spider bites include headache, nausea, vomiting, dizziness, abdominal pain, and partial loss of muscle control. Sweating occurs in varying degrees, particularly around the site of the bite. Swelling of the affected area is common, as is a quickening of the heart-beat. If safe to do so, collect the spider for identification and seek medical attention.

Basic tips for prevention of spider bites include:

- Shake out all clothing and footwear prior to putting it on
- Use an insect repellant
- Wear long pants and shirts
- Tuck in pants
- Be aware of where your hands are and where you lean or sit
- Never reach into holes or crevices

4.2.5 Poisonous Vegetation

Poisonous vegetation that may be encountered include:

These plants carry oil (urushiol) that creates an allergic reaction and irritation in most individuals. Workers may become exposed to urushiol through:

- Direct contact with the plant
- Indirect contact, such as touching tools, animals, or clothing that have urushiol on them
- Inhalation of particles containing urushiol from burning plants

Employees should become familiar with the identification of these plants and large areas of plant growth that must be accessed continuously should be marked for others.

Workers can prevent contact with poisonous plants by taking these steps:

- Wear long sleeves, long pants, boots, and gloves.
  - Wash exposed clothing separately in hot water with detergent.
- Barrier skin creams, such as a lotion containing bentoquatum, may offer some protection before contact.
  - Barrier creams should be washed off and reapplied twice a day.
- After use, clean tools with rubbing alcohol (isopropanol or isopropyl alcohol) or soap and lots of water. Urushiol can remain active on the surface of objects for up to 5 years.
  - Wear disposable gloves during this process.
- Do not burn plants that may be poison ivy, poison oak, or poison sumac.

  - Inhaling smoke from burning plants can cause severe allergic respiratory problems.
- Exposure to any burning of plants by residents should be avoided and work may be postponed in an area where burning is occurring.

Workers who have come in contact with poisonous plants should:

- Immediately rinse skin with wipes containing rubbing alcohol, specialized poison plant washes, degreasing soap (such as dishwashing soap) or detergent, and lots of water.
  - Rinse frequently so that wash solutions do not dry on the skin and further spread the urushiol.
- Scrub under nails with a brush.
- Apply wet compresses, calamine lotion, or hydrocortisone cream to the skin to reduce itching and blistering.
  - Follow the directions on any creams and lotions. Do not apply to broken skin, such as open blisters.
  - Oatmeal baths may relieve itching.
- An antihistamine such as diphenhydramine (Benadryl) can be taken to help relieve itching.
  - Follow directions on the package.
  - Drowsiness may occur.
- In severe cases or if the rash is on the face or genitals, seek professional medical attention.
- Call 911 or go to a hospital emergency room if the worker is suffering a severe allergic reaction, such as swelling or difficulty breathing, or has had a severe reaction in the past.

4.2.6 Dangerous Animals

Dangerous animals will vary depending on the area where work is being conducted. Wild animals that inhabit areas where PS&S conducts field work include but are not limited to:

- Snakes
  - Timber Rattlesnake
  - Cranebrake Rattlesnake
  - Copperhead
  - Eastern Cottonmouth (water moccasin)

  - Coral
- Mammals
  - Black Bear
  - Coyote, wild dogs
  - Bobcat/lynx
  - Moose
  - Rodents
  - Bats
- Fowl
  - Canada Geese
  - Wild Turkey

Many wild animals avoid humans. It is important to know how to respond to an encounter with a wild animal to minimize the chance of an attack, which animals respond to loud noises by running away and which animals feel threatened by loud noises and may proceed to attack. In general, if attacked or bitten by an animal, seek medical attention and report to HR as soon as practical.

- Snakes – 95% of the United States snake population is non-poisonous. The remaining 5% have bites poisonous enough to be fatal.

  Snakes can only jump 1/3 of their body length and typically travel in a slow, slithering manner. Snakes generally avoid humans. If a snake is encountered, assume that it is a poisonous snake. The following precautions should be taken:

  - Stop and assess the situation.
  - Back up slowly.
  - If in a clear area, go around the snake.
  - If you need to move quickly, take a large stick and gently move the snake out of the way.
  - Once past the snake, it will most likely ignore you.

  Venom Extractor Pumps should be included in first aid kits when working in areas with known populations of poisonous snakes. Protective leggings will be worn in areas of high potential for snake contact and when hiking long distances into wilderness areas.

  If bitten, seek medical attention immediately. Try to identify the snake if possible since the treatment with anti-venom can be more specific. Do not cut the bite area; more unnecessary damage is done by self-inflicted wounds.

- Black Bear – A typical black bear can weigh several hundred pounds. Black bears typically avoid humans and will turn and leave if a person stands still and makes a lot of noise. However, bears accustomed to people or those protecting young may react differently. Personnel who encounter a black bear **SHOULD NOT RUN**. The bear will likely chase and attack a running person. Personnel should take the following precautions to reduce the likelihood of a bear attack:

    - Be alert
    - Make noise, especially if it is windy or near rushing water since these may mask your approach
    - Choose routes that offer good visibility
    - Travel in groups of two or more
    - Keep personal items within immediate reach
    - Wrap small quantities of food tightly in sealed containers (Ziploc bag within a sealed plastic container). Leave food locked in vehicles whenever possible
    - When bringing larger quantities of food or storing food at a campsite the best practice is to obtain bear-proof food containers from hunting or backpacking outfitter
    - If cooking food at a campsite, establish the cooking area at least 50-100 feet downwind of the campsite; and avoid highly scented food (such as fish)
    - Do not pursue or approach bears for photographs or any other reason
    - Do not look a bear in the eye as they consider this a challenge. Instead keep your head down and back away slowly

- Coyote, Wild Dogs – Contact with a coyote, or wild dogs is unlikely. If one is encountered, the following precautions should be taken:

    - Stand tall and make yourself look larger
    - Act aggressively towards it – make noise and throw objects such as stones
    - If the animal does not run away immediately, calmly but slowly back away and maintain eye contact
    - Do not turn your back on the animal and DO NOT RUN AWAY

- Bobcats – A bobcat is about twice the size of a common housecat. There are only three reports of bobcat attacks on humans (1 in FL, 1 in MN, and 1 in CA), none fatal. In one of these, the cat was killed and found to be rabid; the others may have been cases of the people attempting to intervene as the cat was preying on a pet. Best advice: Treat like any other animal encountered in the wild.

- Don't corner or threaten it, back off slowly
- Watch out for signs of rabid behavior
- DO NOT attempt to rescue a prey animal from it
- If it does attack, fight back
- If you are bitten or scratched, seek medical treatment on the assumption that the cat may have been rabid

- Canada Lynx – Similar to but slightly larger than a bobcat, small numbers of lynx are found in the northernmost areas of New England and New York. There are no reports of attacks on humans. Use information above for Bobcats if threatened/attacked.

- Moose – Moose are not generally aggressive toward humans. They may however defend themselves if they feel threatened or harassed, or a mother may attack if she feels you are threatening her calf. Bull moose also become more aggressive during the fall mating season.

  - If a moose sees you and begins deliberately walking toward you, take it as a warning that it wants you to back off.
  - If possible get behind a tree, fence, car, building or other obstruction for protection. The large antler rack makes it more difficult for them to make tight corners.
  - If it charges, run away – it will not chase you far.
  - If it does knock you down, roll up in a ball and protect your head – it will attempt to stomp or kick you.
  - Stay down until it moves away.

- Wild Turkeys – Wild turkeys avoid humans and will run away when they sense a human presence. If you encounter a turkey that appears ready to attack you, mimic the turkey's motions (usually side stepping) and make a loud noise.

- Rodents – Rodents such as squirrels, groundhogs, raccoons, and shrews typically will not attack unless they feel cornered or threatened. If you encounter a rodent, it is best to leave it alone and it will likely run away from you. If bitten, seek medical attention.

- Bats – The primary concern is the potential for rabies infection. Bats rarely attack humans and sick bats normally seek a quiet place to hide and die. If you encounter a bat, the following precautions must be taken:

  - Never handle a bat or bat droppings with bare hands.
  - If you are bitten by a bat or if saliva from a bat gets in to your eyes, nose or mouth seek medical attention immediately.

4.2.6.1 Animal Handling

Some projects may require PS&S FP to handle wild animals such as small mammals, reptiles, and birds. Potential hazards associated with handling wild animals may include:

- Bites and scratches
- Zoonotic diseases and parasites
- Allergic reactions

These hazards can be minimized through the use of proper handling techniques and PPE. Prior to performing any animal handling, personnel will receive species/animal-specific training that includes, at a minimum:

- Typical behavior
- Proper handling techniques
- Potential zoonotic diseases and parasites
- PPE requirements

In general:

- Avoid unprotected contact with animals and their bodily fluids and fecal matter
- Whenever possible, use tools such as tongs, nets, traps, and animal control poles
- Use slow, deliberate movements when approaching the animal
- Avoid threatening, aggressive, or quick movements
- Practice good personal hygiene
  - Wash hands frequently and properly
  - Do not eat, drink, or smoke while handling animals
  - Avoid hand-to-face contact

4.2.7 Zoonotic Diseases

Zoonotic diseases, or zoonoses, are diseases that can be transmitted between animals and people. They can include bacterial, viral, fungal, and protozoan infections, as well as parasitic infections such as worms. Proper use of PPE, safe work procedures, and practicing good hygiene are essential in minimizing the possibility of contracting a zoonotic disease.

The potential zoonotic diseases that PS&S personnel may be exposed to is dependent on the animals that may be encountered/handled or if fecal matter is found in large amounts. It is the responsibility of the PM to determine what zoonotic diseases FP may be exposed to based on the animals that may be encountered or handled and to inform FP of these hazards and work practices necessary to minimize the risk. Please see Appendix B for a partial list of zoonotic diseases found in the United States.

The following are zoonotic diseases that are common through much of the United States or are more likely to cause serious illness or death. This is in no way a complete list of possible zoonotic diseases that may be encountered, particularly for FP who handle animals.

4.2.7.1 West Nile Virus

The primary concern related to mosquitoes is West Nile virus, a mosquito-borne virus that can cause encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord). West Nile virus is spread to humans by the bite of an infected mosquito. A mosquito becomes infected by biting a bird that carries the virus. The majority of human infections do not result in illness, with only 20% of infections developing into West Nile fever. Human disease is characterized by a febrile, flu-like illness with quick

onset, usually three to six days, and moderate to high fever lasting three to five days. Other typical symptoms include fever, headache, and body aches, occasionally with a skin rash on the trunk of the body and swollen lymph glands. The symptoms of severe infection (West Nile encephalitis or meningitis) include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis.

4.2.7.2 Rocky Mountain Spotted Fever (RMSF)

This disease is transmitted via the bite of an infected tick. The tick must be attached four to six hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death if untreated, but if identified and treated promptly, recovery typically occurs.

4.2.7.3 Lyme Disease and Erlichiosis

Lyme disease: The disease is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin, but cases have been identified in other states.

Erlichiosis: The disease commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin. Few cases have been identified in other states.

These diseases are transmitted primarily by the deer tick, which is smaller and redder than the common wood tick. The disease may be transmitted by immature ticks, which are extremely small and hard to see. The tick needs to be attached for 36 to 48 hours to transmit Lyme disease. Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, swelling and pain in the joints, and eventually, arthritis. Symptoms of Erlichiosis include muscle and joint aches, and flu-like symptoms, but there is typically no skin rash.

4.2.7.4 Rabies

Rabies is a viral disease that can be transmitted by a bite from an infected animal. Any mammal can be infected and most cases are linked to pets or wild animal bites, most commonly bats, skunks, foxes and raccoons. Some cases have also occurred by contamination of mucus membranes (mouth, nose, eyes) with infected saliva from an infected animal.

If a worker is bitten by an animal, the worker should attempt to gather as much information about the animal as possible. Call the local animal control authorities to safely capture the animal; PS&S personnel are not to attempt to capture or restrain the animal. If captured, animal control authorities will watch the animal for signs of rabies. A special test called “immunofluorescence” is used to look at the animal’s brain to determine if rabies is present. Report any animal bite and seek medical treatment at the earliest convenience. A minor (not life threatening) animal bite is not considered an emergency situation. Treatment for an animal bite from an infected or potentially infected animal is usually post exposure vaccination and treatment with immunoglobulin to improve natural immune response. If treated before symptoms appear, rabies is usually prevented.

Rabies is diagnosed in humans using the immunofluorescence on a piece of skin from the neck, or by testing the saliva or spinal fluid for the presence of the virus.

Symptoms of rabies infection may include:

- Anxiety, stress and tension
- Drooling
- Convulsions
- Exaggerated sensation at the bite site
- Excitability
- Loss of feeling in an area of the body
- Loss of muscle function
- Low grade fever (102 degrees F or lower)
- Muscle spasms
- Numbness and tingling
- Pain at the site of the bite
- Restlessness
- Difficulty swallowing

Once symptoms appear, the disease is usually fatal. Death from respiratory failure typically occurs within days after the onset of symptoms.

Ways to prevent rabies infection include:

- Avoid contact with animals
- Do not carry or leave food out that may attract animals
- Keep cars/trucks closed to prevent animals from entering
- Do not reach into holes

4.2.7.5 Hantavirus

In 1993, a previously unknown disease, Hantavirus Pulmonary Syndrome (HPS), was identified among residents of the southwestern United States. HPS was subsequently recognized throughout the contiguous United States and the Americas. As of May 7, 2003, a total of 336 cases of HPS have been identified in 31 states, with a case fatality rate of 38%.

All Hantavirus known to cause HPS are carried by rats and mice. The deer mouse, which is common and widespread throughout much of the United States, is the primary host. Other hosts include the white-footed mouse, cotton rat, and rice rat. The spread of the Hantavirus to humans occurs most commonly by inhaling airborne dust that has been contaminated with saliva, urine, or feces from infected mice and rats. One may also become infected by contacting contaminated material with broken skin or eyes, a bite from an infected rodent, or possibly from eating contaminated food or water.

Early symptoms include fatigue, fever, and muscle aches, especially the large muscle groups-thighs, hips, back, and sometimes the shoulders. About half of all HPS patients also experience headaches, dizziness, chills, and/or abdominal problems, such as nausea, vomiting, diarrhea, and abdominal pain. The first symptoms generally develop between one and five weeks after exposure to infected rodents and their droppings. Four to ten days after the initial phase of illness, additional symptoms appear, including coughing and shortness of breath. Earache, sore throat, and rash are very uncommon, and their occurrence may help in differentiating HPS from common ailments such as influenza and other respiratory viruses.

4.2.7.6 Histoplasmosis

Soil contaminated with bird or bat droppings may contain the *Histoplasma capsulatum* fungus which causes the respiratory illness histoplasmosis. PS&S FP may be required to work in areas that may be contaminated with fowl or bat droppings. These locations may include poultry farms, caves, or other locations with populations of birds or bats.

While Histoplasmosis primarily affects individuals with compromised immune systems, it can also affect otherwise healthy individuals. Symptoms of

histoplasmosis typically occur within 12 – 14 days following exposure. Histoplasmosis is most commonly seen in its acute phase however a chronic form of histoplasmosis does exist.

The acute phase of histoplasmosis is characterized by non-specific respiratory symptoms (such as a cough) and flu-like symptoms (such as aches, fever). Antifungal medications are administered for the treatment of acute and chronic histoplasmosis.

Medical attention must be sought if an employee begins to exhibit flu-like symptoms after working in an area with fowl droppings. Only a physician will be able to determine if the employee is suffering from seasonal flu, histoplasmosis, or another respiratory illness.

When working in areas with fowl droppings, additional PPE, including respiratory protection, may be required. In addition, extensive decontamination of personnel, equipment, and vehicles may be necessary. Although the flu vaccination will not help to prevent histoplasmosis, the antibodies produced within the person as a result of the vaccination will help to strengthen the immune system. As such, it may be beneficial for personnel working in these areas to be vaccinated against the flu. Prior to entering an area with suspected bird or bat droppings, PS&S FP will contact the PM/SR to determine if these precautions should be followed.

4.2.7.7 Salmonellosis

Salmonellosis is an infection caused by the Salmonella bacteria. Though people commonly think of salmonellosis as a foodborne illness, it can also be contracted from direct or indirect contact with many animals, specifically reptiles, amphibians, and birds. These animals often carry Salmonella on their skin or feathers, or in their bodily fluids. FP may be exposed to Salmonella when

conducting tasks that involve handling reptiles, amphibians, or birds, or contaminated dirt, vegetation, water or other substances.

Symptoms of Salmonellosis include diarrhea, fever, abdominal cramping, and fatigue occurring 12 to 72 hours after infection. The infection typically lasts 4 to 7 days. Most people recover without professional medical treatment. Some people, especially those with compromised immune systems, develop more severe symptoms and complications that may require medical treatment. Complications can include severe dehydration, reactive arthritis, septicemia, and damage to the kidneys.

To reduce the risk of Salmonella infection when handling reptiles, amphibians, or birds or materials from their dens/nests:

- Wear proper PPE, including barrier gloves (nitrile, latex, etc.)
- Do not eat, drink, or smoke

After handling reptiles, amphibians, or birds, or materials from their dens/nests:

- Wash hands thoroughly with soap and water
- Launder clothing as soon as possible
- Follow proper decontamination procedures for equipment that may have been contaminated

4.3 Ladder Safety

Ladders will be capable of supporting the following loads without failure:

- Self-supporting portable ladder should be able to support at least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder will sustain at least 3.3 times the maximum intended load.
- Portable ladder that is not self-supporting should support at least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladders will sustain at least 3.3 times the maximum intended load

- Fixed ladder should be able to support at least two loads of 250 pounds each, concentrated between any two consecutive attachments, plus anticipated loads caused by ice buildup, winds, rigging, and impact loads resulting from the use of ladder safety devices. Each step or rung will be capable of supporting a single concentrated load of at least 250 pounds applied in the middle of the step or rung.
- Ladders will not be loaded beyond the maximum intended load for which they were built, or beyond their manufacturer's rated capacity.

4.3.1 Portable Ladders

The following requirements apply to the use of portable ladders, including job-made ladders:

- When portable ladders are used for access to an upper landing surface, the ladder side rails should extend at least 3 feet above the upper landing surface
- Ladder should be secured at its top to a rigid support that will not deflect, if a 3-feet extension is not possible because of the ladder's length
- Non-self-supporting ladders will be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support)
- Wood job-made ladders with spliced side rails will be used at an angle such that the horizontal distance is one-eighth the working length of the ladder
- Ladders will be used only on stable and level surfaces unless secured to prevent accidental displacement
- Ladders will not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement
- The ladder rungs will be uniformly spaced
- Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, will be secured to prevent accidental displacement, or a barricade will be used to keep the activities or traffic away from the ladder
- The area around the top and bottom of ladders will be kept clear
- The top of a non-self-supporting ladder will be placed with the two rails supported equally unless it is equipped with a single support attachment
- Portable ladders with structural defects, will either be immediately marked as defective, or be tagged with "Do Not Use", and will be withdrawn from service until repaired

4.3.2 Fixed Ladders

The following requirements apply to the use of fixed or permanent ladders:

- Fixed ladders at their point of access/egress will have a step-across distance of not less than 7 inches (18 cm) nor more than 12 inches (30 cm) as measured from the centerline of the steps or rungs to the nearest edge of the landing area. If the normal step-across distance exceeds 12 inches (30 cm), a landing platform will be provided to reduce the distance to the specified limit.
- Fixed ladders will be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder
- Fixed ladders without cages or wells will have a clear width to the nearest permanent object of at least 15 inches (30 cm) on each side of the centerline of the ladder
- Fixed ladders will be provided with cages, wells, ladder safety devices, or self-retracting lifelines where the length of climb is less than 24 feet (7.3 m) but the top of the ladder is at a distance greater than 24 feet (7.3 m) above lower levels
- Where the total length of a climb equals or exceeds 24 feet (7.3 m), fixed ladders will be equipped with one of the following:
- Ladder safety devices
- Self-retracting lifelines, and rest platforms at intervals not to exceed 150 feet (45.7 m)
- A cage or well, and multiple ladder sections with each ladder section not to exceed 50 feet (15.2 m) in length. Ladder sections will be offset from adjacent sections, and landing platforms will be provided at maximum intervals of 50 feet (15.2 m).
- The side rails of through or side-step fixed ladders will extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder.
- For through-fixed-ladder extensions, the steps or rungs will be omitted from the extension and the extension of the side rails will be flared to provide not less than 24 inches (61 cm) nor more than 30 inches (76 cm) clearance between side rails. Where ladder safety devices are provided, the maximum clearance between side rails of the extensions will not exceed 36 inches (91 cm).
- For side-step fixed ladders, the side rails and the steps or rungs will be continuous in the extension
- Individual-rung/step ladders, except those used where their access openings are covered with manhole covers or hatches, will extend at least 42 inches (1.1 m) above an access level or landing platform either by the continuation of the rung spacing as horizontal grab bars or by providing vertical grab bars that will have the same lateral spacing as the vertical legs of the rungs.

4.3.3 General Work Practices

The following work practices should be adhered to by employees when using ladders:

- When ascending or descending a ladder, the user will face the ladder
- Each employee will use at least one hand to grasp the ladder when progressing up and/or down the ladder, always have three parts connected to the ladder (one hand and two feet or two hands and one foot.
- An employee will not carry any object or load that could cause the employee to lose balance and fall. Employees will use a backpack to carry any equipment.
- Ladders will be maintained free of oil, grease, and other slipping hazards
- Ladders will be used only for the purpose for which they were designed
- Ladders will be inspected by a competent person for visible defects on a periodic basis
- Ladder repairs will restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.

4.3.4 Ladder Maintenance

PS&S owned ladders will be kept clean and maintained as recommended by the manufacturer. Ladders will be inspected prior to being used and periodically when in storage. Ladders found to be defective will be removed from service immediately and cleaned, repaired or disposed of by cutting it into small parts.

4.4 Walking/Working Surfaces

It is generally expected that the ground at most field sites may be uneven, the surface may be unreliable due to settling, surface debris, and wet or muddy conditions. Therefore, the potential for slipping, tripping, and falling is present, especially where PPE or respirators may impede vision. Severe trip hazards should be identified in site meetings and demarcated by flags or caution tape.

Debris and site waste should be cleaned daily as poor housekeeping is a main cause of slip, trips or falls on worksites. Report other unsafe conditions to the project PM/SR so appropriate safety precautions can be taken.

Structures under renovation, remediation or construction may also have walking or working surfaces that are dangerous, such as holes in floors, floor openings, wall openings, etc. These hazards should be identified in H&S Checklist and be guarded, however, it is important to remain aware of the conditions in the work area and notify the SR if uncontrolled hazards are identified.

4.5 Hunting Season

Prior to conducting field work, particularly in remote areas, the SR should verify the dates of local hunting seasons. This information can be found on most state government fish and wildlife or natural resources websites. PS&S personnel who will be conducting work activities in a legal hunting area during hunting season will be informed of the dates and, if applicable, times when hunting is legally allowed. Personnel should also be made aware that hunting may take place outside of legal hunting seasons and areas. If evidence of hunting is observed, PS&S personnel should follow the following precautions regardless of legal hunting seasons or areas.

When working during a hunting season on or near hunting grounds or in rural areas, workers should wear ANSI approved blaze orange Class 2 high-visibility vests. Some states have specific requirements for the type of high visibility clothing and the amount of blaze orange on outerwear that hunters wear. In New Jersey 200 square inches of blaze orange are required for most hunters. While there are no regulatory requirements for non-hunters, the FTL should check for such requirements and equip PS&S personnel accordingly. No camouflage clothing of any kind should be worn in these situations.

4.6 Violence

It is possible to be exposed to violence from individuals working on the site or others in the area. You may be the intended victim or a bystander. Using the buddy system is recommended whenever going into areas where there is a possibility of a violent encounter. In some cases, professional security or police assistance may be needed.

PS&S employees are prohibited from carrying firearms to worksites. Cell phones should be available when entering areas of security concern.

Employees who have been involved in a workplace violence episode should notify their PM/SR immediately.

4.7 Severe Weather

Severe weather includes high winds, lightning storms, tornados, hurricanes, snow/ice storms or other weather conditions that could present a hazard to employees. The PM/SR will decide when weather conditions present a hazard and employees should seek shelter and postpone outdoor activities until the hazardous weather conditions have passed.

Projects on bridges, utilizing cranes, derricks or drill rigs will not operate during lightning storms or high winds. If severe weather is predicted for your site location, contact the project PM/SR to determine if activities are being postponed.

4.8 Railway Safety

Personnel working in areas adjacent to active rail traffic must undergo a rail safety orientation prior to working on the project. All work in vicinity of rail tracks will be coordinated with the railway operators (LIRR, NJ Transit, CSX, Amtrak, etc.) safety division.

At a minimum, or in accordance with the requirements of the railway operator's requirements, ANSI approved Class 2 high visibility vests must be worn when working in active railway areas. Some areas or operations will also require the use of a flagman, confirm the requirement for a flagman with the specific rail operator.

PS&S employees should never stop or park vehicles on railroad tracks even if they believe they are inactive. PS&S employees will never ignore warning barriers, lights or signs whether driving or walking around railways.

4.9 Working Alone

In general, PS&S employees should not work alone on potentially hazardous sites such as performing bridge or rooftop inspections, excavations (if the construction contractor is not present), or certain surveys. The need for a second team member to be available for assistance should be evaluated by the SR in consultation with the PM or DM.

4.10 Undeveloped Areas

There are a number of hazards associated with working in undeveloped areas. The following are potential hazards that may be encountered when working in such areas. Though this list is comprehensive it is not exhaustive. The SR must be aware of other hazards that may not be addressed in this section and address them as necessary.

4.10.1 Limited Access

The first hazard likely to be encountered in undeveloped areas is site access. Site access may be by way of a paved or unpaved United States Forest Service roads, logging roads, or other back country roads. Such roads may receive little or no maintenance. Washouts, deep ruts and mud holes may make them impassible to

all but high-clearance 4-wheel drive vehicles. Heavy rainfall may cause flooding, winter snowfall may not be plowed and downed trees or fallen rocks may block them completely.

In some cases it may not be possible to drive directly to the work site. Personnel may have to park vehicles and walk the remaining distance to a site, carrying their gear and equipment with them.

When conducting the initial assessment of the location, the SR must consider:

- Driving safely on rough roads (refer to SOP#15 *Vehicle Safety* for more information)
- Long response time for emergency responders
- Increased evacuation time in case of medical or other emergency
- Possibility that an injury victim may need to be transported by the team to a place where emergency responders can be met
  - NOTE: It is critical that local response organizations be contacted prior to the start of work, to determine what their capabilities and response times will be.
- The need to stop work activities earlier in the day, to exit the site in daylight
- Possibility of being caught by changing weather or road conditions, which could force an unplanned night in wilderness areas
- If walking from vehicles to the work site, first aid kits and any other emergency equipment and supplies, including water, must be carried with the team

4.10.2 Rough Terrain

PS&S personnel may encounter rough terrain when conducting work activities in undeveloped areas. Rough terrain may include mountainous areas, cliff faces, and other types of land features that inhibit travel. **NOTE: It is not expected that any PS&S employee will be trained or equipped to engage in any form of technical rock climbing or rappelling. Teams are to go around cliff faces, rather than ascending or descending them. If it is not possible to complete**

work tasks without significant rock climbing, the PM must be contacted, and appropriate instructions provided.

Specific issues to be considered:

- Increased likelihood of slips and falls –
  - Wear proper footwear, with good foot and ankle support and lug soles
  - Use extreme caution in wet/muddy or snowy/icy conditions
  - Use fall protection equipment if working near cliff tops or other extremely steep areas (any place where a slip or trip could cause the person to fall or slide uncontrollably)
- Falling rocks
  - If working at the base of a cliff or steep hillside, the area must be inspected for signs of rocks that may be loose and fall.
  - Hard hats and protective footwear MUST be worn in these areas.
- Decreased visibility
  - Closely spaced trees and/or thick underbrush may make it difficult for team members to see each other or their vehicles and equipment.
  - If normal communications cannot be maintained continuously, a schedule of contact should be established. If any team member misses a scheduled contact, the rest of the team should regroup at a predetermined location to begin a possible search for the missing member(s).

4.10.3 Communications

Undeveloped areas may not have cell phone coverage. Field teams may have to rely on radio (walkie-talkie) communication within the team. For external communication, it may be necessary to locate the nearest land-line phone, or the nearest spot from which a reliable cell signal can be found. (Note that sometimes a signal can be obtained from a ridgeline when none is available in the valley below.) These locations must be determined before the team starts work in the area. Satellite phones, cell phone boosters or other communications devices may be available in areas where cell phone coverage is unavailable or inconsistent.

4.11 Overhead Electrical Lines

Prior to working near overhead electrical lines, lines will be deenergized and grounded whenever possible. If deenergizing lines is not feasible, other safety measures will be required prior to conducting work.

Other safety measures include maintaining safe clearances from live lines and the use of guarding, isolating, or insulating devices that prevent workers from directly or indirectly contacting live lines. Only qualified workers are permitted to install guarding, isolating, or insulating devices on energized overhead lines.

When an unqualified electrical worker is working in an elevated position or on ground level near energized overhead lines, the worker and all conductive objects being used must remain at least:

- 10 feet from unguarded overhead lines of 50kV or less; or
- 10 feet plus 4 inches for every 10kV over 50kV from unguarded overhead lines exceeding 50kV.

A conductive object is any object that lacks an insulating rating for the voltage range of the overhead lines.

When a qualified worker is near energized overhead lines, the worker and any conductive object without an approved insulating handle must remain a minimum distance from any exposed, energized parts. Please refer to *SOP#22 Electrical Safety* for additional information.

4.12 Overhead Electrical Lines – Vehicular and Mechanical Equipment

Vehicles or mechanical equipment will maintain a minimum clearance of 10 feet between all parts of the vehicle/equipment and energized overhead lines and associated equipment. In addition, the OSHA standard for Cranes and Derricks requires a minimum of 20 feet clearance from electrical lines.

Minimum clearances may be decreased:

- If the vehicle or equipment is in transit and all structures are lowered, a minimum clearance of:
  - 4 feet must be maintained from overhead lines up to 50kV, or
  - 4 feet plus 4 inches per 10kV from overhead lines exceeding 50kV.
- If insulating barriers with appropriate voltage ratings are installed on the energized overhead lines, the minimum clearance may be reduced according to the designed working dimensions of the insulating barrier. The insulating barrier will be separate from the vehicle or equipment and must not be attached to any part of the vehicle or equipment.
- If a qualified worker is on an insulated aerial lift with an appropriate voltage rating, minimum clearances must be maintained between all un-insulated portions of the aerial lift and the energized overhead lines. Please refer to *SOP#22 Electrical Safety* for additional information.

Workers on the ground in the proximity of vehicular or mechanical equipment may not contact the equipment or its parts unless:

- The worker is using PPE with an appropriate voltage rating; or
- The equipment is positioned such that un-insulated or conductive portion of its structure remains the minimum required distance from the energized overhead lines.

When there is the possibility of contact between energized overhead lines and any intentionally grounded vehicle or mechanical equipment with parts that may be raised, workers on the ground will remain clear of the grounding location. The use of

barricades, insulation, or other safety precautions will be taken to protect workers from hazardous ground potentials in the vicinity of the grounding location.

4.13 Lockout and Tagout

PS&S does not conduct maintenance and repair work on equipment and therefore does not utilize Lockout/Tagout equipment or procedures. However PS&S employees may work on or near equipment that has been locked and/or tagged out and therefore are considered affected employees. The following information is provided to assist PS&S employees in confirming that LOTO procedures have been properly implemented by facility owner/operators or contractors' authorized employees.

The Hazard Assessment will include a review of requirements for lockout/tagout of energized electrical, mechanical, high pressure, steam, hydraulic or other system that represents a potential hazard. The machine or equipment will be turned off or shutdown using the procedures established for the machine or equipment stoppage. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment. The Lockout/tagout program will include inspections by a qualified person, who will not be the person using the lockout/tagout in progress. The certified review of the inspection including date, equipment, employees & the inspector will be documented. Lockout/tagout procedures will be coordinated with project client personnel who are responsible for operation and maintenance of project site facilities and equipment. Prior to entering a work environment that includes potentially hazardous equipment or conditions, PS&S requires that the facility or equipment owner implement a lockout/tagout program in order to protect PS&S employees who will be working in proximity to such equipment. PS&S Health and Safety Training programs incorporate training regarding hazards associated with electrical energy, high pressure vessels and equipment, process equipment, potential energy/reaccumulation, engulfment, entrapment and other specific hazards associated with site and facility work activities. The lockout/tagout program will include the following elements:

- Lockout/tagout devices and labels must include the name of the individual responsible for placing the device and causing the locked out equipment to be de-energized or isolated as required to provide a safe work condition
- The preparation for shutdown/isolation; provisions for potential energy storage, reaccumulation and release; and inspection, monitoring and verification of the equipment shutdown/isolation will be documented by the facility or equipment owner authorized employee prior to conduct of work by PS&S employees
- The responsible person for the lockout/tagout measure will include identification of specific personnel or group of personnel and function performed when selecting the lockout/tagout measure
- Employees encountering Lockout and Tagout devices will not attempt to remove, deface or change the device
- This SOP requires that the owner of the facility that is the site of PS&S field services administer Lockout and Tagout procedures including machine or equipment shutdown, which will be verified by the site owner's representative prior to initiation of PS&S work. PS&S is a consulting engineering company. PS&S does not own or operate machines and equipment at client sites. The responsibility for operation and Lockout/Tagout of machines and equipment belongs to the facility owner. The PS&S SOP requires that the facility owner comply with OSHA requirements for machine or equipment shutdown, and that Lockout/Tagout measures are documented before PS&S personnel approach machines or equipment. PS&S services involve noncontact visual inspection, and not physically servicing or contacting machines or equipment. Lockout of energy isolating devices whenever maintenance or servicing is done on machines or equipment will be used to confirm that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury. When the energy isolating devices are not lockable, tagout may be used only in association with provision of project-specific procedures and

training, and project-specific inspection schedule. Additionally, the facility owner will be required to provide at a minimum documentation of the following project-specific Lockout and Tagout machine and equipment shutdown measures:

- Written notice to affected employees that services will be conducted on or near the machine or equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.
- Documentation of the facility owner procedure to identify the type and magnitude of the energy that the machine or equipment utilizes, the hazards of the energy, and the methods to control the energy.
- Documentation of the procedure used to shut down that the machine or equipment.
- Documentation of the procedures used to de-activate the equipment including energy isolating devices so that the machine or equipment is isolated from the energy sources.
- Documentation of the lock out of the energy isolating devices with assigned individual locks.
- Documentation that stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) has been dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
- Documentation that the equipment is disconnected from the energy sources and no personnel are exposed, followed by implementation of an isolation verification process through testing of the equipment by operating the push button or other normal operating control to make certain the equipment will not operate. The operating controls will be returned to neutral or "off" position after verifying the isolation of the equipment.

- Documentation of the inspection of the lock out and tagout, and isolation measures throughout the duration of the work performed by PS&S personnel.
- The facility owner will be responsible for procedures required to restore the machine or equipment to service.

5.1 TRAINING

PS&S employees who are exposed to any hazardous field condition will be trained to recognize and prevent hazards and to use safe work practices to reduce the risks associated with these typical field conditions. This training may be provided as part of discipline specific training or during site safety talks, depending on the hazards and knowledge of the employees.

5.2 Lockout/Tagout Training

Affected employees will be trained to recognize LOTO, why LOTO is implemented, and the importance of leaving LOTO devices in place. Employees are prohibited from tampering with LOTO devices or attempting to restart equipment where LOTO is applied.

Re-training will be conducted if:

- There are changes to:
  - An affected employee's job assignments
  - machines, equipment or processes present new hazards
  - energy control procedures
- The employee demonstrates inadequate knowledge of energy control procedures

6.0 REFERENCES

29 CFR 1926.1053

29 CFR 1910.147

Arizona Game and fish department: Living With Bobcats http://www.azgfd.gov/w_c/urban_bobcat.shtml

University of Wisconsin: Felids of Wisconsin http://www.uwsp.edu/wildlife/carnivore/index.htm

Alaska Division of Fish and Game: What to do about Aggressive Moose http://www.wildlife.alaska.gov/index.cfm?adfg=aawildlife.agmoose

Purdue University: Zoonotic Diseases http://www.purdue.edu/research/vpr/rschadmin/rschoversight/animals/zoonotic.php

Center for Disease Control and Prevention: http://www.cdc.gov/

APPENDIX A – BIOLOGICAL HAZARDS

Deer Tick Nymph

Northern Copperhead

Rattlesnake

APPENDIX B – PARTIAL LIST OF NORTH AMERICAN ZOONOTIC DISEASES

Disease Name	Agent	Animal Carriers/Hosts	Vectors
Bacterial Infections	**Bacteria**	**Animal Carriers/Hosts**	**Vectors**
Brucellosis	Brucella abortus, Brucella canis, Brucella melitensis, Brucella suis	Canids, wild ruminants	
Campylobacteriosis	Campylobacter jejuni, C. fetus, C. coli	Ferrets, mink, felids, canids, birds	
Cat Scratch Fever	Bartonella henselae	Felids	
Chlamydiosis (mammals)	Chlamydophila abortus, C. felis	Cervids, felids	
Ehrlichiosis	Ehrlichia, Neorickettsia, Anaplasma	Rodents, wild ruminants, canids	Ticks
Leptospirosis	Leptospira species	Rodents, canids	
Listeriosis	Listeria monocytogenes	Rabbits, felids, canids, birds	
Lyme Disease	Borrelia burgdorferi	Cervids, opossums, raccoons, rodents, canids	Ticks
Plague	Yersinia pestis	Rodents, felids, rabbits	Fleas
Rat bite fever	Spriillum minus, Streptobacillus moniliformis	Rodents, birds	
Rocky Mountain Spotted Fever	Rickettsia rickettsii	Opossums, rabbits, rodents, canids	Ticks
Salmonellosis	Salmonella species	Reptiles, amphibians, birds	
Streptococcosis	Streptococcus canis, S. equi subsp. zooepidemicus, S. iniae, S. suis	Ferrets, fish, canids, felids	
Tuberculosis (bovine)	Mycobacterium bovis	Badgers, cervids, felids, canids	
Tularemia	Francisella tularensis	Rabbits, rodents	Ticks, deer fly
Viral Infections	**Virus**	**Animal Carriers/Hosts**	**Vectors**
Avian influenza	Orthomyxoviridae influenzavirus A	Canids, felids, birds	
Contagious Ecthyma (Orf)	Parapoxvirus	Wild ruminants	
Influenza	Influenzavirus	Ferrets, mink, felids, canids	
Rabies	Lyssavirus	Any mammal	
West Nile virus	Kunjin Virus, West Nile Virus	Birds	Mosquitoes
Parasitic Infections	**Parasite**	**Animal Carriers/Hosts**	**Vectors**
Acariasis (Mange)	Numerous species of mites	Bats, felids, fox, rabbits, raccoons, rodents, canids, felids, birds	
Babesiosis	*Babesia microti, other Babesia species*	Rodents, wild ruminants, canids, birds	Ticks
Baylascariasis	Baylisascaris procyonis	Rabbits, raccoons, rodents, canids	
Chagas	Trypanosoma cruzi	Rodents, canids, felids, rabbits	Kissing bug

Disease Name	Agent	Animal Carriers/Hosts	Vectors
Cryptosporidiosis	Cryptosporidium parvum	Rodents, canids, felids	
Cysticercosis	Taenia species	Bears, rabbits, rodents, wild ruminants, canids, felids	
Echinococcosis (hydatid disease)	Echinococcus granulosus, E. multilocularis	Canids, felids, herbivores, rodents,	
Giardia	Giardia intestinalis	Beavers, canids, felids	
Hookworms	Ancyclostoma species	Canids, felids	
Leishmaniasis	Leishmania species	Canids, marsupials, rodents, felids	Sand flies
Roundworms	Toxocara species	Canids, felids	
Sarcocystosis	Sarcocystis species	Opossums, rodents, rabbits	
Taeniasis	Taenia species	Canids, felids	
Toxoplasmosis	Toxoplasma gondii	Rabbits, rodents, felids	
Trichuriasis	Trichuris suis, T. trichiura, T. vulpis	Canids	
Fungal Infection	**Fungus**	**Animal Carriers/Hosts**	**Vectors**
Cryptococcosis	Cryptococcus neoformans	Ferrets, canids, felids	
Dermatophytosis (Ringworm)	Microsporum species, Trichophyton species	Rabbits, rodents, canids, felids, birds	

SOP #9
Work Related Injuries and Illnesses

Created: 7-20-2011
Latest Revision: 9/18/2014

TABLE OF CONTENT

1.0 PURPOSE

This guideline establishes procedures for PS&S personnel on the reporting of work related injuries and illnesses.

2.0 SCOPE

This SOP applies to all work related injuries and illnesses which occur to PS&S employees at all PS&S locations or field sites.

3.0 DEFINITIONS

Injury or Illness – An injury or illness is an abnormal condition or disorder. Injuries include cases such as, but not limited to, a cut, fracture, sprain, or amputation. Illnesses include both acute and chronic illnesses, such as, but not limited to, a skin disease, respiratory disorder, or poisoning. (Note: Injuries and illnesses are OSHA recordable only if they are new, work-related cases that meet one or more of the 29 CFR 1904 recording criteria.)

Physician or Other Licensed Health Care Professional – A physician or other licensed health care professional is an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently perform, or be delegated the responsibility to perform, the activities required.

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is responsible for periodic review of the guidelines in this policy.

Human Resources (HR) – HR is responsible for referring employees for non-emergency medical treatment, maintaining records related to injuries and illnesses that occur from occupational causes, and filing required reports with the Workers Compensation Insurance carrier. HR will maintain any required OSHA 300 logs and other records.

Department Manager (DM) – The DM is responsible for the overall implementation of this program. The DM is also responsible for completion of Incident Report Forms and for submitting the completed form to HR and to the appropriate Project Manager(s) and Group Health & Safety Officer(s) and/or Department Health & Safety Officer(s).

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO/DSO is responsible for assisting with incident investigations, determining required corrective actions, and following up on their implementation.

Project Manager (PM) or Site Representative (SR) – The PM/SR is responsible for notifying the DM, assisting with the completion of reports and with conducting injury and illness investigations for their operations.

Employees – Employees are responsible for reporting all work related injuries and/or illnesses immediately to the PM/SR or GSO/DSO. Employees are also responsible for reporting near-misses and incidents that do not result in injury or illness. Employees will assist in the completion of required reports and investigations of accidents.

5.1 GUIDELINES

- Employees must report any incidents or near-misses immediately to the PM/SR or GSO/DSO.
- If medical attention is required, the employee is to follow the guidelines listed in the Emergency Action Plan, H&S Checklist, or Site-Specific HASP for the nearest medical facility or call 911 for emergency medical personnel.
- Unless federal, state or local laws require differently, the PM/SR or GSO/DSO will complete an incident report (in Appendix A) within 24 hours for each injury or illness to personnel or accidental damage to property. Vehicular accidents will be reported for company vehicles and personal vehicles used for business if the accident occurred during company business. For vehicular incidents, a copy of the police report must be attached.
- A copy of the written report will be sent immediately to Human Resources (HR).
- HR will notify the appropriate insurance company. Injuries and illnesses will be reported to the Workers Compensation insurance carrier, vehicular accidents will be reported to the vehicle insurance carrier. The owner of a personal vehicle will report an accident to their insurance carrier.
- The DM is responsible for completion of the incident report, with guidance from the GSO/DSO, and shall review for root causes and corrective actions. The DM will be furnished by the company with proper equipment and resources to conduct the investigation; the required equipment and resources needed to accomplish the investigation is determined on a case-by-case basis. The incident investigation shall include an initial identification and assessment of evidence, and shall review and document physical conditions at the incident location, including environmental conditions at time of incident, activities, use of PPE, personnel present, and. Evidence will be preserved for reportable incidents that occur at project locations. The incident investigation will include witness interviews and written statements, to be made part of the incident report.
- Responsibilities should be assigned for each corrective action as well as target dates for completion. Each completed corrective action will be documented and the documentation will be forwarded to HR, CSO and if appropriate discussed with all CSOs to determine if corrective action is needed in other business units

5.2 Reporting of a Fatality, In-patient Hospitalization, Amputation, or Eye Loss to OSHA

OSHA requires that the employer report by telephone or by OSHA Web Portal any work-related fatality within 8 hours of receiving the information and any single hospitalization, amputation of any body part or loss of an eye within 24 hours of notification. This includes any fatality that ensues up to 30 days after the incident and hospitalizations, amputations or eye loss within 24 hours of the event.

Deaths or injuries from vehicular or public/commercial transportation accidents are not covered. Any fatality hospitalization, amputation or eye loss will be reported as soon as possible to HR and the CSO. PS&S management will then report such incidents to OSHA if needed. The OSHA telephone number to use is 1-800-321-6742 or that of the local OSHA area office. PS&S will not report to OSHA incidents that do not involve its own employees.

The employer of the dead or injured employees is required to orally tell OSHA the following information:

- The employer's name and establishment name;
- The location of the incident;
- The time of the incident;
- The type of reportable event
- The number of fatalities, hospitalized employees, amputations or lost eyes;
- The names of any injured employees;
- The employer's contact person and his or her phone number; and
- A brief description of the incident.

Do not give additional information at this time.

6.1 REFERENCE

29 CFR 1904

APPENDIX A – INCIDENT REPORT FORM

INFORMATION REQUIRED FOR INSURANCE/BENEFITS REQUIREMENTS

Incident Type: Check all that apply.
Injury/Illness:____Disabling____Restricted Duty____Recordable____First-Aid ____
Vehicle/Property DamageAir Emission _____ Spill____Near Miss ____
Third Party Involved____Other ____

WHO WAS INJURED?

Name _____ Date and Time of Incident: Date_____Time _____

Home Address _____ Home Telephone Number _____

_____

Date Reported: _____
Supervisor on Duty _____
Shift/Time Started: _____ Witness (es) _____

_____

Job Classification: _____
Location of Incident: _____
Length of service with company years_____ months_____
Time spent on present job_____

Nature of Injury

_____

_____

_____

_____

Task being performed (Brief description of the task being performed and equipment used.)

_____

_____

_____

MEDICAL INFORMATION/ INJURY CLASSIFICATION

Medical Treatment - Where: _____ Date: _____

Treated by: _____ (Doctors Name and telephone)

If employee is placed on restricted duty, provide details of the restriction.

_____

If employee is placed off duty, provide the next scheduled doctor visit (Doctor and date)

_____

If employee is hospitalized, provide the address of the hospital.

_____

DESCRIBE INCIDENT (What was the work assignment; nature of the incident; result of the incident?)

_____
_____
_____

WHAT HAPPENED? (Tell exactly what happened; give exact location)

_____
_____
_____
_____

WHY DID IT HAPPEN? (What were the contributing factors?)

_____
_____
_____
_____

Employee Signature_____**Date**_____

Department Manager Signature_____**Date**_____

Project Manager Signature_____**Date**_____

SOP #10
Hand and Power Tool Safety Program

Created: 7-20-2011
Last Revision Date: 11-2-2011
Last Revision Date: 7-19-2012

TABLE OF CONTENT

1.0 PURPOSE

The purpose of this guideline is to provide safe procedures for the use of hand and power tools.

2.0 SCOPE

This SOP applies to PS&S personnel who may be required to use hand or power tools for work activities.

3.0 DEFINITIONS

Ground Fault Circuit Interrupter (GFCI) – A Ground Fault Circuit Interrupter (GFCI) is a device to protect against electric shock should someone come in contact with a live wire and a path to ground which would result in a current through his/her body. The GFCI operates by sensing the difference between the currents in the hot and neutral conductors.

Hand Tool – A tool that is manually powered.

Power Tool – A tool that is powered electrically, pneumatically, hydraulically, or by liquid fuel. Power tools may be portable or permanently installed.

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is responsible for periodically reviewing and revising this SOP as needed.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO/DSO is responsible for making appropriate training and personal protective equipment (PPE) available to PS&S employees.

Human Resources (HR) – HR is responsible for the maintenance of training records.

Department Managers (DM) – The DM is responsible for the overall implementation of this program within the operations under their control. The DM is also responsible for providing appropriate resources in personnel and equipment required to complete these operations safely.

Project Manager (PM) and Site Representative (SR) – The PM and/or SR is responsible for communicating the safety requirements, including PPE requirements, of this program to PS&S personnel required to use hand or power tools.

Employees – PS&S employees are responsible for complying with the requirements of this program, using required PPE properly, and following applicable safety procedures.

5.1 GUIDELINES

In general, PS&S employees will:

- Be trained in the proper use of tools
- Maintain tools in good, safe working condition
- Use the right tool for the job
- Inspect tools for damage/defects prior to use
- Immediately remove damaged/defective tools from service
- Verify that safety mechanism/guards are in place prior to use
- Operate tools in accordance with manufacturers' instructions
- Use required PPE properly

5.2 Hand Tools

PS&S employees may be required to use a variety of hand tools, including but not limited to hammers, screwdrivers, machetes, and brush knives and box knives.

Cutting tools:

- Inspection
  - Handle (securely attached to blade, free of splintering or cracks)
  - Blade (sharp, free of nicks)
- Use & handling
  - Cut away from oneself and other people
  - Cover cutting blades during transport
  - Do not carry unprotected cutting tools in pockets or backpacks
  - Store cutting tools with blade points/edge down

Impact tools:

- Inspection
  - Handle (securely attached to head, free of splintering or cracks)
  - Head (not mushroomed, free of cracks)
- Use
  - Keep hands and fingers clear of the strike area
  - Check that the swing is clear

Hand tools with special safety properties may be required in some situations.

- Non-sparking hand tools in potentially flammable atmospheres
- Electrically insulated tools when working on or near energized electrical equipment

5.3 Electric Power Tools

5.2.1 Portable Electric Power Tools

Portable electric power tools must be double insulated or grounded. Only power tools approved by an accredited testing laboratory such as UL, ETL, or CSA are permitted.

Inspection

The housing, power cords, and plugs of portable power tools will be inspected for damage prior to use. Damaged or defective power tools will be removed from service immediately and disposed of or repaired, as appropriate.

- Housings will be inspected for cracks, holes, or other damage
- power cords for loose parts, damaged plugs including missing ground pins, damaged insulation, and pinched or crushed outer jacket which may indicate internal damage

Use

- Power cords will be handled to prevent damage during use, transportation, or storage.
    - Power cords are not to be used for raising, lowering or carrying equipment or tools.
    - Do not secure cords with staples or by any means that may result in damage to the cord.
    - Do not run cords in areas with pedestrian or vehicle traffic; across or through doorways; under carpets; or through windows. If cords must be placed in any of these locations, they must be protected from damage with an appropriate cord runner or other safety device.

- Do not knot, crush, or kink cords.
- Do not place cords in contact with hot or sharp objects.
- When equipment is in use, cords should not be covered, coiled, or compressed in any way.
- Disconnect equipment by grasping and pulling the plug, not the cord.

- Prior to connection, check power cord plugs and receptacles to confirm compatibility. Incompatible plugs and receptacles will not be connected. Altering incompatible plugs (e.g. removing ground pins) or receptacles or using adapters is strictly prohibited.
- Power tools and extension cords used in wet areas must be approved for use in those locations and must have GFCI protection.
- Workers' hands must be dry when connecting or disconnecting power tools

5.2.2 Permanently Wired Electric Power Tools

Electric power tools that are permanently wired are typically used for routine industrial tasks. This may include but are not limited to:

- Lamps and measuring instruments
- Drill presses

In all instances, connecting equipment and tools to power mains must be performed by a licensed electrician.

Permanently wired equipment and tools will be inspected prior to use. If equipment is found to be defective or damaged, it should be tagged as out of service and not used until repaired or replaced. Repair and maintenance of permanently wired equipment should be conducted using appropriate lockout methods by trained individuals.

5.2.3 Ground Fault Circuit Interrupters (GFCIs)

GFCIs are required when power tools are operated:

- Within three feet of a water source or in wet conditions
- Connected to extension cords
- Used outdoors

- On construction sites

GFCI equipment will be tested on a periodic basis (i.e. monthly) and replaced if defective.

5.3 Gasoline Powered Tools

Gasoline powered tools may include brush clearing and demolition equipment (chainsaws, jackhammers.) Some gas powered tools use gasoline, while others use a gasoline/oil mixture. Consult the manufacturer for fuel requirements prior to fueling.

Gas powered tools should be used in well ventilated areas only due to potential buildup of exhaust gases (i.e.carbon monoxide). If a gas powered tool must be used in an enclosed space, air monitoring and/or respiratory protection may be required.

Prior to making adjustments, cleaning, or performing maintenance or repairs, gas powered tools will be powered off.

Gas powered tools can generate a high level of noise. Hearing protection should be worn when operating these tools.

Gas powered tools can also vibrate, which can lead to injury over time. To minimize vibration exposure, PS&S FP should:

- Choose tools with effective, proven anti-vibration features
- Keep tools properly maintained
- Limit the amount of time using the tool
- Take frequent breaks
- Grip the handles only as tightly as necessary to control the tool
- Avoid using tools on the highest speed or throttle

5.3.1 Fuel Storage and Handling

Gasoline will be stored in approved containers and will be handled and transported according to proper procedures for flammable liquids. Containers should be equipped with a funnel or flexible hose for fueling operations.

Fueling operations will be conducted in well ventilated areas at least 10 feet from any source of ignition. Smoking is prohibited during fueling operations.

During fueling operations, gasoline power tools will be:

- Powered off and cool
- Properly grounded and bonded to the fuel container

After fueling is completed, wipe any spilled fuel from the tool. Move to a different location prior to starting the tool.

5.3.2 Maintenance and Servicing

Gas powered tools will be serviced and maintained in accordance with the manufacturer's requirements. Services and repair will be conducted by manufacturer authorized personnel.

5.3.3 Chainsaws

Operating a chainsaw is an inherently dangerous activity. Before operating a chainsaw, PS&S personnel will be properly trained in safe work practices and PPE requirements.

PPE is required when operating a chainsaw including but not limited to:

- Hardhat
- Hearing protection
- Face shield
- Safety glasses
- Hand protection

- Safety shoes

Before starting a chainsaw:

- Inspect it for damage
- Verify that required safety guards and equipment are installed and functioning properly
- Check controls, chain tension, bolts, and handles for proper functioning and adjustment, per the manufacturer's requirements
- Check that handles are clean and firmly attached
- Verify that the chain is sharp and properly lubricated
- Clear away dirt, debris, small tree limbs, and rocks from the cutting path
- Check trees for nails, spikes, or other metal object
- Make sure you have well fitted (not loose) clothing

The specific safe operating requirements vary based on the model and features of a chainsaw. For full operating instructions, consult the manufacturer or the user's manual. In general when operating a chainsaw:

- **Never drop start a chainsaw**
- Maintain secure footing and balance
- Keep **both** hands on the saw's handles at all times
- Stand out of the plane of the cutting chain and guide bar
- Keep the saw at or below shoulder height
- Keep body parts clear of the saw
- Do not allow other people in the work area
- Do not force or put excess pressure on the saw
- Avoid cutting branches that are under tension
- Engage the chain brake or shut the saw off when carrying it

5.3.3.1 Safety Features

Chainsaws should be equipped with at least two separate anti-kickback features. Keep in mind that while these features greatly reduce the risk of kick back they cannot completely eliminate it. Proper handling and use of the chainsaw also helps reduce the risk.

Chainsaws should also be equipped with:

- Front hand guard/Chain brake
- Chain catcher
- Safety throttle

5.3.4 Jackhammers

When operating a jackhammer, required PPE includes but is not limited to:

- Hearing protection
- Face shield
- Safety glasses
- Hand protection
- Safety shoes
- Respiratory protection (if materials contain silica, asbestos, lead, or other respiratory hazards)

Before operating a jackhammer:

- Inspect it for damage
- Verify that required safety guards and equipment are installed and functioning properly
- Check the insertion tool for proper functioning and adjustment, per the manufacturer's requirements
- Check that the insertion tool retainer is locked
- Check that handles are clean and firmly attached
- Verify that One-Call has been contacted and that the work area has been determined to be free of utilities

The specific safe operating requirements vary based on the model and features of a jackhammer. For full operating instructions, consult the manufacturer or the user's manual. In general when operating a jackhammer:

- Maintain secure footing and balance, with feet approximately shoulder width apart
- Keep **both** hands on the jackhammer's handles at all times
- Do not "ride" the jackhammer
- Start the jackhammer when it is upright –not lying on the ground -and controlled
- Keep body parts clear of the insertion tool
- Do not allow other people in the work area

- Power the jackhammer down when carrying it

6.0 TRAINING REQUIREMENTS

PS&S employees who will use hand and/or power tools will receive training in their proper use. The training will include PPE requirements, inspection procedures, safe use and procedure for removing a tool from service.

7.0 REFERENCES

29 CFR 1910, Subpart P
29 CFR 1926, Subpart I

SOP #11
Hazardous Waste Operations

Created: 7-20-2011
Revised: 9/17/14

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this SOP is to provide guidelines for PS&S personnel engaging in activities on hazardous waste sites.

2.0 SCOPE

These guidelines are applicable to all PS&S activities at designated hazardous waste sites as per OSHA 29 CFR 1910.120 or 1926.65. This SOP should be used to assist in the development of the Site-Specific Health and Safety Plan (HASP) for designated hazardous waste sites and other sites with regulated materials or other chemical contamination.

3.0 DEFINITIONS

Contaminated Materials – Contaminated materials are defined as any materials or by-product of a field investigation that are known or suspected to be contaminated with hazardous substances. These include materials such as decontamination solutions, disposable equipment and clothing, drilling mud, well-development fluids and spill-contaminated materials.

Exclusion Zone – The area that contains or may contain contamination.

Contamination Reduction Zone – The area located between the exclusion zone and the support zone that provides a transition between contaminated and clean areas.

Support Zone – The non-contaminated or clean area of the site.

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is responsible for periodically reviewing these guidelines and updating this SOP as needed.

Human Resources (HR) – HR is responsible for administrating the medical surveillance program required by this SOP in accordance with PS&S Corporate Health and Safety Program. HR is also responsible for maintaining some of the required records including medical and training records.

Department Manager (DM) – The DM is responsible for the overall implementation of this SOP. The DM is also responsible for providing appropriate personnel and resources so that operations can be conducted in compliance with this SOP.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO/DSO is responsible for providing appropriate resources in personnel and equipment required to complete these operations safely. They are also responsible for making available required training to affected employees.

Project Manager (PM) and Site Representative (SR) – The PM/SR has primary responsibility for implementing and enforcing the elements of this SOP and the Site-Specific HASP on any PS&S site designated as a hazardous waste site. Due to the complexity of the safety requirements on most hazardous waste sites, it is recommended that an PM/SR be designated to handle coordination of the PS&S HASP with other contractors on the site and the daily safety responsibilities. PM/SR will verify that all employees working on hazardous waste sites have been trained in accordance with this SOP prior to assignment to these duties.

Field Personnel (FP) – FP working at a hazardous waste site and PS&S visitors are responsible for complying with the requirements of this SOP including: site zones, decontamination, air monitoring, proper PPE use, and training. FP will be trained in the area they are working in, to be familiar with expected site-specific conditions, potential hazards and proposed activities.

5.1 GUIDELINES

5.2 Hazards

5.2.1 Chemical Exposure

Preventing exposure to toxic chemicals is a primary concern at hazardous waste sites. Most sites contain a variety of chemical substances in gaseous, liquid or solid form. These substances can enter the unprotected body by inhalation, skin absorption, ingestion, or through a puncture wound (injection). A contaminant can cause damage at the point of contact or act systemically. Chemical contaminants can also remain on equipment and clothing if proper decontamination is not followed. These contaminants can then affect the employee and their family or other contacts.

5.2.2 Fire and Explosion

There are many potential causes of explosions and fires at hazardous waste sites:

- Chemical reactions that produce explosion, fire or heat
- Ignition of explosive or flammable chemicals
- Ignition of materials due to oxygen enrichment
- Agitation of shock or friction-sensitive compounds
- Sudden release of materials under pressure

To protect against these hazards, monitoring for explosive atmospheres or flammable vapors is conducted whenever these conditions may exist. Keep all potential ignition sources away from a flammable or explosive environment and use caution whenever performing tasks that might release these chemicals. Smoking is not allowed on any hazardous waste site.

5.2.3 Oxygen Deficiency

The oxygen content of normal air at sea level is approximately 21%. Physiological effects of oxygen deficiency are readily apparent when oxygen content in the air is at or below 16%, therefore, concentrations less than 19.5% are considered to be oxygen deficient and entry into these areas must be conducted with air supplied respiratory protection. Air monitoring should be conducted whenever there is a potential for oxygen deficient atmospheres, especially in confined spaces (see SOP#1 Confined Space Entry) or areas with poor ventilation. For example, a generator or other gas/diesel-powered equipment operated inside a structure may cause oxygen deficiency.

5.2.4 Ionizing Radiation (IR)

Radioactive materials emit one or more of the three types of harmful radiation: alpha, beta, and gamma. Any site that has the potential to contain IR contamination must have a monitoring program to prevent exposure. Any significant measurement of IR should cease operations until the site has been assessed by a health physicist.

5.2.5 Biologic Hazards

Wastes from hospitals, laboratories and research facilities may contain disease-causing organisms that could infect site personnel. Other biologic hazards that may be present on a hazardous waste site include poisonous plants, insects, animals and indigenous pathogens. Biological agents may be dispersed in the environment via wind and water or by contact with contaminated materials or animal vectors. Protective measures to prevent contact with biological hazards include providing protective equipment, insect repellent, and washing/hygiene facilities.

5.2.6 Physical Hazards

Hazardous waste sites will also contain numerous physical hazards such as:

- Holes or ditches
- Construction operations
- Precariously positioned objects that may fall
- Sharp objects, such as nails, metal shards and broken glass
- Slippery surfaces
- Steep grades/uneven terrain
- Unstable structures/surfaces
- Vehicles and equipment
- Flying debris

PS&S personnel should be alerted to these high potential hazards, especially where moving equipment and vehicles are involved and implement controls as defined in the HASP.

5.2.7 Electrical Hazards

Overhead power lines, downed electrical lines, exposed live wires/equipment and buried cables all pose a danger of shock or electrocution if workers contact or sever them during site operations. See SOP#8 Hazardous Field Conditions, for safe work practices.

5.2.8 Heat Stress

Heat stress is a major hazard on hazardous waste sites, especially for workers wearing personal protective equipment. The same protective materials that shield the body from chemical exposure also limit the dissipation of body heat and moisture. Wearing level B or C PPE can cause heat stress at temperatures of 70^{o}F in as little as 15 minutes. In its early stages heat stress can cause rashes, cramps, fatigue, and discomfort. Continued heat stress can lead to heat stroke and death. Please refer to SOP#18 Heat and Cold Stress for safe work practices.

5.2.9 Cold Exposure

Cold related injuries such as frostbite and hypothermia are faced when working in low temperatures, wet conditions and low wind-chill factors. Please refer to SOP#18 Heat and Cold Stress for safe work practices.

5.2.10 Confined Space Entry

Entry into confined spaces can pose numerous health and safety hazards. In any case where PS&S employees may need to enter confined spaces, PS&S SOP#1 Confined Space Entry, must be implemented.

5.2.11 Noise

Work around large equipment often creates excessive noise. The effects of noise may include:

- Workers being startled, annoyed or distracted
- Physical damage to the hearing, and temporary or permanent hearing loss
- Communication interference that may other hazards

If employees are subjected to noise exceeding an 8-hour time-weighted average of 85 dBA administrative, engineering controls and hearing conservation program must be implemented. Please refer to PS&S SOP#12 Hearing Conservation.

5.3 Planning and Organization

Adequate planning includes developing an overall organizational structure for site operations, establishing a comprehensive work plan that considers each specific phase of the operation, and developing and implementing a Site-Specific Health and Safety Plan (HASP). The potential exposure to hazards in the work area will be addressed first through engineering controls and work practices. Those hazards that cannot be reduced through such administrative measures, engineering controls and work practices will be addressed through identification of required site-specific Personal Protective Equipment. The organizational structure should identify the personnel needed for the overall

operation, establish the chain-of-command, and specify the responsibilities of each employee. The work plan should establish the objectives of site operations and the logistics and resources required to achieve these goals. The site HASP should determine the health and safety concerns for each phase of the operation and define the requirements and procedures for worker and public protection.

A fourth important aspect of planning is coordinating these plans with other contractors/workers on the site and the emergency response community. These may include local emergency responders such as police, fire department, and ambulance and medical facilities, hazmat teams and the National Response Center operated by the Coast Guard.

5.4 Medical Program

Workers handling hazardous wastes may be exposed to chemical, biological and physical hazards. They may develop heat stress while wearing personal protective equipment or working in temperature extremes, or face life-threatening emergencies such as explosions and fires. Therefore, a medical program is essential to assess and monitor workers' health and fitness both prior to assignment and during the course of hazardous operations, to provide emergency and routine treatment as needed, and to maintain worker health.

A site-specific medical program should be developed based on the specific needs, location, and potential exposures of a site and should be included in the HASP. The program should meet the requirements of the Corporate Health and Safety Program Medical Program and be developed with an experienced occupational health physician or other qualified occupational health consultant. The director of a medical program should be a physician who is board-certified in occupational medicine or a medical doctor who has had experience managing occupational health services.

The medical program must address the following:

- Surveillance:
  - Pre-placement screening
  - Periodic medical examinations (and follow up examinations when appropriate)
  - Termination examination
- Treatment:
  - Emergency
  - Non-emergency (on a case-by-case basis)
- Recordkeeping
- Program Review

Personnel specifically covered by the OSHA Standard [29 CFR 1910.120 or 1910.134] who must be offered participation in this program, include:

- Employees who may be exposed to hazardous substances at or above the PEL or other published exposure limit for 30 or more days per year
- Employees who wear a respirator.
- Employees who are injured due to overexposure to hazardous substances during an emergency incident
- Employees who exhibit signs or symptoms of exposure to the chemicals involved

Please refer to the PS&S Health and Safety Program, Section 5.0, Medical Surveillance, for further information.

5.5 Site Characterization

Site characterization provides the information needed to identify site hazards and to select worker protection methods. Site characterization generally proceeds in three phases:

- Prior to site entry, conduct offsite characterization: gather information away from the site or from the site perimeter and develop an initial HASP based on this information.
- Next conduct onsite surveys, personnel involved in this procedure are the only ones allowed onsite.

- Once the site has been determined safe for commencement of other activities, perform ongoing monitoring to provide continuous information about site conditions. The HASP should be updated as needed.

At each phase of site characterization information should be obtained, evaluated and shared with all employees involved. This information is then used for HASP development and updating during the duration of the project.

5.6 Air Monitoring

Airborne contamination can present a significant threat to worker health and safety. Identification and quantification of these contaminants through air monitoring is an essential component of a HASP on hazardous waste sites. Reliable measurements of airborne contaminants are useful for:

- Selecting personal protective equipment
- Delineating zones (exclusion zone) where protection is needed
- Assessing the potential health effects of exposure
- Determining the need for specific medical monitoring
- Evaluating the effectiveness of control methods

Action levels need to be developed for each site that indicates when control methods, such as increasing the level of PPE, need to be implemented. These action levels will depend on the Permissible Exposure Limits (PEL) for the contaminants, anticipated effects of combinations of contaminants, limitations of air monitoring equipment, and the severity and probability of exposure to employees.

Onsite air monitoring may be conducted by the following methods:

- Onsite use of direct reading instruments
- Laboratory analysis of air samples collected in sampling bags or canisters
- Laboratory analysis of air samples collected onto filters or sorbents

5.7 Personal Protective Equipment

When recognized hazards cannot be controlled by engineering or administrative methods, employees must be provided with Personal Protective Equipment (PPE) to control exposures. The purpose of PPE is to protect individuals from the chemical, physical, and biologic hazards that may be encountered on a hazardous waste site. Careful selection and use of adequate PPE should protect the:

- Respiratory system
- Eyes
- Skin
- Face
- Hands
- Feet
- Head
- Hearing

The levels of PPE required on a hazardous waste site must be specific to the hazards associated with the site. Levels of PPE are defined by the following:

Level A Protection

Level A protection (a fully encapsulated suit) is used when significant skin and respiratory hazards exist or are suspected to exist. Since Level A protection is extremely physiologically and psychologically stressful, the decision to use this protection must be carefully considered. The following conditions suggest a need for Level A protection:

- Confined facilities where probability of skin contact is high.
- Sites containing known or suspected hazards that are absorbed through the skin.
- Atmospheres immediately dangerous to life and health via skin absorption.
- Site exhibiting signs of acute mammalian toxicity (e.g., dead animals, illnesses associated with past entry into site by humans).
- Sites at which sealed drums of unknown materials must be opened.
- Total atmospheric readings on the PID or FID indicate >500 ppm of unidentified substances.

- Extremely hazardous substances (for example: cyanide compounds, concentrated pesticides, DOT Poison "A" materials, suspected carcinogens, and infectious substances) are known or suspected to be present, and skin contact is probable.

Level A Personal Protective Equipment (PPE) minimally consists of the following items.

- Open circuit, pressure-demand SCBA or pressure-demand supplied air respirator with escape cylinder
- Totally encapsulated suit, pressure tested
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective (usually incorporated in the suit)
- Boots, chemical protective, steel toe and shank
- Communications

Level B Protection

Level B protection is selected when the highest level of respiratory protection is needed but hazardous material exposure to the few unprotected areas of the body is unlikely. This is level is indicated when:

- The type and concentration of substances has been identified and requires the highest level of respiratory protection.
- IDLH atmospheres, but the substance or concentration does not present a severe skin hazard.
- The type and concentrations of substances that do not meet the selection criteria permitting the use of air purifying respirators.
- It is unlikely that the work being done will generate high concentrations of vapors, gases or particulates that will affect the skin or result in skin contact.

Personal Protective Equipment (PPE) for Level B minimally includes:

- Open circuit, pressure-demand SCBA or pressure-demand supplied air respirator with egress cylinder
- Chemical protective coveralls
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective
- Boots, chemical protective, steel toe and shank; or steel toe work boots with chemical protective outer boots

- Duct tape, to seal around gloves boots, and zippers
- Communications

Level C Protection

Level C protection may be selected when the required level of respiratory protection is known or can be reasonably assumed to be not greater than the level of protection afforded by air purifying respirators, and when hazardous materials exposure to the few unprotected areas of the body (i.e., the back of the neck) is unlikely.

Personal Protective Equipment (PPE) for Level C minimally includes:

- Full face piece air-purifying respirator, with appropriated cartridges
- Emergency escape respirator (carried, optional)
- Chemical protective coveralls
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective
- Duct tape
- Boots, chemical protective, steel toe and shank; or steel toe work boots with chemical protective outer boots.

Level D Protection

Level D is the basic work uniform. Personal Protective Equipment (PPE) for Level D includes:

- Coveralls
- Safety boots/shoes
- Safety glasses with side shields
- Hard hat with optional faceshield
- Gloves, dependent on operations

Level E Protection

Level E protection is used when radioactivity above 10 mr/hr is encountered on a hazardous waste site. Radiological safety experts must be consulted to determine adequate safety and sampling equipment, protective gear, monitoring methods, handling procedures, and remedial options. A health physicist must be consulted to determine personal protective clothing.

Personal Protective Equipment (PPE) for Level E includes:

- Coveralls.
- Air purifying respirator.
- Time limits on exposure.
- Appropriate dermal protection for the type of radiation present.
- Radiation dosage monitoring.

Each level of PPE can be modified as needed, to meet the needs of the individual hazards on the site. No single combination of protective equipment and clothing is capable of protecting against all hazards. Thus PPE should be used with other control measures.

The use of PPE can create significant worker hazards, such as heat stress, impaired vision, physical/psychological effects, or impaired vision, mobility and communication. In general, the higher the levels of PPE, the greater are the associated risks. Over-protection can be just as dangerous as under-protection and should be avoided. See PS&S SOP#6 Personal Protective Equipment for more information regarding its use.

5.8 Handling Drums and Other Containers

Accidents may occur during handling of drums and other hazardous waste containers. The hazards of working with or around drums including damaged or deteriorated drums; heavy equipment; or stacked and/or heavy containers include:

- Detonations
- Fires
- Explosions
- Vapor generation
- Chemical splash
- Physical injuries

While these hazards are always present, it is not anticipated that PS&S employees will be handling drums or containers as part of their job duties. Maintaining distance from these operations should prevent associated injury. However, if necessary, proper work practices, such as minimizing handling and using equipment or procedures that isolates workers from hazards can minimize the risk.

5.9 Work Zones

To reduce the accidental spread of hazardous substances by workers from the contaminated areas to non-contaminated or clean areas, work zones for specific types of operations should be delineated, and the flow of personnel and equipment among the zones should be controlled. Established work zones will allow personnel and equipment to be protected against the hazards of other work zones. These zones will define the work activities and improve contamination minimization. Hazardous waste sites may be divided into as many zones as needed to meet operational and safety objectives. The typical work zones found at hazardous waste site are:

- Exclusion or Hot Zone – The contaminated or potentially contaminated area.
- Contaminant Reduction Zone – The area where decontamination takes place and access is restricted.
- Support Zone – The non-contaminated area where workers are not exposed to contaminants and support equipment and personnel can be located.

5.9.1 Exclusion Zone

The Exclusion or Hot Zone contains or may contain contamination. The outer boundary of the Exclusion Zone is called the Hotline. It should be established following the guidelines below:

- The location of hazardous substances and surface drainage
- The data from the initial site survey
- The results of soil and water sampling
- The physical area necessary for site operations
- Meteorological conditions and the potential for contaminants to be carried by wind from the contaminated area.

The Hotline should be clearly marked by lines, placards, hazard tape, or signs and should be enclosed by physical barriers such as chains, fences, or ropes. Access control points on the periphery of the Exclusion Zone regulate the flow of personnel and equipment from zone to zone and assist in conformance to proper procedures for entering and exiting the zone are followed. Separate entrances and exits help to segregate movement into and out of the Exclusion Zone.

The Exclusion Zone can be subdivided into different areas of contamination based on known or anticipated hazard type and degree, or on the compatibility of waste streams. Such subdivision allows flexibility in health and safety requirements, operations, decontamination procedures, and use of resources. The level of PPE required in each subdivision may vary, as may the level of PPE required for different job assignments within a subdivision. The level of PPE must be specified and posted for each job assignment with each subdivision. When appropriate, different levels of PPE within the Exclusion Zone promote flexibility, effective and cost-effective operation while maintaining a higher degree of health and safety.

5.9.2 Contaminant Reduction Zone (CRZ)

The Contaminant Reduction Zone or Decontamination Zone is the transition area between the contaminated and clean areas. The distance between the Exclusion and Support Zones provided by the CRZ and the proper decontamination of workers and equipment, reduce the physical transfer of hazardous substances into the clean areas.

Decontamination procedures take place in a designated area within the CRZ, called the Contamination Reduction Corridor (CRC) that begins at the Hotline. Two decontamination areas may be set up within the CRC, one for personnel and small equipment and the other for heavy equipment. Access into and out of the CRZ and the Exclusion Zone is through specified Access Control Points.

The boundary between the Support Zone and the CRZ is called the Contamination Control Line. This boundary separates the possibly low contamination area from the clean or non-contaminated Support Zone. Access to the CRZ from the Support Zone can be achieved through two Access Control Points, one for personnel and one for equipment. Personnel entering the CRZ must wear personnel protective clothing and equipment, as required by the Site-Specific HASP. To reenter the Support Zone, workers should follow any decontamination procedures, remove any PPE and equipment and exit through the designated Access Control Point.

The CRZ must be designed to accommodate the following activities:

- Decontamination of equipment, personnel and samples;
- Emergency response, such as transport for injured personnel (safety harness, stretcher), first-aid equipment (bandages, blankets, eye wash, splints, water, etc.), containment equipment (absorbent, fire extinguisher, etc.);
- Equipment re-supply, such as air tanks, personnel protective clothing and

equipment (booties, gloves, chemical suits, etc.), sampling equipment (bottles, soil augers, coolers, drum thief, etc.), and tools;
- Sample packaging and preparation for on-site and off-site analysis;
- Worker temporary rest area, including toilet facilities, benches, chairs, liquids, shade and/or shelter. Water and other potable liquids should be clearly marked and stored properly to maintain all glasses and cups in a clean condition. Wash facilities should be located near drinking facilities to allow employees to wash before drinking. Drinking, washing, and toilet facilities should be located in a safe area where protective clothing can be removed. Facilities should be cleaned and inspected regularly. Maintenance workers should take appropriate protective measures; and
- Drainage/collection and disposal of water and other liquids used during decontamination.

5.9.3 Support Zone

The Support Zone is the location in which administrative and other support functions essential to site operations are conducted. Personnel may wear normal work clothes within this zone because any potentially contaminated clothing, equipment, and samples must remain in the CRZ until decontaminated.

Support Zone personnel must alert the proper agency in the event of an emergency. All emergency telephone numbers, change for telephones (if necessary), evacuation route maps, hospital route maps, and vehicle keys should be kept in an accessible location within the Support Zone.

Facilities located in the Support Zone should be placed after considering factors such as:

- Accessibility (topography, open space available, location of highways and railroad tracks, ease of access for emergency vehicles)
- Resources (adequate roads, power lines, telephones, shelter, and water)
- Visibility (line-of-sight to activities in the Exclusion Zone)
- Wind direction (upwind of Exclusion Zone, if possible)
- Distance (as far from the Exclusion Zone as practical).

5.10 Site Security

Effective site security prevents the exposure of unauthorized/unprotected people to site hazards, protects against increased risk from vandals or persons illegally abandoning waste on the site, prevents theft, and promotes safe working procedures. Site security during working hours can consist of the following:

- Maintain security in the Support Zone and at Access Control Points
- Establish an identification system to identify authorized persons and limitations to their approved activities
- Assign responsibility for enforcing authority for entry and exit requirements
- Erect a fence or other physical barrier around the site, if possible
- If the site is not fenced, post signs around, and have guards patrol the perimeter. Guards must be fully apprised of the hazards involved and be trained in emergency procedures.
- Approve all visitors to the site. Make sure each has a valid purpose for entering the site. Have trained site personnel accompany site visitors at all times and provide them with appropriate PPE.

Site security after hours may consist of the following:

- If possible, assign trained in-house technicians for site surveillance. They should be familiar with the site, the nature of work, the site's hazards, and respiratory protection techniques.
- If necessary, use security guards to patrol the site boundaries. Such personnel may be less expensive than trained technicians, but may require additional training in safety procedures relative to hazardous waste sites;
- Enlist public enforcement agencies, such as the local police department if the site presents a significant risk to local health and safety; and
- Secure equipment

5.11 Site Control Methods

When site hazards and/or work activities may potentially create exposure to site workers and the public, control measures should be implemented. Control measures should be initiated at any time when air monitoring indicates the potential for migration of emissions off-site or outside the immediate CRZ. The procedures should be designed to

control emissions before off-site migration, through implementation of engineering and work practice controls as well as defensive measures. Listed below are examples of control measures.

- Limit the area of open excavation or intrusive activities
- Areas excavated are backfilled or covered with a minimum 6 mil impermeable membrane
- Working face of excavation is a moderate slope in compliance with excavation regulations
- Exposed sides of excavation or intrusive activities where work is not conducted are covered
- Use fine mist to keep down dust as well as volatile organic compounds (VOC)
- Keep haul distance of excavated materials to as short a distance as possible
- Immediately cover excavated material stockpile.

5.12 Site Emergencies

The nature of work at hazardous waste sites makes emergencies a continual possibility. Emergencies happen quickly and unexpectedly and require immediate response. At a hazardous waste site, an emergency may be as limited as a worker experiencing heat stress or as vast as an explosion that spreads toxic fumes throughout a community. Planning for these emergencies is essential to protect workers and respond rapidly to the emergency. Such emergency response planning includes:

- Personnel roles, chain-of command, communication, training
- Site mapping, security/control, refuge location, evacuation routes, muster locations, decontamination stations
- Medical treatment/First-Aid
- Equipment
- Emergency procedures and response planning
- Spill containment
- Documentation
- Reporting

The emergency plan is developed as part of the site-specific health and safety plan and should be compatible and coordinated with other employers on the site, the pollution

response, disaster, fire and emergency plans of local, state and federal agencies. It should be reviewed prior to initiation of site operations and also be periodically reviewed and amended in response to new or changing site conditions. The emergency response plan will identify the site-specific organization and procedures for management of the response effort. The senior PS&S project employee present during an emergency situation will act as the designated PS&S emergency coordinator and will implement emergency response procedures for PS&S personnel.

5.13 Decontamination

Individuals working at sites where hazardous substances are present may become contaminated during the course of their work. Protective clothing and respirators help prevent the wearer from becoming contaminated or inhaling contaminants. Good work practices help to reduce the contamination of protective clothing, instruments and equipment. Even with these safeguards, contamination may occur. Harmful materials can be transferred to clean areas and expose unprotected personnel. In removing contaminated clothing, personnel may come in direct contact with and/or inhale the contaminants.

To prevent such occurrences, contamination reduction and decontamination procedures must be developed and implemented. Such procedures must be in place before anyone enters a contaminated area and they must be continued (and modified as necessary) throughout the operation.

Several factors need to be considered when planning for the decontamination of personnel and equipment. The most important factor is the types of contaminants involved. The more harmful the contaminant, the more extensive and thorough decontamination must be. The implementation of decontamination, the correct usage of

protective clothing and the zoning of work areas minimize contamination from one area to another.

The exact decontamination procedures are determined by evaluating a number of factors specific to the site. Factors that must be considered include:

- The extent and type of hazard(s) expected,
- Flammable / explosive potential,
- Meteorological conditions,
- Topography,
- Levels of PPE selected, and
- Availability of equipment and supplies

The decontamination plan is part of the site's HASP and outlines the procedures to be used for decontaminating personnel and equipment at a given site. The procedures are designed to maximize worker protection and limit contact with contaminants. The initial decontamination plan is based on the "worst-case" assumption that all personnel and equipment leaving the Exclusion Zone are grossly contaminated. The plan includes a system for washing and rinsing, at least once, all of the PPE worn and equipment used. The washing and rinsing are performed in combination with the sequential removal of PPE. Decontamination begins with the most heavily contaminated articles (usually boot and gloves), and progresses to the least contaminated articles. Ideally, contamination should decrease as a person moves from one station to another along the decon line.

Elements of an effective Decontamination Plan include:

- Location, design and layout of the decontamination corridor
- Identification of the decontamination equipment needed
- Defining the appropriate decontamination methods
- Establishment of procedures to minimize contamination of clean areas
- Establishment of procedures to prevent contamination of personnel
- Identification of proper waste disposal procedures
- Evaluation of the decon effectiveness

The site PM/SR monitors the decontamination procedures. The procedures are monitored for effectiveness, and modified as needed. Any modifications are then incorporated into the decontamination plan.

The types of decontamination equipment, materials and supplies are generally selected on the basis of availability. The ease of equipment decontamination and disposability is also considered. Soft bristle scrub brushes or long handled brushes are used to remove contaminants. Buckets of water or garden sprayers are used for rinsing. Large galvanized washtubs, stock tanks or children's wading pools can be used as containers for wash and rinse solutions. Large plastic garbage cans or similar containers lined with plastic bags are useful for the storage/disposal of contaminated clothing and equipment.

5.13.1 Decontamination Methods

There are two basic methods of removing of contaminants from PPE, physical and chemical. In most cases, gross contamination can be removed by physical means such as brushing and scraping that dislodge the contaminants. Other physical methods could include wiping, low-pressure air and the use of heat. A wash/rinse process using cleaning solutions (chemical removal) should follow physical removal of gross contamination. Chemical removal methods include dissolving contaminants, the use of surfactants, neutralizing contaminants, solidification of contaminants and disinfection/sterilization procedures.

Reusable PPE, sampling equipment, tools and other equipment are usually decontaminated by scrubbing with detergent and water using a soft bristle brush followed by rinsing with copious amounts of water. While this process may not be fully effective in removing some contaminants (in some cases, the contaminants may react with water), it is a relatively safe option compared to the use of a decontaminating solution. The contaminants must be identified before a

decontamination chemical is used, as reactions of incompatible chemicals could be dangerous.

Heavy equipment such as bulldozers, trucks, backhoes, and drilling equipment are difficult to decontaminate. The methodology generally used involves washing the equipment on sloped concrete or plastic covered pad with a soapy water solution followed by a thorough water rinse. The wash and rinse solutions are applied through the use of a high-pressure spray unit. Particular attention should be given to tires, bucket, tracks and other components that directly contact the contaminated materials. Wipe tests should be employed to determine the effectiveness of the decontamination procedure. Wash water may need to be collected for proper disposal.

Small equipment such as reusable PPE, respirators, and hand tools can normally be decontaminated on site. Covering small equipment in plastic reduces contamination and difficulty with decon. However, items such as monitoring equipment may require a more specialized decontamination at an offsite facility. Equipment which is not thoroughly decontaminated on site should be placed in clean, safe container for transport to an offsite facility. Commercial laundry facilities are available for various types of contaminated clothing.

The decontamination facilities may include showers and change rooms, if specified in the site-specific health and safety plan. Access to decontamination showers and change rooms will be restricted to designated project personnel.

5.13.2 Effectiveness of Decontamination

The effectiveness of decontamination needs to be evaluated for the safety of all personnel involved. Available methods to determine decontamination

effectiveness include visual inspection, monitoring devices, ultraviolet light, and wipe sampling.

There is no reliable test to immediately determine how effective decontamination has been. Visual inspections are easily performed but may not be effective for all types of contaminants. Ultraviolet light used in conjunction with visual observations is used for evaluating the decontamination of certain refined oils and solvent wastes. The use of ultraviolet light should be assessed by a health professional, since there are potential health risks from exposure.

Real time monitoring devices may sometimes be a quick method of evaluating decontamination effectiveness. However an appropriate sampling strategy needs to be developed and the equipment must be able to detect the contaminant at "safe" levels. It should be noted that many real time monitoring instruments (PID, FID) do not measure specific or individual chemicals, but whole classes of chemicals.

Wipe sampling is usually followed by a laboratory analysis, which can be costly. Appropriate sampling strategies need to be developed and followed.

5.13.3 Disposal Considerations

All equipment used for decontamination must be decontaminated and/or disposed of properly. Buckets, brushes, PPE, tools, and other contaminated equipment should be collected, placed in containers, and labeled. Spent solutions and wash water should be collected and disposed of properly. PPE that is not completely decontaminated should be placed in containers, for further decontamination and/or disposal. The amount of waste generated during the decontamination process should be consideration as disposal costs can be significant.

5.14 Training

Anyone who has access to a designated hazardous waste site must recognize and understand the potential hazards on the site. Training staff will have the training and/or academic credentials and instructional experience to demonstrate competency. The objectives of the training program are:

- To make workers aware of the potential hazards they may encounter
- To provide the knowledge and skills necessary to perform the work with minimal risk to worker health and safety
- To make workers aware of the purposes and limitations of safety equipment, including PPE
- To allow workers can safely avoid or escape from emergencies

HazWOPER training will be provided by outside courses as needed.

- Employees that are exposed or potentially exposed to hazardous wastes will receive a minimum of 40 hours of instruction off site, and a minimum of three days of field experience under the direct supervision of a trained supervisor.
- Workers who may be on site occasionally for a limited task and who are unlikely to be exposed over permissible exposure limits will receive a minimum of 24 hours of instruction off site, and the minimum of one day of actual field experience under the direct supervision of a trained, experienced supervisor.
- The PM/SR or other employee who supervises employees engaged in hazardous waste operations will receive 40 hours of initial training, and three days of supervised field experience and at least eight additional hours of specialized Supervisor Training at the time of job assignment.
- All employees will receive eight hours of refresher training annually.
- Site-specific, pre-entry training must be conducted regarding the actual hazards and control methods to be used on the site, including emergency action plans. This training needs to be conducted whenever conditions or operations change or to maintain appropriate hazard control.
- Additional training in individual hazards and SOP, like Respiratory Protection and Confined Spaces, may also be needed. Please see appropriate SOP for more information.
- Individuals who are likely to witness or discover a hazardous substance release well be trained to initiate an emergency response sequence by notifying the proper authorities of the release.

6.0 REFERENCES

CFR 29 1910.120 or 1926.65 Hazardous Waste Operations

APPENDIX A: BENZENE AND LEAD AWARENESS

1.1 PURPOSE

The purpose of the PS&S Benzene and Lead Exposure Awareness Plan is:

- To protect employees from the health hazards associated with benzene and lead by eliminating or minimizing exposure,
- To provide appropriate training to employees to prevent exposure to benzene and lead, and
- To comply with OSHA requirements

2.0 SCOPE

This program applies to PS&S employees who may work on sites with potential occupational exposure to benzene and/or lead. Project sites with the potential for lead and/or benzene exposure include: petroleum refining sites, tank gauging (tanks at producing, pipeline & refining operations), and field maintenance. It is not expected that PS&S employees will be exposed to benzene or lead above the Permissible Exposure Limits (PEL) or Action Levels during normal operations; PS&S employees are prohibited from working in areas where there is the potential for exposure to benzene or lead above the Action Levels. Lead and Benzene awareness training is provided as part of PS&S Corporate Health and safety Program and Procedures: Health and safety training is provided at time of hire, during site-specific HASP orientation, and during annual refresher training.

3.0 DEFINITIONS

Action Level – An employee exposure, without regard to the use of respirators, to an airborne concentration of a hazardous material calculated as an 8-hour time weighted average (TWA) workday that OSHA requires some action to be performed, usually monitoring.

Benzene (C(6)H(6)) (CAS Registry No. 71-43-2) – Liquefied or gaseous benzene. It includes benzene contained in liquid mixtures and the benzene vapors released by these liquids. It does not include trace amounts of unreacted benzene contained in solid materials.

Container – Any barrel, bottle, can, cylinder, drum, reaction vessel, storage tank, or the like, but does not include piping systems.

Competent Person – Is someone who through education and experience has the knowledge to identify exposures, implement controls and oversee the operations to monitor and control employee exposures to benzene and lead.

Emergency – Any occurrence such as, but not limited to, equipment failure, ruptures of containers, or failure of control equipment which may or does result in an unexpected significant release.

Employee Exposure – An exposure to airborne benzene or lead that would occur if the employee were not using respiratory protective equipment.

Lead – Metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

Regulated Area – Any area where airborne concentrations of benzene or lead exceed or can reasonably be expected to exceed the permissible exposure limits, either the 8-hour time weighted average or the short-term exposure limit for 15 minutes.

Permissible Exposure Limit (PEL) – This is the time weighted average (TWA) to which OSHA allows employees to be exposed to a hazardous material and is not expected to cause adverse health effects to most workers.

Short-Term Exposure Limit (STEL) – This is the OSHA-established 15-minute maximum concentration of an airborne contaminant to which an employee may be exposed.

Time weighted Average (TWA) – This is when an exposure to air contaminants is averaged over a period of time, usually 8 hours, or a full shift.

Threshold Limit Value (TLV) – A TLV is an occupational exposure limit that is a recommended standard published by the American Conference of Governmental Industrial Hygienists (ACGIH) to which most employees can be exposed repeatedly without adverse health effects. This is not a regulatory standard, but is often the most conservative occupational exposure level available.

4.1 GUIDELINES

4.2 Occupational Exposure Limits

Benzene – OSHA
AL = 0.5 ppm (parts per million) for an 8-hour time-weighted average (TWA)
PEL = 1 ppm of air for an 8-hour TWA
STEL = 5 ppm as averaged over a sampling period of 15 minutes

The American Conference of Governmental Industrial Hygienists (ACGIH) recommends a Threshold Limit Value (TLV) of 0.5 ppm with an 8-hour TWA, and a STEL of 2.5 ppm averaged over any 15-minute period. *[NOTE: In some cases, the ACGIH limits for airborne concentrations of contaminants are below the OSHA PEL. In such instances, PS&S will determine the feasibility of using the lower limit(s).]*

Lead – OSHA
AL = Thirty (30) ug/m^3 (micrograms per cubic meter) of air
PEL = Fifty (50) ug/m^3

PS&S will determine that no employee is exposed to lead or benzene at concentrations greater than the AL. If a potential exposure is identified, the PM or FP must contact the Corporate Safety Officer for guidance.

4.3 Health Hazards

4.3.1 Benzene

Benzene is a colorless and highly flammable liquid with a sweet smell. It is a known carcinogen (leukemia). Benzene is a skin and respiratory irritant. Low levels can cause central nervous system effects and drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Inhalation is the primary route of exposure for benzene.

4.3.2 Lead

Lead, a heavy metal, is a potent neurotoxin that accumulates in soft tissues and bone. It is a poisonous metal that damages the nervous system and causes blood and brain disorders. Lead poisoning can occur from ingestion of food or water contaminated with lead or through inhalation or ingestion of contaminated soil or dust. Effects are the same regardless of route of exposure.

4.4 Exposure Assessment

PS&S will determine that no employee is exposed to lead or benzene at concentrations greater than the AL based on representative air monitoring or other documented data.

Exposure assessment air monitoring will be conducted when needed by a qualified industrial hygienist at the request of PS&S or other contractor working in an area of potential exposure. PS&S or designee will observe the monitoring and/or obtain a written report of the results.

4.5 Compliance Program

A site-specific Health and Safety Plan (HASP), including lead and benzene awareness, will be established and implemented on sites where these contaminants are known to be present. This program will discuss the activities in which lead or benzene may be emitted and where air monitoring may be needed to identify the hazards, including activities conducted by other contractors on the site.

PS&S employees working immediately adjacent to an area where lead or benzene is being released during an activity will either be removed from the area or air monitoring will be conducted to allow employees to be removed if monitoring indicates airborne levels nearing the AL. Air monitoring will be conducted throughout the duration of the site work for projects that have a potential for lead or benzene, based upon the project hazard assessment. If the initial determination or subsequent monitoring reveals employee exposure to be at or above the action level but below the permissible exposure limit PS&S will repeat monitoring in accordance with this paragraph at least every 6 months. PS&S will continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level (1910.1025(d)(6)(ii)).

PS&S will, within 15 working days after the receipt of the results of any monitoring performed under this section, notify each affected employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to affected employees (1910.1025(d)(8)(i)).

Whenever the results indicate that the representative employee exposure, without regard to respirators, exceeds the permissible exposure limit, PS&S will include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action taken or to be taken to reduce exposure to or below the permissible exposure limit (1910.1025(d)(8)(ii)).

4.6 Safe Work Practices

PS&S personnel will not enter regulated benzene or lead work areas.

Employees must abide by any signs/labels/assessment reports indicating the presence of benzene or lead containing materials. Appropriate work practices should be followed to prevent the lead containing materials from being disturbed. For projects that have identified potential lead and benzene exposure the HASP will include provisions for use of respirators during the time period necessary to install or implement engineering or work practice controls, where engineering and work practice controls are insufficient and in emergencies. Project personnel will comply with PS&S Corporate Health and Safety Program requirements for fitness for respirator use, including training and participation in medical surveillance program. Site specific PPE will be provided when required in conformance with the HASP at no cost to the employee. The site-specific HASP will address provision of decontamination procedures and changing area, and implementation of decontamination procedures prior to use of hygiene, restroom and dining facilities. Personal decontamination procedures will include washing of skin areas that contacted lead contaminated materials.

4.7 Signs and Communication

Information concerning benzene and lead hazards will be communicated according to the requirements of the PS&S SOP #2 *Hazard Communication*.

The entrance to regulated areas will be posted with signs that read:

For lead:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

For benzene:

DANGER
BENZENE
CANCER HAZARD
FLAMMABLE - NO SMOKING
AUTHORIZED PERSONNEL ONLY
RESPIRATOR REQUIRED

PS&S employees will not enter these regulated areas.

5.0 Training

PS&S employees who may work on projects where the potential exists to be exposed to benzene or lead or to soil that contains elevated levels of benzene or lead are required to complete initial benzene and/or lead awareness training. This training provides general awareness regarding benzene and lead exposure, health hazards, and appropriate control measures. Benzene and lead awareness training will be documented including dates of training, employee name, and trainer name. Training is required before assignment to areas of potential exposure.

PS&S employees who may be exposed to benzene and/or lead are required to complete project-specific training. This training will provide a discussion of benzene and/or lead areas, exposure determination, monitoring, regulated activities and areas, specific engineering and work practice control measures. This training will be specified in the site specific HASP for the project. In addition, employees will be made aware of contingency plans and provisions for potential removal from the area/site if exposure levels near the AL.

6.1 References

OSHA 29 CFR 1926.1128: Benzene 1910.1028: Benzene
OSHA 29 CFR 1910.1025 and 1926.62 Lead

SOP #12
Hearing Conservation

Created: 7-20-2011
Last Revision Date: 11-2-2011
Last Revision Date: 7-19-2012

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1.0 PURPOSE

This guideline provides necessary information to establish safe procedures for employees who may be exposed to the hazards associated with high noise levels.

2.0 SCOPE

This SOP applies to all project locations where the potential exists for exposure to high noise levels. It is designed to protect the hearing of those working at PS&S locations and project sites. This SOP applies to all employees who may be subjected to an 8-hour Time-Weighted Average (TWA) of 85 decibels (dBA) or greater.

3.0 DEFINITIONS

Action Level (AL) – A dose of 50% of the PEL (TWA of 85 dBA for an 8-hour workday). An effective written HCP must be developed and implemented and hearing protection devices must be made available to workers exposed to this noise at this level.

CAOHC – Council of Accreditation in Occupational Hearing Conservation.

dBA – Unit of measurement for sound intensity based on a frequency weighed average that best simulates the sensitivity of the human ear (the A scale).

Decibel (dB) – Unit of measurement for sound intensity (sound pressure level) that is a logarithmic scale.

Dose – The percent of allowable noise a worker is exposed to over a period of time.

Hearing protection devices (HPD) — PPE designed to reduce the intensity of sound reaching the worker's ear. These devices may be inserted in the ear canal or worn enclosing the ear. HPD is rated by the amount of noise reduction the wearer may expect, Noise Reduction Rating (NRR).

Occupational Safety and Health Administration (OSHA) — Federal authority that develops and enforces regulations protecting worker health and safety.

Noise Reduction Rating (NRR) – A Noise Reduction Rating is given to all Hearing Protectors based on the amount of noise, in dB, that use of the equipment is expected to provide the wearer.

These ratings are determined by laboratory tests and usually provide only 50% actual reduction as stated by the NRR.

Permissible Exposure Level (PEL) – The OSHA established limit for exposure to a hazardous substance. The PEL for noise is a TWA of 90dBA measured over an 8-hour period. It is the equivalent to a noise dose of 100% as defined in 29 CFR 1910.95. The PEL is adjusted for shorter or longer periods of exposure.

Personal Protective Equipment (PPE) – Equipment designed to be worn by a worker to protect against workplace hazards when engineering and administrative controls are inadequate or not feasible.

Standard Threshold Shift – A change in hearing acuity relative to a baseline audiogram that indicates an average of 10dB or more @ 2000, 3000, and 4000 Hertz in either ear.

Time-Weighted Average (TWA) – Cumulative exposure to hazardous agents in the workplace averaged over the duration of the work shift (usually an 8-hour time period).

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is responsible for periodic review and updating of the guidelines in this SOP as needed.

Human Resources (HR) – HR is responsible for the maintenance of audiometric testing and training records.

Department Manager (DM) – The DM is responsible for the overall implementation of this program. The DM is also responsible for providing appropriate personnel and resources so that operations can be conducted in compliance with this program.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO and/or DSO is responsible for making hearing conservation training available and for scheduling annual audiograms for affected employees.

Project Manager (PM) and Site Representative (SR) – The PM and/or SR has responsibility for the overseeing and enforcing the requirements of this program. The PM/SR should be able to identify different types of project activities that are associated with high noise levels. The PM/SR is also responsible for making appropriate hearing protection devices available to employees during high noise exposure activities and to enforce the correct use of these devices when required.

Field Personnel (FP) – FP are responsible for observing safety guidelines and wear hearing protection devices properly whenever required.

5.1 GUIDELINES

Exposure to high levels of sound can negatively impact the hearing of workers and put stress on other parts of the body. The two major factors influencing hearing loss are intensity (or loudness) and duration. OSHA limits worker exposure to noise to less than 90 dBA for an 8- hour day (PEL). As loudness increases, OSHA shortens the duration that workers can be exposed to that level of sound, as listed below in Table 1. When workers have to raise their voices over the noise of surrounding machinery to be heard by someone 3 feet away, sound levels are likely to be over 85dBA.

Noise is classified as continuous, intermittent, or impact. Continuous noise has a constant level with duration of greater than one second. Intermittent noise may be the result of periodic equipment operation or traveling in and out of high noise areas. Impact noise has a short duration, one second or less, with an interval greater than 1 second. Examples of impact noise are hammer blows (jackhammer, pile-driver) or explosions.

Initial hearing loss may be temporary. However, repeated noise exposure over a substantial length of time will produce permanent hearing loss. A person may not be aware of this noise-induced hearing loss since it occurs slowly over many years. Noise-induced hearing loss occurs due to the destruction of organs of the inner ear. Noise-induced hearing loss cannot be corrected. To prevent hearing loss in workers, excessive noise sources must be removed or isolated, or exposure to the intensity or duration must be limited.

For PS&S employees exposure to high noise areas are currently only expected to occur on construction sites, at soil drilling or boring sites, during mechanical evaluations of facilities owned by others in conjunction with an engineering assignment or in-house Building Maintenance.

5.2 Noise Level Exposures

OSHA Standard 29 CFR 1910.95 and 1926.52 to protect employees working in conditions of excessive noise. The Standard specifies that:

- Protection against the effects of noise exposure shall be provided when the sound levels and duration exceed those shown in Table 1.
- When employees are subjected to sound levels exceeding those listed in Table 1, feasible engineering and/or administrative controls shall be utilized. If such controls fail to reduce sound levels to within the levels of the table, personal protective equipment shall be provided and used to reduce sound level exposures within the levels of the table.

Table 1 lists the OSHA Permissible Noise Levels for continuous and intermittent noise. Exposures at or above the limits require implementing engineering controls administrative controls and/or hearing protection.

Table 1 : OSHA Permissible Exposure Limits (PEL) for Noise

Hours/day	DBA
12	87
10	88
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
≤ 0.25	115

5.3 Noise Measurements

Existing mechanical equipment maintained by PS&S will have the adjacent noise levels identified utilizing an approved Sound Level Meter (SLM) and the results analyzed to determine if the requirements of this SOP apply. If regular exposure will occur, a

dosimeter should be worn by affected employee during a full work shift to determine their noise dose, or the exact amount of noise they were exposed to which is averaged over time. While the SLM is best to identify areas or equipment where noise levels are high, the dosimeter is used to determine if an employee's exposure exceeds the OSHA PEL for noise.

Any records of noise measurements will be maintained for a minimum of 2 years.

Due to the variable nature of the fieldwork conducted by PS&S, it would be prohibitive to conduct noise surveys on most construction or evaluation project sites. Therefore, assumptions will be made based on the observation and an understanding of operations and the equipment which is likely to cause high noise levels on job sites. If workers have to raise their voices over the surrounding noise to be heard by someone 3 feet away it is an indication that sound levels are likely to be over 85dBA.

5.4 Participation in the Hearing Conservation Program

Workers who are exposed to noise equal to or exceeding the OSHA Action Level of 85 dBA (8-hour TWA) must be included in the Hearing Conservation Program. PS&S employees who regularly work in the following operations or conditions would be included in this program:

- Working on construction sites, in close proximity to drilling, pile driving or boring equipment
- Working on or near mechanical equipment identified as producing high noise levels

Employees who visit sites with the above operations or conditions on an infrequent basis or for short durations are less likely to be exposed to noise exceeding the OSHA AL. However, this does not prevent these employees from wearing hearing protectors to reduce their exposures.

5.5 Audiometric Testing Program

Participating employees will have a baseline Audiogram established within six months of the employee's first exposure at or above the AL. This baseline audiogram will be used as a comparison to subsequent audiograms. Subsequent annual audiograms are compared to the baseline audiogram to determine if a standard threshold shift has occurred. Audiograms must be given after at least 14 hours without exposure to high noise levels.

The audiograms must be performed by a licensed or certified audiologist, otolaryngologist, physician or technician certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC). The results of the audiograms must be evaluated by an audiologist, otolaryngologist, or physician who will determine whether there is a need for further hearing evaluation.

If an annual audiogram indicates a standard threshold shift has occurred, the employee shall be notified in writing within 21 days of the determination. A retest may be performed within 30 days to confirm the standard threshold shift. When a standard threshold shift occurs, and it is determined to be occupationally related the employee must:

- Wear hearing protection and be trained in their use and care if not already wearing hearing protection
- Be refitted and retrained in the use of hearing protection offering greater attenuation if already using hearing protection
- Be referred for further examination or additional testing, if appropriate, or if employer thinks ear pathology is related to wearing hearing protection.
- A standard threshold shift is considered a recordable accident for the OSHA 300 log, if applicable.

PS&S will offer audiometric testing free of cost to participating employees who perform the above identified risk job assignments. Audiometric testing records will be maintained by HR for the length of employment plus 30 years.

5.6 Engineering and Administrative Controls

OSHA requires that methods to reduce the noise through engineering controls must be considered first. Engineering controls for noise should be designed to reduce the production of noise at the source, interrupt the transmission of noise along a pathway from the source to the receiver, or attenuate the intensity at the receiver. Since most noise sources are equipment that is not owned or under the control of PS&S and the nature of PS&S fieldwork, engineering controls are usually not feasible. PS&S will consider noise reduction engineering controls for any equipment owned and operated by PS&S.

Administrative controls are measures taken to limit the amount of time that an employee is exposed to high noise levels. This typically is done by rotating or moving employees between areas of high and low noise exposure, and/or controlling the operating duration of equipment producing excessive noise levels. This may be considered on some projects where PS&S employees are available and are authorized.

Employees are also encouraged to distance themselves from noise producing equipment since this will reduce noise exposures.

5.7 Hearing Protection Devices (HPD)

When feasible engineering and administrative controls fail to reduce an employee's noise exposure to acceptable levels, the employee is inspecting high noise construction operations (Pile Driving or Blasting), or as required by the SR or PM, personal protective equipment in the form of hearing protection devices (HPD) must be used.

PS&S will provide HPD to all employees exposed to an 8-hr. time-weighted average of 85 decibels at no cost to the employee. Employees are encouraged to wear HPD whenever they are in areas of high noise levels. Employees required to wear hearing

protectors will be notified by the PM/SR for each project and it will be identified on the project H&S Checklist or HASP.

The effectiveness of hearing protection can be evaluated from its noise reduction rating (NRR). To determine the noise reduction a worker should receive from an earplug, divide the labeled NRR by 2 (i.e. earplug with NRR of 30dB, has a working attenuation of 15dB). Earmuffs provide a working attenuation approximately 75% of the labeled NRR (i.e. ear muff with NRR of 45 dB, has a working attenuation of 33dB).

6.0 TRAINING

Participating PS&S employees will receive annual Hearing Conservation training as part of discipline specific training. This training will include the following:

- The effects of noise on hearing
- The purpose of hearing protection devices, various types available, selection, fitting, use and care of hearing protection devices
- The purpose of audiometric testing and an explanation of test procedures
- Typical noise levels of various equipment and operations and identifying high noise environments

7.0 RECORDKEEPING

HR will maintain Hearing Conservation records as follows:

- Audiometric testing records for the length of employment plus 30 years
- Hearing Conservation training records three (3)years
- Noise measurement records for a minimum of two (2) years

8.1 REFERENCES

OSHA 29 CFR 1910.95 and 1926.52

SOP #14
Multi-Employer Site Safety

Created: 7-20-2011
Last Revision Date: 9/17/14

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1.0 PURPOSE

The purpose of this guideline is to provide information regarding the requirements for working on project sites with subcontractors to PS&S and/or for working in the proximity of unrelated, third party contractors.

2.0 SCOPE

This SOP applies to project sites where PS&S is working with PS&S Subcontractors directly or where the site is a multi-employer construction site on which PS&S employees are required to work in or near areas that are under the control of another firm. PS&S lacks the authority to manage the health and safety programs and procedures of other entities, and therefore will not attempt to manage such programs and procedures. Similarly, PS&S will not, in any way, direct the means and methods of any other firm. To protect PS&S employees, PS&S may identify hazards that are caused or controlled by other employers and may need to identify their health and safety practices. In the event that PS&S employees identify hazards to others during the course of performing their duties, they will take the steps as set forth in this guideline, section 6.0, to exercise reasonable care and avoid the risk of injury on the site.

3.0 DEFINITIONS

Creating Employer – The employer who creates the hazard, or creates the potential exposure by bringing employees into contact with a hazard, regardless of who the employees work for.

Competent Person – A competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate the hazard.

Controlling Employer – The employer who has control (or ability to exercise control) over the exposing, creating, or correcting employers, and may also be an exposing, creating, or correcting employer.

Correcting Employer – The employer who is responsible for correcting the hazard, regardless of whom created the hazard or whom the employees work for.

Decontamination Area – An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated.

Exposing Employer – The employer whose own employees are exposed to a hazard, regardless of who may have created the hazard.

Imminent Danger – This is any condition or practices where a danger exists which could reasonably be expected to pose an immediate threat of death or serious physical harm before it can be eliminated through corrective actions.

Site-Specific Health and Safety Plan (HASP) – The site-specific health and safety program developed for PS&S employees working on a hazardous project.

PS&S Subcontractor – A business firm contracted directly by PS&S to perform support work or services on or in connection with the project site.

Construction Contractor – A business firm that performs construction work under contract to an owner (such as a general contractor) or performs construction work under subcontract to a general contractor or other construction contractor. These firms have no direct contract with PS&S but they are working on the same project site as PS&S employees.

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is the PS&S employee responsible for periodic review of the guidelines in this policy.

Department Manager (DM) – The DM is the PS&S employee responsible for the overall implementation of this program. The DM is also responsible for providing appropriate personnel and resources so that operations can be conducted in compliance with this program.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO and/or DSO is the PS&S employee responsible for making required training available to employees and providing required PPE. The GSO/DSO will also act as a resource for the DM and the PM/SR. The GSO/DSO will assist with identifying appropriate subcontractors and with identifying and correcting health and safety hazards, as appropriate.

Project Manager (PM) and Site Representative (SR) – The PM and/or SR is the PS&S employee responsible for establishing safe work practices when working on multi-employer sites. It is the PM/SR's responsibility to determine that PS&S Subcontractors are meeting the safety requirements that may affect PS&S employees also working on the site. To protect PS&S

employees, the PM/SR may be responsible for confirming the documentation, training and safety procedures of PS&S Subcontractors. The PM/SR is responsible for protecting PS&S employees against hazards created by other contractors on the site.

Field Personnel (FP) – FP are PS&S employees responsible for abiding by the requirements of this program and for notify the PM/SR of any identified health and safety hazards or unsafe acts or conditions caused by a contractor or PS&S Subcontractor.

5.1 GUIDELINES

OSHA defines the role of all employers working on a multi-employer site based on the hazard identified as one of the following (defined above in Section 3.0):

- Controlling employer
- Correcting employer
- Creating employer
- Exposing employer

Based on these definitions, OSHA has the authority to issue citations to different employers who may have nothing to do with the identified hazard, except that their employees were being exposed to the hazard. OSHA provides guidelines to assist the PS&S PM/SR and employees in working with other employers and determining appropriate actions on multi-employer sites.

General Statement Regarding PS&S–Contractor Relations

PS&S is an architectural and engineering consulting firm, not a construction company. Employees must not give the impression that PS&S can direct the means or methods of construction work, including safety measures. PS&S employees have no authority or responsibility for construction operations and are generally on site to confirm that, when completed, the finished work generally confirms with the design intent.

On rare occasions, PS&S may assume a contract to complete a construction/remediation project. In these unusual cases, it is important for the PM and field employees to understand the additional

responsibilities and authorities that PS&S may have as a Controlling Employer on the site. These additional responsibilities and actions are listed in Section 6.3 below.

5.2 Coordination of H&S Plans

The PM/SR must be aware of the activities of Construction Contractors on the site that may affect PS&S employee safety. To protect PS&S employees, it may be necessary on some projects to coordinate H&S functions between PS&S and Construction Contractors. This is especially important when defining emergency action plans. The PM is responsible for identifying potential hazards and conflicts of working with Construction Contractors to coordinate needed functions (i.e., emergency signals and procedures). This information should be added to the H&S Checklist or HASP.

On multi-employer sites, PS&S personnel will contact the site's competent person or Construction Manager to determine the relevant construction contractor's required or suggested safety measures, hazards that could endanger PS&S employees, and determine if the construction contractor has provided needed safety equipment. PS&S is not responsible for the health and safety of others, including any construction contractor or PS&S Subcontractor.

Contractors will work under their own Site-specific Health and Safety Plan. PS&S and contractors will coordinate pre-job and kick-off meetings, safety orientations, tailgate safety meetings, job safety analysis, hazard assessments, project phase safety inspections, and post-job safety performance reviews.

5.3 Selection of PS&S Subcontractors

The safety behavior of PS&S Subcontractors could endanger PS&S employees.
Therefore, the PM is responsible for the selection of PS&S Subcontractors and should

evaluate the prospective PS&S Subcontractor's safety performance. Criteria for PS&S Subcontractor selection process should include:

- Check of the PS&S Subcontractor's safety history (EMR, Incident rate, OSHA 300 (3 years), OSHA citation and inspection history)
- Review the PS&S Subcontractor's safety procedures
- Obtain references of health and safety performance from past projects

Contractors who do not follow proper safety procedures should not be hired in the future by PS&S. Each PM, with the assistance of their GSO/DSO, should consider developing a list of PS&S Subcontractors who exhibit good safety compliance, as well as PS&S Subcontractors who have failed to exhibit such tendencies, and who should not be hired by PS&S.

5.4 Contract Language

It is important for the PM or SR to understand the contract language as it relates to the responsibilities and authority for health and safety on the site. In some cases PS&S may have some responsibility for oversight of the PS&S Subcontractor and may retain stop work authority if hazardous conditions or operations exist. Review these issues with the DM or CSO before starting field activities.

5.5 PS&S Subcontractor Safety Procedures

To protect PS&S employees, PS&S should request copies of the PS&S Subcontractor's HASP or safety procedures prior to the start of field activities to establish that they reflect industry standards, are site-specific and consistent with PS&S health and safety procedures. The PM or SR will communicate any deficiencies to the PS&S Subcontractor for resolution. This review does not relieve the subcontractor of its responsibilities to provide a safe working environment for its own employees. The

PS&S reviewer may comment upon, but will not "approve" or use any other terms that indicate or imply "approval" of the PS&S Subcontractor's HASP.

To protect PS&S employees, the PM should also confirm that employees of the PS&S Subcontractors have been provided training prior to beginning field operations. A letter or other written communication stating that the employees have been trained would be sufficient. If the PM cannot confirm that such training has taken place, the PM will contact the CSO or DM to discuss possible termination of the Subcontractor's services.

On multi-employer sites, where Construction Contractors are operating, the PM or SR should review the general contractor's HASP or procedures to identify activities that may expose PS&S personnel to hazards and recommended control methods. If appropriate these hazards should be added to the PS&S H&S Checklist or HASP and control methods implemented.

6.1 PROJECT OPERATIONS

PS&S employees must not give the impression that they can direct the means or methods of construction work, including safety measures. PS&S employees have no authority or responsibility for construction operations and are not responsible for safety of other employees on construction sites. PS&S employees will take actions, as described below, to protect themselves, their coworkers, and to provide reasonable care to others working on the site.

6.2 Onsite Actions

To protect the health and safety of PS&S employees and any others on the construction site the PM, SR or a designee will take the following actions:

- Conduct periodic site inspections of the areas where PS&S employees are working and address any identified hazardous condition that may affect PS&S employees or PS&S Subcontractors

- Determine whether Construction Contractors and PS&S Subcontractors are conducting their own safety inspections and correcting hazardous conditions as appropriate

Actions to be taken in the event that PS&S employees observe hazards to employees of PS&S or others during the course of performing their duties, in which PS&S employees have special expertise due to their experience, training and/or professional licensure:

- The PM or SR or individual PS&S employee will implement interim measures to protect themselves and other PS&S employees and subcontractors who may be exposed to the hazard
- If PS&S employees cannot be reasonably protected from the hazard or conduct their duties safely, the PM or SR will consider removing employees from the area
- PS&S employees will advise a responsible employee of the contractor or Controlling Employer of the nature of the hazard observed
- If no action to correct the hazard is taken, the PS&S employee will contact the CSO, GSO, DSO or PM for further direction and action

In the event of an imminent danger of substantial personal injury or bodily harm to PS&S employees or others on the construction site, the PS&S employee will:

- Warn those in harm's way to be reasonably protective of other workers' health and safety
- Remove PS&S employees and subcontractors from the area of the hazard
- Notify the contractor and Controlling Employer of the observed hazard and how it is interfering with PS&S ability to conduct its work safely
- Notify the CSO, GSO, DSO or PM of the situation and actions taken

It is essential that the actions taken, as set forth above, be well documented in clear, concise field log notes, or as otherwise directed by the GSO, DSO or CSO.

6.3 Prevention of Control by Action

In the course of taking the actions stated above to reasonably avoid the risk of injury to PS&S employees, and others on a site, **the PS&S employee will make no statements directing the form or type of corrective measures to be taken**. It is the responsibility of the construction contractor who created the hazard to determine how to control the

hazard. Defining the methods of controlling the hazard may create additional liability for PS&S by assuming responsibility for correcting the hazard properly.

In the event that the PS&S employee reasonably believes that PS&S's contract with the owner contains a duty or obligation, to order that certain work be stopped if there is a grave and imminent danger, and that belief is confirmed with by the DM, GSO, DSO or CSO, the PS&S employee must (a) state clearly that the authority is being exercised on behalf of the owner; and (b) limit their action to the stopping of work and not state means or methods by which the danger can be averted.

6.4 Controlling Employer

On rare occasions, PS&S may assume a contract to complete a construction/remediation project. In these unusual cases, it is important for the PM and field employees to understand the responsibilities and authorities that PS&S may have as a Controlling Employer on the site.

PS&S as a Controlling Employer may be responsible for confirming the safe operation of its subcontractors. Additional procedures may be implemented after management review. These procedures do not, in any way, eliminate the contractor's responsibilities for safety of their own employees.

- ***Pre-Screening*:** Construction contractor which PS&S is considering for part of the construction work should be screened during the bid process for a history of safe operations. The following items may be considered during this pre-screening:
  - Implementation of a safety program
  - Safety training of its employees
  - Enforcement of safety rules
  - Safety performance history
    - Workers' compensation experience modification (≤1.0)
    - OSHA violation history (≤1 in the past 3 years)
    - References regarding safe operations
    - Previous safe work with PS&S
- ***Competent Person:*** A "competent person" as defined by OSHA in 29 C.F.R.

1926.32(f) must be present to oversee the safety of the construction work. This person should be appointed by a construction subcontractor.

- A "competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them."

➢ ***Reasonable Care by PS&S:*** PS&S should be reasonably diligent in requiring its subcontractors to adhere to OSHA requirements to protect their own employees and others on the site. This may include:

- PS&S employees may, during the time they are present on the construction site, periodically inspect the safety of its subcontractors' work. Such inspections will be documented (date, unsafe conditions found, who notified, status of corrective action).
  - If a safety hazard is identified, the subcontractor will be informed and be required to implement corrective action. If the subcontractor refuses or fails to correct the hazard, PS&S should (if permitted by contractual terms) have the condition corrected and back-charge the subcontractor for the cost.
  - If the hazard recurs, PS&S may (if permitted by contractual terms) impose a fine or dismiss the subcontractor.
- PS&S employees may, when present on the site, periodically hold safety meetings to discuss and coordinate safety efforts. Such safety meetings will be documented and all present will sign an attendance form (date, topics discussed and attendance).

***Note*:** OSHA states that, "A controlling employer must exercise reasonable care to prevent and detect violations on the site. The extent of the measures that a controlling employer must implement to satisfy this duty of reasonable care is less than what is required of an employer with respect to protecting its own employees. This means that the controlling employer is not normally required to inspect for hazards as frequently or to have the same level of knowledge of the applicable standards or of trade expertise as the employer it has hired."

7.0 RECORDKEEPING

Records regarding safety complaints or corrective action will be maintained in the project file.

8.0 REFERENCES

29 CFR 1926.16 Rules of Construction
29 CFR 1926.20 General Safety and Health Provisions

APPENDIX A – NOTIFICATION OF HAZARD DOCUMENTATION FORM

This form is to be used to document the notification of a contractor, general contractor, owner or other controlling employer of hazards being created or existing at a multiemployer worksite where PS&S is working. This form should be completed after verbal or non-verbal (email/text) notification is provided.

Date:	Time of notification:
Project:	Project Manager:
Location:	Your Name:
List other contractors/consultants on site	
General Contractor/Owner:	
Describe in detail the hazard:	
Indicate who was notified:	
Indicate their reaction:	
Was the hazard corrected? Yes No If no, protect PS&S employees and subcontractors and remove them from the area if necessary.	
If yes, how was the hazard corrected?	
Is the area safe for work? Yes No If no, indicate why.	
Signature	Date

SOP #15
Vehicle Safety

Created: 7-20-2011
Last Revision Date: 9/17/2014

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SOP #15 Vehicle Safety

1.0 PURPOSE

To establish procedures for the implementation of a safe driving program for PS&S employees.

2.0 SCOPE

This policy applies to all PS&S employees while operating a company vehicle or a personal vehicle on company business.

3.0 DEFINITIONS

Company Vehicle – A vehicle owned, leased or rented by PS&S and provided to a PS&S employee for use.

Personal Vehicle – A vehicle owned or leased by a PS&S employee for their personal transportation that may be used for company business.

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is responsible for periodic review of this procedure and for updating this SOP as needed.

Human Resources – HR is responsible for confirming employee drivers licensing status and documenting a valid driver's license for employees who drive on company business. HR will maintain appropriate records.

Department Manager (DM) – The DM is responsible for the overall implementation of this SOP. The DM is also responsible for providing appropriate personnel and resources so that operations can be conducted in compliance with this SOP.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO/DSO is responsible for making required training available to personnel who may drive company vehicles or personal vehicles for business purposes.

The GSO and/or DSO's responsibilities may also include:

- Review monthly vehicle inspections to verify that required and preventive maintenance are being performed (company-owned and leased)
- Conduct accident investigations on all vehicular accidents to determine possible corrective actions
- Verify PMs/SRs have been properly briefed on driving safety guidelines required by states and localities
- Verify all required state inspections have been performed on all company owned, leased or rented vehicles

Project Manager (PM) and Site Representative (SR) – The PM/SR is responsible for establishing safe work practices and enforcing the requirements of this SOP when employees operate vehicles for business purposes.

Employees – All employees allowed to operate company-owned or leased vehicles must understand and comply with the requirements of this policy.

Employees are responsible for:

- Conducting daily or pre-use inspections of the vehicle
- Operating the vehicle in a safe manner
- Reporting any problems with the vehicle or accidents to the PM/SR
- Notifying the DM and PM/SR of any medical condition that may affect your ability to drive
- Reporting any and all accidents and injuries to the PM/SR and HR

5.1 GUIDELINES

5.2 Pre-use Inspection

The following pre-use inspection is provided to promote safe and proper vehicle maintenance and operation. These items should be checked before each day's operation of any vehicle.

- Verify the headlights, tail-lights, and turn signals are working properly.
- Check gauges, and listen for unusual sounds that could indicate a need for maintenance.
- Check tire pressure and condition.
- If pulling a trailer, check the trailer hitch and safety chain in addition to the trailer lights and tires.
- Be sure all loose equipment is secured.
- Confirm that the windshield and side windows are clean and that rear/side view mirrors

are clean and adjusted for proper vision.
- Start the engine and observe all instruments, gauges and indicating lights for proper operation. Do not operate a vehicle if any warning light is illuminated.
- Check the brake system for proper operation.
- Check windshield wipers and horn.
- Driver and all passengers must fasten their seat belts before moving.

5.3 Vehicle Operation Standards

The standards of operation are designed to prevent vehicle accidents, comply with federal, state, and local regulations, prevent injury to employees and the public, and reduce vehicle operating and repair costs.

5.2.1 Proper Vehicle Usage

- Only authorized persons may operate or ride in PS&S company vehicles.
- All vehicles, drivers and operation of the vehicle must comply with PS&S policies, as well as local, state, and federal laws.
- Driver and all passengers must always wear seat belts when moving.
- Proper vehicle usage is the responsibility of the driver.
- All mandatory State inspections are to be performed on a timely basis.
- The use of hand-held cellular phones and other devices while driving is prohibited. In addition, texting, emailing, and programming a Global Positioning System is prohibited while driving. While hands-free cellular is an option, their use does not reduce the number of cellular involved accidents. It is safer to pull over and park when talking. It is PS&S's policy and laws in many states require that if a cell phone is used during vehicle operation, a hands-free device must be utilized.

5.2.2 Safe Operation

The principle causes of accidents are distracted drivers, excessive speed, following too closely, not keeping your eyes on the road, and backing up. Most accidents occur in intersections. Tips to avoid accidents at intersections include:

- Look to the left, then the right and again to the left before crossing intersections.
- Establish eye contact with other drivers or pedestrians. Remember that

pedestrians have the right-of-way.

- Watch out for traffic lights that have been green for some time. Anticipate the change.
- Maintain a safe driving distance: use the 2-second rule. You should be able to count 2 seconds before reaching a stationary point after the car in front has passed that point.
- Reduce speed in congested area or during poor driving conditions (weather, rough road, darkness).
- Always be alert. Reduce the potential distractions while driving (cell phone, conversation, loud music, eating, drinking, shaving, and reading). Multitasking should not be done while driving.
- Vehicles stopped, parked, or left standing should be left in a manner that prevents damage to the vehicle, other vehicles, equipment or personnel in that area.
- Vehicles will not be left unattended until the motor has been shut off, the key removed, the parking brake set and appropriate gear engaged.
- Backing a vehicle is discouraged and requires a spotter when backing into congested areas or pedestrian traffic.
- No employee will operate a company or personal vehicle used for company business in a reckless manner.
- Drivers of company vehicles are responsible for keeping the vehicle and equipment clean and free of trash.
- The operator of a vehicle must secure equipment and materials before moving the vehicle.
- Loads projecting beyond the sides of a vehicle or more than 4 feet beyond the rear of a vehicle must be properly marked by a red light at night or a red flag (12" square in size) in the daytime.
- All loads must be secured to prevent movement or shifting during vehicle operations.
- Vehicles loads must be within the manufacturer's legal limit for occupancy and loading.

5.2.3 Fueling Operation

Do not refuel the vehicle with the engine running. The individual performing the fueling must remain outside of the vehicle during the fueling operation. Do not smoke or use a cellular phone while refueling the vehicle.

5.2.4 Driver Qualifications

All drivers must meet the following qualifications:

- All vehicle operators must have a valid driver's license, which is appropriate for the type of vehicle being driven.
- Operating a vehicle under the influence of drugs or alcohol is strictly prohibited.
- Drivers with restricted licenses or with more than 2 moving violations on their license should not be driving on company business.

5.3 Safety Equipment in Vehicles

All company vehicles will contain:

- First aid kit (including Bite and Sting Kits, and American Red Cross Community First Aid and Safety Manual)
- Reflective safety vests
- Flares
- Hard hats
- Safety glasses
- Material Safety Data Sheets (MSDS), if any chemicals are being used, stored, or transported in the vehicle
- Emergency response procedures including telephone numbers
- Flashlight
- Proper container (cooler) with fresh, clean water for drinking as appropriate.
- Fire extinguisher

Additional safety equipment that may be required can include:

- Gas detectors, tripod and ventilation equipment if confined space entry is anticipated
- Traffic signs, flags, cones for work in right of ways and roadsides
- High intensity yellow flashing beacons for vehicles on construction sites, performing survey on high volume roadways, or as appropriate for field conditions.
- Flotation devices and water safety equipment for use in marine environments
- Any other equipment specified by client contract or other standard (generally accepted) safety procedures

5.4 All Terrain Utility Vehicles (ATUVs)

ATUVs are not toys and should be operated with care, in a safe manner. Prior to operating an ATUV, an employee must:

- Obtain approval from the client (if appropriate)

- Obtain approval from the CSO and GSO/DSO
- Receive task specific training
- Must wear-approved high visibility safety vests (see SOP#6 *Personal Protective Equipment*)

ATUVs will be equipped with appropriate safety devices including but not limited to:

- Roll cages
- Seat belts
- Headlights
- Taillights

The following safety precautions are to be followed while operating ATUVs:

- Fueling will only be conducted after the ATUV that has been shut down for a minimum of 5 minutes
- Speeds will not exceed 25 mph
- ATUVs are not licensed and are for off-road use only. Therefore, ATUVs will not be operated on public roadways. Trailers or alternative methods of transportation must be used on public roadways.
- Avoid steep inclines and extremely rough terrain
- Do not carry passengers unless the ATUV is specifically designed for passengers AND they are protected by roll-over and seat belts.

A pre-operation inspection in accordance with the manufacturer's instructions will be performed prior to operation. Additionally, a documented inspection must be completed monthly, at a minimum. The following items are to be checked during a pre-operation ATUV inspection:

- Safety systems are fully operational and in good condition. This may include:
  - Head- and tail-lights
  - Brakes
  - Seatbelts
  - Roll cage
- Tire pressure meets manufacturer's requirements and is equal on all tires. (May require the use of a low pressure tire gauge.)
- Fluids are at the proper levels. This may include:
  - Coolant
  - Brake fluid
  - Engine oil
  - Drive shaft/transaxle oil
- Engine compartment is free of excessive dirt and debris

- Wheel nuts are present and tight
- Ignition and kill switches are functioning properly
- Drive belt/chain are properly adjusted and lubricated and free of excessive wear

An example checklist is included in Appendix A – ATUV Inspection Checklist.

5.5 Vehicle Maintenance

All vehicles must be maintained in a good working condition. Preventative maintenance will be conducted in accordance with the vehicle manufacturer's recommendation. Company vehicles will be maintained by PS&S. Personal vehicles that are used on company business must be maintained by the owner in a safe manner and in compliance with all state and local regulations. It is recommended that personal vehicles used for company business be equipped with a first aid kit. All State required inspections will be completed in a timely manner. Departments/Groups may have specific procedures for vehicle maintenance requirements, which should be followed in addition to the requirements specified in this document.

At least monthly, an inspection will be conducted. The Vehicle Inspection Checklist form must be completed and copies sent to the PM/SM. The vehicle inspection includes, but is not limited to:

- Tire pressure and condition
- Horn operation
- Brake and head lights
- Mirrors and glass
- Appropriate safety equipment
- Oil and all other fluid levels
- Wiper conditions

Any identified problems with the vehicle that might affect its safe operation will be reported to the Manager and prevent the vehicle from being operated. Examples of these deficiencies would include, but are not limited to, problems braking, steering difficulty, horn or lights (turn signals, head or brake) inoperable, seat belt malfunction, missing mirrors, badly worn

or cut tires. Vehicles will not be operated if any warning light is on, until appropriate repairs can be made.

5.6 Accidents/Citations

Report all vehicle accidents to your SR, PM, and GSO/DSO as soon as possible. This includes vehicle accidents to personal vehicles on company business. Report any traffic citation within 24 hours to your Supervisor. This applies equally to citations received operating company or personal vehicles during or after work hours.

Any change in the status of an employee's driving privileges must be reported to management within 24 hours. PS&S reserves the right to take independent disciplinary action depending upon the nature of a violation received while operating a company vehicle and to deny privileges of company vehicle use to employees with unsafe driving records.

5.7 Parking

Always park the vehicle in a safe location and observe all local laws. When parked along a busy public street, warning triangles or cones should be placed in front of and behind the vehicle. The parking brake should be set. Company vehicles will be parked overnight at PS&S facilities unless specific authorization is approved for it to be garaged by an employee.

5.8 Chemical Transportation

If chemicals are transported, DOT regulations requiring hazmat endorsed licenses, proper shipping papers and placarding must be observed. Appropriate spill response materials should be available. Hazardous waste will not be transported in PS&S vehicles without authorization and proper shipping requirements being met.

6.0 TRAINING/QUALIFICATIONS

Before operation of company- or personal vehicles, selected employees must:

- Have a valid US driver's license for the type of vehicle assigned
- Be able to safely operate the vehicle assigned
- Be familiar with state-specific vehicle operation requirements and company vehicle inspection (walk around and monthly) requirements
- Be knowledgeable of and follow Accident/Citation and Vehicle Maintenance reporting policies in this procedure
- Be briefed on the responsibilities outlined in this procedure

7.1 REFERENCES

John Deere product website http://www.deere.com

OSHA Health and Safety Topic: Motor Vehicle Safety

APPENDIX A – ATUV PERIODIC INSPECTION CHECKLIST

Vehicle ID:_____ Vehicle Model: _____

Inspector Name:_____ Date: _____

Inspection Item	Acceptable		Comments/Corrections
	Yes	No	
Head and Tail lights			
Tires, including pressure			
Fluid levels (fuel, oil, coolant, and brake)			
Brakes and park brake operation			
Driveline CV boots (for tears or punctures)			
Air restriction indicator			
Seat belt			
Horn			
Grass and debris in engine compartment, muffler area, and front grille			
Fluid leaks			
Any loose hardware			
Missing or loose wheel bolts			
Drive line (lubrication and general condition)			
Spark arrestor			
Radiator			
Brake pads			
Clutch wear buttons			
Battery			
Other:			

SOP #18
Heat and Cold Stress

Created: 7-20-2011
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TABLE OF CONTENTS

1.0 PURPOSE

To establish procedures for the implementation and monitoring of a heat and cold stress prevention program and to describe symptoms that characterizes excessive exposure to heat and cold environments.

2.0 SCOPE

These guidelines apply to all PS&S employees who may be exposed to warm environments exceeding 70 degrees Fahrenheit while performing work in personal protective equipment (Level C and B) or in hot environmental conditions exceeding 80 degrees Fahrenheit for normal (Level D) work. The heat index (combination of heat and humidity) is more effective at determining the true heat load on the body.

These guidelines also apply to all employees who may be exposed to cold working environments with an ambient temperature of 30 degrees Fahrenheit or less. This may also depend on the work environment, for example working in water.

3.0 DEFINITIONS

Acclimatization - Acclimatization is the process of the body becoming accustomed to extremes in temperature.

ACGIH Cold Stress Threshold Limit Values (TLVs) – Limits intended to protect workers from the most severe effects of cold stress and cold injury and to describe exposures to cold working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV objective is to prevent the deep body core temperature from falling below 36 ^{o}C (96.8 ^{o}F) and to prevent cold injury to body extremities.

ACGIH Heat Stress Threshold Limit Values (TLVs) – Limits intended to protect workers from the most severe effects of heat stress and heat injury and to describe exposures to hot working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV objective is to prevent the deep body core temperature from exceeding 38 C (100.4 F).

Deep Body Temperature - Deep Body Temperature is the core temperature of the body as determined by rectal temperature measurements. For a single, occasional exposure to a cold environment, a drop in core temperature to no lower than 35 ^{o}C (95 ^{o}F) is permissible.

Equivalent Chill Temperature (ECT) - ECT is an index describing the effect of the cooling power of moving air on exposed flesh. The effect of wind velocity at a certain temperature is expressed as the equivalent cooling effect of a lower temperature with still air.

Frostbite - Local tissue damage caused by exposure to cold temperatures. Severe occurrence may lead to deep tissue damage, gangrene or possible loss of the affected area.

Hypothermia - Lowering of the body core temperature due to exposure to cold. Severe hypothermia may result in death.

Personal Protective Equipment Levels (A, B, C, D) – Personal protective equipment (PPE) levels are defined in the OSHA Hazardous Waste Operations and Emergency Response standard (1910.120). Level D PPE is equivalent to normal working clothing and PPE needed on a construction site (i.e. Hardhat, safety shoes, safety glasses, and work clothing). Level C provides minimal protection from chemicals with a protective suit (Tyvec® or chemical coated suit) and an air-purifying respirator. Level B provides a higher level of protection for respiratory hazards by the addition of an air-supplied respirator. Level A provides the highest amount of respiratory and skin contact protection with supplied air respirator and a fully encapsulated outer suit.

Work-Rest Regimen – Defined as a ratio of time spent working versus time spent resting. The ratio applies to one-hour periods. For example, a work-rest regiment of 75% work, 25% rest corresponds to 45 minutes work and 15 minutes of rest each hour.

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is responsible for periodic review of the guidelines in this SOP.

Department Manager (DM) – The DM is responsible for the overall implementation of this SOP. The DM is also responsible for providing appropriate personnel and resources so that operations can be conducted in compliance with this SOP.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO/DSO is responsible for making required training available to personnel who may be exposed to heat or cold stress conditions. The GSO/DSO is also responsible for field inspections and the completion of H&S Checklists.

Project Manager (PM) and Site Representative (SR) – The PM and/or SR is responsible for establishing procedures to identify and prevent heat and cold stress conditions. The PM/SR will determine if work-rest regime is needed and will enforce prevention methods outlined in this SOP.

Field Personnel (FP) – FP will be alert to signs and symptoms of heat and cold stress for themselves and their co-workers. FP must also be aware of emergency actions to take in the event of harmful exposure to hot or cold environments.

5.1 GUIDELINES

5.2 Control Strategies for Heat Stress

5.1.1 Effects of Heat Stress

Hot weather can cause physical discomfort, a decrease in work efficiency, and personal injury. Wearing personal protective equipment may put a worker at considerable risk of developing heat stress due to the decrease in natural body ventilation.

A number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker can cause heat stress. Heat stress is one of the most common (and potentially serious) illnesses at hazardous waste sites. Therefore, heat stress evaluation procedures, including regular monitoring and preventive measures, are essential to the health and safety of personnel conducting fieldwork.

Early symptoms of heat stress may include fatigue, irritability, anxiety, and decreased concentration, dexterity or movement. If not recognized or treated, heat stress may become a serious medical condition.

Heat related problems include:

- Heat Rash is caused by continuous exposure to hot and humid air and aggravation of the skin by chafing clothes. This decreases the ability to tolerate heat as well as being a nuisance.
- Heat Cramps are caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs and symptoms of heat cramps include muscle cramps and pain in the extremities and abdomen.
- Heat Exhaustion is caused by increased stress on various organs to meet increased demands for body cooling. Signs and symptoms of heat exhaustion

include shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; or fatigue.

- Heat Stroke is the most severe form of heat stress. Heat stroke is considered an Immediately Dangerous to Life or Health (IDLH) condition and must be treated as an emergency. Any person suffering from heat stroke must be cooled down immediately and brought to a hospital. Signs and symptoms of heat stroke include red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; or coma.

It is important to note that individuals vary in their susceptibility and their reactions to heat related conditions. Factors that may predispose someone to a heat condition include:

- Lack of physical fitness
- Lack of acclimatization
- Age
- Dehydration
- Obesity
- Alcohol and drug use
- Infection
- Sunburn
- Diarrhea
- Chronic disease

5.1.2 First-Aid/Medical Treatment

The following First-Aid and medical treatments are recommended.

- Heat Rash – Apply mild drying lotions and recommend wearing clean, dry clothing between heat exposures.
- Heat Cramps – Administer commercially available electrolyte-balanced liquids (e.g. Gatorade) or water. Increase rest breaks until acclimatized. Seek medical attention if serious.
- Heat Exhaustion – Remove to cooler environment, rest in reclining position. Drink plenty of fluids. Seek medical attention if no improvement.
- Heat Stroke – Immediate and rapid cooling by immersion in water (not ice) with massage, or wrapping in a wet sheet and fanning. Avoid overcooling. These steps are to be taken while waiting for emergency response to arrive, or while transporting the victim to an emergency medical facility. This is a ***LIFE-THREATENING*** situation.

5.1.3 Heat Stress Prevention

The following are possible control methods that can help prevent or reduce heat stress. Not all will be appropriate on all sites or in all situations. The H&S Checklist or site specific HASP should identify the prevention methods to be used on each site.

- Acclimatization to heat involves a series of physiological and psychological adjustments that occur in an individual during the first week of exposure to hot environmental conditions. Workers new to the hot environment should be provided more frequent rest breaks or work for shorter periods in the heat.
- Drinking water will be available to the workers to encourage frequent small drinks, i.e., one cup every 15-20 minutes (about 150 ml or ¼ pint).
- The water should be kept reasonably cool (55-60° F) and be stored outside any suspected or identified contaminated areas.
- Workers will be encouraged to maintain well balanced diets. If workers are not acclimatized, a commercially available product such as Gatorade® or Exceed® may be used for electrolyte replacement.
- Cooling devices may be used to aid natural body ventilation. These devices, however, add weight, and their use should be balanced against worker efficiency.
- Long cotton underwear should be worn. It acts as a wick to help absorb moisture and protect the skin from direct contact with heat-absorbing protective clothing.
- Provide air-conditioned shelter or shaded areas to protect personnel during rest periods.
- Install mobile showers and/or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct operations in the early morning or evening.
- Rotate shifts of workers. Add additional personnel to work teams to allow for breaks in extreme heat conditions. Work-rest regimens should be instituted.
- Mandate work slowdowns in extreme heat conditions.
- Good hygienic standards must be maintained by recommending frequent change of clothing and daily showering. Clothing should be permitted to dry during rest periods.

5.1.4 Heat Stress Monitoring

In some extreme cases where employees may be required to wear PPE that will increase the potential for heat related illnesses, biological monitoring, such as

body temperature or weight monitoring, may be needed. In these cases, a heat alert will be developed and written into the site-specific HASP for the project. The specifics of the plan will be described in the HASP since each site will have specific needs.

5.2 Control Strategies for Cold Stress

If properly protected, personnel can work efficiently in cold environments. Cold injuries are classified as either localized, as in frostbite or generalized, as in hypothermia. Physical conditions that worsen the effects of cold include allergies, vascular disease, smoking, drinking, and specific drugs and medications.

Factors contributing to cold injury include exposure to humidity and high winds, duration of exposure, contact with wetness or metal, inadequate clothing, age and general health of the individual, including circulation and diet. The wind-chill factor or the combination of wind speed and air temperature is a better indicator of the current thermal condition than temperature alone. The wind increases the rate of cooling. The table below shows the cooling power of wind on exposed flesh.

The greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. In addition, water conducts heat 240 times faster than air; thus, the body cools suddenly when chemical-protective equipment is removed and the clothing underneath is wet from perspiration.

Wind Speed (mph)	Actual Temperature Reading (F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (ECT) (F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-64	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
Wind speed greater than 40 mph have little additional effect	LITTLE DANGER in < 1 hr with dry skin. Maximum danger of false sense of security				INCREASING DANGER Danger from freezing of exposed flesh within one minute			GREAT DANGER Flesh may freeze within 30 seconds				
	Trench foot and immersion foot may occur at any point on this chart											

**2002 ACGIH TLV Thermal Stress*

5.2.1 Frostbite

Local injury resulting from the cold is called frostbite. Frostbite of the extremities can be categorized by degrees of damage:

- Frost nip or incident frostbite – this is a condition characterized by a sudden blanching or a whitening of the skin.
- Superficial frostbite – the skin has a waxy or white appearance and is firm to the touch, but the tissue beneath is resilient.
- Deep frostbite – tissues are cold, pale, and solid; extremely serious injury.

Factors that contribute to frostbite include handling solvents, tight footwear, use of alcohol, wet clothing, high altitudes and race. African-Americans are three to six times more likely to get frostbite than Caucasians.

Frostbitten or potentially frostbitten skin should never be rubbed. The rubbing action can result in permanent tissue damage. For frostnip, the skin should be warmed by applying firm pressure with a hand or other warm body part.

Professional medical help should be sought for frostbite cases since it is difficult to assess the degree of frostbite. First-aid responders can begin to warm the affected part by skin-to-skin contact or by submerging in 108 to 110 degree water. Care should be taken, because the skin is easily burned due to loss of feeling in the affected part. It is important to note that pain will occur when the thawing begins.

5.2.2 Hypothermia

Hypothermia is the general lowering of the body temperature. It can occur from exposure to conditions well above freezing. This condition can occur when a worker is immersed in cold water or is exposed to cool, high winds. Individuals who are in a state of physical exhaustion, or have had insufficient food are particularly susceptible to hypothermia.

The first symptoms of hypothermia are uncontrollable shivering and the sensation of cold. The heartbeat then slows and sometimes becomes irregular, the pulse weakens and the blood pressure changes. Other symptoms are slurred and slow speech, memory lapses, incoherence, drowsiness, poor judgment, mental confusion and apparent exhaustion. See table below for additional clinical symptoms of hypothermia.

Table 1- Progressive Clinical Presentations of Hypothermia*

Core Temperature		**Clinical Signs**
C	F	
37.6	99.6	"Normal" rectal temperature
37	98.6	"Normal" oral temperature
36	96.8	Metabolic rate increases in an attempt to compensate for heat loss
35	95.0	Maximum shivering
34	93.2	Victim conscious and responsive, with normal blood pressure
33	91.4	Severe hypothermia below this temperature
32 31	89.6 87.8	Consciousness clouded; blood pressure becomes difficult to obtain; pupils dilated but react to light; shivering ceases
30 29	86.0 84.2	Progressive loss of consciousness; muscular rigidity increases; pulse and blood pressure difficult to obtain; respiratory rate decreases
28	82.4	Ventricular fibrillation possible with myocardial irritability
27	80.6	Voluntary motion ceases; pupils nonreactive to light; deep tendon and superficial reflexes absent
26	78.8	Victim seldom conscious
25	77.0	Ventricular fibrillation may occur spontaneously
24	75.2	Pulmonary edema
22 21	71.6 69.8	Maximum risk of ventricular fibrillation
20	68.0	Cardiac standstill
18	64.4	Lowest accidental hypothermia victim to recover

**2011 ACGIH TLV Thermal Stress*

When a person is mildly hypothermic, he/she should be moved indoors where it is warm, wet clothing removed, and a warm beverage provided. The body must be rewarmed slowly. In more severe cases emergency medical services needed immediately. While transporting the person or awaiting the arrival of the emergency unit the following steps should be taken to try to prevent further heat loss.

Actions to take:

- Keep the person dry, remove wet clothing
- Apply external warmth
- Have person breathe warm moist air
- Handle the person gently
- Remain alert of any complications

Actions to avoid:
- Give hot liquids
- Allow person to exercise

5.2.3 Cold Stress Prevention

The best protection against hypothermia and frostbite is prevention. Prevention includes proper work practices, protective clothing and proper diet. The following is recommended to prevent cold related injuries:

- Temperature and wind monitoring at the site
- Reduce exposed skin
- Dress in layers
- Work periods with frequent breaks for rewarming
- Supply of beverages
- Bare skin should not contact metal objects
- The buddy system should be used
- Clothing that becomes damp or wet should be changed immediately
- Provide shelter when working outside for prolonged periods
- Remove PPE in sheltered area to prevent wind cooling of perspiration

If work is performed continuously at 20°F ECT or below, heated warming shelters should be made available for employee to use during warm-up breaks. A work-warming regimen can be established using the ACGIH guidelines. These guidelines assume that workers are properly clothed for periods of work at temperatures below freezing.

For work at or below 10° F ECT the following should apply:

- The worker should be under constant protective observation (buddy system or other direct supervision)
- The work rate should not be so vigorous as to cause sweating that will result in wet clothing; if heavy work must be done, all rest periods be taken in heated shelters and the opportunity for changing into dry clothing will be provided.
- Provisions will be made to allow employees to become accustomed to the required protective clothing as well as to their working environment.
- The working conditions as well as the weight and bulkiness of clothing will be included in estimating the required work rate or lifting requirements.

The work will be arranged in such a way that sitting still or standing still for long periods is minimized. Unprotected metal chair seats will not be used. The worker should be protected from drafts to the greatest extent possible.

5.2.4 Clothing Requirements

Clothing should be worn loosely, in layers, and selected for the type of work to be performed. The loose clothing and layers provide maximum protection because layers of warm air are trapped between the clothing layers. This method of dressing also allows the outer layer to be removed during heavy manual work, or if there is an increase in temperature. The layer closest to the skin should keep the skin dry and allow the perspiration to escape.

The outer layers of clothing are for insulation and should be made of wool, goose down, or synthetic fiber-filled materials. Wool absorbs significant amount of body moisture before losing its ability to insulate, making it preferable to cotton. Gore-Tex® and polypropylene are often recommended for use next to the skin. If clothing becomes damp or wet from the work activity or perspiration, it should be changed. Waterproof outerwear should be worn if there is precipitation.

Up to 50 percent of heat loss occurs through the head, ears and back of the neck. Appropriate head coverings are an important clothing item. Hands should be protected since hands and fingers are susceptible to frostbite.

Footwear should be waterproof. Waterproof boots should be worn when working outside in snow or wet areas. The soles and upper part of the boots should provide good insulation. A combination of working boots and rubber overboots is a cost-effective method of providing insulation. The footwear should not be too constricting and the socks should allow evaporation of perspiration.

6.0 TRAINING

PS&S employees who may be exposed to heat and cold conditions will receive training conducted as part of discipline specific training in safe work practices for heat and cold stress. The training will include the following:

- The workers will be instructed in hot weather procedures, including
  - Proper cooling procedures and appropriate first-aid treatment.
  - Proper clothing practices
  - Proper eating and drinking habits
  - Recognition of impending heat exhaustion
  - Recognition of signs and symptoms of impending heat stroke
  - Safe work practices

- The workers will be instructed in cold weather procedures, including:
  - Proper warming procedures and appropriate first-aid treatment
  - Proper clothing practices
  - Proper eating and drinking habits
  - Recognition of frostbite
  - Recognition of signs and symptoms of hypothermia
  - Safe work practices

7.0 REFERENCE

ACGIH Threshold Limit Values (TLV) and Biological Exposure Indices (BEI)

DHHS (NIOSH) Publication No. 86-113 (April 1986) Criteria for Recommended Standard: Occupational Exposure to Hot Environments

SOP #21
Bloodborne Pathogens

Created: 7-20-2011
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TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this SOP is to protect employees from the health hazards associated with bloodborne pathogens, and to provide appropriate treatment and counseling should an employee be exposed to bloodborne pathogens.

2.0 SCOPE

This applies to PS&S employees with potential occupational exposure to blood and other potentially infectious materials during the completion of job duties.

3.0 DEFINITIONS

Blood – Human blood, human blood components, and products made from human blood.

Bloodborne Pathogens (BBP) – Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Center for Disease Control (CDC) – The government agency that is responsible for investigating and controlling disease in the US.

Contaminated – The presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Contaminated Sharps – Any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

Decontamination – The use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Engineering Controls – Devices and items (e.g., sharps disposal containers) that isolate or remove the bloodborne pathogens hazard from the workplace.

Exposure Incident – A specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

Licensed Healthcare Professional - a person whose legally permitted scope of practice allows him or her to independently perform the activities required by paragraph (f) Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up.

HBV – Hepatitis B virus that causes Hepatitis B, a serious liver disease.

HIV – Human immunodeficiency virus that causes AIDS.

Occupational Exposure – Reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Other Potentially Infectious Materials (OPIM) – Includes:

- The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;
- Any unfixed tissue or organ (other than intact skin) from a human (living or dead)

Parenteral – Piercing mucous membranes or the skin barrier through such events as needle sticks, human bites, cuts, and abrasions.

Personal Protective Equipment (PPE) – Specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Regulated Waste – Liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

Source Individual – Any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee.

Sterilize – The use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

Universal Precautions – An approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Work Practice Controls – Practices that reduce the likelihood of exposure by altering the manner in which a task is performed.

4.0 RESPONSIBILITIES

Corporate Health & Safety Officer (CSO) – The CSO is responsible for the annual review and updating of the guidelines in this SOP as needed. The CSO, or the CSO's designee, will also review any new technology available that may reduce employee exposure to BBP.

Human Resources (HR) – HR is responsible for the maintenance of training and medical records.

Department Managers (DM) – The DM is responsible for the overall implementation of this program within the operations under their control. The DM is also responsible for providing appropriate resources in personnel and equipment required to complete these operations safely and in compliance with this program.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO and/or DSO is responsible for making initial and annual BBP training and medical evaluations available for affected employees. They will provide appropriate PPE and follow up on any exposure incidents using the Investigation Form.

Project Manager (PM) and/or Site Representative (SR) – The PM and/or SR is responsible for verifying that assigned employees have been appropriately trained. The PM/SR is also responsible for overseeing and enforcing safety procedures and requirements.

Employees – Employees are responsible for compliance with the BBP SOP. This includes, but is not limited to, using good personal hygiene habits, participating in BBP training, using good practices, and knowing which work tasks have potential occupational BBP exposure.

5.0 EXPOSURE DETERMINATION

Potential exposure to BBP at PS&S have been identified in the following job classifications and tasks:

- First-Aid Personnel –Designated First-Aid Workers who may encounter BBP or OPIM while rendering First-Aid treatment.

6.1 METHODS OF COMPLIANCE

6.2 Universal Precautions

All human blood, tissues or body fluids visibly contaminated with blood, and the following body fluids are treated as if they are known to be infected with bloodborne pathogens:

- Semen
- Vaginal secretions
- Cerebrospinal fluid
- Synovial fluid
- Pleural fluid
- Pericardial fluid
- Peritoneal fluid
- Amniotic fluid
- Saliva
- Plasma and plasma derived products

In circumstances where it is difficult or impossible to differentiate between body and fluid types, all body fluids will be assumed potentially infectious. Universal Precautions will be employed whenever there is any potential exposure to human blood or OPIM.

6.3 Engineering Controls

Engineering controls will be used wherever feasible to eliminate or minimize employee exposure to bloodborne pathogens. New technology will be periodically reviewed to determine its feasibility of use at PS&S work sites. This evaluation will focus on the reduction of injuries that cause exposure to blood or OPIM. Employee input will be part of the evaluation and selection of all new engineering controls.

Any existing engineering controls are reviewed annually for proper function and needed repair or replacement. Engineering controls used at PS&S work sites include:

- Hand washing facilities, which are readily accessible to employees who have potential exposure in office sites and some project sites
- Leak-resistant bags for handling potentially contaminated materials

6.4 Work Practice Controls

Work practice controls reduce the likelihood of exposure by altering the manner in which a task is performed. Some examples of work practice requirements for employees are:

- Employees will wash hands immediately or as soon as feasible after removal of gloves or other personal protective equipment.
- Following direct contact with blood or any OPIM, employees will wash hands and exposed skin with soap and water as soon as possible. They will also flush mucous membranes with water if they have been in contact with blood or OPIM.
- Eating, drinking, smoking, applying cosmetics or lip balm and handling contact lenses is prohibited in work areas where there is potential for exposure to BBP. This would be any area where wastewater samples might be stored or processed.
- Equipment that may be contaminated will be decontaminated prior to reuse, service or shipping.
- An appropriate biohazard label will be attached to any potentially contaminated equipment and containers.
- All procedures involving the handling or potential exposure to blood or OPIM will be performed in such a way as to minimize splashing or spraying.

6.5 Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) will be used if occupational exposure remains after instituting engineering and work practice controls, or if those controls are not feasible.

The PPE that may be used to control BBP exposure includes, but is not limited to:

- Gloves
- Face shields
- Safety glasses
- Pocket masks

PPE will be provided to employees:

- At no cost to employees,
- Accessible and in appropriate sizes for employees at the work site, and
- Cleaned, repaired, replaced, and disposed properly at no cost to employees.

All PPE will be inspected periodically and repaired or replaced as needed to maintain its effectiveness. Disposable PPE, especially gloves, will be replaced as soon as possible after contamination, or if they are torn, punctured or otherwise lose their ability to function as an "exposure barrier". Reusable PPE will be cleaned, laundered and decontaminated as needed. Employees will remove all PPE prior to leaving a work area. Employees will not remove potentially BBP contaminated PPE from the site.

6.6 Housekeeping

The following tasks will be required on an "as-needed" basis to minimize exposure to BBP:

- Personnel assigned to do housekeeping or cleaning where potential BBP are present must wear PPE appropriate for the job including: gloves and safety glasses during cleaning and decontamination work.
- Equipment and surfaces suspected to be contaminated with BBP will be cleaned and decontaminated as soon as feasibly possible.
- Initial clean up of blood or OPIM must be followed by the use of an approved germicide (10% bleach or other FDA listed TB biocide).
- Equipment contaminated with blood or other potentially infectious materials will be cleaned, and decontaminated prior to servicing or shipping.
- The decontamination procedure recommended by the germicide manufacturer will be followed.
- Potentially contaminated broken glassware and other sharps will be picked up using mechanical means (such as dustpan and brush, tongs, forceps, etc.) and disposed of in rigid, puncture resistant, leak resistant containers (i.e. sharps containers).
- Reusable containers such as bins, pails, and cans that have a likelihood of contamination will be inspected and decontaminated when visibly contaminated.

7.1 HEPATITIS B VACCINATION

PS&S will make available the HBV vaccination series to employees who may have occupational exposure to BBP. The Hepatitis B vaccination, which consists of three inoculations over a six-month period, will be made available after the employee has received the required training and within ten days of initial assignment to tasks that may have BBP exposure or after an incident for employees who perform first aid as a collateral duty only (see section 6.1). PS&S will provide medical evaluations and Hepatitis B vaccination series that are:

- Made available at no cost to the employee
- Made available to employees at a reasonable time and place
- Performed by or under the supervision of a licensed physician or health care professional
- Provided according to the current recommendations of the U.S. Public Health Service (CDC)
- All laboratory tests will be conducted by an accredited laboratory at no cost to the employee.

The following considerations will be included:

- The vaccine will not be provided to employees who exhibit the following:
  - Antibody testing has revealed that the employee is immune
  - The vaccine is contraindicated for medical reasons.
- Pre-screening for antibody titer is not required; it is only made available to employees who wish to take it.
- The vaccine will be made available to employees who initially decline, but later decide to accept the vaccine.
- Employees who refuse the Hepatitis B vaccine **must** sign the Hepatitis B Vaccination Declination Form (Appendix B). This is documentation that the Vaccine was offered and does not prevent the employee from getting the Vaccine at a later date.
- Presently, booster doses are not presently recommended by CDC.

7.2 First-Aid Worker Vaccination Program

PS&S employees whose primary job assignments do not pose BBP exposure risks but who are designated First Aid workers will be offered the Hepatitis B Vaccination Series after they respond to an incident which has exposed them to blood or OPIM.

All first aid incidents involving the presence of blood or OPIM will be reported to HR and the BUSA before the end of the work shift during which the incident occurred. The report must include:

- The names of all first-aid providers who rendered assistance, regardless of the use of PPE
- A description of the first-aid incident, including date and time
- A determination of whether or not an exposure incident occurred
- A record of all such first aid incidents will be maintained by HR

The Hepatitis B Vaccination series will available to unvaccinated first-aid personnel who have rendered assistance in any situation involving the presence of blood or OPIM, regardless of whether or not a specific exposure incident occurred. The vaccination must be offered as soon as possible but no more than 24 hours after an incident.

8.0 POST-EXPOSURE EVALUATION AND FOLLOW-UP

Any employee exposed to bloodborne pathogens must notify his Supervisor and BU Manager immediately. If an employee is involved in an exposure incident:

- The employee will be offered a medical evaluation and appropriate treatment as expeditiously as possible, at no cost to the employee.
- An investigation of the circumstances surrounding the exposure incident will be conducted.

The Supervisor will investigate every exposure incident. A written summary of the incident is prepared and recommendations are made for preventing similar incidents in the future. Appendix C "BBP Incident Investigation Form" should be completed along with the "Post Exposure Evaluation and Follow Up Checklist" in Appendix D.

If the exposure incident involves a source individual, that person will be provided medical counseling and consent for blood testing will be requested, where required by law. Source individual's blood will be collected and tested as recommended by CDC. All results of such

source testing will be kept confidential and will be discussed, as appropriate with the exposed employee only after they have been made aware of all applicable confidentiality regulations. If the employee agrees to a baseline blood test, but does not agree to HIV testing, the blood sample will be preserved for 90 days to allow consent to be given at a later date. However, it is recommended by CDC that treatment for HIV exposed individual occur within a few hours of exposure.

The evaluation and follow-up will include the following:

- All blood testing and medical consultations will be conducted by licensed health care professionals.
- All laboratory tests are conducted by an accredited laboratory.
- Evaluation will be provided as soon as possible after exposure.
- Follow up evaluations will be discussed with the physician.

A healthcare professional that evaluates an employee after an exposure incident will be provided with the following:

- A copy of the Bloodborne Pathogens Standard (OSHA Regulation 1910.1030)
- A description of the employee's duties relevant to the exposure incident
- Documentation of the route of exposure and circumstances under which the exposure occurred
- Results of the source individual's blood tests, if available
- All other medical records relevant to the appropriate treatment of the employee including vaccination status

Within 15 days of the consultation, the healthcare professional will provide a written opinion evaluating the exposed employee. This written opinion will remain part of the employee's medical record. The written opinion will contain only the following information:

- Whether Hepatitis B Vaccination is indicated
- Whether the employee has received the Hepatitis B Vaccination
- Confirmation that the employee has been informed of the results of the evaluation
- Confirmation that the employee has been told about any medical conditions resulting from the exposure incident which require further evaluation or treatment

All other findings or diagnoses will remain confidential and will not be included in the written opinion. PS&S will furnish a copy of this opinion to the exposed employee.

9.1 INFORMATION TRAINING

PS&S will use various methods to communicate and describe the hazardous exposures to employees. This includes the use of labels, signs, and training.

9.2 Labels and Signs

Biohazard warning labels will be used to identify potential contamination. A sample label can be found in Appendix A. The following items will be labeled:

- Contaminated equipment
- Waste containers and bagged waste that is potentially contaminated with BBP
- Cleaning materials that are potentially contaminated with BBP

9.3 Training

Training will be required for employees with potential occupational exposure to BBP or OPIM. Training records will be maintained by HR.

Training will be provided at the time of initial assignment to tasks where occupational exposure may occur and at annually thereafter, and if an employee fails to demonstrate a working knowledge of the BBP SOP. Training will include:

- A copy of the OSHA BBP standard and explanation of its contents
- The modes of transmitting BBP
- The epidemiology and symptoms of HBV and HIV
- PS&S written BBP SOP and how to obtain a copy
- Methods to recognize tasks/activities that might cause exposure to BBP
- The use and limitations of control methods, including:
    - Engineering controls

  - Work practice controls
  - Personal protective equipment
  - New technology available
- The types, selection, proper use, location, removal, and decontamination and disposal of PPE
- The Hepatitis B Vaccine:
  - Efficacy
  - Safety
  - Method of administration
  - Benefits of vaccination
  - PS&S Vaccination program, including post incident reporting and vaccination of first aid workers
- Post-exposure evaluation and follow-up procedure
- Emergency procedures for an exposure incident
- Signs and labels and/or color coding requirements
- Provision for a question and answer session on the training.

10.1 RECORD KEEPING

HR will maintain medical and training records. Records will be available for examination by the employee by written request. Medical records will be confidential and released only with the written consent of the employee.

10.2 Medical Records

Medical records will be maintained for the term of employment plus thirty years. The records will be maintained confidential. Medical Records will include:

- Employee name,
- Social security number,
- HBV vaccination status (including evaluation, report by the medical professional, and dates of all vaccinations received), and
- Records related to reported exposure incidents, including results of examination, medical testing, follow-up health care professional's written opinion, and all information provided to the evaluating health care professional.

10.3 Training Records

Training records will be maintained for a minimum of three years from the date of the training session, and made available for inspection and copying to employees, and authorized OSHA representatives upon request.

Training records will include:

- Date(s) of each training session
- Contents/summary of the training session
- Names and qualifications of the instructor(s)
- Names and job titles of employees attending the training sessions

11.0 CONTAMINATED WASTE

Waste generated by handling, cleaning, or decontaminating BBP or OPIM will be disposed of in accordance with Federal, State, and local regulations.

APPENDIX A - SAMPLE BIOHAZARD LABEL

APPENDIX B - HEPATITIS B VACCINE DECLINATION (MANDATORY)

I understand that due to my occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring the Hepatitis B Virus (HBV) infection. I have been given the opportunity to be vaccinated with Hepatitis B Vaccine, at no charge to me. However, I decline to receive the Hepatitis B Vaccination at this time.

I understand that by declining this vaccine, I continue to be at risk of acquiring the HBV, a serious disease. If in the future, I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with the Hepatitis B Vaccine, I can receive the vaccination series at no charge to me.

My reason for choosing not to participate is: _____

_____

_____

(It is not compulsory that the above information be provided by the employee.)

_____ _____

Signature **Date**

APPENDIX C - BBP EXPOSURE INCIDENT INVESTIGATION FORM

Employee Name:_____ Date of Incident:_____ Time of Incident:_____
Location:_____

Potentially Infectious Materials Involved:

TYPE	SOURCE
_____	_____
_____	_____
_____	_____

Circumstances (work being performed, etc.):

_____

_____

_____

How incident was caused (accident, equipment, malfunction, etc.)

_____

_____

_____

Personal protective equipment being used:

Actions taken (decontamination, clean-up, reporting, etc.):

_____

_____

_____

Recommendations for avoiding repetition:

_____

_____

_____

APPENDIX D - POST-EXPOSURE EVALUATION AND FOLLOW-UP CHECKLIST

The following steps must be taken, and information transmitted, in the case of an employee's exposure to Bloodborne Pathogens:

ACTIVITY	COMPLETION DATE & INITIALS
Employee furnished with documentation regarding exposure incident	_____
Source individual identified (_____) source individual or NA	_____
Source individual's consent for blood tested requested _____No consent for testing source obtainable	_____
Appointment arranged for employee with healthcare professional (_____) healthcare professional's name	_____
Physician's Written Opinion received and provided to employee	_____

Documentation forwarded to healthcare professional:

_____ Bloodborne Pathogens Standard

_____ Description of exposed employee's duties

_____ Description of exposure incident, including routes of exposure

_____ Information regarding source individual, if applicable

_____ Employee's medical records

SOP #22
Electrical Safety

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TABLE OF CONTENTS

1.0 PURPOSE

This SOP provides guidelines and requirements to establish safe procedures for employees who may be exposed to electrical hazards while working with or near electrical equipment.

2.0 SCOPE

This program applies to PS&S employees who may be exposed to live electrical hazards while conducting work activities. PS&S does not perform work on electrical systems or equipment but may need to access areas in the vicinity of such equipment for surveying or engineering design purposes.

3.0 DEFINITIONS

Approach Boundary – The distances that employees must remain from live electrical equipment to prevent potential injury.

Arc Flash – A sudden release of electricity that is conducted through the air from a high voltage source to another conductor or a nearby ground.

Arc Flash Boundary – When an arc flash hazard exists, an approach limit at a distance from a prospective arc source within which a person could receive a second degree burn if an electrical arc flash were to occur.

De-energized – Free from any electrical connection to a source of potential difference and from electrical charge; not having a potential different from that of the earth.

Electrically Safe Work Condition – A state in which an electrical conductor or circuit part has been disconnected from energized parts, locked/tagged in accordance with established standards, tested to confirm the absence of voltage, and grounded if determined necessary.

Energized – Electrically connected to, or is a source of, voltage. May include stored or residual energy.

Limited Approach Boundary – An approach limit at a distance from an exposed energized electrical conductor or circuit part within which a shock hazard exists.

Personal Protective Equipment (PPE) – Personal Protective Equipment (PPE) is any equipment worn by an individual to protect the individual from a hazard. This includes gloves, respirators, and ear plugs, as well as arc-rated clothing and electrically insulating PPE.

Prohibited Approach Boundary – An approach limit at a distance from an exposed energized electrical conductor or circuit part within which work is considered the same as making contact with the electrical conductor or circuit part.

Qualified Worker – One who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved. A qualified worker may work on energized electrical equipment over 50 volts.

Restricted Approach Boundary – An approach limit at a distance from an exposed energized electrical conductor or circuit part within which there is an increased risk of shock, due to electrical arc-over combined with inadvertent movement, for personnel working in close proximity to the energized electrical conductor or circuit part.

Servicing and/or Maintenance – Activities such as installing, setting up, adjusting, inspecting, modifying, maintaining and/or servicing machines or equipment.

Substations and Other Areas with Live Electrical Hazards – An auxiliary power station where electricity is received from one or more major power stations, converted, and distributed. Other Areas with Live Electrical Hazards refers to any active installation associated with the transmission of electricity.

Unqualified Worker – Employees who have not been trained or authorized to perform work on energized electrical equipment over 50 volts. With little exception, unqualified workers are required to remain outside of the limited approach boundary. They are strictly prohibited from entering the restricted approach boundary and from conducting testing, troubleshooting, voltage measurements, or repairs on energized electrical systems.

Working On – Intentionally coming in contact with energized electrical conductors or circuit parts with the hands, feet, or other body parts, with tools, probes, or with test equipment, regardless of the personal protective equipment a person is wearing. There are two categories of "working on": *Diagnostic (testing)* is taking readings or measurements of electrical equipment with approved test equipment that does not require making any physical change to the equipment; *repair* is any physical alteration of electrical equipment (such as making or tightening connections, removing or replacing components, etc.).

4.0 RESPONSIBILITIES

Corporate Safety Officer (CSO) – The CSO is responsible for the periodic review and update of this program.

Human Resources (HR) – HR is responsible for the maintenance of training records.

Department Managers (DM) – The DM is responsible for the overall implementation of this program within the operations under their control. The DM is also responsible for providing appropriate resources in personnel and equipment required to complete these operations safely and in compliance with this program.

Group Health & Safety Officer (GSO) and/or Department Health & Safety Officer (DSO) – The GSO and/or DSO is responsible for making required PPE and training available to employees who may be exposed to electrical hazards while conducting work activities. The GSO and/or DSO will also conduct Field Inspections and will follow up on identified deficiencies. The GSO/DSO will review and approve the H&S Checklist or Site Specific HASP prior to commencing work with electrical hazards.

Project Manager (PM) and/or Site Representative (SR) – The PM and/or SR is responsible for verifying that assigned employees have been appropriately trained. The PM/SR is also responsible for overseeing and enforcing safety procedures and requirements.

Field Personnel (FP) – FPs are responsible for complying with this SOP.

5.1 GUIDELINES

5.2 Electrical Hazards

5.1.1 Shock Hazards

Electrical shock is the effect produced on the body, particularly the nervous system, by electric current passing through it, and its effect depends on:

- Current strength (which in turn depends on voltage)
- The path the current takes through the body
- The surface resistance of the skin

Shock effects can result from exposure to voltages as low as 15V. Fatalities can result from exposures to voltages as low as 70V. Fatal injuries have been recorded

as a result of exposure to the normal domestic and industrial voltage of 240V A.C. and from currents of 25-30 milliamps.

Prevention of shock hazards can be accomplished by maintaining safe distances from electrical equipment and transmission wires, using non-conductive equipment and wearing appropriate personal protective equipment (PPE.)

Results of Physical Contact with Current/Voltage	
k (60 Hz)	Sensation
LESS THAN 1.0 MA	**PERCEPTION LIMIT**
From 6.0 to 8.0 mA	Tingling, annoyance
From 8.0 to 25 mA	Discomfort, cramps
From 25 to 50 mA	Loss of control, asphyxia
From 50 to 100 mA	Ventricular fibrillation
More than 100 mA	Shock, cardiac arrest

5.1.2 Burns and Arc Flash

Burns are caused by the passage of heavy current through the body or by direct contact with an electrically heated surface. An arc flash or explosion can cause severe burns. The intense heat generated by arcing from a short circuit may also cause burns. All cases of burns require immediate medical attention.

5.1.3 Explosion and Fire

Where flammable gases or vapors are present, special care is necessary in the design and selection of electrical equipment. In such areas, all equipment should be fully explosion-proof. The following may cause fires:

- Sparks
- Short circuits
- Overloading
- Old wiring

6.1 CONTROL METHODS

Whenever possible, electrical conductors and circuit parts will be placed into an electrically safe work condition before personnel:

- Perform work within the limited approach boundary of exposed electrical conductors or parts

  or
- Interact with equipment where electrical conductors or parts are not exposed but an increased risk of injury from an arc flash hazard exists.

Work on energized electrical conductors or circuit parts is allowed only if:

- The employer can demonstrate that de-energizing introduces additional hazards or increased risk
- The employer can demonstrate that de-energizing is infeasible due to equipment design or operational limitations
- The system operates at less than 50 volts and there is no increased potential for electrical burns or explosions due to electric arcs

PS&S personnel will not work on electrical systems, conductors, or circuit parts; however, they may be exposed to electrical hazards when performing certain work activities, such as conducting arc flash surveys, electrical design for new systems or renovations, or working at electrical substations. These work activities do not require PS&S personnel to open or contact live electrical equipment. Whenever possible, PS&S personnel will conduct work while maintaining safe distances from energized electrical equipment. In the rare event where PS&S personnel require electrical equipment to be opened, the equipment will be first de-energized by a qualified worker or the equipment will be opened by a qualified worker and unqualified workers will remain clear of the limited approach boundary. Where safe distances cannot be maintained and equipment cannot be de-energized, additional controls will be required, and work may not proceed until reviewed and approved by the DM and PM/SR.

When work is conducted around energized equipment, the following requirements will be met.

6.2 General Requirements

Personnel will assume that electrical conductors, circuits, parts, and equipment are energized until proven electrically safe.

Personnel will **not**:

- Work within the limited approach boundary of energized equipment when impaired due to fatigue, illness, or other reason
- Reach blindly into areas where electrical hazards may exist
- Enter spaces containing exposed energized parts unless illumination is provided that enables the employee to work safely
- Wear conductive articles and items such as jewelry, watches, and cell phones will not be worn where they present an electrical contact hazard with exposed energized electrical conductors or circuit parts

6.1.1 Unqualified Workers

Unqualified workers will not physically remove electrical panels or guards but may be present when these guards are removed to observe present electrical equipment for design purposes and to conduct arc flash surveys. Only qualified workers as defined above may conduct tasks that expose them to energized electrical parts. Electrical systems will be de-energized whenever possible. Conductors and parts of electrical equipment that have been de-energized but not locked or tagged out will be treated as live parts. If de-energizing equipment is not possible, PS&S personnel will conduct only non-contact testing of energized electrical equipment. PS&S personnel will observe limited approach boundary requirements and will wear appropriate PPE as designated by the site arc flash hazard survey or based on the requirements of NFPA 70E.

Unqualified workers will not enter spaces that are required to be accessible to qualified workers only, including restricted approach boundaries and other requires areas.

6.1.2 Qualified Workers

Qualified workers may conduct tasks that expose them to energized electrical parts. Only qualified workers may conduct tasks such as testing, troubleshooting, and voltage measuring within the limited approach boundary.

6.2 Notification

PS&S will notify the appropriate facility/property personnel:

- Prior to conducting tasks that may pose unusual electrical hazards
- If unanticipated hazards are encountered
- Of any measures taken by PS&S personnel to correct hazards

6.3 Hazard Identification and Risk Assessment

Hazard identification and risk assessment will be done prior to performing work within the limited approach boundary or the arc flash boundary of energized electrical conductors and circuit parts operating at 50 volts or more, or where an electrical hazard exists.

The project PM/SR will complete a Health and Safety Checklist and will review it with affected PS&S project personnel during the job briefing conducted prior to commencing work. This review will include identified hazards, safe work procedures, required PPE, and if applicable, special precautions, energy source controls, and work permits.

If hazards, work procedures, or PPE requirements change, or if other changes occur that might affect personnel safety, the Health and Safety Checklist will be updated and reviewed with project personnel prior to re-commencement of work.

6.4 Work Permits

Work conducted within the limited approach boundary and/or the arc flash boundary of exposed energized electrical conductors or circuit parts that have not been placed in an electrically safe work condition is considered energized electrical work and requires a written work permit, with the following exceptions:

- Work performed within the limited approach boundary is conducted by qualified workers and involves tasks such as testing, troubleshooting, and voltage measuring, and appropriate safe work practices and PPE are utilized
- Work tasks consist of visual inspection and the restricted approach boundary will not be crossed

6.5 Test Instruments and Equipment

Test instruments, equipment, and associated accessories will be rated for the electrical circuits and equipment to which they will be connected and will be appropriate to the work environment to which they will be exposed and for the manner in which they will be used. Test instruments, equipment, and associated accessories will be visually inspected prior to each use. Verification of that instruments and equipment are in proper working order will be performed before and after each absence of voltage test. Any instrument, equipment, or accessory that is found to be damaged, defective, malfunctioning, or otherwise unsafe will be removed from service until repairs are made and safe operation is verified. Items that cannot be returned to safe condition will be discarded and replaced, as appropriate.

6.6 Approach Boundaries

All personnel will observe the limited approach boundaries as per NFPA 70E when working near energized electrical circuits and equipment, will not enter the limited approach boundary area without approval as stated above, and are prohibited from entering the restricted approach boundary. Approach boundaries should be indicated on electrical equipment. When electrical equipment is not labeled with approach boundaries, NFPA 70E Table 130.4(C)(a) will be used to determine minimum approach distances.

6.6.1 Unqualified Workers

Unqualified workers will not enter the limited approach boundary of energized electrical conductors or parts with one exception. If it is necessary for an Unqualified worker to cross the limited approach boundary, a Qualified worker will advise the Unqualified worker(s) of possible hazards and will continuously escort the Unqualified worker(s) while within the limited approach boundary. Unqualified workers are prohibited from entering the restricted approach boundary.

NFPA 70E Table 130.4(C)(a) Approach Boundaries to Energized Electrical Conductors or Circuit Parts for Shock Protection for Alternating-Current Systems (All dimensions are distance from energized electrical conductor or circuit part to employee.)				
(1)	**(2)**	**(3)**	**(4)**	**(5)**
Nominal System Voltage Range, Phase to Phase[a]	Limited Approach Boundary[b]		Restricted Approach Boundary[b]; Includes Inadvertent Movement Adder	Prohibited Approach Boundary[b]
	Exposed Movable Conductor[c]	Exposed Fixed Circuit Part		
<50 V	Not specified	Not specified	Not specified	Not specified
50 V–300 V	3.0 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	Avoid contact	Avoid contact
301 V–750 V	3.0 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	0.3 m (1 ft 0 in.)	25 mm (0 ft 1 in.)
751 V–15 kV	3.0 m (10 ft 0 in.)	1.5 m (5 ft 0 in.)	0.7 m (2 ft 2 in.)	0.2 m (0 ft 7 in.)
15.1 kV–36 kV	3.0 m (10 ft 0 in.)	1.8 m (6 ft 0 in.)	0.8 m (2 ft 7 in.)	0.3 m (0 ft 10 in.)
36.1 kV–46 kV	3.0 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	0.8 m (2 ft 9 in.)	0.4 m (1 ft 5 in.)
46.1 kV–72.5 kV	3.0 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	1.0 m (3 ft 3 in.)	0.7 m (2 ft 2 in.)
72.6 kV–121 kV	3.3 m (10 ft 8 in.)	2.5 m (8 ft 0 in.)	1.0 m (3 ft 4 in.)	0.8 m (2 ft 9 in.)
138 kV–145 kV	3.4 m (11 ft 0 in.)	3.0 m (10 ft 0 in.)	1.2 m (3 ft 10 in.)	1.0 m (3 ft 4 in.)
161 kV–169 kV	3.6 m (11 ft 8 in.)	3.6 m (11 ft 8 in.)	1.3 m (4 ft 3 in.)	1.1 m (3 ft 9 in.)
230 kV–242 kV	4.0 m (13 ft 0 in.)	4.0 m (13 ft 0 in.)	1.7 m (5 ft 8 in.)	1.6 m (5 ft 2 in.)
345 kV–362 kV	4.7 m (15 ft 4 in.)	4.7 m (15 ft 4 in.)	2.8 m (9 ft 2 in.)	2.6 m (8 ft 8 in.)
500 kV–550 kV	5.8 m (19 ft 0 in.)	5.8 m (19 ft 0 in.)	3.6 m (11 ft 10 in.)	3.5 m (11 ft 4 in.)
765 kV–800 kV	7.2 m (23 ft 9 in.)	7.2 m (23 ft 9 in.)	4.9 m (15 ft 11 in.)	4.7 m (15 ft 5 in.)
a For single-phase systems, select the range that is equal to the system's maximum phase-to-ground voltage multiplied by 1.732.				
b See definition in Article 100 and text in 130.4(D)(2) and Annex C for elaboration.				
c This term describes a condition in which the distance between the conductor and a person is not under the control of the person. The term is normally applied to overhead line conductors supported by poles.				

6.7 Personal and Other Protective Equipment

Additional PPE and other protective equipment may be required when working in areas where there is potential exposure to energized electrical equipment. PPE and other protective equipment requirements are dependent on the potential shock and/or arc hazard and the proximity to the exposed energized conductors/parts.

PPE and other protective equipment will conform to applicable standards, as stated in NFPA Table 130.7(C)(14).

NFPA 70E Table 130.7(C)(14) Standards on Protective Equipment		
Subject	**Document Title**	**Document Number and Revision**
Apparel-Arc Rated	Standard Performance Specification for Flame Resistant and Arc Rated Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Electric Arc and Related Thermal Hazards	ASTM F 1506-10a
Footwear-Dielectric Test Method	Standard Test Method for Determining Dielectric Strength of Dielectric Footwear	ASTM F 1116-03(2008)
Footwear-Standard Performance Specification	Standard Specification for Performance Requirements for Foot Protection	ASTM F 2413-05
Footwear-Standard Test Method	Standard Test Methods for Foot Protection	ASTM F 2412-05
Gloves-Leather Protectors	Standard Specification for Leather Protectors for Rubber Insulating Gloves and Mittens	ASTM F 696-06
Gloves-Rubber Insulating	Standard Specification for Rubber Insulating Gloves	ASTM D 120-09
Gloves and Sleeves-In-Service Care	Standard Specification for In-Service Care of Insulating Gloves and Sleeves	ASTM F 496-08
Head Protection-Hard Hats	Personal Protection - Protective Headwear for Industrial Workers	ANSI/ISEA Z89.1-2009
Rainwear-Arc Rated	Standard Specification for Arc and Flame Resistant Rainwear	ASTM F 1891-06
Rubber Protective Products-Visual Inspection	Standard Guide for Visual Inspection of Electrical Protective Rubber Products	ASTM F 1236-96(2007)
Sleeves-Insulating	Standard Specification for Rubber Insulating Sleeves	ASTM D 1051-08

PPE and other protective equipment will be inspected, stored, and maintained in accordance with manufacturers' recommendations. At a minimum, PPE and other protective equipment will be visually inspected for defects, damage, or other unsafe conditions prior to use each day and following an incident that could reasonably be suspected to have caused damage. Damaged, defective, or unsafe PPE or other protective equipment will be immediately removed from service and repaired or replaced, as appropriate.

6.7.1 Insulating Protective Equipment

Protective shields, protective barriers, or insulating materials will be provided as necessary and will be used when working in confined or enclosed work spaces where electrical hazards may exist. Only insulating protective equipment (IPE) that meets OSHA standards will be used. IPE must be rated for the voltage range of the electrical system. IPE may include:

- Rubber insulating gloves
- Rubber insulating blankets
- Other insulating equipment based on operation

In addition to visual inspections, IPE gloves must be given an air test prior to use. IPE must be subjected to periodic electrical testing, based on the type of IPE.

Rubber IPE Maximum Test Intervals (from NFPA 70E Table 130.7(C)(7)(c))		
Type	**Testing Frequency**	**Applicable Standard***
Blankets	Before first issue; every 12 months thereafter†	ASTM F 479
Covers	If insulating value is suspect	ASTM F 478
Gloves	Before first issue; every 6 months thereafter†	ASTM F 496
Line hose	If insulating value is suspect	ASTM F 478
Sleeves	Before first issue; every 12 months thereafter†	ASTM F 496
*ASTM F 478, *Standard Specification for In-Service Care of Insulating Line Hose and Covers*; ASTM F 479, *Standard Specification for In-Service Care of Insulating Blankets*; ASTM F 496, *Standard Specification for In-Service Care of Insulating Gloves and Sleeves.*		
†If the insulating equipment has been electrically tested but not issued for service, it is not permitted to be placed into service unless it has been electrically tested within the previous 12 months.		

6.7.2 Arc-Rated Clothing

When working within the arc-flash boundary, arc-rated clothing and PPE may be required. Arc-rated clothing and additional PPE requirements will be determined using NFPA 70E Table 130.7(C)(15)(a) and Table 130.7(C)(16). These tables are provided in Appendix A.

6.8 Substations and Other Areas with Live Electrical Hazards

These guidelines should be used by the DM and/or PM/SR when electrical substations or other electrical systems or equipment are encounter during PS&S work operations. Additional controls may be required by the property owner and will be reviewed and implemented as appropriate.

When working in substations, generation facilities or switchyards, special safety considerations are required. While PS&S personnel will not be conducting any operations related to electrical systems, they may be required to access substations and related facilities for surveying or other work tasks. In the majority of situations, PS&S personnel should be able to maintain safe distances from energized electrical equipment. However, if it is necessary for PS&S project personnel to access areas within approach boundaries, and systems cannot be de-energized during the operation, then additional controls as specified in this SOP must be followed.

Only non-conducting equipment will be used or carried when working on substations. All metal items will be removed and emptied from pockets, including jewelry, watches cell phones, and other electronic or metal equipment.

Any work conducted at an operating substation will require the GSO/DSO review of the H&S Checklist or Site Specific Safety Plan prior to beginning work on the site. The GSO/DSO will review the project H&S Checklist or Health and Safety Plan (HASP) to confirm all precautions have been addressed.

7.1 TRAINING

PS&S personnel who are unqualified workers will be trained in:

- Potential hazards associated with electricity
- Any electrical safety procedures needed for their job duties
- How to avoid electrical hazards

PS&S personnel who may be exposed to energized electrical equipment while conducting work within the limited approach boundary are considered qualified workers and will be trained and competent in:

- Potential hazards associated with electricity
- Safe work practices for working with or near electrical equipment, including skills and knowledge in:
    - Recognizing exposed live electrical equipment
    - Determining the nominal voltage of exposed live parts
    - Minimum approach distances based on nominal voltage
    - Required PPE and control methods
- Proper use, inspection, and care of PPE and other protective equipment

Training will be conducted prior to conducting work with the potential for exposure to live electrical equipment. Retraining will be conducted:

- At least every three years
- When an employee does not comply with the requirements of this SOP
- If work procedures, equipment, or other safety requirements change
- If work practices not routinely used during an employee will be used

Training documentation will be maintained by HR for the duration of the employee's employment. Documentation will include the name of employees in attendance, training content, and training date(s).

8.0 REFERENCES

NFPA 70E Standard for Electrical Safety in the Workplace

OSHA 1910.269 – Electric Power Generation, Transmission, and Distribution

OSHA 1910.331-1910.335 – Electrical

APPENDIX A

NFPA 70E Table 130.7(C)(15)(a) Hazard/Risk Category Classifications and Use of Rubber Insulating Gloves and Insulated and Insulating Hand Tools-Alternating Current Equipment (Formerly Table 130.7(C)(9))			
Tasks Performed on Energized Equipment	**Hazard/Risk Category**	**Rubber Insulating Gloves**	**Insulated and Insulating Hand Tools**
Panelboards or other equipment rated 240 V and below Parameters: Maximum of 25 kA short circuit current available; maximum of 0.03 sec (2 cycle) fault clearing time; minimum 18 in. working distance; Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters: 19 in.			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	0	N	N
Circuit breaker (CB) or fused switch operation with covers on	0	N	N
CB or fused switch operation with covers off	0	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	1	Y	Y
Remove/install CBs or fused switches	1	Y	Y
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	1	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	0	N	N
Work on energized electrical conductors and circuit parts of utilization equipment fed directly by a branch circuit of the panelboard	1	Y	Y
Panelboards or other equipment rated > 240 V and up to 600 V Parameters: Maximum of 25 kA short circuit current available; maximum of 0.03 sec (2 cycle) fault clearing time; minimum 18 in. working distance; Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters: 30 in.			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	1	N	N
Circuit breaker (CB) or fused switch operation with covers on	0	N	N
CB or fused switch operation with covers off	1	Y	N
Work on energized electrical conductors and circuit parts, including voltage testing	2	Y	Y
Remove/install CBs or fused switches	2	Y	Y
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	1	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	0	N	N
Work on energized electrical conductors and circuit parts of utilization equipment fed directly by a branch circuit of the panelboard	2	Y	Y
600 V class motor control centers (MCCs) Parameters: Maximum of 65 kA short circuit current available; maximum of 0.03 sec (2 cycle) fault clearing time; minimum 18 in. working distance; Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters: 53 in.			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	1	N	N
CB or fused switch or starter operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch or starter operation with enclosure doors open	1	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	2	Y	Y
Work on control circuits with energized electrical conductors and circuit parts	0	Y	Y

NFPA 70E Table 130.7(C)(15)(a) Hazard/Risk Category Classifications and Use of Rubber Insulating Gloves and Insulated and Insulating Hand Tools-Alternating Current Equipment (Formerly Table 130.7(C)(9))			
Tasks Performed on Energized Equipment	**Hazard/Risk Category**	**Rubber Insulating Gloves**	**Insulated and Insulating Hand Tools**
120 V or below, exposed			
Work on control circuits with energized electrical conductors and circuit parts >120 V, exposed	2	Y	Y
Application of temporary protective grounding equipment, after voltage test	2	Y	N
Work on energized electrical conductors and circuit parts of utilization equipment fed directly by a branch circuit of the motor control center	2	Y	Y
600 V class motor control centers (MCCs) Parameters: Maximum of 42 kA short circuit current available; maximum of 0.33 sec (20 cycle) fault clearing time; minimum 18 in. working distance; Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters: 165 in.			
Insertion or removal of individual starter "buckets" from MCC	4	Y	N
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	4	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	1	N	N
600 V class switchgear (with power circuit breakers or fused switches) and 600 V class switchboards Parameters: Maximum of 35 kA short circuit current available; maximum of up to 0.5 sec (30 cycle) fault clearing time; minimum 18 in. working distance; Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters: 233 in.			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	2	N	N
CB or fused switch operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch operation with enclosure doors open	1	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	2	Y	Y
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	0	Y	Y
Work on control circuits with energized electrical conductors and circuit parts >120 V, exposed	2	Y	Y
Insertion or removal (racking) of CBs from cubicles, doors open or closed	4	N	N
Application of temporary protective grounding equipment after voltage test	2	Y	N
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	4	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	2	N	N
Other 600 V class (277 V through 600 V, nominal) equipment Parameters: Maximum of 65 kA short circuit current available; maximum of 0.03 sec (2 cycle) fault clearing time; minimum 18 in. working distance (except as indicated); Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters: 53 in.			
Lighting or small power transformers (600 V, maximum) Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	2	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	1	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	2	Y	Y
Application of temporary protective grounding equipment, after voltage test	2	Y	N

NFPA 70E Table 130.7(C)(15)(a) Hazard/Risk Category Classifications and Use of Rubber Insulating Gloves and Insulated and Insulating Hand Tools-Alternating Current Equipment (Formerly Table 130.7(C)(9))			
Tasks Performed on Energized Equipment	**Hazard/Risk Category**	**Rubber Insulating Gloves**	**Insulated and Insulating Hand Tools**
Revenue meters (kW-hour, at primary voltage and current)—insertion or removal	2	Y	N
Cable trough or tray cover removal or installation	1	N	N
Miscellaneous equipment cover removal or installation	1	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	2	Y	Y
Application of temporary protective grounding equipment, after voltage test	2	Y	N
Insertion or removal of plug-in devices into or from busways	2	Y	N
NEMA E2 (fused contactor) motor starters, 2.3 kV through 7.2 kV Parameters: Maximum of 35 kA short circuit current available; maximum of up to 0.2 sec (12 cycle) fault clearing time; minimum 36 in. working distance; Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters: 422 in.			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	3	N	N
Contactor operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
Contactor operation with enclosure doors open	2	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	4	Y	Y
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	0	Y	Y
Work on control circuits with energized electrical conductors and circuit parts >120 V, exposed	3	Y	Y
Insertion or removal (racking) of starters from cubicles, doors open or closed	4	N	N
Application of temporary protective grounding equipment, after voltage test	3	Y	N
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	4	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	3	N	N
Insertion or removal (racking) of starters from cubicles of arc-resistant construction, tested in accordance with IEEE C37.20.7, doors closed only	0	N	N
Metal clad switchgear, 1 kV through 38 kV Parameters: Maximum of 35 kA short circuit current available; maximum of up to 0.2 sec (12 cycle) fault clearing time; minimum 36 in. working distance; Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters: 422 in.			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	3	N	N
CB operation with enclosure doors closed	2	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB operation with enclosure doors open	4	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	4	Y	Y
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	2	Y	Y
Work on control circuits with energized electrical conductors and circuit parts >120 V, exposed	4	Y	Y
Insertion or removal (racking) of CBs from cubicles, doors open or closed	4	N	N

NFPA 70E Table 130.7(C)(15)(a) Hazard/Risk Category Classifications and Use of Rubber Insulating Gloves and Insulated and Insulating Hand Tools-Alternating Current Equipment (Formerly Table 130.7(C)(9))			
Tasks Performed on Energized Equipment	**Hazard/Risk Category**	**Rubber Insulating Gloves**	**Insulated and Insulating Hand Tools**
Application of temporary protective grounding equipment, after voltage test	4	Y	N
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	4	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	3	N	N
Opening voltage transformer or control power transformer compartments	4	N	N
Arc-resistant switchgear Type 1 or 2 (for clearing times of < 0.5 sec with a perspective fault current not to exceed the arc-resistant rating of the equipment) Parameters: Maximum of 35 kA short circuit current available; maximum of up to 0.2 sec (12 cycle) fault clearing time; minimum 36 in. working distance; Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters: 422 in.			
CB operation with enclosure door closed	0	N	N
Insertion or removal (racking) of CBs from cubicles, doors closed	0	N	N
Insertion or removal of CBs from cubicles with door open	4	N	N
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	2	Y	Y
Insertion or removal (racking) of ground and test device with door closed	0	N	N
Insertion or removal (racking) of voltage transformers on or off the bus door closed	0	N	N
Other equipment 1 kV through 38 kV Parameters: Maximum of 35 kA short circuit current available; maximum of up to 0.2 sec (12 cycle) fault clearing time; minimum 36 in. working distance; Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters: 422 in.			
Metal-enclosed interrupter switchgear, fused or unfused			
Switch operation of arc-resistant-type construction, tested in accordance with IEEE C37.20.7, doors closed only	0	N	N
Switch operation, doors closed	2	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	4	Y	Y
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	4	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	3	N	N
Outdoor disconnect switch operation (hookstick operated)	3	Y	Y
Outdoor disconnect switch operation (gang-operated, from grade)	2	Y	N
Insulated cable examination, in manhole or other confined space	4	Y	N
Insulated cable examination, in open area	2	Y	N
Notes:	Y = Yes (required). N = No (not required).		
(1) Rubber insulating gloves are gloves rated for the maximum line-to-line voltage upon which work will be done.			
(2) Insulated and insulating hand tools are tools rated and tested for the maximum line-to-line voltage upon which work will be done, and are manufactured and tested in accordance with ASTM F 1505, *Standard Specification for Insulated and Insulating Hand Tools*.			
(3) The use of "N" does not indicate that rubber insulating gloves and insulated and insulating hand tools are not required in all cases. Rubber insulating gloves and insulated and insulating hand tools may be required by 130.4, 130.7 (C) (7)(a), and 130.7(D)(1).			
(4) For equipment protected by upstream current limiting fuses with arcing fault current in their current limiting range (1⁄2 cycle fault clearing time or less), the hazard/risk category required may be reduced by one number.			
(5) For power systems up to 600 V the arc flash boundary was determined by using the following information: When 0.03 second trip time was used, that indicated MCC or panelboard equipment protected by a molded-case circuit breaker. Working distance used was 18 in. (455 mm). Arc gap used was 32 mm for switchgear and 25 mm for MCC and protective device type 0 for all. When 0.33 or 0.5 second trip time was used, that indicated a LVPCB (drawout circuit breaker) in switchgear. Working distance was 18 in. (455 mm). Arc gap used was 32 mm and protective device type 0 for all. All numbers were rounded up or down depending on closest multiple of 5.			

Appendix A

NFPA 70E Table 130.7(C)(15)(a) Hazard/Risk Category Classifications and Use of Rubber Insulating Gloves and Insulated and Insulating Hand Tools-Alternating Current Equipment (Formerly Table 130.7(C)(9))			
Tasks Performed on Energized Equipment	**Hazard/Risk Category**	**Rubber Insulating Gloves**	**Insulated and Insulating Hand Tools**
(6) For power systems from 1 kV to 38 kV the arc flash boundary was determined by using the following information: No maximum values were given in the 2009 edition of NFPA 70E for short-circuit current or operating time. Two sets of equations were performed: 35 kA AIC and 0.2 second operating time and 26 kA AIC and 0.2 second operating time. 0.2 seconds was used by adding the typical maximum total clearing time of the circuit breaker to an estimated value for relay operation. This coincides with the IEEE 1584 values of 0.18 second operating time and 0.08 tripping time rounded off. A short-circuit current of 35 kA was used as a maximum (HRC-4@~40 cal/cm2) and 26 kA was used to compare the effects of lowering the short circuit current (HRC-4 @ ~ 30 cal/cm2). Working distance used was 36 in. (909 mm), arc gap was 6 in. (455 mm), and protective device type 0 for all.			

From NFPA 70E Table 130.7(C)(16) Protective Clothing and Personal Protective Equipment (PPE)		
Hazard/Risk Category	**Clothing Description and PPE Requirements**	
0	**Protective Clothing: Nonmelting or untreated natural fiber (i.e., cotton, wool, rayon or silk, or blends of these materials) with a fabric weight of at least 4.5 oz/yd²** Shirt (long sleeve) Pants (long)	**PPE** Safety glasses or safety goggles SR Hearing protection (ear canal inserts) Heavy duty leather gloves[1]
1	**Arc-Rated Clothing[3]: Minimum Arc Rating of 4 cal/cm²** Shirt (long sleeve) and pants (long) or coverall Flash suit hood or faceshield[2] Jacket, parka, rainwear, or hardhat liner AN	**PPE** Hard hat Safety glasses or goggles SR Hearing protection (ear canal inserts) Heavy duty leather gloves[1] Leather work shoes AN
2	**Arc-Rated Clothing[3]: Minimum Arc Rating of 8 cal/cm²** Shirt (long sleeve) and pants (long) or coverall Flash suit hood or faceshield[2] and balaclava Jacket, parka, rainwear, or hardhat liner AN	**PPE** Hard hat Safety glasses or goggles SR Hearing protection (ear canal inserts) Heavy duty leather gloves[1] Leather work shoes
3	**Arc-Rated Clothing System[3]: Minimum Arc Rating of 25 cal/cm²** Shirt (long sleeve) AR Pants (long) AR Coverall AR Flash suit jacket AR Flash suit pants AR Flash suit hood Gloves[1] Jacket, parka, rainwear, or hard hat liner AN	**PPE** Hard hat Safety glasses or safety goggles SR Hearing protection (ear canal inserts) Leather work shoes
4	**Arc-Rated Clothing System[3]: Minimum Arc Rating of 40 cal/cm²** Shirt (long sleeve) AR Pants (long) AR Coverall AR Flash suit jacket AR Flash suit pants AR Flash suit hood Gloves[1] Jacket, parka, rainwear, or hard hat liner AN	**PPE** Hard hat Safety glasses or safety goggles SR Hearing protection (ear canal inserts) Leather work shoes
	AN: as needed (optional). AR: as required. SR: selection required.	

Notes:

(1) If rubber insulating gloves with leather protectors are required by Table 130.7(C)(15)(a) and Table 130.7(C)(15)(b), additional leather or arc-rated gloves are not required. The combination of rubber insulating gloves with leather protectors satisfies the arc flash protection requirement.

(2) Face shields are to have wrap-around guarding to protect not only the face but also the forehead, ears, and neck, or, alternatively, an arc-rated arc flash suit hood is required to be worn.

(3) *Arc rating* is defined in Article 100 and can be either the arc thermal performance value (ATPV) or energy of break open threshold (EBT). ATPV is defined in ASTM F 1959, *Standard Test Method for Determining the Arc Thermal Performance Value of Materials for Clothing*, as the incident energy on a material, or a multilayer system of materials, that results in a 50 percent probability that sufficient heat transfer through the tested specimen is predicted to cause the onset of a second-degree skin burn injury based on the Stoll curve, in cal/cm2. EBT is defined in ASTM F 1959 as the incident energy on a material or material system that results in a 50 percent probability of breakopen. Arc rating is reported as either ATPV or EBT, whichever is the lower value.

Appendix A

Appendix A

Appendix C

Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN

-FOR-

Glenwood Container Site

72 Alexander Street
Yonkers, Westchester County, New York

BCP Site #C360154

Prepared for:

Fondak Enterprises, LLC
225 Paddock Street
Watertown, New York 13601

November 2018

Prepared by:

Paulus, Sokolowski and Sartor Engineering, PC
1 Larkin Plaza, 2nd Floor
Yonkers, New York 10701

TABLE OF CONTENTS

Attachments

1.0 INTRODUCTION

The purpose of this Quality Assurance Project Plan (QAPP) and Sampling and Analysis Plan (SAP) is to present the organization, objectives, specific quality assurance/quality control (QA/QC) procedures, and to outline and detail sample collection and analytical procedures leading to valid data for use during remedial activities as part of the Remedial Action Work Plan (RAWP) on the Fondak Enterprises site (the Site) located at 72 Alexander Street, located in the City of Yonkers, Westchester County, New York.

The QAPP provides descriptions of protocols to be utilized for field sampling, sample handling and storage, laboratory analysis, record keeping and data evaluation and management. The quantitative and qualitative data generated from the RAWP would be utilized to assess if remedial action objectives have been achieved.

2.0 PROJECT ORGANIZATION AND RESPONSIBILTY

A project organization has been developed to identify the roles and responsibilities of the various parties involved with this RAWP. The organizational structure for this RAWP includes New York State Department of Environmental Conservation (NYSDEC), Paulus, Sokolowski and Sartor Engineering, PC (PS&S), and the required subcontractors (i.e., analytical testing laboratories, drillers, etc). Although the Quality Assurance/Quality Control (QA/QC) responsibilities are principally the responsibility of the PS&S Project Manager and Project Quality Assurance Manager (PQAM), proper implementation of QA/QC requirements necessitate that the entire project staff be cognizant of procedures and goals.

The PS&S team will consist of the following personnel, with a description of their responsibilities:

Janos M. Szeman, P.E. is the Engineer of Record. He has primary responsibility and authority for implementing and executing the technical, QA, and administrative aspects of the pre-design investigation, including the overall management of the project team. The Project Manager is accountable for ensuring that the RAWP Field Program is conducted in accordance with applicable plans and guidelines, including the QAPP/SAP and the Site-Specific Health and Safety Plan (HASP). In addition, the Project Manager will communicate technical, QA and administrative matters to Fondak Enterprises, LLC.

Scott Caporizzo is the Project Manager and the Field Operations Lead (FOL). He has primary responsibility and authority for implementing and executing the RAWP Field Program in accordance with applicable plans and guidelines, including the QAPP/SAP, and the Site-Specific Health and Safety Plan (HASP). In addition, he will communicate technical and QA matters to the Engineer of Record and coordinate RAWP activities with the selected subcontractors. He will be responsible for the management and supervision of the field remedial activities and for providing consultation and decision-making on day-to-day issues relating to the excavation and installation activities. The FOL will monitor the excavation and installation to determine that operations are consistent with plans and procedures, and that the data acquired meets the geotechnical data quality

needs. When necessary, the FOL will document any deviations from the plans and procedures for approval.

Camila Israel is the Project Quality Assurance Manager (PQAM) and will be responsible for review of data upon receipt from the analytical laboratory. The PQAM will be responsible for ensuring that analytical data are in conformance with requirements of this QAPP/SAP.

Janos M. Szeman is also the Health and Safety Coordinator (HSC). The HSC is responsible for the implementation of the HASP. The HSC will advise project staff on health and safety issues, conduct health and safety training sessions, and monitor the effectiveness of the health and safety program conducted in the field.

The services of an analytical laboratory subcontractor will also be necessary to perform the supplemental investigation activities. The Project Manager, with assistance from the FOL and PQAM, will be the liaison between PS&S and the analytical laboratory subcontractor.

Any laboratory utilized for the analysis of environmental samples will be a NYSDEC-certified laboratory. The laboratory will deal directly with the consultant in regard to analytical parameters, sample handling, and analytical results reporting. The laboratory will be responsible for providing materials for sample collection, handling, and transportation in accordance with QA/QC requirements.

3.0 DATA QUALITY REQUIREMENTS

Data quality requirements and assessments will be consistent with the NYSDEC's Division of Environmental Remediation regulations and guidance. Quantification limits, estimated accuracy, accuracy protocol estimate precision and precision protocol will be determined by the laboratory and will be in conformance with NYSDEC requirements.

The methods of analysis will be in accordance with United States Environmental Protection Agency (USEPA) SW846. Specific analytical procedures and laboratory QA/QC descriptions are not included in this QA/QC Plan but will be available upon request from the laboratory selected to perform the analyses. The laboratory will be a NYSDEC certified laboratory.

3.1 Data Usage

The data generated from the remedial action sampling will be used confirm remedial action objectives have been achieved. The data will also be utilized to monitor the health and safety of workers at the site and potential receptors off site.

3.2 Data Comparability

Data will be presented using standard reporting units and reporting formats, including the reporting of QC data. In addition, sample locations, collection procedures and analytical methods from earlier studies will be evaluated for comparability with current procedures/methods.

3.3 Data Completeness

The acceptability of 100% of the data is desired as a goal for this project. The acceptability of less than 100% complete data, meeting laboratory QA/QC protocols/standards, will be evaluated on a case-by-case basis. The QA officer will provide data validation services to assist in confirming the acceptability of the reported laboratory analytical data. A total of

10% of each laboratory generated data package will be validated to assist in confirming the reliability of the entire laboratory reporting package.

3.4 Laboratory Sample Custody Procedures

A NYSDEC-certified laboratory meeting the requirements for sample custody procedures, including cleaning and handling sample containers and analytical equipment, will be used to analyze samples collected as part of the RAWP. The selected laboratory's Standard Operating Procedures will be made available upon request.

4.0 SAMPLING PROCEDURES

Environmental sampling may generally include obtaining samples of different media utilizing different techniques. The following summarizes the various environmental media that may be conducted in support of this remedial action.

1. Post Excavation Confirmation Soil Samples - Soil samples will be collected following excavation of contaminant source areas.

2. Waste Characterization Samples – Soil/waste water samples may be collected for waste characterization for off-site disposal.

3. Groundwater - Groundwater samples may be obtained from monitoring wells, which may be installed as part of remedial action to satisfy the requirements of a future SMP media monitoring plan.

4. Soil Vapor Samples – Soil vapor samples may be collected as part of a soil vapor mitigation system installation.

5. Air - Ambient air samples may be collected on and off site, within buildings and outdoors, to identify the effectiveness of the vapor mitigation system.

A detailed discussion of the sampling program for a site and selection of sample matrices and locations is provided in the RAWP.

4.1 Analytical Parameters

Post-excavation confirmation sidewall soil samples collected from the Site will typically be analyzed for:

1. Volatile Organic Compounds (VOCs) (Method 8260B).
2. Semi-Volatile Organic Compounds (SVOCs) (Method 8270D);
3. Metals (Method 6010) - 8 RCRA Metals plus (Be, Cu, Ni, Zn, Fe, Ti, V, Mo and Cr+6); and
4. PCBs (Method 8081)

Refer to the RAWP for specific sample parameter requirements. Waste characterization sampling will be conducted following protocol of the proposed disposal facility.

Groundwater samples may be collected and analyzed as detailed in a future SMP media monitoring plan.

Soil vapor and indoor air samples collected from the property will typically be analyzed for:

1. VOCs (USEPA TO-15)

Table 1 presents a summary of the parameters/sample fraction that may be monitored for at the property, together with the typical sample location, type of sample, sample matrix, type of sample container, method of sample preservation, holding time and analytical method.

Table 1

SUMMARY OF ANALYTICAL PARAMETERS

Sample Matrix	**Sample Type**	**Analytical Parameter**	**EPA Analytical method**	**Sample Preservation**	**Maximum Holding Time**	Sample Container
Soil Vapor	Grab	BTEX and Naphthalene	USEPA/600/4-89/017 Modified Method T01	Cool to 4°C	7 days from VTSR	Sorbent Tube
Soil Vapor	Grab	Chlorinated Volatile Organics	USEPA/600/4-89/017 Modified Method T01	Cool to 4°C	7 days from VTSR	Sorbent Tube
Soil Vapor	Grab	TO - 15	USEPA TO-15	Cool to 4°C	7 Days from VTSR	SUMMA Canister
Ambient Air	Grab	BTEX and Naphthalene	USEPA/600/4-89/017 Modified Method T01	Cool to 4°C	7 days from VTSR	Sorbent Tube
Ambient Air	Grab	Chlorinated Volatile Organics	USEPA/600/4-89/017 Modified Method T01	Cool to 4°C	7 days from VTSR	Sorbent Tube
Ambient Air	Grab	TO - 15	USEPA TO-15	Cool to 4°C	7 Days from VTSR	SUMMA Canister
Soil	Grab	VOCs	Method 8260	Cool to 4°C	10 days after VTSR for analysis	Glass, clear/40 ml/2 ICHEM 200 series or equivalent
Soil	Grab/Composite	SVOCs	Method 8270	Cool to 4°C	10 days after VTSR for extraction, 40 days after extraction for analysis	Glass, clear/8 oz./1 ICHEM 200 series or equivalent
Soil	Grab/Composite	PCBs/Pesticides	Method 8081/8082	Cool to 4°C	10 days after VTSR for extraction, 40 days after extraction for analysis	Glass, clear/8 oz./1 ICHEM 200 series or equivalent
Soil	Grab/Composite	RCRA Metals	Method 6010/7471	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months for all other metals	Glass, clear/8 oz./1 ICHEM 200 series or equivalent
Soil	Grab/Composite	TAL Metals	Method 6010/7471	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months for all other metals	Glass, clear/8 oz./1 ICHEM 200 series or equivalent

VTSR - Verified time of sample receipt at the laboratory.

Table 1 (continued)

SUMMARY OF ANALYTICAL PARAMETERS

Sample Matrix	**Sample Type**	**Analytical Parameter**	**EPA Analytical method**	**Sample Preservation**	**Maximum Holding Time**	Sample Container
Groundwater	Grab	VOCs	Method 624	Cool to 4°C, HCL to pH<2	14 days after VTSR for analysis	Glass, clear/40 ml/3 ICHEM 300 series or equivalent
Groundwater	Grab	SVOCs	Method 625	Cool to 4°C	7 days after VTSR for extraction, 40 days after extraction for analysis	Glass, amber/1 L/2 ICHEM 300 series or equivalent
Groundwater	Grab	PCBs/Pesticides	Method 608	Cool to 4°C	7 days after VTSR for extraction, 40 days after extraction for analysis	Glass, amber/1 L/2 ICHEM 300 series or equivalent
Groundwater	Grab	RCRA Metals	Method 200.7	HNO_3 to pH <2 Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of all other metals	Plastic/1 L/1 ICHEM 300 series or equivalent
Groundwater	Grab	TAL Metals	Method 200.7	HNO_3 to pH <2 Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of all other metals	Plastic/1 L/1 ICHEM 300 series or equivalent

VTSR - Verified time of sample receipt at the laboratory.

4.2 Detailed Sampling Procedures

Environmental samples to be collected as part of the RAWP may consist of groundwater, soil, soil vapor, and ambient air. Sample locations may consist of monitoring wells, soil borings, excavation sidewalls, wastewater disposal/sanitary systems, and soil vapor points. Actual sample media locations are described in the RAWP. General sampling guidelines, including sample media, depths, equipment, rationale and analytical parameters is provided in Table 2.

During soil sample collection, an attempt will be made to maintain sample integrity by preserving its physical form and chemical composition to as great an extent as possible. An appropriate sampling device (i.e., decontaminated or dedicated equipment) will be utilized to transfer the sample into the sample container. The sample will be transferred into the sample bottle as quickly as possible, with no mixing, to make certain that the volatile fraction is not lost. Laboratory provided containers would be fitted with seals to minimize volatilization.

The materials involved in groundwater sampling are critical to the collection of high quality monitoring information, particularly where the analyses of volatile organic compounds, pH sensitive or reduced chemical constituents are of interest. The materials of construction for bailers and pump parts will be PTFE (e.g., Teflon^{R}) stainless steel and/or polyethylene.

Table 2

SUMMARY OF SAMPLING PROGRAM

Environmental Media	**Sample Location**	**Sample Point**	**Sample Depth**	**Equipment**	**Rationale**	**Sample Analysis**
Post Excavation Confirmation Soil Samples	On Site	CSA Bottom of Excavation and Sidewalls	In conformance with DER-10 Section 5.4(b)	Disposable polystyrene scoop or sterile wooden tongue depressor	To confirm remedial action objectives achieved	Refer to RAWP Table 3.7.1
Soil/Wastewater Characterization Samples	On Site	Storage containers or stockpiles	Dependent on visual characteristics and total organic vapor field screening	Dedicated polyethylene scoop or disposable polyethylene tubing with bottom check valve.	For off-site disposal	Dependent on proposed disposal facility
Groundwater Samples	On Site	Screened Interval of Monitoring Well	Dependent on depth to groundwater and installed interval depth	Disposable polyethylene tubing with bottom check valve	Future SMP media monitoring plan	Dependent on future SMP media monitoring plan requirements
Soil Vapor Samples	On Site	Probe Location or Sampling Port	At depth of sub-slab depressurization system	SUMMA canister	To determine effectiveness of vapor management system.	TO-15
Air	On Site	Probe Location or Sampling Port	At depth of sub-slab depressurization system	SUMMA canister	To determine effectiveness of vapor management system.	TO-15

There will be several steps taken after the transfer of the soil, vapor, wastewater, and groundwater sample into the sample container that are necessary to properly complete collection activities. Once the sample is transferred into the appropriate container, the container will be capped and, if necessary, the outside of the container will be wiped with a clean paper towel to remove excess sampling material. The container will not be submerged in water in an effort to clean it. Rather, if necessary, a clean paper towel moistened with distilled/deionized water will be used.

The sample container will then be properly labeled. Information such as sample number, location, collection time and date, sampler's initials and sample description will be recorded on the field log forms. Associated paper work (e.g., Chain of Custody forms) will then be completed and will accompany the sample. During sample transport to the laboratory the samples will be packaged in a manner that will allow the appropriate storage temperature to be maintained during shipment to the laboratory. Samples will be delivered to the laboratory within 48 hours of collection.

4.3 Sample Identification

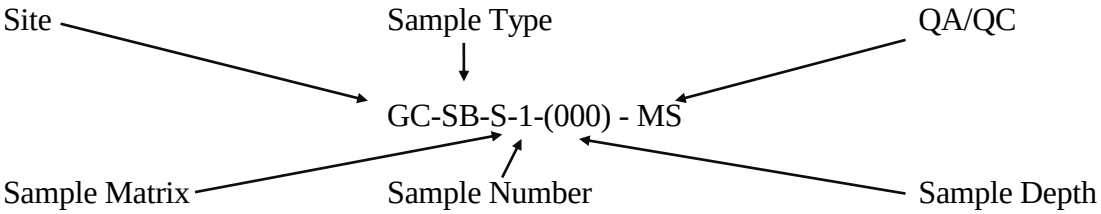
Samples collected will be labeled with a sample identification code. The code will identify the site, sample location, sample matrix and series numbers for sample locations with more than one sample. Samples will be labeled according to the following system:

- Site: – Site name (i.e., Former Glenwood Container)
- Sample Type:
  – Soil Boring or Probe "SB"
  – Monitoring Well "MW"
  – Test Pit "TP"
  – Floor Drain "FD"
  – Soil Vapor Probe "SV"
  - Sample Matrix:
    – Soil "S"
    – Groundwater "GW"
    – Air "A"
    – Soil Vapor "SV"
    – Waste Water "WW"
  - Sample Number: – For circumstances where more than one sample of the same type and/or from the same location will be collected, a consecutive sample number will be

assigned. When more than one sample is collected from a borehole in a sampling round at different depths, the depth will be indicated on the sample container and in the field log book.

- Quality Assurance/ Quality Control (QA/QC):
  - Matrix Spike "MS"
  - Matrix Spike Duplicate "MSD"
  - Field Blank "FB"
  - Trip Blank "TB"

According to the above sample identification procedures, an example of a sample label may be:



4.4 Sample Handling, Packaging and Shipping

Samples will be placed in the appropriate containers in accordance with NYSDEC requirements. The holding time criteria identified in the ASP will be followed as specified in Table 1.

Prior to packaging any samples for shipment, the sample containers will be checked for proper identification and compared to the field log forms for accuracy. The samples will then be wrapped with a cushioning material and placed in a cooler (or laboratory shuttle) with a sufficient amount of bagged ice or "blue ice" packs in order to keep the samples at 4°C until arrival at the laboratory. If an office trailer is located on-site and equipped with a sample refrigerator, the samples may be maintained in the sample refrigerator prior to placement in laboratory shuttle container.

The necessary documentation required to accompany the sample during shipment will be placed in a sealed plastic bag and taped to the underside of the cooler lid. The cooler will

then be sealed with fiber (duct) or clear packing tape, and custody seals will be placed in such a manner that any opening of the cooler prior to arrival at the laboratory can be detected.

Samples will be shipped to the laboratory receipt within 48 hours of sample collection in accordance with NYSDEC requirements. The laboratory will be notified prior to the shipment of the samples.

4.5 Sampling Methodologies

4.5.1 Soil Vapor

1) Be certain that the sample location is noted on Location Sketch.

2) Drive the decontaminated stainless steel probe with removable inner rod into the ground to the desired depth, above the zone of saturation, leaving approximately one-foot of the probe exposed above the ground surface.

    a. Alternatively, a semi-permanent or permanent point can be installed. The steel probe shall be removed from the desired depth and a six-inch soil vapor implant shall be hung with silicon/Teflon tubing in the open borehole and surrounded by a minimum of 1 foot of #00 well sand (6" above the center of the vapor implant and 6" below the center of the vapor implant). Silicon/Teflon tubing shall connect up to above the ground surface. Hydrated granular bentonite or a bentonite slurry shall be filled in the borehole above the #00 well sand to a depth of approximately 1 foot below ground surface. The remaining depth can be filled with soil cuttings from the borehole or additional hydrated bentonite/bentonite slurry. Final installation (semi permanent or permanent) shall be completed in accordance with the NYSDOH Vapor Intrusion Guidance (2006).

    b. If a sub slab sample is required, NYSDOH Vapor Intrusion Guidance shall be followed regarding sampling methods and sample collection. A permanent sub slab point shall be installed to a depth of approximately 0-2 inches below the concrete slab. Alternatively, a sub-slab sample can be collected from built-in sampling ports, a component of a sub-slab depressurization system, if installed.

    c. gate valve in the vent pipe riser

d. Passing helium leak tests are required prior to sampling soil vapor points and sub slab points as outlined and in accordance with the NYSDOH Vapor Intrusion Guidance.

3) Connect new silicon/teflon tubing to the probe and the personal sampling pump. Turn on pump. Allow the pump to run until the soil vapor within the probe has reached equilibrium.*

a. For sub slab and soil vapor points, pumping rate should not exceed 0.2L/min as outlined in the NYSDOH Vapor Intrusion Guidance. A manual, graduated syringe may be used in place of a pump if appropriate ball valves/locks are in place.

b. Prior to sample collection, confirm an appropriate volume of air has been purged equal to a minimum of three times the air volume present in the tubing and manifold setup.

4) Collect a vapor sample using a gas tight syringe, sorbent tube or SUMMA canister.

a. Summa canisters shall be equipped with flow controllers restricting sample collection to less than 0.2L/min.

b. Indoor air samples should be collected concurrently with sub slab sampling, when possible (see Section 4.5.2).

5) Shut off pump (or remove graduated syringe/re-set ball valves/locks) and disconnect tubing.

6) Extract probe from the ground and decontaminate according to the procedures in Section 5.

4.5.2 Ambient Air (Indoor/Outdoor Air Sampling)

1) Be certain that the sample location is noted on Location Sketch.

2) Follow the NYSDOH Vapor Intrusion Guidance for collection of ambient air samples.

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*In order to establish the amount of time required for the soil vapor to reach equilibrium in the probe, two approaches can be utilized:

a. Once the personal sampling pump is turned on, collect a sample every 1 to 2 minutes and analyze on the portable GC. Continue to collect samples until two consecutive samples yield comparable results. Do this at two or three locations in order to establish a pumping time.

b. Instead of using a personal sampling pump, attach the silicon tubing from the probe directly to a PID or FID. Once a steady reading is obtained, the system is considered to be in equilibrium. (Not recommended if low levels of volatile organic vapors are present [i.e., <1 ppm].)

3) Identify historical and current uses of the building.

4) Complete a product inventory for the Property.

5) Note if the heating or air conditioning are functioning and operational during the sampling.

6) Note weather conditions.

7) Note any spills, stains or odors from field instrumentation during the indoor air sample collection.

8) Indoor air sample collection shall be restricted to less than 0.2 L/min and should be collected over a period of 24 hours.

   i) If sub slab sampling is part of the scope of work, it should be completed during the indoor air sampling event.

9) An outdoor air sample shall be collected concurrently with indoor air sample collection.

4.5.3 Waste Soil/Water

1. Be certain that the sample location is noted on Location Sketch.

2. Be certain that the sampling equipment is decontaminated utilizing the procedures outlined in Section 5.

3. Remove laboratory pre-cleaned sample containers from sample cooler, label container with indelible marker; fill out Sample Summary Form and Chain of Custody Form.

4. Dig/scoop out soil to desired depth (i.e., 0 to 6 inches), set aside and obtain an organic vapor measurement with a PID/FID.

5. If water is present, collect a water sample using a disposable scoop or filling the bottle directly by lowering into the water. Replace the container cover. If water is not present, sample the soil at the bottom of the excavation using a disposable scoop, place into the open sample containers and replace the container covers.

6. If reusable, decontaminate the sampling equipment according to the procedures described in Section 5.

7. Place disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

8. Additional steps/protocol may be required based on disposal facility specific sampling requirements.

4.5.4 Soil (Test Pit)

Test pit excavation will be conducted using a backhoe or excavator.

1. Be certain that the sample location is noted on Location Sketch.

2. Be certain that the sampling equipment, including the backhoe/excavator bucket, is decontaminated utilizing the procedures outlined in Section 5.

3. Remove laboratory pre-cleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Summary Form and Chain of Custody Form.

4. Lower the bucket into the test pit and remove soil/waste material and place excavated material on top of 6-mil or greater plastic sheeting, segregating the non-visually impacted soils from the visually impacted soils.

5. Immediately upon retrieval of the soil/waste material, obtain an organic vapor measurement with a PID or FID.

6. Depending upon the organic vapor measurement, odors and visual characteristics, obtain a soil sample from the backhoe bucket with a scoop and/or wooden tongue depressor, place into the open sample containers and replace the container covers.

7. Fill out Test Pit Log Form, including a description of soil/waste with location, depth and material sampled.

8. Return the sample container to the cooler.

9. Backfill test pit by returning the visually impacted soils to the bottom of the test pit followed by the non-visually impacted soils.

10. If reusable, decontaminate the sampling equipment according to the procedures described in Section 5.

11. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

4.5.5 Soil (Probe)

1. Be certain that the sample location is noted on Location Sketch.

2. Remove laboratory pre-cleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Summary Form and Chain of Custody Form.

3. Drive the probe to the desired sampling depth.

4. Retrieve the soil probe and immediately after opening it, obtain an organic vapor measurement with a FID or PID and complete boring log form.

5. Remove a sample aliquot from the soil probe using a disposable scoop or sterile wooden tongue depressor, place into the open sample container and replace the container cover.

6. Return the sample container to the cooler.

7. If reusable, decontaminate the sampling equipment according to the procedures described in Section 5.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

4.5.6 Soil (Borehole, Split Spoon)

1. Be certain that the sample location is noted on Location Sketch.

2. Be certain that the sampling equipment (split spoon) has been decontaminated utilizing the procedures outlined in Section 5.

3. Remove laboratory pre-cleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Summary Form and Chain of Custody Form.

4. Drill into the soil to the desired depth and drive the split spoon sampler.

5. Retrieve the split spoon and immediately after opening the split spoon, obtain an organic vapor measurement with a PID or FID and fill out Boring Log Form.

6. Remove a sample aliquot from the split spoon using a disposable scoop or sterile wooden tongue depressor, place into the open sample container and replace the container cover.

7. Return the sample container to the cooler.

8. If reusable, decontaminate the sampling equipment according to the procedures described in Section 5.

9. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

4.5.7 Groundwater (Probe)

1. Be certain sample location is noted on Location Sketch.

2. Remove the laboratory pre-cleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Summary Form and Chain of Custody Form.

3. Obtain a sample by using a dedicated polyethylene tubing equipped with a bottom check valve.

4. After sample collection, obtain field measurements including pH, conductivity, temperature and turbidity.

5. Gently pour the sample into the sample container taking care not to spill on the outside of the container, spill any of the preservative or overfill container and replace cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is done by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

6. If a sample is to be collected for metals analysis, the turbidity must be less than 50 NTUs. If the turbidity cannot be reduced to less than 50 NTUs, the sample will be filtered in the field or by the laboratory. Both the filtered and unfiltered portion of the sample will be analyzed.

7. Return sample containers to sample cooler.

8. Place all disposable personal protective equipment and disposal sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

4.5.8 Groundwater (Monitoring Well)

1. Measure the depth of water using a decontaminated water level indicator and compute the volume of standing water in the well.

2. Remove three to five times the volume of standing water from the well until field measurements (pH, conductivity, temperature and turbidity) stabilize, or until the well is dry, whichever occurs first. Turbidity should be less than 50 NTUs prior to collection of a sample for metals analysis. If utilizing "Low-Flow" purging continuously monitor field measurements (pH, conductivity, turbidity, temperature, dissolved oxygen and redox potential) until stabilization.

3. Remove the laboratory pre-cleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Summary Form and Chain of Custody Form.

4. Obtain a sample by using a disposable polyethylene bailer or from the discharge point when utilizing "Low Flow" purging.

5. If the turbidity of the sample is greater than 50 NTUs, the metals portion of the sample will be filtered in the field or by the laboratory. Both the filtered and unfiltered portion of the sample will be analyzed.

6. Gently pour the sample into the sample container taking care not to spill on the outside of the container, spill any of the preservative or overfill container and replace the cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is done by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

7. Return sample container to sample cooler.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

4.6 Grab Sampling and Composite Sampling

Grab sampling consists of collecting a sample from a discrete interval, utilizing the appropriate sampling tool, and submitting that sample for analysis. The discrete intervals for Grab Samples should be outlined in the Site-specific Work Plan for the subject site. Composite sampling consists of homogenizing different grab samples, of the same material, into one sample for analysis. Composite sampling should be performed by collecting the individual grab samples and combining them in a decontaminated stainless steel pan or bowl where the soils can be combined prior to being placed in the sample container. The number of composite samples collected would depend on the amount of material being sampled and the respective sample analysis. Composite samples for volatile organics will be collected from each discrete grab samples and placed in the sample container prior to the remainder of the soils being mixed.

4.7 Monitoring Well Installation

To provide for the collection of representative groundwater samples permanent two-inch or four-inch diameter monitoring wells will be installed. Groundwater monitoring wells will be constructed of threaded two-inch or four-inch-diameter Schedule 40 PVC well casing equipped with 10-slot or 20-slot well screen. The well screen should extend nominally to 5 feet below the water table with a minimum of two feet of well screen situated above the water table (total length of 10 to 15 feet). The length of well screen extending above the top of the water table would be determined based on field conditions. The appropriate clean silica sand size should be used for the screen being utilized (i.e., No. 1 sand for 10-slot screen and No. 2 sand for 20-slot screen) shall be placed in the annular space around the well from one foot below the screened interval extending to a minimum of two feet above the top of the well screen. For a two-inch diameter well, the annular space for the filter pack should be between 2 to 4 inches thick. (The 4 ¼ inside diameter hollow stem augers will have to be retracted as the filter pack is installed to yield the required annular space.) A two-foot bentonite seal shall then be placed above the sand pack and wetted with potable

water for a minimum of 15 minutes before backfilling the remaining space with a cement-bentonite grout. If warranted by depth, backfilling will be completed using a tremie pipe placed below the surface of the grout. Solid PVC riser, attached to the well screen, will extend approximately to grade for flush-mount installations or approximately two feet above grade for above-ground mount installations. A flush-mount or above-grade mount protective casing with a locking water-tight well cap will then be installed and a measuring point marked on each PVC well riser. Well construction diagrams will be prepared for each well. Modifications to the well installation/construction procedures may be warranted if subsurface conditions (presence of finer grained materials or DNAPL) indicate that they may be necessary. Any modifications must be approved by the Project Manager and appropriate onsite personnel.

4.8 Well Development

Following their installation, the groundwater monitoring wells will be developed, using a two-inch diameter Grundfos submersible pump(s) (or equivalent) until the water is reasonably free of turbidity and field readings (pH, conductivity, temperature, and dissolved oxygen) sufficiently stabilize. Fifty nephelometric turbidity units (NTUs) or less will be the turbidity goal but not an absolute value. To minimize suspended material, the wells will be developed very carefully using low-flow submersible pump techniques. The wells will be developed at low pumping rates, on the order of 0.5 to one gallons per minute (gpm). Bailers will not be used for developing these wells (nor will bailers be used for sampling except for VOC compounds). The wells will be allowed to equilibrate for 14 days prior to sampling. The volume of water removed, the well development time, and field instrument readings will be recorded on the field forms.

5.0 DECONTAMINATION PROCEDURES

Whenever possible, field sampling equipment should be sterile/disposable and dedicated to a particular sampling point. In instances where this is not possible, a field cleaning/decontamination procedure will be used to mitigate cross contamination between sample locations. A decontamination station/pad will be established for field sampling activities. This will be an area located away from the source of contamination so as not to adversely impact the decontamination procedure, but close enough to the sampling locations to keep equipment transport handling to a minimum after decontamination.

5.1 Field Decontamination Procedures

Non-disposable equipment will be decontaminated at appropriate intervals (e.g., prior to initial use, prior to moving to a new sampling location and prior to leaving the site). Different decontamination procedures are used for various types of equipment that are used to collect samples. When using field decontamination, sampling should commence in the area of the site with the lowest contamination, if known or probable, and proceed through to the areas of highest contamination. It may be necessary to repeat a decontamination procedure if the sampler is used to obtain a Non Aqueous Phase Liquid (NAPL) sample.

5.2 Decontamination Procedure for Drilling/Probing Equipment

Equipment such as drill rigs and other mobile equipment will receive an initial cleaning prior to use at the site. The frequency of decontamination while on site will depend on how the equipment is actually used in relation to collecting environmental samples. Wash/rinse solutions will be collected and containerized on site until testing results provide for an appropriate disposal option.

After the initial decontamination, cleaning may be reduced to those areas that are in close proximity to materials being sampled. Drill rig/probe items such as augers, drill/probe rods and drill bits will be cleaned in between sample locations.

Drilling/probing equipment will be decontaminated in the following manner:

1. Wash thoroughly with nonresidual detergent (alconox) and tap water using a brush to remove particulate matter or surface film. Pressure washing will be utilized, if necessary, to remove any oil and/or tar accumulations on the back of the rig, auger flights, drill rods, drill head, etc. Any loose paint chips, paint flakes and rust must also be removed;

2. Steam clean (212°F), if necessary; and

3. Once decontaminated, remove items from the decontamination area.

Also, following the general cleaning procedures described above, downhole/drilling sampling items, such as split spoon samplers, Shelby tubes, rock corers, or any other item of equipment which will come in direct contact with a sample during drilling, will be decontaminated by the methods outlined in this section.

5.3 Decontamination Procedure for Sampling Equipment

Teflon, PVC, polyethylene, stainless steel and downhole sampling equipment decontamination procedures will be the following:

1. Wash thoroughly with nonresidual detergent (alconox) and clean potable tap water using a brush to remove particulate matter or surface film. Pressure washing will be utilized, if necessary, to remove oil and/or tar.

2. Steam clean (if necessary to remove oil and/or tar).

3. Rinse thoroughly with tap water.

4. Rinse thoroughly with distilled water.

5. Rinse with Nitric Acid (10% solution), in a well ventilated area, if sampling for metals.

6. Rinse thoroughly with distilled water.

7. Rinse with methanol (pesticide grade), in a well ventilated area and air dry.

8. Rinse thoroughly with distilled water and air dry.

9. Wrap completely in clean aluminum foil with dull side against the equipment. For small sampling items, such as scoops, decontamination will take place over a drum specifically used for this purpose.

Methanol has been chosen because it is not an analyte of concern on the Target Compound List. The solvent will be allowed to evaporate and then a final distilled/deionized water rinse will be performed.

6.0 DOCUMENTATION

Proper management and documentation of field activities is essential to provide that necessary work is conducted in accordance with the sampling plan and QA/QC Plan in an efficient and high quality manner. Field management procedures will include following proper chain of custody procedures to track a sample from collection through analysis, noting when and how samples are split (if required); preparing a Location Sketch; completing Sample Summary Forms, Chain of Custody Forms, and Test Pit, Boring, Drilling and Well Construction Logs; maintaining a daily Field Forms; completing Daily Equipment Calibration Logs; preparing Daily Field Activity Reports; completing Field Change Forms; filling out a Daily Air Monitoring Form and maintenance of Photographic documentation. Copies of each of these forms are included in the Attachments Section. Proper completion of these forms and the field forms are necessary to support the consequent actions that may result from the sample analysis. This documentation will support that the samples were collected and handled properly.

6.1 Site Location Map and Sample Location Sketch

During remedial action, samples from various media will be collected on-site. A Site location map is provided as Attachment A. For each sampling point, a Location Sketch will be completed using permanent references and distances to the sampling point noted, if possible.

6.2 Sample Summary Form

At each sampling location, a Sample Summary Form is filled out including, but not limited to, the following information:

1. Site Name;
2. Client Name;
3. Sample identification number;
4. Date;

5. Time of sample collection;
6. Sample Matrix ;
7. Sample Depth ;
8. Analysis to be performed; and
9. PID readings.

6.3 Chain of Custody

The Chain of Custody (COC) Form is initiated at the laboratory with container preparation and shipment to the site. The form remains with the sample(s) at times and bears the name of the person assuming responsibility for the samples. This person is tasked with providing secure and appropriate handling of the containers and samples. When the COC form is complete, it will indicate that there was no lapse in sample accountability.

A sample is considered to be in an individual's custody if any of the following conditions are met:

a) It is in the individual's physical possession, or
b) It is in the individual's view after being in his or her physical possession, or
c) It is secured by the individual so that no one can tamper with it, or
d) The individual puts it in a designated and identified secure area.

In general, Chain of Custody Forms are provided by the laboratory selected to perform the analytical services. At a minimum, the following information will be provided on these forms:

1. Project name and address;
2. Project number;

3. Sample identification number;
4. Date;
5. Time;
6. Sample location;
7. Sample type/description ;
8. Sample matrix;
9. Analysis requested;
10. Number of containers and volume taken;
11. Remarks;
12. Type of waste;
13. Sampler(s) name(s) and signature(s);
14. Spaces for relinquished by/received by signature and date/time; and
15. Required laboratory deliverables/format

Chain of custody forms to be used will be those provided by the chosen analytical laboratory.

The Chain of Custody Form will be filled out and signed by the person performing the sampling. The original of the form will travel with the sample and will be signed and dated each time the sample is relinquished to another party, until it reaches the laboratory or analysis is completed. The field sampler will keep one copy and a copy will be retained for the project file. The sample bottle will also be labeled with an indelible marker with a minimum of the following information:

1. Project identification/number/site name
2. Sample number
3. Analysis to be performed
4. Date and time of collection

A copy of the completed form will be returned by the laboratory with the analytical results.

6.4 Split Samples

Whenever samples are being split with another party, a record of this activity should be maintained in the field log book. A copy of the Chain of Custody Form will indicate the split sample.

6.5 Field Logs

Pertinent information regarding the site, site activities and sampling procedures will be documented in the field logs. Notations will be made in logs, noting the time and date of entries. Information recorded in the logs will include, but not be limited to, the following:

The first page of the log will contain the following information:

1. Project name and address
2. Name, address and phone number of field contact
3. Client and address, if different from above
4. Site personnel
5. Arrival and departure of on-site personnel
6. Weather
7. Activity to be performed

Daily entries will be made for the following information:

8. Purpose of sampling
9. Location of sampling point

10. Number(s) and volume(s) of sample(s) taken

11. Description of sampling point and sampling methodology

12. Date and time of sample collection

13. Collector's sample identification number(s)

14. Sample distribution and method of storage and transportation

15. References, such as sketches of the sampling site or photographs of sample collection

16. Field observations, including results of field analyses (e.g., pH, temperature, specific conductance), water levels, drilling logs, and organic vapor and dust readings

17. Signature of personnel responsible for completing log entries.

6.6 Daily Field Activity Report

At the end of each day of field work, the Field Operations Manager, or designee, will complete this form noting personnel on site and summarizing the work performed that day, equipment, materials and supplies used results of field analyses, problems and resolutions. This form will be signed and subject to review.

6.7 Field Changes and Corrective Actions

Whenever there is a required or recommended change or correction in the investigation/sampling procedures. This field change will be completed by the Field Operations Manager and the SFC on-site supervisor, and approved by a SFC representative and the NYSDEC Project Manager, if required.

7.0 CALIBRATION PROCEDURES

With regard to field equipment, the following will be maintained at the project site:

1. Equipment calibration records and operating procedures which will include provisions for documentation of frequency of calibration, conditions, calibration standards and records reflecting the calibration procedures, methods of usage and repair history of the measurement system. Calibration of field equipment will be performed daily at the sampling site prior to commencement of work activities so that any background contamination can be taken into consideration and the instrument calibrated accordingly. The equipment operation manuals will also be maintained on site.

2. A schedule of preventive maintenance tasks, consistent with the instrument manufacturer's specific operation manuals, which will be carried out to minimize down time of the equipment.

3. Spare bulbs, filters and manufacturer manuals will be on hand to facilitate equipment maintenance and simple repair.

Analytical instrumentation calibration procedures and preventive maintenance, in accordance with NYSDEC requirements, for laboratory equipment, will be contained in the laboratory's standard operating procedures (SOP) which will be available upon request.

7.1 Performance of Field Audits

During field activities, the QA/QC officer will accompany sampling personnel into the field, in particular during the initial phase of the field program, to verify that the site sampling program is being properly conducted, and to detect and define problems so that corrective action can be taken early in the field program. Findings will be documented and provided to the Field Operations Manager.

7.2 Control and Disposal of Contaminated Material

During construction and sampling of the temporary monitoring wells and soil borings, contaminated waste, soil and water may be generated from drill cuttings, drilling fluids,

decontamination water, development water and purge water. Soil cuttings generated during the investigation will be handled in a manner consistent with NYSDEC requirements.

Water generated during the investigation, including decontamination water will be containerized on site. The RAWP will provide detailed information on the disposal of water generated during the investigation.

Department of Transportation approved 55-gallon drums, rolloff and/or water holding tank will be used for the containment of soil cuttings and water, and for disposal of personal protective clothing and disposable sampling equipment (i.e., bailers, scoops, tongue depressors, etc.). The drums will be sealed, marked and labeled with a description of the contents and from what location they were collected. Waste containers will be stored on site in a secure area.

8.0 DATA REDUCTION, VALIDATION AND REPORTING

A NYSDEC certified laboratory meeting the New York State requirements for documentation, data reduction and reporting will be used. Data will be cataloged according to sampling locations and sample identification nomenclature.

8.1 Data Validation

A summary document regarding data validation will be completed by the laboratory, using the appropriate NYSDEC required forms and submitted with the data package. Data validation will be performed in order to define and document analytical data quality. The data validation process will assist in confirming that analytical requirements specific to this work plan, including the QA/QC Plan are followed.

The data validation process will provide an assessment of the laboratory's performance based upon contractual requirements and applicable analytical criteria. The report generated as a result of the data validation process will provide an interpretation of the usefulness of the data that can be evaluated by the end user of the analytical results. The overall level of effort and specific data validation procedure to be used will be for a "10% validation."

During the review process, it will be determined whether the contractually required laboratory submittals for sample results are supported by sufficient back-up data and QA/QC results to enable the reviewer to conclusively determine the quality of data. Each data package will be checked for completeness and technical adequacy of the data. Upon completion of the review, the reviewers will develop a QA/QC data validation report for each analytical data package.

"Qualified" analytical results for any one field sample will be established and presented based on the results of specific QC samples and procedures associated with its sample analysis group or batch. Precision and accuracy criteria (i.e., QC acceptance limits) will be used in determining the need for qualifying data. Where test data have been reduced by the

laboratory, the method of reduction will be described in the report. Reduction of laboratory measurements and laboratory reporting of analytical parameters will be verified in accordance with the procedures specified in the NYSDEC program documents for each analytical method (i.e., recreate laboratory calculations and data reporting in accordance with the method specific procedure). The standard operating guideline manuals and any special analytical methodology required will specify documentation needs and technical criteria and will be taken into consideration in the validation process. Copies of the complete data package and the validation report, including the laboratory results data report sheets, with any qualifiers deemed appropriate by the data reviewer, and a supplementary field QC sample result summary statement, will be submitted to the NYSDEC.

The following is a description of the two-phased approach to data validation which will be used in the investigation. The first phase is called checklisting and the second phase is the analytical quality review, with the former being a subset of the latter.

1. Checklisting - The data package will be checked for correct submission of the contract required deliverables, correct transcription from the raw data to the required deliverable summary forms and proper calculation of a number of parameters.

2. Analytical Quality Review - The data package will be closely examined to recreate the analytical process and verify that proper and acceptable analytical techniques have been performed. Additionally, overall data quality and laboratory performance will be evaluated by applying the appropriate data quality criteria to the data to reflect conformance with the specified, accepted QA/QC standards and contractual requirements.

At the completion of the data validation, a Summary Data Validation/Usability Report will be prepared and submitted to NYSDEC.

8.2 Performance and System Audits

A NYSDEC-certified laboratory which has satisfactorily completed performance audits and performance evaluation samples will be used to perform sample analyses for the investigation.

8.3 Corrective Action

A NYSDEC certified laboratory will meet the requirements for corrective action protocols, including sample "clean up" to attempt to eliminate/mitigate matrix interference. High levels of matrix interference may be present in waste, soil and sediment samples. This interference may prevent the achievement of detection limits if no target compounds are found. In order to avoid unnecessary dilutions, the cleanup methods may be required to be performed by the laboratory as necessary.

8.4 Trip Blanks

The primary purpose of a trip blank is to detect other sources of contamination that might potentially influence contaminant values reported in actual samples, both quantitatively and qualitatively. The following have been identified as potential sources of contamination:

1. Laboratory reagent water;
2. Sample containers;
3. Cross contamination in shipment;
4. Ambient air or contact with analytical instrumentation during preparation and analysis at the laboratory; and
5. Laboratory reagents used in analytical procedures.

A trip blank will consist of a set of 40 ml sample vials filled at the laboratory with laboratory demonstrated analyte free water. Trip blanks will be handled, transported and analyzed in the same manner as the samples acquired that day, except that the sample

containers themselves are not opened in the field. These sample containers will only travel with the sample cooler. The temperature of the trip blanks will be maintained at 4°C while on site and during shipment. Trip blanks will return to the laboratory with the same set of bottles they accompanied in the field.

The purpose of a trip blank is to control sample bottle preparation and blank water quality as well as sample handling. Thus, the trip blank will travel to the site with the empty sample bottles and back from the site with the collected samples in an effort to simulate sample handling conditions. Contaminated trip blanks may indicate inadequate bottle cleaning or blank water of questionable quality. Trip blanks will be implemented only when collecting water samples and analyzed for volatile organic compounds only at a frequency of one per day.

8.5 Method Blanks/Holding Blanks

A method blank is an aliquot of laboratory water or soil which is spiked with the same internal and surrogate compounds as the samples. The purpose of the method blank is to define and determine the level of laboratory background contamination. Frequency, procedure and maximum laboratory containment concentration limits should be in accordance with NYSDEC requirements. A holding blank is an aliquot of analyte-free water that is stored with the environmental samples in order to demonstrate that the samples have not been contaminated during laboratory storage. This blank will be analyzed using the same analytical procedure as the samples.

8.6 Matrix Spikes/Matrix Spike Duplicates and Spiked Blanks

Matrix spike samples are quality control procedures used by the laboratory as part of its internal Quality Assurance/Quality Control program. The matrix spikes (MS) and matrix spike duplicates (MSD) will be aliquots of a designated sample (water or soil) which are spiked with known quantities of specified compounds. These QA/QC samples will be used to evaluate the matrix effect of the sample upon the analytical methodology, as well as to

determine the precision of the analytical method used. A matrix spike blank will be an aliquot of analyte-free water, prepared in the laboratory, and spiked with the same solution used to spike the MS and MSD. The matrix spike blank (MSB) will be subjected to the same analytical procedure as the MS/MSD and used to indicate the appropriateness of the spiking solution by calculating the spike compound recoveries. The frequency regarding the MSB will be as per NYSDEC certified laboratory requirements. The MS/MSD will be collected at a frequency of 1 for every 20 collected samples for sample media.

8.7 Field Blanks

The primary purpose of a field blank is to detect other sources of contamination that might potentially influence contaminant values reported in actual samples, both quantitatively and qualitatively. The following have been identified as potential sources of contamination:

1. Sample containers;
2. Cross contamination; and
3. Improper decontamination procedures.

A field blank will be generated by pouring laboratory supplied analyte free water over decontaminated sampling equipment and placed into laboratory supplied containers. Field blanks will be handled, transported and analyzed in the same manner as the collected environmental samples. The temperature of the field blanks will be maintained at 4°C while on site and during shipment.

The purpose of a field blank is to identify whether improper decontamination procedures were employed or cross contamination has occurred. Field blanks will be implemented at a frequency of one per twenty (20) samples collected or once per week whichever is greater and will be analyzed for the most comprehensive suite of parameters within the field blank set of 20 environmental samples.

8.8 Blind Duplicates

The purpose of a blind duplicate is to confirm the accuracy of the analytical laboratory. Blind duplicates will be implemented at a frequency of one per twenty (20) samples collected or once per week whichever is greater. The blind duplicate will be collected at the same interval as one of the collected environmental samples and will be identified and labeled with a similar identification scheme as previously noted. The sampler will identify in the field log forms the sample number indicating that it was collected a blind duplicate. The blind duplicate and will be analyzed for the same parameters as the sample it mimics.

8.9 Field Management Forms

Field management forms are included in Attachments B through O.

Former Glenwood Container
NYSDEC Site No. C360154
72 Alexander Street, Yonkers, NY 10701

Attachment A

Site Location Map

Education

Energy Utility

Hospitality

Public Sector

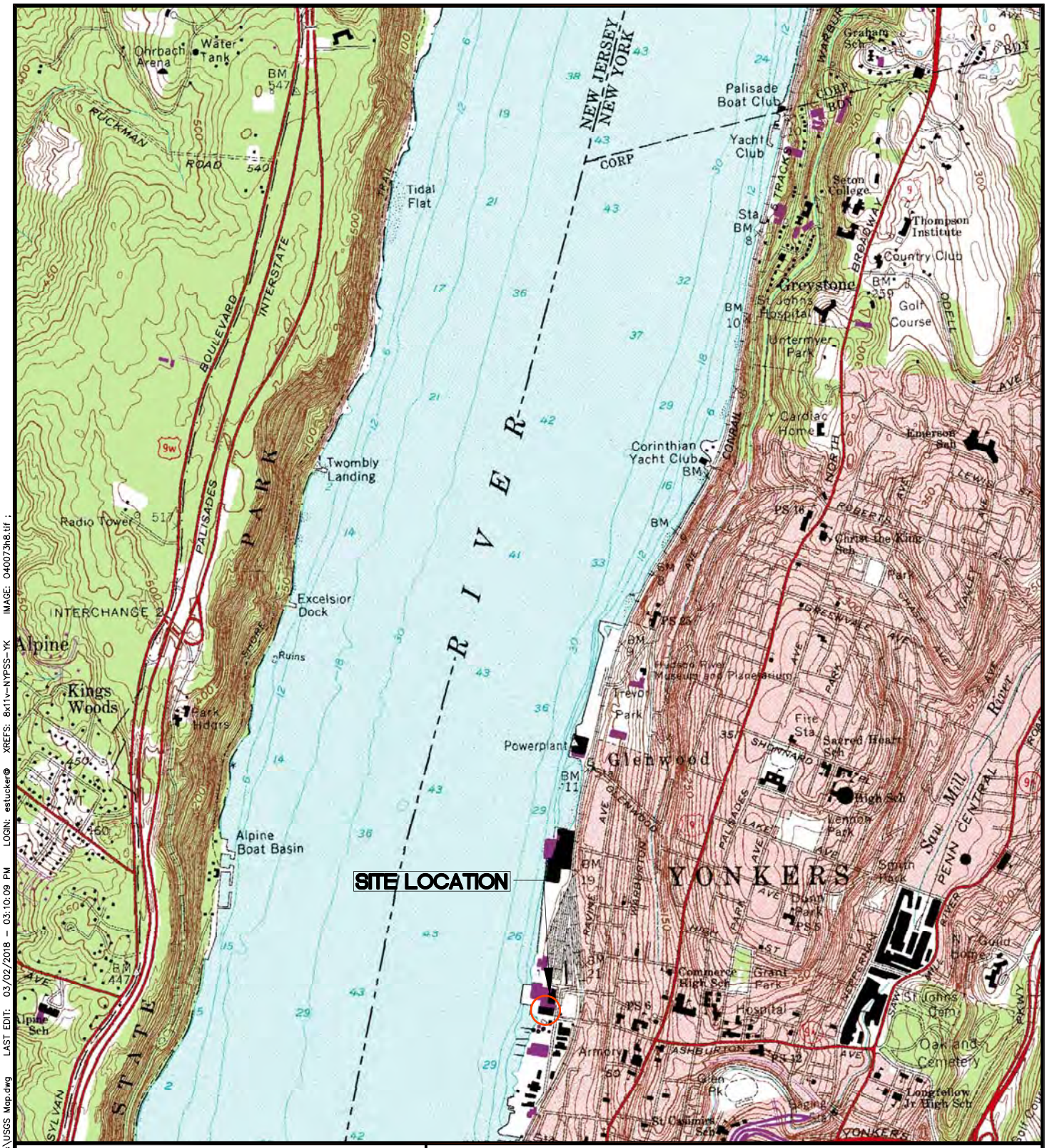
Real Estate

Science & Technology

55 Main Street
3rd Floor
Yonkers, NY 10701

t. 914.509.8600

www.psands.com



PS&S
integrating design & engineering
PAULUS, SOKOLOWSKI AND SARTOR
55 MAIN STREET
3RD FLR
YONKERS, NEW YORK 10701
PHONE: (914) 509-8600
FAX: (914) 407-1679

PROJECT TITLE

FONDAK ENTERPRISES, LLC
72 ALEXANDER STREET
YONKERS, WESTCHESTER COUNTY, NEW YORK

SHEET TITLE

FIGURE 1
SITE LOCATION MAP
(USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES)

DATE:	03/02/18	DRN. BY:	RP	PROJ. NO.:	05794.0001
SCALE:	NTS	CK'D BY:	CB	SHT. NO.:	1

FILE NAME: P:\05794\0001\DWGs\C-Civil\Figures\USGS Map.dwg LAST EDIT: 03/02/2018 - 03:10:09 PM LOGIN: estucker@ XREFS: 8x11v-NYPSS-YK IMAGE: 040073h8.tif ;

Attachment B

Sample Reporting Limit Definitions / Data Qualifiers

HC Reporting Limit Definitions/Data Qualifiers

REPORTING DEFINITIONS

DF = Dilution Factor

MDL = Method Detection Limit

RL* = Reporting Limit

ND = Not Detected

RT = Retention Time

NA = Not Applicable

**Samples with elevated Reporting Limits (RLs) as a result of a dilution may not achieve client reporting limits in some cases. The elevated RLs are unavoidable consequences of sample dilution required to quantitate target analytes that exceed the calibration range of the instrument.*

DATA QUALIFIERS

A- Indicates that the Tentatively Identified Compound (TIC) is suspected to be an aldol-condensation product. These compounds are by-products of acetone and methylene chloride used in the extraction process.

B- Indicates analyte was present in the Method Blank and sample.

d- For Pesticide and PCB analysis, the concentration between primary and secondary columns is greater than 40%. The lower concentration is generally reported.

E- Indicates the concentration exceeded the upper calibration range of the instrument.

J- Indicates the value is estimated because it is either a Tentatively Identified Compound (TIC) or the reported concentration is greater than the MDL but less than the RL. For samples results between the MDL and RL there is a possibility of false positives or misidentification at the quantitation levels. Additionally, the acceptance criteria for QC samples may not be met.

R- Retention Time is out.

Y- Indicates a contaminant found in the blank at less than 10% of the concentration of a contaminant found in the sample.

Attachment C

Chain of Custody Form

Hampton-Clarke, Inc. (WBE/DBE/SBE)

175 Route 46 West and 2 Madison Road, Fairfield, New Jersey 07004
Ph: 800-426-9992 | 973-244-9770 Fax: 973-244-9787 | 973-439-1458
Service Center: 137-D Gaither Drive, Mount Laurel, New Jersey 08054
Ph (Service Center): 856-780-6057 Fax: 856-780-6056

Hampton-Clarke WBE/DBE/SBE 800-426-9992

CHAIN OF CUSTODY RECORD

A Women-Owned, Disadvantaged, Small Business Enterprise

NELAC/NJ #07071 | PA #68-00463 | NY #11408 | CT #PH-0671 | KY #90124 | DE HSCA Approved

Project# (Lab Use Only)

Page _____ of _____

3) Reporting Requirements (Please Circle)

Turnaround	Report Type	Electronic Deliv.
When Available:	Data Summary	Hazsite/CSV
1 Business Day (100%) *	Results + QC (Waste)	EnviroData
2 Business Days (75%) *	NJ Reduced	Excel - NJ Regulatory
3 Business Days (50%) *	NY Reduced	Excel - NY Regulatory
4 Business Days (35%) *	PA Reduced	Excel - PA Regulatory
5 Business Days (25%)	Full / Category B	EQuIS *(specify below)*:
10 Business Days (Stand.)	Category A	4-File/EZ/NYS/Reg. 2 or 5
Other: _____	Electronic (PDF)	Other: _____

*** Expedited TAT Not Always Available. Please Check with Lab.**

Customer Information

1a) Customer: _____
Address: _____
_____
1b) Email/Cell/Fax/Ph: _____
1c) Send Invoice to: _____
1d) Send Report to: _____

Project Information

2a) Project: _____
_____
2b) Project Mgr: _____
2c) Project Location (City/State): _____
_____
2d) Quote/PO # (If Applicable): _____

FOR LAB USE ONLY ↓

Batch #

===> Check If Contingent ===>

Matrix Codes

DW - Drinking Water **S** - Soil **A** - Air
GW - Ground Water **SL** - Sludge
WW - Waste Water **OL** - Oil
OT - Other (please specify under item 9, Comments)

7) Analysis *(specify methods & parameter lists)*

<=== Check If Contingent <===

Lab Sample #	4) Customer Sample ID	5) Matrix	6) Sample Date	6) Sample Time	Sample Type: Composite (C)	Sample Type: Grab (G)	8) # of Bottles: None	MeOH	En Core	NaOH	HCl	H2SO4	HNO3	Other:	9) Comments

10) Relinquished by:	Accepted by:	Date	Time

Additional Notes

Comments, Notes, Special Requirements, HAZARDS

Indicate if low-level methods required to meet current groundwater standards (SPLP for soil):

- ☐ BN or BNA (8270D SIM)
- ☐ VOC (8260C SIM or 8011)
- ☐ SPLP (BN, BNA, Metals)

Check if applicable:

- ☐ Project-Specific Reporting Limits
- ☐ High Contaminant Concentrations
- ☐ NJ LSRP Project **(also check boxes above/right)**

For NJ LSRP projects, indicate which standards need to be met:

- ☐ NJDEP GWQS
- ☐ NJDEP SRS
- ☐ NJDEP SPLP
- ☐ Other (specify):

Cooler Temperature

11) Sampler (print name): **Date:**

Please note NUMBERED items. If not completed your analytical work may be delayed.
A fee of $5/sample will be assessed for storage should sample not be activated for any analysis.

Attachment D

Field Investigation Summary Form

Daily Field Investigation Summary

Project:	
Field Personnel:	
Location:	
Date:	
Weather:	
Job No.:	
Purpose:	
Contacts:	

FIELD OBSERVATIONS:

Attachment E

Field Drilling Log Form

Paulus, Sokolowski, & Sartor
Field Drilling Log

Job Name: _____
Job Name: _____

Boring Log Number:_____
Date:_____
Weather:_____

Drilling Company: _____
Driller/Helper: _____

Depth	Recovery	PID ppm	HCN ppm	Description	Environmental Description

Attachment F

Test Pit Log Form

Paulus, Sokolowski & Sartor	**TEST PIT LOG**	TEST PIT NUMBER

PROJECT NUMBER:
PROJECT NAME:
LOCATION:
EXCAVATION CO:
EXCAVATION METHOD:
OPERATOR:
ENVIRONMENTAL SCIENTIST:

WEATHER:
TOTAL DEPTH:
GROUND SURFACE ELEVATION:
DATE BEGUN:
DATE COMPLETED:

DEPTH	SAMPLE NUMBER	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0									
2									
4									
6									
8									
10									

Attachment G

Soil Boring Log Form

Paulus, Sokolowski & Sartor	BORING LOG	BOREHOLE NUMBER -

PROJECT NUMBER:
PROJECT NAME:
LOCATION:
DRILLING CO:
DRILLING METHOD:
DRILLER / HELPER:
ENVIRONMENTAL SCIENTIST:

WEATHER:
TOTAL DEPTH:
GROUND SURFACE ELEVATION:
DATE BEGUN:
DATE COMPLETED:

DEPTH	SAMPLE NUMBER	RECOVERY (in)	PID (ppm)	HCN (ppm)	WATER LEVEL	SOIL DESCRIPTION	USCS SYMBOL	LITHOLOGY	ENVIRONMENTAL DESCRIPTIONS	VISUAL OBSERVATIONS
0 2 4 6 8 10 12 14 16 18 20										

Attachment H

Well Construction Log Form

Paulus, Sokolowski, & Sartor	WELL CONSTRUCTION LOG	WELL NUMBER -

PROJECT NUMBER:
PROJECT NAME:
LOCATION:
DRILLING CO:
DRILLING METHOD:
DRILLER/HELPER :
ENVIRONMENTAL SCIENTIST:

WEATHER :
TOTAL DEPTH:
GROUND SURFACE ELEVATION:
DATE BEGUN:
DATE COMPLETED:

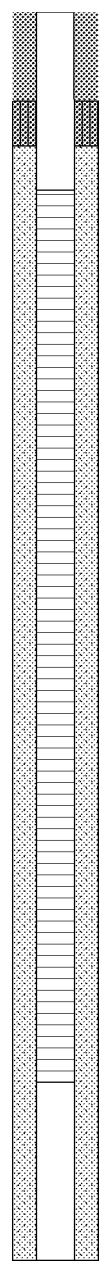
PVC CASING (DIA.) -
SCREEN (DIA.) -
PVC CASING (DIA.):

MATERIAL 1 -
MATERIAL 2 -
MATERIAL 3 -

LENGTH 1 -
LENGTH 2 -
LENGTH 3 -

DEPTH

WELL CONSTRUCTION



WELL SCHEMATICS

CEMENT SEAL 0 - 0.5'

BENTONITE SEAL 0.5' - 1.5'

SOLID PVC CASING 0 - 2'

SAND PACK 1.5' - 14'

PVC 20 SLOT SCREEN 2' - 12'

SOLID PVC CASING 12' - 14'

Attachment I

Equipment Calibration Form

PS&S DUST TRAK INSTRUMENT CALIBRATION FORM

Job Name: _____ **Personnel:** _____

Job No: _____ **Weather:** _____

Location: _____ **Page :** _____

Date: _____

Date	Serial No.	Time	Zero Calibration No. mg/m^3

NOTES:

PS&S PID INSTRUMENT CALIBRATION LOG

Job Name: ______________________ **Personel:** ______________________
Job Number: ______________________ **Weather** ______________________
Location: ______________________ **Instrument No.:** ______________________
Date: ______________________
Instument Type: ______________________

Date	Calibration Gac Conc.	Calibration Y/N	Reading	Maintenance Notes
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		
	100 ppm	Y		

INSTRUMENT CALIBRATION FORM

Job Name: ______________________ **Personnel:** ______________________
Job No: ______________________ **Weather:** ______________________
Location: ______________________ **Boring Location:** ______________________
Date: ______________________

Instrument: ______________________
Serial No. : ______________________

Sensor	Cal. Gas Concentration	Instrument Reading	Adjusted		Adjusted Reading	Calibration Gas Maker	Calibration Gas Lot #
H_2S	25		Yes	No			
CO	50		Yes	No			
LEL	50		Yes	No			
HCN	10		Yes	No			
O_2	20.9		Yes	No			

Instrument: ______________________
Serial No. : ______________________

Sensor	Cal. Gas Concentration	Instrument Reading	Adjusted		Adjusted Reading	Calibration Gas Maker	Calibration Gas Lot #
H_2S	25		Yes	No			
CO	50		Yes	No			
LEL	50		Yes	No			
HCN	10		Yes	No			
O_2	20.9		Yes	No			

Instrument: ______________________
Serial No. : ______________________

Sensor	Cal. Gas Concentration	Instrument Reading	Adjusted		Adjusted Reading	Calibration Gas Maker	Calibration Gas Lot #
H_2S	25		Yes	No			
CO	50		Yes	No			
LEL	50		Yes	No			
HCN	10		Yes	No			
O_2	20.9		Yes	No			

Instrument: ______________________
Serial No. : ______________________

Sensor	Cal. Gas Concentration	Instrument Reading	Adjusted		Adjusted Reading	Calibration Gas Maker	Calibration Gas Lot #
H_2S	25		Yes	No			
CO	50		Yes	No			
LEL	50		Yes	No			
HCN	10		Yes	No			
O_2	20.9		Yes	No			

Instrument: ______________________
Serial No. : ______________________

Sensor	Cal. Gas Concentration	Instrument Reading	Adjusted		Adjusted Reading	Calibration Gas Maker	Calibration Gas Lot #
H_2S	25		Yes	No			
CO	50		Yes	No			
LEL	50		Yes	No			
HCN	10		Yes	No			
O_2	20.9		Yes	No			

Attachment J

Monitoring Well Sampling Record Form

MONITORING WELL SAMPLING RECORD

Client:

Project Number:

Location:

Personnel:

Date:

Weather:

Conversion Data	
Well dia. (In)	Gallon/ft
2.0"	0.16
2.5"	0.255
4.0"	0.65
5.0"	1.02
5.5"	1.23
6.0"	1.47
8.0"	2.61

1. MONITORING WELL DATA: **VOLUME FACTOR USED:**

Well Permit No: _____

Well No:_____Well Dia. (in):_____ Gallons/Foot: _____

Ground Surface Elevation (Ft):_____ One Well Volume:_____

Top of Well Casing Elevation (Ft):_____ Three Well Volumes:_____

Stand-up/Flush Mount (Ft):_____ Start of Purge: _____

Well Depth-Top of Casing (Ft):_____ Finish of Purge :_____

Depth to Water-Top of Casing (Ft):_____ Flow Rate (GPM):_____

Depth to Water-Ground Surface (Ft):_____ Gallons Purged:_____

Water Level Elevation (Ft):_____ Method of Purge:_____

Static Head of Water (Ft):_____

2. MONITORING WELL SAMPLING AND FIELD MEASUREMENTS

Initial Headspace Reading _____ Instrument _____

Parameter	**Pre-Purge**	**Post Purge**	**Sample**
Time:	_____	_____	_____
HDSPC (ppm):	_____	_____	_____
Depth to Water (Ft):	_____	_____	_____
Product Thickness:	_____	_____	_____
Visual:	_____	_____	_____
Temperature ( ):	_____	_____	_____
pH (SU):	_____	_____	_____
Conductivity ( ):	_____	_____	_____
Dissolved Oxygen (mg/L):	_____	_____	_____

Time, Start Sampling: _____ Time, End Sampling: _____

Sampling Method:_____

Sample Filtering Required:_____Method:_____

Field Preservation Required: _____ Analysis:_____

Sample Analysis Required: _____

3. COMMENTS AND NOTES:

_____

_____

_____

_____

_____

Attachment K

"Low-Flow" Well Sampling Form

"LOW-FLOW" SAMPLING TECHNIQUE
GROUNDWATER QUALITY PARAMETER READINGS

Project Name.: _____ Personnel: _____

_____ Weather: _____

Project Number: _____ Location: _____

Date: _____

WELL INFORMATION

Well Number: _____ Screened Interval: _____ Pump Start Time: _____ Total Purged: _____

Well Depth: _____ Pump Intake Depth: _____ Pump Stop Time: _____ Purge Method: _____

PID (ppm): _____ Pumping Rate: _____ Sample Time: _____ Initial Depth to Water: _____

TIME	TEMPERATURE (^{o}C)	pH (SU)	CONDUCTIVITY (mS/cm)	DISSOLVED OXYGEN (ppm)	TURBIDITY (ntu)	OXYGEN REDUCTION (mv)	WATER LEVEL (ft.)	Flow Rate (ml/min.)
Criteria	*3%*	*0.1*	*0.030*	*10%*	*10%*	*+/- 10mv*	*0.3 ft*	*200 - 500*

Comments: _____

_____

_____

_____

Attachment L

Slug Test Data Form

SLUG TEST DATA							
Test Well:				Length of Gravel Pack:			
Test Date:				Gravel Pack Radius:			
Depth to Water - GS:				Well Casing Radius:			
Depth of Well - GS:				Slug Volume Added:			
Depth to Well Screen - GS:				Slug Volume Removed:			
Length of Well Screen/Open Hole:				One Well Volume:			
Job Name:				Job Number:			
	TIME	**TIME INTERVAL**	**DEPTH**		**TIME**	**TIME INTERVAL**	**DEPTH**
1				**51**			
2				**52**			
3				**53**			
4				**54**			
5				**55**			
6				**56**			
7				**57**			
8				**58**			
9				**59**			
10				**60**			
11				**61**			
12				**62**			
13				**63**			
14				**64**			
15				**65**			
16				**66**			
17				**67**			
18				**68**			
19				**69**			
20				**70**			
21				**71**			
22				**72**			
23				**73**			
24				**74**			
25				**75**			
26				**76**			
27				**77**			
28				**78**			
29				**79**			
30				**80**			
31				**81**			
32				**82**			
33				**83**			
34				**84**			
35				**85**			
36				**86**			
37				**87**			
38				**88**			
39				**89**			
40				**90**			
41				**91**			
42				**92**			
43				**93**			
44				**94**			
45				**95**			
46				**96**			
47				**97**			
48				**98**			
49				**99**			
50				**100**			

NOTES:

Attachment M

Soil Vapor Sampling Form

Paulus, Sokolowski & Sartor
Soil Gas Screening
Air Sampling Equipment Calibration Data Sheet

Project Name:_____ By: _____

Project Location:_____ Sampling Date: _____

Calibration Gases:

Screening Instrument To Be Calibrated	Pollutant To Be Measured	Calibration Gas Concentration	Calibration Gas Lot/Serial Number	Calibration Gas Manufacturer

Calibration Record:

Screening Instrument With Serial No.	Calibrated Pollutants	Instrument Response	Calibration Time	Reason for Calibration: (scheduled, unexpected response, etc.)

Comments: _____

Attachment N

Soil Gas Monitoring Data Form

Paulus, Sokolowski & Sartor
SOIL GAS MONITORING DATA SHEET

Page: _____ of _____

By:

Project Name:

Project Location:

Ambient Temperature:_____

Barometric Pressure:_____

Weather Conditions:_____

Ground Conditions (wet/dry):_____

Bar Hole or Well Pt. ID	Time (military)	Percent LEL	Percent Oxygen	Percent Methane	VOC (ppm)	Slam Count	Remarks

Additional Comments:

Attachment O

Data Usability Summary Report Form

Data Usability Summary Report

Site:		Case Number:
SDG Number(s):	Date Rec'd by Lab :	Lab Report Date:
Reviewed by:		Date Reviewed:

Number of samples of each matrix in data package: ___ water ___ soil
Analyses requested: Volatile organics Semivolatile organics Metals/cyanide

1.	Is the data package complete as defined under the requirements for NYSDEC ASP Category B deliverables?	**Yes**	No
	Exceptions:		Details attached
	Actions:		Details attached
2.	Have all holding times been met (see QA/QC Plan)?	**Yes**	No
	Exceptions:		
	Actions/effect on results:		Details attached
3.	Do all the QC data fall within the protocol required limits and specifications? (blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls, sample data)	**Yes**	No
	Reported exceptions:		Details attached
	Actions/effect on results:		Details attached
4.	Have all of the data been generated using established and agreed upon analytical protocols? Test method(s):	**Yes**	No
	Reported exceptions:		Details attached
	Actions/effect on results:		Details attached
5.	Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?	**Yes**	No NA
	Exceptions:		Details attached
	Actions/effect on results:		Details attached
6.	Have the correct data qualifiers been used by the laboratory?	**Yes**	No
	Exceptions:		Details attached

Specific issues reported by laboratory (check all that apply):

Sample(s) reanalyzed at dilution	Details attached
Blank contamination	Details attached
Matrix effects	Details attached
Other:	Details attached

Changes by reviewer (attach markup of data form):

Data qualifiers added/changed	Details attached
Some data rejected (R)	Details attached

Appendix D

Backfill Criteria Requirements

Appendix 5
Allowable Constituent Levels for Imported Fill or Soil
Subdivision 5.4(e)

Source: This table is derived from soil cleanup objective (SCO) tables in 6 NYCRR 375. Table 375-6.8(a) is the source for unrestricted use and Table 375-6.8(b) is the source for restricted use.

Note: For constituents not included in this table, refer to the contaminant for supplemental soil cleanup objectives (SSCOs) in the Commissioner Policy on *Soil Cleanup Guidance*. If an SSCO is not provided for a constituent, contact the DER PM to determine a site-specific level.

Constituent	Unrestricted Use	Residential Use	Restricted Residential Use	Commercial or Industrial Use	If Ecological Resources are Present
Metals					
Arsenic	13	16	16	16	13
Barium	350	350	400	400	433
Beryllium	7.2	14	47	47	10
Cadmium	2.5	2.5	4.3	7.5	4
Chromium, Hexavalent[1]	1 [3]	19	19	19	1 [3]
Chromium, Trivalent[1]	30	36	180	1500	41
Copper	50	270	270	270	50
Cyanide	27	27	27	27	NS
Lead	63	400	400	450	63
Manganese	1600	2000	2000	2000	1600
Mercury (total)	0.18	0.73	0.73	0.73	0.18
Nickel	30	130	130	130	30
Selenium	3.9	4	4	4	3.9
Silver	2	8.3	8.3	8.3	2
Zinc	109	2200	2480	2480	109
PCBs/Pesticides					
2,4,5-TP Acid (Silvex)	3.8	3.8	3.8	3.8	NS
4,4'-DDE	0.0033 [3]	1.8	8.9	17	0.0033 [3]
4,4'-DDT	0.0033 [3]	1.7	7.9	47	0.0033 [3]
4,4'-DDD	0.0033 [3]	2.6	13	14	0.0033 [3]
Aldrin	0.005	0.019	0.097	0.19	0.14
Alpha-BHC	0.02	0.02	0.02	0.02	0.04 [4]
Beta-BHC	0.036	0.072	0.09	0.09	0.6
Chlordane (alpha)	0.094	0.91	2.9	2.9	1.3
Delta-BHC	0.04	0.25	0.25	0.25	0.04 [4]
Dibenzofuran	7	14	59	210	NS
Dieldrin	0.005	0.039	0.1	0.1	0.006
Endosulfan I	2.4[2]	4.8	24	102	NS
Endosulfan II	2.4[2]	4.8	24	102	NS
Endosulfan sulfate	2.4[2]	4.8	24	200	NS
Endrin	0.014	0.06	0.06	0.06	0.014
Heptachlor	0.042	0.38	0.38	0.38	0.14
Lindane	0.1	0.1	0.1	0.1	6
Polychlorinated biphenyls	0.1	1	1	1	1

Constituent	Unrestricted Use	Residential Use	Restricted Residential Use	Commercial or Industrial Use	If Ecological Resources are Present
Semi-volatile Organic Compounds					
Acenaphthene	20	98	98	98	20
Acenaphthylene	100	100	100	107	NS
Anthracene	100	100	100	500	NS
Benzo(a)anthracene	1	1	1	1	NS
Benzo(a)pyrene	1	1	1	1	2.6
Benzo(b)fluoranthene	1	1	1	1.7	NS
Benzo(g,h,i)perylene	100	100	100	500	NS
Benzo(k)fluoranthene	0.8	1	1.7	1.7	NS
Chrysene	1	1	1	1	NS
Dibenz(a,h)anthracene	0.33 [3]	0.33 [3]	0.33 [3]	0.56	NS
Fluoranthene	100	100	100	500	NS
Fluorene	30	100	100	386	30
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	NS
m-Cresol(s)	0.33 [3]	0.33 [3]	0.33 [3]	0.33 [3]	NS
Naphthalene	12	12	12	12	NS
o-Cresol(s)	0.33 [3]	0.33 [3]	0.33 [3]	0.33 [3]	NS
p-Cresol(s)	0.33	0.33	0.33	0.33	NS
Pentachlorophenol	0.8 [3]	0.8 [3]	0.8 [3]	0.8 [3]	0.8 [3]
Phenanthrene	100	100	100	500	NS
Phenol	0.33 [3]	0.33 [3]	0.33 [3]	0.33 [3]	30
Pyrene	100	100	100	500	NS
Volatile Organic Compounds					
1,1,1-Trichloroethane	0.68	0.68	0.68	0.68	NS
1,1-Dichloroethane	0.27	0.27	0.27	0.27	NS
1,1-Dichloroethene	0.33	0.33	0.33	0.33	NS
1,2-Dichlorobenzene	1.1	1.1	1.1	1.1	NS
1,2-Dichloroethane	0.02	0.02	0.02	0.02	10
1,2-Dichloroethene(cis)	0.25	0.25	0.25	0.25	NS
1,2-Dichloroethene(trans)	0.19	0.19	0.19	0.19	NS
1,3-Dichlorobenzene	2.4	2.4	2.4	2.4	NS
1,4-Dichlorobenzene	1.8	1.8	1.8	1.8	20
1,4-Dioxane	0.1 [3]	0.1 [3]	0.1 [3]	0.1 [3]	0.1
Acetone	0.05	0.05	0.05	0.05	2.2
Benzene	0.06	0.06	0.06	0.06	70
Butylbenzene	12	12	12	12	NS
Carbon tetrachloride	0.76	0.76	0.76	0.76	NS
Chlorobenzene	1.1	1.1	1.1	1.1	40
Chloroform	0.37	0.37	0.37	0.37	12
Ethylbenzene	1	1	1	1	NS
Hexachlorobenzene	0.33 [3]	0.33 [3]	1.2	3.2	NS
Methyl ethyl ketone	0.12	0.12	0.12	0.12	100
Methyl tert-butyl ether	0.93	0.93	0.93	0.93	NS
Methylene chloride	0.05	0.05	0.05	0.05	12

Volatile Organic Compounds (continued)					
Propylbenzene-n	3.9	3.9	3.9	3.9	NS
Sec-Butylbenzene	11	11	11	11	NS
Tert-Butylbenzene	5.9	5.9	5.9	5.9	NS
Tetrachloroethene	1.3	1.3	1.3	1.3	2
Toluene	0.7	0.7	0.7	0.7	36
Trichloroethene	0.47	0.47	0.47	0.47	2
Trimethylbenzene-1,2,4	3.6	3.6	3.6	3.6	NS
Trimethylbenzene-1,3,5	8.4	8.4	8.4	8.4	NS
Vinyl chloride	0.02	0.02	0.02	0.02	NS
Xylene (mixed)	0.26	1.6	1.6	1.6	0.26

All concentrations are in parts per million (ppm)
NS = Not Specified

Footnotes:
[1] The SCO for Hexavalent or Trivalent Chromium is considered to be met if the analysis for the total species of this contaminant is below the specific SCO for Hexavalent Chromium.
[2] The SCO is the sum of endosulfan I, endosulfan II and endosulfan sulfate.
[3] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the Track 1 SCO value.
[4] This SCO is derived from data on mixed isomers of BHC.

Appendix E

Community Air Monitoring Plan (CAMP)

COMMUNITY AIR MONITORING PLAN

-FOR-

Glenwood Container Site

72 Alexander Street
Yonkers, Westchester County, New York

BCP Site #C360154

Prepared for:

Fondak Enterprises, LLC
225 Paddock Street
Watertown, New York 13601

November XX, 2018

Prepared by:

Paulus, Sokolowski and Sartor Engineering, PC
1 Larkin Plaza, 2nd Floor
Yonkers, New York 10701

Table of Contents

TABLES

FIGURES

ATTACHMENTS

1.0 Introduction

1.1 General Approach

This Community Air Monitoring Plan (CAMP) has been developed to provide specific procedures for measuring, documenting, and responding to potential airborne contaminants during intrusive activities at the Glenwood Container Site in the City of Yonkers, Westchester County, New York (herein referred to as the "Site"). A Site Location Map is included as Figure 1. The Site is identified as New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) Site Number C360154. This CAMP builds on the CAMP guidelines established by the New York State Department of Health (NYSDOH) in the NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (DER-10). DER-10 requires that real-time monitoring for total volatile organic compound (TVOC) and particulates (i.e., dust) be conducted upwind and downwind of ground intrusive activities at contaminated sites. The CAMP real-time TVOC and particulate matter monitoring activities will be performed by the NYSDEC Brownfield Cleanup Program (BCP) Site Volunteer Environmental Engineer of Record designated qualified environmental professional (QEP). The Site QEP will be responsible to operate, maintain, and report the real-time TVOC and dust monitoring activities in accordance with this CAMP. Further, the Site QEP will be coordinate with the Site Construction Manager and the Contractor in the event of any CAMP exceedances as presented in this CAMP.

The purpose of the air monitoring program is to provide early detection of potential short-term emissions. This early detection is intended to expedite any necessary mitigation measures, and to reduce the potential for the community and public to be exposed to hazardous limits. The CAMP will be conducted with a real-time air monitors, streaming data to a central location (Site trailer) for analysis. Air monitoring for Site personnel within the exclusion zones is covered in the Specific Health and Safety Plan (HASP).

Site remedial action activities are proposed for this project BCP Site; where, the major ground intrusive activities include the removal of two contaminant source areas (CSAs), and installation of a Site-wide cover system.

2.0 Sampling and Analytical Procedures

This section of the CAMP presents a detailed description of the air monitoring sampling and analytical procedures.

Real-time sampling methods will be used to determine air concentrations during the project. Sampling for TVOC and particulate matter less than 10 micrometers in size (PM-10) will occur at two locations. One location will be found upwind of the remediation activities, while the second will be downwind of the remediation activities. On-Site meteorological conditions will be monitored to determine the direction of the wind to accurately place the sampling locations.

2.1 Low Action Level and High Action Level

A Low Action Level is a contaminant concentration that when exceeded triggers contingent measures that will be implemented in the field. A Low Action Level requires specific VOC/particulate matter producing temporary work stoppage until the appropriate contingent measures are implemented. A High Action requires an immediate work stoppage and implementation of appropriate contingent measures until the real-time air monitoring concentrations are below the Low Action level. The Low Action Level and High Action Level are summarized in the following Table A and further detailed in the attached Table 1. The values were developed in accordance with the NYSDOH Generic CAMP and Site specific values (refer to Attachment A of this CAMP).

Table A: Low Action Level and High Action Level

Target Compounds (15-minute average concentration)	**Observed Levels**
Low Action Level	
TVOCs	5.0 ppm
PM-10	100* µg/m^3
High Action Level	
TVOCs	25 ppm
PM-10	150* µg/m^3

ppm = parts per million
µg/m^3 = micrograms per meter cubed
* Value greater than background. Background is defined as the current upwind 15-minute average concentration.

2.2 Real-Time Station Monitoring

Real-time air monitoring will be conducted upwind and downwind of the work area along the Site perimeter. The air monitoring program is to confirm that on-Site activities do not result in a sustained (15 minute average) release of contaminants above the Action Levels beyond the Site boundary. Real-time monitors will operate continuously during remediation activity.

Dust will be monitored using an aerosol monitor (i.e., TSI DustTrak PM-10) and volatile organic compounds (VOCs) will be monitored using a photoionization detector (PID). Monitor device specification sheets can be found in Attachment C. The monitors will continuously analyze VOC and dust concentrations. Data will be stored within both the TSI DustTrak PM-10 and PID data-loggers.

2.3 Supplemental Monitoring

Supplemental monitoring will be performed around the exterior of the remedial activities with a handheld PID monitor. The supplemental walk-around monitoring will be completed when Site conditions reach the Low Action Level. Fifteen-minute average readings will be recorded continuously with the handheld equipment, and downloaded at the end of each day used.

2.4 Baseline Sampling

Pre-remediation sampling will be completed to determine a baseline ambient air concentration prior to the start of sediment remediation activities. Baseline conditions will be determined for both PM-10 and TVOCs for the Site.

3.0 Data Management

Data will be generated from real-time stations from both upwind and downwind stations, as well as the supplementary walk-around monitors. The data will be evaluated and summarized in the attached weekly table (refer to Table 2) which will include:

- Daily average wind speed, wind direction, humidity, and air temperature
- Minimum and maximum fifteen-minute average concentrations of TVOC, and PM-10
- Upwind and downwind comparison of Alert and Action Levels reached during the week
- Summary of Site activities
- Air Monitoring Locations

The attached weekly table (refer to Table 2) will be prepared and transmitted to the NYSDEC and NYSDOH as requested. Raw data generated from real-time stations will be stored and submitted to NYSDEC/NYSDOH upon request.

4.0 Contingency Plan

The purpose of the CAMP Contingency Plan is to identify potential Site control measures that may be implemented in response to elevated levels of contaminants in the ambient air. The contingency plan will rely on the real-time monitoring data generated and is described in the above CAMP Table A. An explanation of the specific conditions and response actions for VOCs and PM-10 are summarized below.

4.1 VOCs

Low Action Level will be in effect when the TVOC concentration is greater than or equal to the Low Action Level 5.0 ppm but less than the High Action Level 25.0 ppm. When this tier is reached, a Site meeting will take place between the contractor, air monitor, and any on-site NYSDEC or NYSDOH representatives to determine appropriate corrective actions. Refer to the attached Table 1 for additional detail.

High Action Level will be in effect when the TVOC concentration is greater than or equal to the Action Level of 25.0 ppm. Under this tier, all work will be halted and a representative from the NYSDEC and NYSDOH will be notified. The notification will include a description of the control measures implemented to prevent further exceedances. Work will resume when TVOC levels drop below Low Action Levels. Refer to the attached Table 1 for additional detail.

4.2 Particulate Matter

Low Action Level will be in effect when the PM-10 concentration is greater than or equal to 100 $\mu g/m^3$ above the background level. Under this level, additional dust suppression techniques will be implemented to reduce the generation of fugitive dust (see below), and corrective actions will be taken to protect site personnel and reduce the potential for contamination migration. Corrective actions include holding a Site meeting with the Contractor to discuss additional dust suppression techniques, and increasing the level of personal protection for on-site personnel.

High Action Level will be in effect when the PM-10 concentration is greater than 150 $\mu g/m^3$ above the background level. Under this High Action Level, work will be halted and a representative from the NYSDEC and NYSDOH will be notified. The notification will include a description of the control measures implemented to prevent further exceedances. Work will resume when fugitive dust levels drop below Low Action Levels. The following techniques will be used to suppress dust generation during construction activities (refer to Attachment B):

1. Apply water on exposed soil surfaces;

2. Install temporary soil stabilization measures in accordance with the Specification Section 2120, Soil Erosion and Sediment Control Requirements;
3. Wet equipment and excavation faces, as appropriate;
4. Wet excavation equipment buckets during excavation and dumping, as appropriate;
5. Manage and haul materials in NYSDEC and NYSDOT approved tarped or watertight containers;
6. Restrict Site vehicle speeds to 5 miles per hour (mph);
7. Cover excavated areas and material after excavation activity ceases; and
8. Minimize the excavation footprint size and/or number of excavations.

Attachment A

NYSDEC Generic Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

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

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

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

Community Air Monitoring Plan

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

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

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

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

VOC Monitoring, Response Levels, and Actions

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

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

December 2009

Attachment B

Fugitive Dust and Particulate Monitoring

DER-10 / Technical Guidance for Site Investigation and Remediation

New York State Department of Environmental Conservation

DEC Program Policy

Issuing Authority: Val Washington	**Title:** Deputy Commissioner, Office of Remediation and Materials Management
Date Issued: May 3, 2010	**Latest Date Revised:**

I. Summary: This guidance provides an overview of the site investigation and remediation process for the New York State Department of Environmental Conservation (DEC) remedial programs administered by the Division of Environmental Remediation (DER). These include the Inactive Hazardous Waste Disposal Site Remedial Program, known as the State Superfund Program (SSF); Brownfield Cleanup Program (BCP); Environmental Restoration Program (ERP); and Voluntary Cleanup Program (VCP); and certain petroleum releases.

II. Policy: DER administers the SSF, BCP, ERP, VCP and Bulk Storage Programs and provides response to releases of petroleum. This guidance assists the user in developing and implementing investigation and remediation projects involving contaminated sites under these programs administered by DER. It is a separate document of the requirements for a remedial program set forth in statute and regulation, as well as in guidance. It reflects DER's experience and knowledge in developing and managing the various programs for the past 25 years.

III. Purpose and Background: This guidance provides the scope of activities needed to satisfy minimum requirements for the life-cycle of the site-specific remedial program under the SSF, BCP, ERP, and VCP, and for certain petroleum releases. It facilitates consistent, accurate, efficient and timely completion of remedial projects. It also contains the minimum technical activities DEC will generally accept for projects where DER oversight, approval or acceptance is sought or mandated by law.

DER will, however, determine the acceptable minimum technical activities for a particular site upon consideration of all the facts and circumstances of such site under the authority of applicable laws and regulations. No provision of this guidance document should be construed to limit DER's authority to require additional investigation and/or remediation based upon site-specific conditions. Sections 1.1 and 1.2 present the scope and applicability of this guidance document in more detail.

No provisions of this guidance, however, should be construed to alter the requirements of the Navigation Law or Environmental Conservation Law, or any regulation or order or permit having the force of law. This guidance does not replace or supersede protocols established for emergency spill response actions, emergency drum removal actions, and other such events requiring immediate responses and follow-up. In such time-critical situations, existing guidance established pursuant to applicable emergency response laws, regulations and policy, and directives of the on-scene DEC Spill Responder or Project Manager must be followed.

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

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

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

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

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

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Attachment C

CAMP Equipment Specification Sheets

DUSTTRAK™ II AEROSOL MONITORS MODELS 8530, 8530EP AND 8532

DESKTOP OR HANDHELD UNITS FOR ANY ENVIRONMENT, ANY APPLICATION

DustTrak™ II Aerosol Monitors are battery-operated, data-logging, light-scattering laser photometers that give you real-time aerosol mass readings. They use a sheath air system that isolates the aerosol in the optics chamber to keep the optics clean for improved reliability and low maintenance. From desktop and desktop with external pump models to a handheld model, the DustTrak II offers a suitable solution for harsh industrial workplaces, construction and environmental sites and other outdoor applications, as well as clean office settings. The DustTrak II monitors measure aerosol contaminants such as dust, smoke, fumes and mists.

Features and Benefits

All Models

+ Real-time mass concentration readings and data-logging allow for data analysis during and after sampling.
+ Simultaneously measure size-segregated mass fraction concentrations corresponding to PM1, PM2.5, Respirable, PM10, and Total PM size fractions
+ Easy-to-use graphical user interface with color touch-screen for effortless operation

Desktop Models (8530 and 8530EP)

+ Energy-efficient, long lasting external pump for continuous, unattended, 24/7, outdoor monitoring applications (Model 8530EP only)
+ Long life internal pump for shorter work-shift or IAQ sampling applications (Model 8530)
+ Gravimetric reference sampling capability for custom reference calibrations
+ Automatic zeroing (with optional zero module) to minimize the effect of zero drift
+ STEL alarm setpoint for tracking 15-minute average mass concentrations

Handheld Model (8532)

+ Long life internal pump for continuous sampling
+ Single-point data collection for walk through surveys
+ Lightweight design with ergonomic handle for portable applications

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Desktop Models: Ideal for Long-Term Surveys and Remote Monitoring Applications

The DustTrak II is offered as a standard desktop (Model 8530), as well as a desktop with external pump (Model 8530EP.) Both models have manual and programmable data logging functions, making them ideal for unattended applications. The standard desktop model is most suitable for indoor, continuous monitoring, while the desktop with external pump is designed for 24/7 unattended, remote monitoring outdoors.

The DustTrak II desktop models come with USB (device and host), Ethernet, and analog and alarm outputs allowing remote access to data. User adjustable alarm setpoints for instantaneous or 15-minute short-term excursion limit (STEL) are also available on desktop models. The alarm output with user-defined setpoint alerts you when upset or changing conditions occur.

The DustTrak II desktop monitors have several unique features:

+ Measure aerosols in high concentrations up to 400 mg/m3.
+ External pump (Model 8530EP) with low power consumption for continuous, unattended monitoring in remote outdoor locations.
+ Gravimetric sampling capability using a 37-mm filter cassette which can be inserted in-line with the aerosol stream allowing you to perform an integral gravimetric analysis for custom reference calibrations.
+ Zeros automatically using the external zeroing module. This optional accessory is used when sampling over extended periods of time. By zeroing the monitor during sampling, the effect of zero drift is minimized.
+ STEL alarm feature for tracking 15-minute average mass concentrations when alarm setpoint has been reached for applications like monitoring fugitive emissions at hazardous waste sites.

Handheld Models: Perfect for Walk-Through Surveys and Single-Point Data Collection Applications

The DustTrak II Handheld Model 8532 is lightweight and portable. It is perfect for industrial hygiene surveys, point source location monitoring, indoor air quality investigations, engineering control evaluations/validation, and for baseline trending and screening. Like the desktop models, it has manual and programmable data logging functions. In addition, the handheld model also has a single-point data logging capability. Single-point data collection is used for walk-through industrial hygiene surveys and indoor air quality investigations.

Applications	Desktop	Handheld
Aerosol research studies	+	+
Baseline trending and screening	+	+
Engineering control evaluations		+
Engineering studies		+
Epidemiology studies	+	+
Indoor air quality investigations	+	+
Industrial/occupational hygiene surveys	+	+
Point source monitoring		+
Outdoor environmental monitoring	+	
Process monitoring	+	+
Remote monitoring	+	

Battery Performance		
Models 8530 and 8530EP (Typical) 6600 mAH Li-Ion Battery Pack (P/N 801680)	1 Battery	2 Batteries
Battery runtime (hours)	Up to 6	Up to 12
Charge time* (hours) in DustTrak	4	8
Charge time* (hours) in external battery charger (P/N 801685)	4	8

Model 8532 (Typical) 3600 mAH Li-Ion Battery Pack (P/N 801681)	Battery
Battery runtime (hours)	Up to 6
Charge time* (hours) in DustTrak	4
Charge time* (hours) in external battery charger (P/N 801686)	4

* Of a fully depleted battery

Desktop Monitor with External Pump, Model 8530EP

DustTrak II Aerosol Monitor Features

All Models

+ Li-Ion rechargeable batteries
+ Internal and external battery charging capabilities
+ Outlet port for isokinetic sampling applications
+ User serviceable sheath flow and pump filters
+ Logged test pause and restart feature
+ Logged test programming
  + Color touch screen–either manual mode or program mode
  + TrakPro™ Data Analysis Software via a PC
+ User adjustable custom calibration settings
+ Instantaneous alarm settings with visual and audible warnings
+ Real-time graph display
+ View statistical information during and after sampling
+ On-screen instrument status indicators: FLOW, LASER and FILTER
+ Filter service indicator for user preventative maintenance

Desktop Models (8530 and 8530EP)

+ Long life external pump (8530EP)
+ Internal pump (8530)
+ Hot swappable batteries
+ Gravimetric reference sample capability
+ Auto zeroing module (optional accessory)
+ STEL alarm setpoint

Handheld Model (8532)

+ Long life internal pump
+ Single-point data collection for walk through surveys

Easy to Program and Operate

The graphical user interface with color touch-screen puts everything at your fingertips. The easy-to-read display shows real-time mass concentration and graphical data, as well as other statistical information along with instrument pump, laser and flow status, and much more. Perform quick walk-through surveys or program the instrument's advanced logging modes for long-term sampling investigations. Program start times, total sampling times, logging intervals, alarm setpoints and many other parameters. You can even set up the instrument for continuous unattended operation.

TrakPro™ Software Makes Monitoring Easier than Ever

TrakPro™ Data Analysis Software allows you to set up and program directly from a PC. It even features the ability for remote programming and data acquisition from your PC via wireless (922 MHz or 2.4 GHz) communications or over an Ethernet network. As always, you can print graphs, raw data tables, and statistical and comprehensive reports for record keeping purposes.

Handheld Monitor, Model 8532

SPECIFICATIONS

DUSTTRAK™ II AEROSOL MONITORS MODELS 8530, 8530EP AND 8532

Sensor Type
90° light scattering

Particle Size Range
0.1 to 10 µm

Aerosol Concentration Range

8530 Desktop	0.001 to 400 mg/m³
8530EP Desktop with External Pump	0.001 to 400 mg/m³
8532 Handheld	0.001 to 150 mg/m³

Resolution
±0.1% of reading or 0.001 mg/m³, whichever is greater

Zero Stability
±0.002 mg/m³ per 24 hours at 10 sec time constant

Flow Rate
3.0 L/min set at factory, 1.40 to 3.0 L/min, user adjustable

Flow Accuracy
±5% of factory set point, internal flow controlled

Temperature Coefficient
+0.001 mg/m³ per °C

Operational Temp
32 to 120°F (0 to 50°C)

Storage Temp
-4 to 140°F (-20 to 60°C)

Operational Humidity
0 to 95% RH, non-condensing

Time Constant
User adjustable, 1 to 60 seconds

Data Logging
5 MB of on-board memory (>60,000 data points)
45 days at 1 minute logging interval

Log Interval
User adjustable, 1 second to 1 hour

Physical Size (H x W x D)

Handheld	4.9 x 4.8 x 12.5 in. (12.5 x 12.1 x 31.6 cm)
Desktop	5.3 x 8.5 x 8.8 in. (13.5 x 21.6 x 22.4 cm)
External Pump	4.0 x 7.0 x 3.5 in. (10.0 x 18.0 x 9.0 cm)

Weight

Handheld	2.9 lb (1.3 kg), 3.3 lb (1.5 kg) with battery
Desktop	3.5 lb (1.6 kg), 4.5 lb (2.0 kg)-1 battery, 5.5 lb (2.5 kg)-2 batteries
External Pump	3.0 lb (1.4 kg)

Communications

8530	USB (host and device) and Ethernet. Stored data accessible using flash memory drive
8530EP	USB (host and device) and Ethernet. Stored data accessible using flash memory drive plus, cable assembly for external pump
8532	USB (Hose and device). Stored data accessible using flash memory drive

Power-AC
Switching AC power adapter with universal line cord included, 115-240 VAC

Analog Out

8530/8530EP	User selectable output, 0 to 5 V or 4 to 20 mA. User selectable scaling range

Alarm Out

8530/8530EP	Relay or audible buzzer Relay Non-latching MOSFET switch + User selectable set point + -5% deadband + Connector 4-pin, Mini-DIN connectors
8532	Audible buzzer

Screen

8530	5.7 in. VGA color touchscreen
8532	3.5 in. VGA color touchscreen

Gravimetric Sampling

8530/8530EP	Removable 37 mm cartridge (user supplied)

CE Rating

Immunity	EN61236-1:2006
Emissions	EN61236-1:2006

Specifications are subject to change without notice.

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Germany	**Tel:** +49 241 523030		

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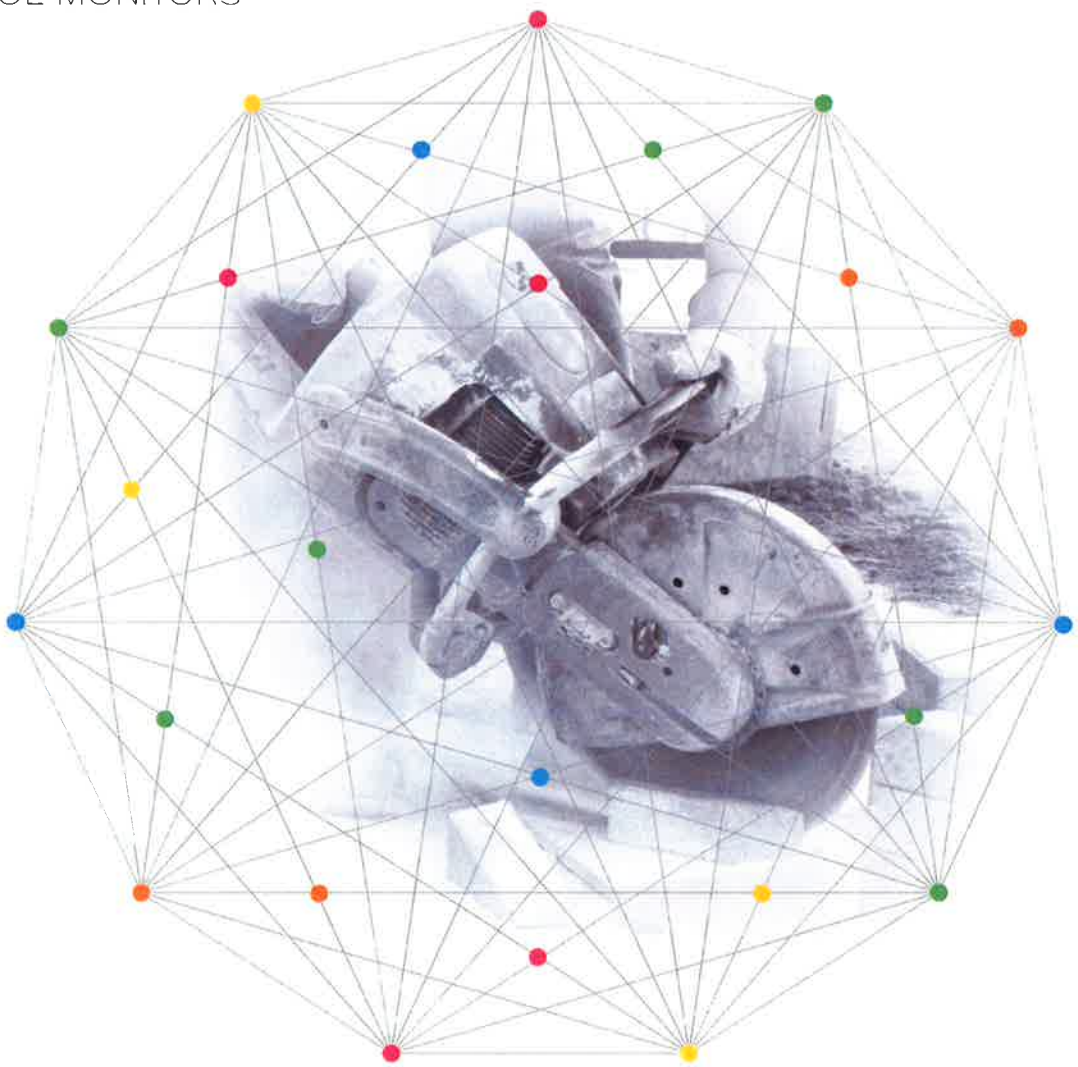
REAL-TIME DUST AND AEROSOL MONITORING

THE DUSTTRAK™ II AND DRX AEROSOL MONITORS



UNDERSTANDING, ACCELERATED

REAL-TIME DUST MONITORING. ANY ENVIRONMENT. ANY APPLICATION.

The DustTrak™ II and DRX Aerosol Monitors are battery-operated, data-logging, light-scattering laser photometers that give you real-time aerosol mass readings. They use a sheath air system that isolates the aerosol in the optics chamber to keep the optics clean for improved reliability and low maintenance. From desktop and desktop with external pump models to handheld models, the DustTrak DRX and DustTrak II offer a suitable solution for harsh industrial workplaces, construction and environmental sites and other outdoor applications, as well as clean office settings. DustTrak DRX and DustTrak II monitors measure aerosol contaminants such as dust, smoke, fumes and mists.

Application	Desktop	Handheld
Aerosol research studies	+	+
Baseline trending and screening	+	+
Emissions monitoring	+	+
Engineering control evaluations		+
+ Corrective action validation		+
Engineering studies		+
Epidemiology studies	+	+
Indoor air quality investigations	+	+
Industrial/occupational hygiene surveys	+	+
Point source monitoring		+
Outdoor environmental monitoring	+	
+ Fugitive emissions monitoring	+	
+ Site perimeter monitoring	+	
+ Fenceline monitoring	+	
+ Dust control operations	+	+
+ Environmental research studies	+	
Process Monitoring	+	+
Remote monitoring	+	

EASY TO PROGRAM, EASY TO OPERATE

The new graphical user interface with color touch-screen puts everything at your fingertips. The easy-to-read display shows real-time mass concentration and graphical data as well as other statistical information along with instrument pump, laser and flow status, and much more. Perform quick walk-through surveys or program the instrument's advanced logging modes for long-term sampling investigations. Program the start time, total sampling time, logging intervals, alarm setpoints and many other parameters. You can even set up the instrument for continuous unattended operation.

TrakPro™ Software Makes Monitoring Easier than Ever

TrakPro™ Data Analysis Software allows you to set up and program directly from a PC. It even features the ability for remote programming and data acquisition from your PC via wireless (922 MHz or 2.4 GHz) communications or over an Ethernet network. As always, you can print graphs, raw data tables, and statistical and comprehensive reports for recordkeeping purposes.

HANDHELD MODELS

Perfect for Walk-Through Surveys and Single-Point Data Collection Applications

Handheld DustTrak aerosol monitors (Models 8532 and 8534) are lightweight and portable. They are perfect for industrial hygiene surveys, point source location monitoring, indoor air quality investigations, engineering control evaluations / validation, and for baseline trending and screening. Like desktop models, they have manual and programmable data logging functions. They also have single-point data logging capability useful for industrial hygiene walk-through surveys and indoor air quality investigations.

DESKTOP MODELS

Ideal for Long-Term Surveys and Remote Monitoring Applications

The DustTrak is also offered as a standard desktop (Models 8530 and 8533), as well as desktop with external pump (Models 8530EP and 8533EP.) All models have manual and programmable data logging functions, making them ideal for unattended applications. The standard desktop model is most suitable for indoor, continuous monitoring, while the desktop with external pump is designed for 24/7 unattended, remote monitoring outdoors.

The DustTrak desktop models come with USB (device and host), Ethernet, and analog and alarm outputs allowing remote access to data. User adjustable alarm setpoints for instantaneous or 15-minute short-term excursion limit (STEL) are also available on desktop models. The alarm output with user-defined setpoint alerts you when upset or changing conditions occur.

THE DUSTTRAK DESKTOP MONITORS HAVE SEVERAL UNIQUE FEATURES:

+ External pump (Models 8530EP and 8533EP) with low power consumption for continuous, unattended monitoring in remote outdoor locations.
+ Gravimetric sampling capability using a 37-mm filter cassette which can be inserted in-line with the aerosol stream, allowing you to perform an integral gravimetric analysis for custom reference calibrations.
+ Zeros automatically using the external zeroing module. This optional accessory is used when sampling over extended periods of time. By zeroing the monitor during sampling, the effect of zero drift is minimized.
+ STEL alarm feature for tracking 15-minute average mass concentrations when alarm setpoint has been reached for applications like monitoring fugitive emissions at hazardous waste sites.

ADVANCED TECHNOLOGY
UNSURPASSED PERFORMANCE

DustTrak II Aerosol Monitors

All DustTrak II Aerosol Monitors are continuous, real-time, single-channel, 90° light-scattering laser photometers that are used to determine the mass concentration of aerosols. A built-in pump allows for the use of a variety of size-selective inlet conditioners to measure aerosol concentrations corresponding to PM10, PM2.5, PM1, or respirable size fractions.

DustTrak DRX Aerosol Monitors

The DustTrak DRX Aerosol Monitors are laser photometers that simultaneously measure mass and size fraction - something no other monitor can do. Both the desktop and handheld monitors are continuous, real-time, 90° light-scattering laser photometers that simultaneously measure size-segregated mass fraction concentrations corresponding to PM1, PM2.5, Respirable, PM10, and Total PM size fractions. They combine both particle cloud (total area of scattered light) and single particle detection to achieve mass fraction measurements.

This size-segregated mass fraction measurement technique is superior to either a basic photometer or optical particle counter (OPC). It delivers the mass concentration of a photometer and the size resolution of an OPC.

+ Photometers can be used at high mass concentration, but they do not give any size information (unless used with size selective inlet conditioners) and significantly underestimate large particle mass concentrations.
+ OPC's provide size and count information; however, they do not provide any mass concentration information and cannot be used in high mass concentration environments.

Comparison of Arizona Road Dust: DustTrak DRX vs. TEOM

The PM10 figures on the next page show size-segregated Arizona Road Dust mass concentration measured by the DustTrak DRX monitor. These mass concentrations were compared with a Tapered Element Oscillating Microbalance (TEOM). Three separate experiments were performed with PM2.5, Respirable, and PM10 inlet conditioners attached to the inlet of the TEOM. Each size-segregated mass fraction channel measured by the DustTrak DRX monitor shows excellent correlation with the TEOM using the proper inlet conditioner.

For additional information on this comparison, see TSI Application Note EXPMN-004.

REAL-TIME, ACCURATE RESULTS

DustTrak DRX Aerosol Monitor Advantages Over TEOM

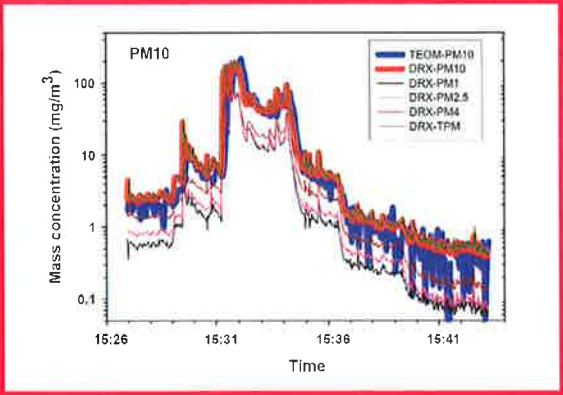
1. Faster response time
2. Continuous and faster data acquisition rate (once per second)
3. Simultaneous measurement of size segregated mass fraction concentrations
4. Size segregated mass fraction data is shown in real-time
5. No need for multiple instruments for different size fraction measurements
6. No need for size-selective inlet conditioners
7. No consumables and low maintenance
8. Much lower cost of ownership - one instrument can do the work of five

DustTrak DRX Aerosol Monitor Advantages Over OPCs

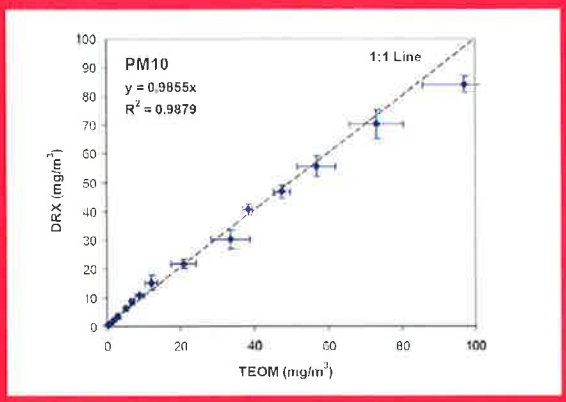
1. Simultaneous measurement of size-segregated mass fraction concentrations
2. Size-segregated mass fraction data is shown in real-time
3. Can be used in high mass concentration environments
4. Ability to generate custom calibration factors with integrated gravimetric reference sampling capability based on aerosol of interest
5. Significantly reduces mass conversion errors using particle size and count data due to particle density, refractive index and shape
6. Lower particle detection range down to 0.1 µm in particle size

DustTrak DRX Aerosol Monitor Advantages Over Single-Channel Photometers

1. Greater sensitivity to particles >1 µm in size
2. Simultaneous measurement of size-segregated mass fraction concentrations
3. Size-segregated mass fraction data is shown in real-time
4. Ability to generate custom calibration factors with integrated gravimetric reference sampling capability based on aerosol of interest
5. No need for multiple instruments for different size fraction measurements
6. No need for size-selective inlet conditioners



Comparison of Arizona Road Dust (A1) mass concentration measured by the DustTrak DRX and the TEOM with a PM10 impactor.



Linear correlation between DustTrak DRX and TEOM for Arizona Road Dust (A1) mass concentration measurement. The TEOM ran with a PM10 impactor.

PARAMETERS AND FEATURES CHART

THE CHART BELOW IS A GUIDE FOR SELECTING A DUSTTRAK AEROSOL MONITOR MODEL THAT BEST FIT YOUR MEASUREMENT NEEDS.

Features	DustTrak II Desktop Model 8530	DustTrak II Desktop Model 8530EP	DustTrak II Handheld Model 8532	DustTrak DRX Desktop Model 8533	DustTrak DRX Desktop Model 8533EP	DustTrak DRX Handheld Model 8534
Gravimetric reference sample (37 mm filter cassette, user supplied) capability with active flow control for flow accuracy, ±5% of factory setpoint	+	+		+	+	
User adjustable custom calibration settings	+	+	+	+	+	+
Auto zeroing module (optional accessory)	+	+		+	+	
15 minute STEL alarm	+	+		+	+	
Instantaneous alarm settings with visual and audible warnings	+	+	+	+	+	+
Logged test pause and restart feature	+	+	+	+	+	+
Logged test programming	+	+	+	+	+	+
+ Color touch screen - either manual mode or program mode	+	+	+	+	+	+
+ TrakPro Data Analysis Software via a PC	+	+	+	+	+	+
TrakPro Data Analysis Software	+	+	+	+	+	+
+ Remote programming and real-time data acquisition	+	+	+	+	+	+
+ USB host with wireless radio modem (922MHz/2.4GHz)	+	+	+	+	+	+
+ Ethernet	+	+		+	+	
+ Analog / alarm output	+	+		+	+	
Download data directly from instrument via	+	+	+	+	+	+
+ USB flash drive to PC	+	+	+	+	+	+
+ USB device to PC	+	+	+	+	+	+
+ Ethernet to PC	+	+		+	+	+
View statistical information during and after sampling	+	+	+	+	+	+
Real-time graph display	+	+	+	+	+	+
Long life internal pump	+		+	+		+
Long life external pump		+			+	
Li-Ion rechargeable batteries	+	+	+	+	+	+
Hot swappable batteries	+	+		+	+	
Internal and external battery charging capabilities	+	+	+	+	+	+
Outlet port for isokinetic sampling applications	+	+	+	+	+	+
On-screen instrument status indicators: FLOW, LASER and FILTER	+	+	+	+	+	+
Filter service indicator for user preventative maintenance	+	+	+	+	+	+
User serviceable sheath flow and pump filters	+	+	+	+	+	+
Display and user interface - 5.7" VGA color touch screen	+	+		+	+	
Display and user interface - 3.6" VGA color touch screen			+			+

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MiniRAE 2000

Portable Handheld VOC Monitor

The rugged **MiniRAE 2000** is the smallest pumped handheld volatile organic compound (VOC) monitor on the market. Its Photoionization Detector's (PID) extended range of 0-10,000 ppm makes it an ideal instrument for applications from environmental site surveying to HazMat/Homeland Security.

Key Features

Proven PID technology The patented 3D sensor provides a 3-second response up to 10,000 ppm and sets a new standard for resistance to moisture and dirt.

Self-cleaning lamp and sensor Our patented self-cleaning lamp and sensor minimize the need for maintenance and calibration.

The MiniRAE 2000 lamp and sensor can be taken apart in seconds for easy maintenance without any tools!

Measure more chemicals than with any other PID With over 100 Correction Factors built into the **MiniRAE 2000** memory and the largest printed list of Correction Factors in the world (300+), RAE Systems offers the ability to accurately measure more ionizable chemicals than any other PID. When a gas is selected from the MiniRAE 2000's library, the alarm points are automatically loaded into the meter.

User friendly screens make it easy to use for simple applications and flexible enough for sophisticated operations.

Drop-in battery When work schedules require putting in more than the 10 hours supplied by the standard NiMH battery, the drop-in alkaline pack supplied with every MiniRAE 2000 lets you finish the job.

Rugged Rubber Boot The standard rubber boot helps assure that the MiniRAE 2000 survives the bumps and knocks of tough field use.

Strong, built-in sample pump draws up to 100 feet (30m) horizontally or vertically.

Tough flexible inlet probe

Large keys operable with 3 layers of gloves.

Easy-to-read display with backlight.

Stores up to 267 hours of data at one minute intervals for down-loading to PC (with the datalogging option).

3-year 10.6 eV lamp warranty

Applications

HazMat/Homeland Security

- Initial PPE (personal protective equipment) assessment
- Leak detection
- Perimeter establishment and maintenance
- Spill delineation
- Decontamination
- Remediation

Industrial Hygiene/Safety

- Confined Space Entry (CSE)
- Indoor Air Quality (IAQ)
- Worker exposure studies

Environmental

- Soil and water headspace analysis
- Leaking underground storage tanks
- Perimeter fenceline monitoring
- Fugitive emissions (EPA Method 21)
- Vapor recovery breakthrough
- Landfill monitoring

RAE Systems Inc.
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Room 8, 6/F, Hong Leong Plaza, 33 Lok Yip Road, Fanling, N.T. • Hong Kong
Tel: 852.2669.0828

RAE SYSTEMS

Specifications*

Default Sensor Settings**

Gas Monitor	Range (ppm)	Resolution (ppm)	Response Time (T90)
VOCs	0 - 999 ppm	0.1 ppm	< 3 sec
	100 - 10,000 ppm	1 ppm	< 3 sec

Detector Specifications

Size	8.2"L x 3.0"W x 2.0"H (21.8 x 7.62 x 5.0 cm)
Weight	20 oz with battery pack (553g) w/o rubber boot
Sensor	Photoionization sensor with standard 10.6 eV or optional 9.8eV or 11.7 eV UV lamp
Battery	• Rechargeable, external, field replaceable Nickel-Metal-Hydride (NiMH) battery pack • Alkaline battery holder (for 4 AA batteries)
Operating Period	10 hours continuous operation
Display	Large LCD, backlight activated manually, with alarms or darkness
Keypad	1 operation and 2 programming keys
Direct Readout	• VOCs as ppm by volume • High and low values • STEL and TWA (in hygiene mode) • Battery and shut down voltage
Alarms	90 dB buzzer and flashing red LED to indicate exceeded preset limits • High: 3 beeps and flashes per second • Low: 2 beeps and flashes per second • STEL and TWA: 1 beep and flash per second • Alarms automatic reset or latching with manual override • Optional plug-in pen size vibration alarm • User adjustable alarm limits
Calibration	Two point field calibration of zero and standard reference gas. Calibration memory of 8 calibration gases, alarm limits, span values and calibration date
Datalogging	Optional 267 hours (at one minute intervals) with date/time. Header information includes monitor serial number, user ID, site ID, date and time
Sampling Pump	• Internal, integrated flow rate 400 cc/min • Sample from 100' (30m) horizontally or vertically
Low Flow Alarm	Auto shut-off pump at low flow condition
Communication	Download data and upload instrument set-up from PC through RS-232 link to serial port
Temperature	14° to 104°F (-10° to 40°C)
Humidity	0% to 95% relative humidity (non-condensing)
EM/RFI	Highly resistant to EMI /RFI. Compliant with EMC Directive 89/336/EEC
IP-rating	IP-55: protected against dust, protected against low pressure jets of water from all directions
Hazardous Area Approval	• US and Canada: UL and cUL, Classified for use in Class I, Division 1, Groups A, B, C and D hazardous locations • Europe: ATEX II IG EEx ia IIC T4
Attachment	Durable bright yellow rubber boot w/belt clip & wrist strap
Warranty	Lifetime on non-consumable components (per RAE Systems Standard Warranty), 3 years for 10.6.V PID lamp, 1 year for pump and battery

* On going projects to enhance our products means that these specifications are subject to change

** Performance based on isobutylene calibration

MiniRAE 2000 and Accessories

Monitor only includes:

- 10.6eV, 9.8eV or 11.7eV as specified
- RAE Systems UV lamp: 10.6eV, 9.8eV or 11.7eV as specified
- 5-inch Flex-I-Probe
- External filter
- Rubber boot with belt clip
- Alkaline battery adapter
- Tool kit
- Lamp cleaning kit
- Nickel-Metal-Hydride battery
- 120/230 V AC/DC wall adapter (if specified)
- Operation and maintenance manual

Monitor with accessories kit adds:

- Hard transport case with pre-cut foam
- 5 porous metal filters and O-rings
- Organic vapor zeroing adapter
- Gas outlet port and tubing

Optional calibration kit adds:

- 10 ppm isobutylene calibration gas, 34L
- Calibration regulator and flow controller

Datalogging monitor adds:

- ProRAE Suite software package for Windows 98, NT, 2000 and XP
- Computer interface cable

Optional Guaranteed Cost of Ownership Program:

- 4-year repair and replacement guarantee
- Annual maintenance service

ATEX

ISO 9001 CERTIFIED

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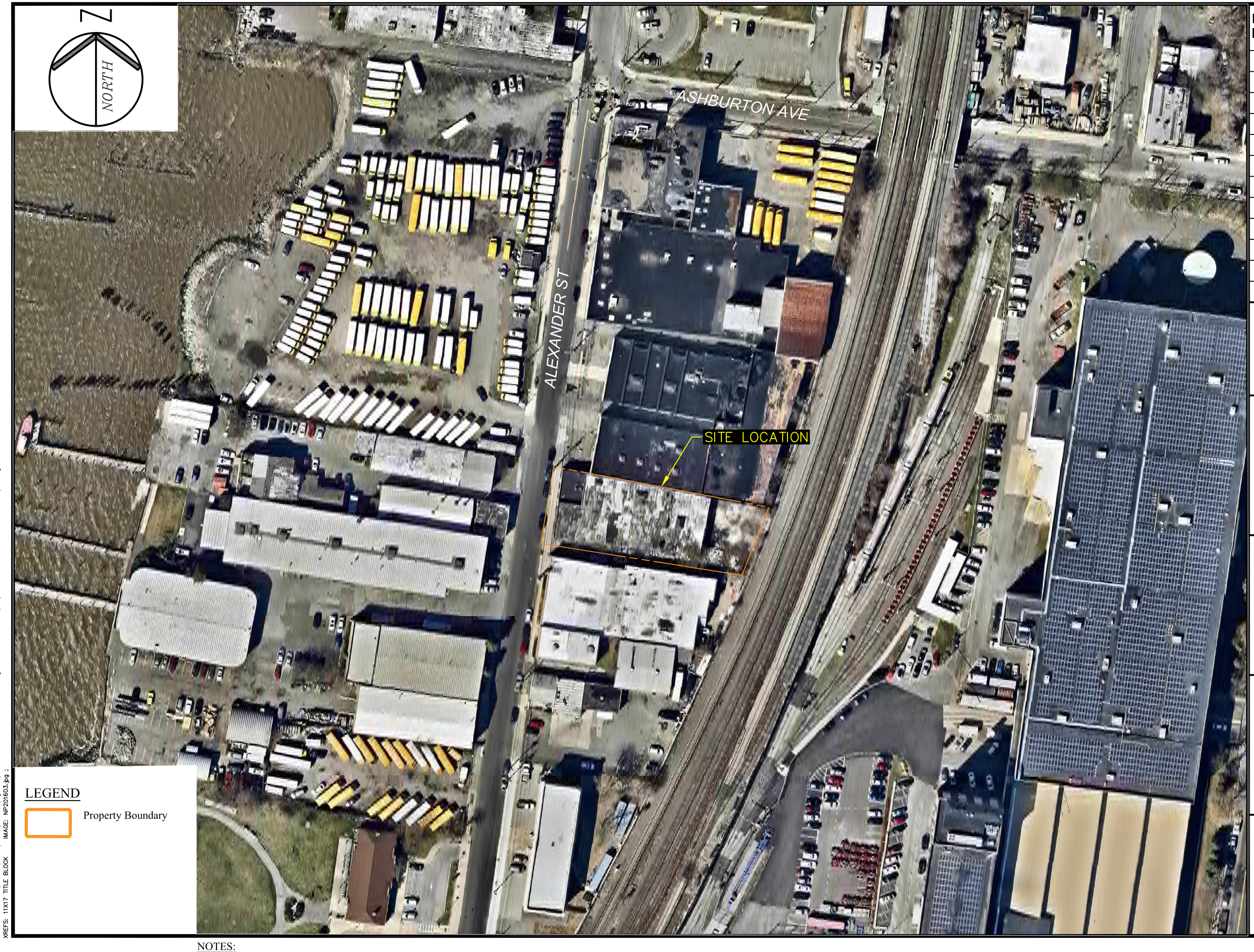
Tel: 852.2669.0828

FIGURES

- Figure 1 Site Location Map



NOTES:

1. AERIAL IMAGERY SHOWN WAS OBTAINED FROM BING MAPS DATED MARCH 26, 2016

REV. / ISSUE	DATE	DESCRIPTION

PAULUS, SOKOLOWSKI AND SARTOR ARCHITECTURE & ENGINEERING, P.C.

1 LARKIN PLAZA
2nd FLOOR
YONKERS, NEW YORK 10701
PHONE: (914) 509-8600

PROJECT

72 ALEXANDER STREET
FONDAK ENTERPRISES LLC

CITY OF YONKERS, WESTCHESTER COUNTY, NY

SHEET TITLE

SITE LOCATION PLAN

PROJ. NO.:	05794-0001
DATE:	03/28/2017
DRAWN BY:	AK
CHECKED BY:	PM
SCALE:	1"=30'
SHEET NO.	FIGURE 1

FILE NAME: P:\05794\0001\DWGs\C-Civil\Figures\05794030-E_FIGURE_YN_PJM.dwg LAST EDIT: 04/03/2017 – 03:53:24 PM LOGIN: pmchugh
XREFS: 11X17 TITLE BLOCK IMAGE: NP2016O3.jpg ;
pmchugh

TABLES

- Table 1 Summary of Community Air Monitoring Plan Corrective Actions, Equipment and Procedures
- Table 2 Weekly Data Summary Report

One Larkin Plaza
2nd Floor
Yonkers, NY 10701

t. 914.509.8600

www.psands.com

Table 1
Summary of Community Air Monitoring Plan Corrective Actions, Equipment and Procedures
Former Glenwood Container (NYSDEC Site C360154)
72 Alexander Street, Yonkers, New York

Corrective Action Criteria		
	Total VOCs	**Total Particulates PM-10**
Low Action Limit[a]	>5 ppm 15 minute average	>100 µg/m^3 above upwind concentration 15 minute average
Corrective Action	Temporary halt and continuously monitor. If concentrations decrease to below 5 ppm, resume work with continuous monitor.	Temporary halt work and implement dust suppression. Resume work if concentrations are <100 µg/m3.
	If > 5ppm but < 25ppm, identify source of vapors, take corrective actions to abate emissions and continuous monitor.	If > 100 µg/m3 but < 150 µg/m3, identify source of dust emissions and take action to abate emissions.
	Resume work if the 15-min average remains <25 ppm at the nearest downwind CAMP station.	Resume work if concentrations are <150 µg/m^3, dust suppression controls are in place, and no visible dust is migrating from the work area.
	N/A	NA
High Action Limit[a]	>25 ppm 15 minute average	>150 µg/m^3 above upwind concentration 15 minute average
Corrective Actions	Halt work. Implement measures to reduce concentrations of TVOC in the ambient air.	Halt work. Implement dust control measures to reduce concentrations of dust particulates in the ambient air.
	Resume work if the 15-min average is < 5ppm at the nearest downwind CAMP station.	Resume work if the 15-min average is <100 µg/m3 at the nearest downwind CAMP station.
	N/A	NA
CAMP Equipment and Procedures		
Monitoring Equipment	RAE MiniRAE 2000 PID, or equivalent	TSI DustTrak PM-10, or equivalent
Sampling/Analytical Method	Direct Reading	Direct Reading
Frequency	Continuous during intrusive activities; Periodic during non-intrusive activities	Continuous during intrusive activities; Periodic during non-intrusive activities
Sampling Time	NA	NA
Averaging Time	15 minutes	15 minutes
Recordkeeping	Electronic datalog	Electronic datalog
Turnaround Time	Real time - daily	Real time - daily

Footnotes:

General note - all action and alarm limits are values set above background concentrations

NA = not applicable

a - Values obtained from New York State Department of Health Generic Community Air Monitoring Plan

b - wind direction will be determined by the use of a wind sock/anemometer system

Table 2
Weekly CAMP Data Summary Report
Former Glenwood Container (NYSDEC Site No. C360154)
72 Alexander Street - Yonkers, New York

	Observed Detections				On-site Weather Data			
	Upwind		Downwind		Wind		Air	
	PM-10 ($\mu g/m^3$)	VOC (ppm)	PM-10 ($\mu g/m^3$)	VOC (ppm)	Speed (mph)	Direction	Humidity %	Tempature Degrees °F
Date	Min & Max 15-minute Averages				Daily Averages			
Mon __/___/__	/	/	/	/				
Tue __/___/__	/	/	/	/				
Wed __/___/__	/	/	/	/				
Thu __/___/__	/	/	/	/				
Fri __/___/__	/	/	/	/				
Sat __/___/__	/	/	/	/				
Sun __/___/__	/	/	/	/				

PM-10 = Particulate Matter (dust) Action Limits: PM-10 = 150 $\mu g/m^3$ $\mu g/m^3$ = Micrograms per cubic meter
VOC = Volatile Organic Compounds VOC = 5 ppm ppm = Parts per million (by volume)
ND = No Data NA = Not Applicable

Date	Description of Site Activities
Mon __/___/__	
Tue __/___/__	
Wed __/___/__	
Thu __/___/__	
Fri __/___/__	
Sat __/___/__	
Sun __/___/__	

Date	CAMP Station Locations	Equipment Issues, Etc.
Mon __/___/__	UW:	
	DW:	
Tue __/___/__	UW:	
	DW:	
Wed __/___/__	UW:	
	DW:	
Thu __/___/__	UW:	
	DW:	
Fri __/___/__	UW:	
	DW:	
Sat __/___/__	UW:	
	DW:	
Sun __/___/__	UW:	
	DW:	

Appendix F

Citizen Participation Plan (CPP)

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
Glenwood Container Site, Site No. C360154

November 2016

72 Alexander Street
City of Yonkers
Westchester County, New York

Contents

* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **Fondak Enterprises, LLC ("Applicant")**
Site Name: **Glenwood Container Site ("Site")**
Site Address: **72 Alexander Street, Yonkers, NY 10701**
Site County: **Westchester**
Site Number: **C360154**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants who conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at: http://www.dec.ny.gov/chemical/8450.html .

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

Site Contact List

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.
The site contact list includes, at a minimum:

- chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;
- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

Note: The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site.
See http://www.dec.ny.gov/chemical/61092.html .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

CP Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The

flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

Technical Assistance Grant

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

As of the date the declaration (page 2) was signed by the NYSDEC project manager, the significant threat determination for the site had not yet been made.

To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

Citizen Participation Activities	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repository(ies)	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement (BCA):	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation **Note:** Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA.
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report • Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)	At the time the cleanup action has been completed. **Note:** The two fact sheets are combined when possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

Information submitted with the BCP application regarding the environmental condition at the site are currently under review and will be revised as additional information becomes available.

There are no issues of major public concern known at this time. Since this project will involve primarily rehabilitation of an existing building, with only minor exterior work that will likely involve some excavation in the parking/paved areas around the building and regrading and new paving, it is not likely this project will create any major issues of public concern. Any dust or odors created from the remedial and renovation work that will take place will be managed under the oversight of the NYSDEC and NYSDOH and pursuant to approved work plans, which shall include required dust and odor control measures that must be implemented to avoid unnecessary impacts on the surrounding area.

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

- Location – 72 Alexander Street, City of Yonkers, Westchester County, New York
- Setting – Urban
- Site size – 0.4 Acres
- Adjacent properties – Industrial, Commercial, Railroad

History of Site Use, Investigation, and Cleanup

The Site was developed between 1917 and 1942 and was initially used as a warehouse. Speedway Garage and Universal Glenwood Packaging began operating on the property some time prior to 1971. Garage operations ceased prior to 1982, and the property was operated by Glenwood Container and Universal Glenwood Packaging until 2001. The Site has been used since this time for minor warehousing activities and no use of chemicals has occurred.

Past operation of the Site included the potential use of interior floor drains as a disposal site for petroleum, onsite underground storage tanks, and junk truck storage. The main

source of contamination found to date is the result of on-Site USTs, contaminated site-wide historic fill and historic releases from the Site's past industrial operations. The Site is located in a Brownfield Opportunity Area approved by the City of Yonkers and also on a street with a number of other ongoing Brownfield Cleanup Program projects.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a "qualitative exposure assessment." This assessment characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant proposes that the site will be used for unrestricted purposes.

To achieve this goal, the Applicant will conduct investigation activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant has completed a full site investigation before it entered into the BCP. The Applicant has submitted an investigation report for the full site investigation. NYSDEC will determine if the investigation goals and requirements of the BCP have been met or if additional work is needed before a remedy can be selected."

The site investigation has several goals:

1) define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) identify the source(s) of the contamination;
3) assess the impact of the contamination on public health and the environment; and
4) provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant submits a draft “Remedial Investigation Work Plan” to NYSDEC for review and approval. NYSDEC makes the draft plan available to the public review during a 30-day public comment period.

NYSDEC will use the information in the investigation report to determine if the site poses a significant threat to public health or the environment. If the site is a “significant threat,” it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

A summary of the past environmental reports prepared to date is as follows;

A. September 25, 2012 Phase I Environmental Site Assessment (“ESA”) Prepared by PS&S.

A Phase I Environmental Site Assessment (“ESA”) was conducted by PS&S Integrated Design and Engineering (“PS&S”) to identify recognized environmental conditions (RECs), as defined by ASTM-1527-05, based on the past and current uses of the Site, which could impact future plans relative to site development. The Phase I ESA identified RECs indicating that environmental contaminants were likely to be present on the Site.

Past Uses

Review of available Fire Insurance Maps and the City Directory Abstract revealed that the Site was developed by 1942 with one centrally located building and several smaller buildings to the east. From 1951 to 2004 the Site was identified as Flour and Gro. Warehouse. There was also an auto garage on the Site from 1951 through 1957. The Site was also identified as Universal Glenwood Packaging from 1971 through 2001. From 1982 through 2001, the Site was also identified as Glenwood Container.

Zoning

According to the City of Yonkers Zoning Map, the Site is situated within an industrially zoned district. The historic and present uses are consistent with the current zoning. The planned brewery use is permitted under the current zoning even though a variance may be needed for the restaurant and retail functions. Yonkers has created a Master Plan, Urban Renewal Plan and Brownfield Opportunity Area Plan and this use is also generally consistent with the Plan although zoning approvals will be required.

Groundwater and wetlands

Local groundwater flow direction, inferred from available topographic mapping of the area and the EDR Radius Report, is generally west toward the Hudson River. The Hudson River is a Littoral Zone (LZ), and a wetland area identified as E1UBL (Estuarine, Subtidal, Unconsolidated Bottom, Subtidal). This wetland type is characterized as estuarine and marine deep-water.

Possible Contaminants

The Phase I revealed six recognized environmental conditions (RECs) on the Site and suggested that a Phase II Environmental Site Assessment (Phase II ESA) was necessary:

1. The Site historically contained petroleum stored in underground storage tanks (USTs) located in the western portion of the site, and no documentation was obtained indicating the USTs were removed.
2. Petroleum staining was observed near interior floor drains in the loading dock area of the Site, and standing liquid was observed in these drains. Petroleum staining was also observed in an area of junk truck storage in the Site's southern unpaved driveway. Additionally, there are documented and suspected contaminated facilities upgradient and cross-gradient of the Site with respect to groundwater flow. As a result, the migration of off-site contamination via groundwater beneath the Site is possible. These facilities were identified as the former Patclin Chemical Company located south of the Site and the former Polychrome Manufacturing facility north of the Site.
3. Because the building was built before 1978, it is suspected to contain lead based paint.
4. Because the building was built before 1978, it likely contains asbestos containing building materials (ACBM).
5. Because the building was constructed before 1979 and fluorescent light ballasts were observed during site reconnaissance, it is likely that some fluorescent light ballasts that are currently in place were manufactured with PCBs.
6. Due to the Site's former use as an auto repair shop, referred to as "Speedway Garage" during the 1970s, it is likely that the Site contains petroleum products and/or storage containers that may present subsurface contamination at the Site.

The Phase I recommended subsurface testing in accordance with all applicable regulations to address the potential soil and groundwater contamination issues resulting from the observed presence of petroleum in onsite drains and near junk truck storage, and at the property boundary to determine the condition of underlying soil and to evaluate the potential presence of off-site contamination. The Phase I also recommended a Lead Based Paint (LBP) Survey and an ACBM Survey, and recommended replacement and disposal of onsite fluorescent light ballasts.

B. September 2011 Limited Phase II Environmental Site Investigation by PS&S.

The subsurface Phase II Environmental Site Investigation ("ESI") was conducted by PS&S to investigate the RECs that were identified during PS&S' Phase I ESA. The ESI included the following areas of investigation: (1) Areas downgradient of the Site's suspect USTs; (2) The area of the loading dock floor drains; (3) the truck storage areas in the south driveway; and (4) the upgradient area in the east parking area and the cross-gradient area in the south driveway. The environmental media sampled included surface soil, subsurface soil, sediment (floor drains), groundwater, and soil vapor.

PS&S advanced thirteen soil borings via direct push (GeoProbe) methods on the Site. Seven borings were installed along the Site's southern boundary, which is a driveway shared by the adjacent Patclin Site, two borings were installed in the Site's external eastern parking area along the railroad tracks, three borings were installed inside the building and one boring was installed on the Site's western boundary street frontage near Alexander Street. Generally, one soil sample was collected from each soil boring. PS&S collected two sediment samples from the floor drains in the loading dock area. Three onsite groundwater monitoring wells were also installed in the southeast and western portion of the Site and immediately downgradient of the suspect underground storage tank area. Finally, two soil vapor samples were collected from approximately 4 feet below the building's floor surface grade and above the groundwater table.

Sediment Findings: Petroleum impacts were observed on both of the sediment samples taken from the onsite drains. Both samples included wet, black material with a petroleum and septic odor. The analytical results indicated that TCL VOCs were detected in both sediment samples. Exceedances of the unrestricted use soil cleanup objectives ("SCOs") included the compounds Acetone, Toluene, o-Xylenes, p- & m-Xylenes, total Xylenes, and 1,2,4-Trimethylbenzene. No TCL SVOCs exceeded any SCOs in the sediment samples. Arsenic, Barium, Cadmium, Copper, and Lead were detected in the sediment at concentrations exceeding the Restricted Commercial Use SCOs. PCBs were detected and exceeded the unrestricted use SCOs, but not the commercial use SCOs. PCBs Aroclor 1254 and 1260 were detected in the sediment samples both below their respective SCOs. [NOTE: There is a typo in the Phase II indicating these were pesticides, but these were PCBs exceedances.]

Soil Findings: A chemical or petroleum odor was observed in recovered soil at seven borings. Volatile organic vapor readings were measured with what is called a PID meter at the four borings with the highest VOC readings ranging from 0.2 ppm to 40 ppm. Volatile Organic Compounds (VOCs) were detected in all soil samples. Unrestricted use SCO exceedances were found in six soil samples. Semi Volatile Organic Compounds (SVOCs) were also detected in all soil samples, except for one sample taken from 13-

15 feet, including: Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, and Indeno(1,2,3-cd)pyrene. Exceedances of the commercial use soil cleanup objectives (SCOs) for Benzo(a)pyrene were found in two borings. Finally, heavy metals were detected in all soil samples, including exceedances of one or more of the following metals: arsenic, copper, iron, lead, selenium and zinc. Exceedances of the commercial use SCOs for Arsenic were found in two borings.

Groundwater Findings: VOCs were detected in exceedance of the water quality standard in all groundwater samples, including exceedances of Isopropylbenzene, Acetone and Methylene Chloride however, since Acetone and Methylene Chloride were also detected in the laboratory blanks for all of the samples and are common laboratory contaminants these exceedances could not be confirmed. Isopropylbenzene was detected in one well above its Technical and Operational Guidance Series Groundwater Effluent Limitations.

Soil Vapor Findings: 25 VOCs were detected in the SV-GP1 sample and 15 VOCs were detected in SV-GP-2 sample, all of which exceeded the “background” concentrations of the greater of the NYS indoor and NYS outdoor standards. Methylene chloride was detected at concentrations above the standard set in the New York State Department of Health October 2006 Guidance Document for Evaluating Soil Vapor Intrusion of 60 ug/m3. Trichloroethene was detected at two locations with concentrations above the NYSDOH Standard of 5 ug/m3.

Based on these findings, the Phase II concluded that the suspect USTs may be responsible for petroleum impacts on the Site. The Phase II further concluded that petroleum, VOC, SVOC, and metal impacts in the Site’s drains and near the Site’s Truck Storage Area may be attributable to historical releases from the sites former operations. The Phase II also concluded that soil impacts along the southern boundary may be attributable to historical releases from the former facility located to the south of the Site.

The Phase II recommended that the two suspect USTs located in the western portion of the Site and the impacted sediment documented in the floor drains should be removed and disposed of properly off-Site. The Phase II also recommended further delineation of site-wide impacts and additional soil and groundwater investigations through a Remedial Investigation (RI) to support future remedial action decisions. Further study and/or potential vapor intrusion mitigation is warranted at the Site, and a soil vapor assessment should be performed after remediation.

Interim Remedial Measures

An Interim Remedial Measure (IRM) is an action that can be undertaken at a site when a source of contamination or exposure pathway can be effectively addressed before the

site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period.

Remedy Selection

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a “Certificate of Completion” (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a “Remedial Work Plan”. The Remedial Work Plan describes the Applicant’s proposed remedy for addressing contamination related to the site.

When the Applicant submits a draft Remedial Work Plan for approval, NYSDEC would announce the availability of the draft plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a final engineering report that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

Certificate of Completion

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

Site Management

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An *institutional control* is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An *engineering control* is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A -
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

John Spellman
Project Manager
NYSDEC
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
518-402-9662
John.spellman@dec.ny.gov

Citizen Participation Specialist
NYSDEC Region 3
Sarah Shepard
21 South Putt Corners
New Paltz, NY 12561
P: (845) 256-3154
F: (845) 255-3042
sarah.shepard@dec.ny.gov

New York State Department of Health

Sarita Wagh
Project Manager
NYSDOH
Empire State Plaza – Corning Tower,
Room 1787
Albany, NY 12237
Phone: (518) 402-7860
BEEI@health.ny.gov

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Yonkers Public Library
1 Larkin Center
Yonkers, NY 10701
Attn: Edward M. Falcone

Phone: (914) 337-1500
Hours:

Wednesday	9AM–8PM
Thursday	9AM–8PM
Friday	10AM–5PM
Saturday	9AM–5PM
Sunday	12–5PM
Monday	9AM–8PM
Tuesday	9AM–8PM

Appendix B - Site Contact List

Hon. Kirsten Gillibrand
U.S. Senate
780 Third Ave., Suite 2601
New York, NY 10017

Hon. Charles Schumer
U.S. Senate
780 Third Ave., Suite 2301
New York, NY 10017

Roman Kozicky, Chairman
Yonkers Planning Board
87 Nepperhan Ave
Yonkers, NY 10701

Elliot L. Engel, Congressman
U.S. House of Representatives
6 Gramatan Ave., Suite 205
Mt Vernon, NY 10550

Andrea Stewart-Cousins
State Senator
28 Wells Ave, Bldg. 3
Yonkers, NY 10701

Mike Spano
The City of Yonkers Mayor
City Hall
Yonkers, NY 10701

Liam J. McLaughlin
The City of Yonkers City Council President
40 S Broadway
Yonkers, NY 10701

Robert P. Astorino
Westchester County Executive

148 Martine Ave.
White Plains, NY 10601

Shelly Mayer
Assemblywoman
35 E. Grassy Sprain Rd., 406B
Yonkers, NY 10701

Neil J. Sullivan, Chairman
Westchester Planning Board
87 Nepperhan Ave # 319
Yonkers, NY 10701

Edward Buroughs, Commissioner
Department of City Planning and Development
148 Martine Ave.
White Plains, NY 10601

Wilson Kimball Commissioner
Yonkers Planning and Development
87 Nepperhan Ave.
Yonkers, NY 10701

Vincent Spano
City Clerk
40 S. Broadway
Yonkers, NY 10701

Timothy Idoni
County Clerk
110 MLK Jr. Blvd.
White Plains, NY 10601

Christopher Johnson
City of Yonkers Council District 1
40 S. Broadway
Yonkers, NY 10701

The Journal News
Media Outlet

1133 Westchester Ave., Suite N110
White Plains, NY 10604

Dr. Sheila Amier
County Health Dept.
145 Huguenot Street
New Rochelle, NY 10801

Kenneth W. Jenkins
County Legislator
148 Martine Ave.
White Plains, NY 10601

Virginia Perez
County Legislator
148 Martine Ave.
White Plains, NY 10601

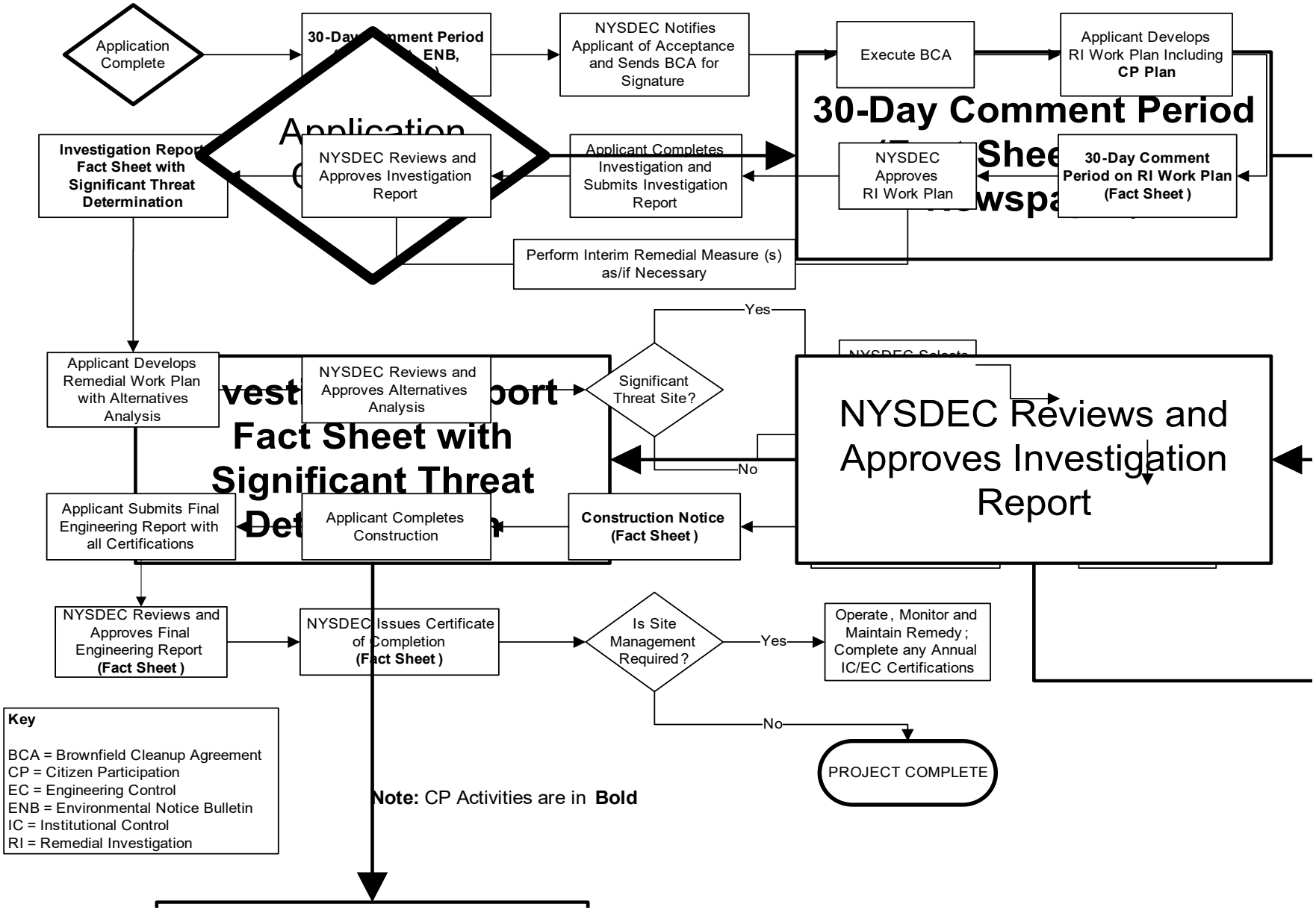
Thomas Maier
Commissioner of Public Works
40 S. Broadway, Room 311
Yonkers, NY 10701

Hon. Judith A. Myers
County Legislator
800 Michaelian Office Bldg.
White Plains, NY 10601
Yonkers, NY 10701

Westchester County Department of Social Services
Operator of 131 Warburton Avenue
131 Warburton Avenue
Yonkers, NY 10701

Appendix C - Site Location Map

Appendix D– Brownfield Cleanup Program Process



Division of Environmental Remediation

Remedial Programs
Scoping Sheet for Major Issues of Public Concern

Division of Environmental Remediation

Remedial Programs
Scoping Sheet for Major Issues of Public Concern

Site Name: Glenwood Container Site

Site Number: C360154

Site Address and County: 72 Alexander Street, Westchester County, Yonkers, NY

Remedial Party(ies): Fondak Enterprises, LLC

Note: For Parts 1. – 3., the individuals, groups, organizations, businesses and units of government identified should be added to the site contact list as appropriate.

Part 1. List major issues of public concern and information the community wants. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and information needs. **Use this information as an aid to prepare or update the Major Issues of Public Concern section of the site Citizen Participation Plan.**
There are no known issues of major public concern to date. Any potential dust and odor issued that may be created during remediation and rehabilitation of the on-Site building will be managed and mitigated to avoid surrounding area impact.

How were these issues and/or information needs identified?
These are standard known potential impacts during remediation and rehabilitation projects.

Part 2. List important information needed **from** the community, if applicable. Identify individuals, groups, organizations, businesses and/or units of government related to the information needed.
No information is now needed from the community. The community will be allowed to comment on the project during both the BCP process and during a zoning approval review.

How were these information needs identified?
These are standards processes in both the BCP and City of Yonkers for public input.

Part 3. List major issues and information that need to be communicated **to** the community. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and/or information.
The community needs to be aware that remediation may require excavation and that there may be truck traffic generated during active on-Site remediation. This will be communicated to the public in Fact Sheets and at a hearing is requested. The public may also see the tanks being removed off-Site.

How were these issues and/or information needs identified?
These issues are part of all BCP remediation projects where Site excavation is required.

Part 4. Identify the following characteristics of the affected/interested community. This knowledge will help to identify and understand issues and information important to the community, and ways to effectively develop and implement the site citizen participation plan (mark all that apply):

a. Land use/zoning at and around site:
☐ **Residential** ☐ **Agricultural** ☐ **Recreational** ☒ **Commercial** ☒ **Industrial**

b. Residential type around site:
☒ **Urban** ☒ **Suburban** ☐ **Rural**

c. Population density around site:
☐ **High** ☒ **Medium** ☐ **Low**

d. Water supply of nearby residences:
☒ **Public** ☐ **Private Wells** ☐ **Mixed**

e. Is part or all of the water supply of the affected/interested community currently impacted by the site?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Yonkers receives its water from upstate reservoirs.

f. Other environmental issues significantly impacted/impacting the affected community?
☐ **Yes** ☒ **No**

Provide details if appropriate:
N/A

g. Is the site and/or the affected/interested community wholly or partly in an Environmental Justice Area?
☐ **Yes** ☒ **No**

h. Special considerations:
☐ **Language** ☐ **Age** ☐ **Transportation** ☐ **Other**

Explain any marked categories in **h:**

Part 5. The site contact list must include, at a minimum, the individuals, groups, and organizations identified in the instructions for **Part 5.** Are other individuals, groups, organizations, and units of government affected by, or interested in, the site, or its remedial program? (Mark and identify all that apply, then adjust the site contact list as appropriate.)

☐ **Non-Adjacent Residents/Property Owners:**

☐ **Local Officials:**

☐ **Media:**

☐ **Business/Commercial Interests:**

☐ **Labor Group(s)/Employees:**

☐ **Indian Nation:**

☐ **Citizens/Community Group(s):**

☐ **Environmental Justice Group(s):**

☐ **Environmental Group(s):**

☐ **Civic Group(s):**

☐ **Recreational Group(s):**

☐ **Other(s):**

Prepared/Updated By: Linda Shaw, Esq. **Date:** 8/16/16

Reviewed Approved By: **Date:**