NYSDOT FORMER MILLER HILL YARD SITE

STEUBEN, COUNTY

FREMONT, NEW YORK

DRAFT Remedial Action Work Plan

NYSDEC BCP Number: C851045

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Certification Statement

I, _____, certify that I am currently a NYS registered professional engineer 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) and Green Remediation (DER-31).

_____	_____	_____
NYS Professional Engineer #	Date	Signature

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List of Acronyms

Acronym	Definition
1,2-DCA	1,2-dichloroethane
AAR	Alternatives Analysis Report
AG-R	Agricultural-Residential
AGVs	Air Guideline Values
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
ca.	Circa
CAMP	Community Air Monitoring Plan
CCR	Construction Completion Report
CFR	Code of Federal Regulations
cis-1,2-DCE	cis-1,2-dichloroethene or cis-1,2-dichloroethylene
CoC	Contaminants of Concern
COC	Certificate of Completion
CP	Commissioner Policy
CPP	Citizen Participation Plan
CSM	Conceptual Site Model
CU	Commercial Use
CVOC	Chlorinated Volatile Organic Compound
DER	Division of Environmental Remediation
DMM	Division of Materials Management
DOB	Department of Buildings
DTW	depth to water
DUSR	Data Usability Summary Report
EC	Engineering Controls
ECL	Environmental Conservation Law
EDD	Electronic Data Deliverable
EE	Environmental Easement
ELAP	Environmental Laboratory Approval Program

Acronym	Definition
ESC	Erosion and Sediment Control
eV	Electron volt
FER	Final Engineering Report
ft	Feet
ft amsl	feet above mean sea level
ft bgs	feet below ground surface
FWIA	Fish & Wildlife Remedial Impact Analysis
GAC	Granular-Activated-Carbon
GPD	Gallons per day
GPRS	Ground Penetrating Radar Survey
GSR	Green and Sustainable Remediation
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IA	Indoor Air
IC	Institutional Controls
IDW	Investigation-Derived Waste
IPaC	Information for Planning and Consultation
IRM	Interim Remedial Measure
IRMCCR	Interim Remedial Measure (No. 2) Construction Completion Report
IRM3CCR	Interim Remedial Measure (No. 3) Construction Completion Report
LD-R	Low-Density Residential
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
MNA	Monitored Natural Attenuation
NLEB	Northern Long-Eared Bat
NTU	Nephelometric Turbidity Units
NY / NYS	New York / New York State
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health

Acronym	Definition
NYSDOT	New York State Department of Transportation
NYSDPW	New York State Department of Public Works
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
"P"	Potential
PCBs	Polychlorinated biphenyl
PCE	Tetrachloroethylene or Perchloroethylene
PDB	Passive Diffusion Bag
PFAS	Per- and Polyfluoroalkyl Substances
PID	Photoionization Detector
POET	Point-of-Entry Treatment
POGW	Protection of Groundwater
PPE	Personal Protective Equipment
PSG	Passive Soil Gas
PVC	Polyvinyl Chloride
PW	Private Wells
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RAOs	Remedial Action Objectives
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
ROW	rights-of-way
SC	Site Characterization
SCG	Standards, Criteria and Guidance
SCO	Soil Cleanup Objectives
SCWP	Site Characterization Work Plan
SEFA	Spreadsheets for Environmental Footprint Analysis

Acronym	Definition
SGV	Standards and Guidance Value
SMP	Site Management Plan
SoMP	Soils/Materials Management Plan
SPDES	State Pollutant Discharge Elimination System
sq ft	square footage
SRIWP	Supplemental Remedial Investigation Work Plan
SSV	sub-slab vapor
SVI	Soil Vapor Intrusion
SVIWP	Soil Vapor Intrusion Work Plan
SVOCs	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCE	Trichloroethene or Trichloroethylene
TCL	Target Compound List
TIC	Tentatively Identified Compound
TOGS	Technical and Operational Guidance Series
TP	Test Pit
µg/kg	Micrograms per kilogram
USACOE	United States Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UU	Unrestricted Use
VOC	Volatile Organic Compounds
WZTC	Work Zone Traffic Control

Executive Summary

On behalf of the New York State Department of Transportation (NYSDOT; or the "Participant"), Stantec Consulting Services Inc. (Stantec) has prepared this Remedial Action Work Plan (RAWP) for the NYSDOT Miller Hill Yard Brownfield Cleanup Program (BCP) site located at 7578 State Route 21 in the Town of Fremont, Steuben County, New York (hereinafter referred to as the "Site"). The NYSDOT entered into a Brownfield Cleanup Agreement (BCA) for the Site with the New York State Department of Environmental Conservation (NYSDEC). The BCA was executed by the parties on September 12, 2017. The Site is designated by the Department as BCP Site #C851045.

Site Description/Physical Setting/Site History

The Site is located in the Town of Fremont (Steuben County) at 7578 State Route 21. The Site consists of one parcel of property, approximately 8.8 acres in size. Approximately 5.7 acres of the Site are surrounded by a chain-link fence with a locking gate. The majority of the Site area inside the fence is generally flat or gently sloping in the south-southwesterly direction, with a steeper slope in the northern portion. The area outside the perimeter of the fence is primarily grass/brush-covered or wooded. Outside the fence, the property slopes upward steeply to the northeast, and downward steeply on the southwest boundary.

The Site has a long history of usage dating to at least the 1930s. In December 1938, the New York State Department of Public Works (NYSDPW; the precursor agency to NYSDOT) reportedly obtained the Site property from a private landowner. The NYSDPW in turn sold the property to the U.S. Army Corps of Engineers (USACOE, under the Department of Commerce, Bureau of Public Roads) in November 1948. The USACOE used the Site as a borrow source for sand and gravel for an unknown length of time. The NYSDPW then re-acquired the property in October 1960. The NYSDOT was created in 1968 and replaced the NYSDPW. Therefore, NYSDOT and its precursor agency owned the Site from 1938 to 1948 and again from 1960 to the present.

NYSDOT used the Site for a variety of activities. Anecdotal evidence suggests that the Site was not fenced and therefore access was uncontrolled for a long period of time, and the public used the former borrow pit for disposal of trash. NYSDOT also reportedly used the Site during

the 1960s through the 1970s for filling and burial of miscellaneous highway-related wastes, including soil, trees and other wood, metallic materials, waste asphalt and intact or damaged/crushed 55-gallon drums. This included numerous drums of unused (expired) white and yellow road-marking paint, which are now known to have contained volatile organic compounds (VOCs), lead, and other contaminants at hazardous levels.

Between the 1970s and approximately 2014 when environmental investigation activities began, NYSDOT's primary use of the Site was for storage and staging of highway-related equipment and construction materials. The current chain-link fence and locking gate that now surrounds the Site was reportedly installed circa (ca.) 1998.

Summary of the Remedial Investigation

Completion of the Remedial Investigation (RI) program is the culmination of several years of investigation and interim remediation work at the Site. Prior to implementation of the RI, other preliminary investigations were conducted as part of NYSDOT Site Characterization (SC) activities.

Prior to NYSDOT investigations, initial investigations performed by NYSDEC were prompted by the detection of the VOC trichloroethene or trichloroethylene (TCE) in a water sample taken in 2007 from one of the City of Hornell Water Supply Wells located approximately one-half mile south of the Site. NYSDEC's subsequent investigations included drilling and sampling of soil and groundwater and sampling of several private water supply wells during the approximate timeframe December 2009 through May 2013. This investigation is generally referred to as the "Carquest Investigation," named for a former commercial automotive parts business where TCE was detected in a private drinking water well, and in a monitoring well subsequently installed on the property. NYSDEC also detected TCE in September 2013 in groundwater monitoring wells it had installed on the Site. NYSDEC indicated in a letter to NYSDOT dated May 19, 2014 that it suspected hazardous waste had been disposed at the Site and therefore the Site could potentially be listed on the NYS Inactive Hazardous Waste Disposal Sites Registry (Registry). The Site was entered into the NYSDEC's Registry tracking system, assigned Site #851045, and given a "P" (Potential) classification. NYSDOT subsequently took over the investigation to further characterize environmental conditions at the Site. Ultimately, the Site retained a "Non-Registry" status since it was instead accepted into the BCP. As

investigation work progressed, it was re-classified to "A" (Active) status; this classification still applies.

NYSDOT authorized Stantec in 2014, under a Term Agreement for environmental services, to begin SC investigations on the Site. These investigations consisted of additional soil and groundwater sampling and other investigative methodologies on the Site. Once the Site was accepted into NYSDEC's BCP, the RI work was performed between November 2018 and June 2021. The RI program generally included: onsite surface soil sampling; sampling of 32 offsite private water supply wells and resampling of select locations; re-development of offsite monitoring wells previously installed by NYSDEC; well gauging and groundwater sampling of existing onsite and offsite wells; drawdown monitoring at five existing offsite wells during a City well pumping event; installation of seven additional offsite and five additional onsite monitoring wells; well gauging and groundwater sampling of newly-installed wells for VOCs; a comprehensive gauging event including a total of 34 onsite and offsite monitoring wells; and a soil vapor intrusion investigation. The RI findings were documented in a Remedial Investigation Report, which was approved by NYSDEC and the New York State Department of Health (NYSDOH) (also referred to collectively as the Departments) and is summarized as follows:

Due to the long history of commercial usage and disposal activities on the Site, chlorinated volatile organic compounds (CVOCs) are present both onsite and, to a limited extent, in offsite downgradient locations. Investigations completed at the Site have identified the following contaminant[s] of concern (CoC[s]) and impacted media that require consideration of potential remedial action or monitoring:

- *Onsite CVOCs in Soil*: Potential onsite remaining CVOC-impacted soil was identified in two sample locations located in the southern portion of the Site to the west of and within Interim Remedial Measure (IRM) Excavation 3-03.

- *Onsite CVOCs in Groundwater*: Exceedances of NYSDEC groundwater standards have been limited to the CVOCs TCE, cis-1,2-dichloroethene or cis-1,2-dichloroethylene (cis-1,2-DCE), and 1,2-dichloroethane (1,2-DCA). The current onsite plume is delineated, with groundwater impacts concentrated in the southern portion of the Site and along the

southwestern [downgradient] property line. CVOCs at the Site, namely TCE, have migrated offsite onto the adjacent properties to the south.

- *Offsite CVOC in Groundwater*: The offsite plume is generally delineated (with the exception of the southern adjacent property) and the area of greatest offsite impacts is in the vicinity of the former Carquest Site property. TCE remains the only groundwater CoC in the offsite Study Area. Recent groundwater sampling data from December 2022 indicates that the TCE impacts are minor compared to the plume initially mapped in 2013. Between 2019 and 2021, only one location in the offsite Study Area exhibited a TCE exceedance: private well PW-16, which is located on the former Carquest Site property. No offsite monitoring wells were reported with groundwater exceedances in the December 2022 sampling event.

Summary of Interim Remedial Measures

Three IRMs have been performed for this Site concurrent with the NYSDOT investigation field programs described above.

- IRM No. 1: Water Treatment Plant – City Wells: The City intermittently operates two groundwater supply wells as a supplement to the City's primary water supply system, which is sourced with treated surface water. Due to the presence of TCE in these wells, and with the presumption that the Miller Hill Yard Site was a source, NYSDOT funded the design and construction of the treatment plant to remove VOCs detected in the water pumped from City Well #1 and City Well #2. The plant was commissioned in July 2016 and continues to be operated by the City Water Department.
- IRM No. 2: Drum and Waste Removal: In July 2015, investigations encountered several buried 55-gallon steel drums of white road-marking paint (still in liquid form) in the northern portion of the Site. In response to this discovery, NYSDOT and Stantec designed and implemented a source-area drum and waste-removal IRM project. An area of approximately 17,500 sq ft in the northern portion of the Site was excavated and approximately 493 paint drums or drum carcasses, paint-impacted soil and other waste materials and debris (approximately 2,970 tons) were removed and disposed offsite. The

work was performed during the period March through December 2017. Waste streams included both non-hazardous and hazardous wastes.

Confirmatory samples from the northeastern corner and southern sidewall of the excavation exhibited exceedances of some applicable NYSDEC Soil Cleanup Objectives (SCOs) (NYSDEC, 2006)[1]. Due to expiration of the Term Contract under which NYSDOT's remedial contractor was operating, work on this IRM was ceased at the end of 2017. The excavation was backfilled, except for a narrow 'trench' along the eastern side. IRM No. 3, described below, was then executed in 2018 to complete the excavation of impacted materials.

- IRM No. 3: Additional Source Material Excavations 3-01 through 3-04: This IRM consisted of additional excavation of impacted soils and waste materials across the Site that were considered to be remaining source areas. Excavations 3-01 and 3-02 were extensions of the Drum Removal excavation described above (IRM No. 2), where residual contamination at concentrations above applicable SCOs (NYSDEC, 2006) were identified. Two additional excavations (3-03 and 3-04) were performed to further address other possible onsite source areas. Approximately 11,200 tons of impacted soil and other miscellaneous wastes, including approximately 134 intact or partial drums were removed and disposed from these areas and disposed offsite. Waste streams included both non-hazardous and hazardous wastes. Confirmatory sampling results indicated that remaining soil largely met applicable SCOs. The work was essentially complete in August 2019.

Additionally, NYSDOT arranged for installation of Point-of-Entry Treatment (POET) systems for one private commercial water supply well and two private residential wells located generally downgradient of the Site due to historical and recent detection of VOCs. The systems were installed in March 2020. Results of follow-up sampling indicate that the systems have been effective in removing/reducing VOCs from these private water supplies such that effluent

[1] During the Interim Remedial Measures, Site Characterization/Remedial Investigation activities, and Alternatives Analysis, the Soil Cleanup Objectives (SCOs) used and referenced were those effective (as of December 14, 2006) at the time of the field work, laboratory analyses, and reporting. The applicable SCOs for implementation of this RAWP will be the revised SCOs effective December 31, 2025.

samples collected to date have been non-detect (below quantitation limits) for TCE thereby meeting drinking water standards.

Qualitative Human Health Exposure Assessment

Potential current and future human health exposures are summarized below and will continue to be mitigated through Engineering and Institutional Controls. Exposure risks will also be reduced by addressing the onsite groundwater contamination through a remedial program that will minimize and monitor further offsite contaminant migration.

- Vapor inhalation exposure pathways for occupants of select offsite Study Area structures may be addressed through a supplemental Soil Vapor Intrusion (SVI) investigation, should the remaining property owners contact NYSDOT and request to move forward with sampling.

- Exposure pathways involving vapor inhalation during construction, remediation, or utility work would be expected to be temporary, limited to periods of excavation/ground-intrusive activities or groundwater sampling, and mitigated with required site management controls.

- Direct exposure by way of ingestion or dermal contact with impacted groundwater was addressed through the IRM#1 City of Hornell Well Treatment System and the RI private well sampling program, which ultimately led to POET system installations at three downgradient properties.

Fish and Wildlife Assessment (FWIA)

A Fish & Wildlife Remedial Impact Analysis (FWIA) was not required. NYSDEC guidance regarding evaluations of fish and wildlife exposure assessment focuses attention on sensitive ecological receptors. Inquiries with the NYSDEC Natural Heritage Program and the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool did not identify any significant habitats on the Site.

Summary of the Remedy

Based on the nature and extent of contamination and Site geologic and hydrogeologic conditions, the remedial technologies selected to address the Site impacts and achieve a Track 4

Commercial Use (CU) clean-up include: a targeted supplemental soil excavation, installation of an additional pair of downgradient offsite monitoring wells to support long-term groundwater monitoring, and Site controls. The following is a list of selected remedial actions.

1. Delineation of the limits of remaining soil/fill exhibiting CVOC concentrations exceeding Protection of Groundwater (POGW) SCOs;
2. Excavation of identified remaining soil/fill exhibiting CVOC concentrations exceeding POGW SCOs ~~listed in Table [x]~~;
3. Screening for indications of contamination (by visual means, odor, and monitoring with Photoionization Detector [PID]) of all excavated soil during any intrusive Site work;
4. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track 4 Commercial Use and Protection of Groundwater SCOs;
5. Appropriate off ~~-S~~site disposal of all excavated material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;
6. Import of materials to be used for backfill and cover in compliance with: (1) Commercial Use and Protection of Groundwater SCOs ~~chemical limits~~ and other specifications included in Chapter 5 of the Department of Environmental Remediation (DER)-10 ~~Table [x]~~, (2) all Federal, State and local rules and regulations for handling and transport of material, and (3) NYSDOT construction specifications;
7. ~~Construction and maintenance~~ Maintenance of a site cover consisting of existing surface cover materials including non-impacted soil, imported stone from IRM backfill activities, and compacted roadbed materials to prevent human exposure to residual contaminated soil/fill remaining under the Site;
8. Installation, development, survey, gauging, and sampling of two new downgradient off~~-~~site monitoring wells to support the long-term monitoring component of the selected remedy. The sampling of these will also be complemented with gauging/sampling of the balance of the proposed long-term monitoring network.

9. Recording of an Environmental Easement, including Institutional Controls, to prevent future exposure to any residual contamination remaining at the Site (a copy of the Environmental Easement will be provided as an appendix to the Site Management Plan (SMP) ~~in Appendix [x]~~);

10. Publication of a SMP for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls (IC and EC), (2) monitoring, (3) operation and maintenance and (4) reporting;

11. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

1.0 Introduction

The New York State Department of Transportation (NYSDOT) entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in September 2017, to investigate and remediate the NYSDOT Former Miller Hill Yard Site (the "Site"), which is an 8.8-acre property located at 7578 State Route 21 in the Town of Fremont, Steuben County, New York. NYSDOT is a Participant in the Brownfield Cleanup Program (BCP). NYSDOT's usage of the Site has essentially been of a commercial and/or industrial type, generally consisting originally of miscellaneous disposal and filling, followed by site grading and minor paving, then ultimately temporary storage of equipment and materials. NYSDOT anticipates potential future use of the Site by NYSDOT for staging, storage, or similar purposes. ~~[Site usage type, i.e., Restricted Residential use, Commercial use, etc.] is proposed for the property. When completed, the Site will contain [general description of Site usage]. Refer to the Brownfield Cleanup Program (BCP) application for additional details.~~

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of contamination as described in the Revised Remedial Investigation Report (RIR; Stantec, 2024) based on data obtained during the Remedial Investigation (RI), performed between November 2018 and June 2021 under the BCP Agreement between NYSDOT and NYSDEC, as well as two preceding phases of investigation described further in Section 2.0. An Alternatives Analysis Report (AAR) dated September 8, 2025 (Stantec, 2025) was approved by the NYSDEC and the New York State Department of Health (NYSDOH) (also referred to collectively as the Departments) on December 16, 2025, and ~~It~~ provides an evaluation of ~~a Track 1 cleanup and other~~ applicable Remedial Action alternatives, their associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in DER-10, DER-31, and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State and local laws, regulations and requirements. The RI for this Site did not identify onsite fish and wildlife resources. A significant threat determination to human health and the environment has not yet been made. Upon determination, notice will be provided for public review.

A formal Remedial Design document will not be prepared. Addenda to this RAWP may be prepared for Department review and approval, and incorporated into the Remedial Action as additional data are obtained during the design-stage field program described herein.

1.1 SITE LOCATION AND DESCRIPTION

The Site is located in the County of Steuben, Town of Fremont, New York and is identified as property Tax Map number 122.00-03-058-000 on the Town of Fremont Tax Map. A United States Geological Survey (USGS) topographic map (Figure 1) shows the Site location. The Site is situated on an approximately 8.8-acre property bounded as follows: the Site is bounded on the northwest by State Route 21 and several residential properties on the north and west side of the highway. The property immediately to the southwest is a vacant weed- and brush-covered parcel. A wooded area and a private residence are located adjacent on the south, and a residence and agricultural property abut the Site to the northeast, at a higher elevation. Seeley Creek (referred to on various maps as Carrington Creek), a class C stream, flows westward through the adjacent wooded area within approximately 150 feet of the southeastern boundary of the Site (see Figure 2). ~~A boundary map is attached to the BCA as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. The 8.8-acre property is fully described in Appendix [x] – Metes and Bounds. A global positioning system coordinate for the starting point is included.~~

Approximately 5.7 acres of the Site are surrounded by a chain-link fence with a locking gate. The majority of the Site area inside the fence is generally flat or gently sloping in the south-southwesterly direction, with a steeper slope in the northern portion. Portions of this area are weed covered, although much of the interior of the site is now covered with crushed stone as a result of grading from the Interim Remedial Measure (IRM) construction activities described in Section 2.3.3. The area outside the perimeter of the fence is primarily grass/brush-covered or wooded. Outside the fence, the property slopes upward steeply to the northeast, and downward steeply on the southwest boundary. Overall, the ground surface elevation ranges from approximately 1,190 feet above mean sea level (ft amsl) along the western property boundary to 1,302 ft amsl in the southeast corner of the Site. Ground surface elevation inside the fence ranges from approximately 1,192 ft amsl in the northwestern corner to 1,232 ft amsl in the northeastern corner.

1.2 CONTEMPLATED REDEVELOPMENT PLAN

The Remedial Action to be performed under the RAWP is intended to make the Site protective of human health and the environment consistent with the contemplated end use. ~~The proposed redevelopment plan and end use is described here to provide the basis for this assessment. However, the Remedial Action contemplated under this RAWP may be implemented independent of the proposed redevelopment plan~~ NYSDOT's usage of the Site has essentially been of a commercial and/or industrial type, generally consisting originally of miscellaneous disposal and filling, followed by site grading and minor paving, then ultimately temporary storage of equipment and materials. NYSDOT anticipates potential future use of the Site by NYSDOT for staging, storage, or similar purposes. NYSDOT has no foreseeable plans for future sale and/or re-development of the Site.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The Site is located in an area of mixed residential and agricultural use, with a nearby concentration of commercial businesses approximately 1,100 feet (ft) to the southwest (see Figures 1 through 3). Based on the Town of Fremont's zoning map, the Site and adjacent lands on the southeast side of Route 21 are zoned "AG-R" (Agricultural-Residential). Properties across Route 21 are zoned "LD-R" (Low-Density Residential).

As described above, the Site is bounded on the northwest by State Route 21 and several residential properties on the north and west side of the highway. The property immediately to the southwest is a vacant weed- and brush-covered parcel. A wooded area and a private residence are located adjacent on the south, and a residence and agricultural property abut the Site to the northeast, at a higher elevation. Seeley Creek, a class C stream, flows westward through the adjacent wooded area within approximately 150 feet of the southeastern boundary of the Site. No federally- or state-designated wetlands, ponds, or lakes are located on the Site or on immediately adjacent properties. As shown on Figure 3, the nearest mapped downgradient wetlands are located approximately 0.5 miles south of the Site. Other wetlands extend along Canisteo Creek, approximately 0.5 miles southwest of the Site.

Also depicted on Figure 3 is an approximate outline of the area of offsite investigation related to the Site investigations, hereinafter referred to as the Study Area. The approximate

Study Area limits generally encompass private wells (PWs) located upgradient and north of the Site and extend to the southernmost monitoring well installed by NYSDEC at the NYSDOT facility approximately 0.5 miles south of the two City of Hornell auxiliary public water supply wells (identified as “City Well #1” and “City Well #2”, and hereinafter referred to in general as “the City of Hornell Water Supply Wells” or individually by their designated well name [City Well #1 or City Well #2] as applicable). As described in more detail in the AAR (Stantec, 2025), the City of Hornell Water Supply Wells are used as a supplemental source for the municipal supply system and are operated periodically or seasonally depending on water demand.

2.0 Description Of ~~Remedial~~ Investigation Findings

Initial investigations of the Site commenced by NYSDEC offsite, near the City of Hornell Water Supply Wells and eventually included drilling and sampling onsite; the second round of investigation occurred onsite as a site characterization (SC) investigation by NYSDOT and Stantec prior to the Site being accepted into the BCP. The RI investigation followed in conjunction with three IRMs. The following subsections describe these phases of study, along with limited discussions of the findings. Table 1 provides a summary of the previous environmental deliverables prepared for the Site, including various reports, work plans, and memos. Table 2 provides a summary of the investigative programs and tasks and the approximate timeframes of execution. ~~Figure 4 provides a generalized timeline of Site ownership, historical Site activities, phases of environmental investigation/remediation, and other project milestones.~~

2.1 SITE HISTORY

The Site had a long history of usage dating to at least the 1930s. Figure 4 provides a generalized timeline of Site ownership, historical site activities, phases of environmental investigation/remediation, and other project milestones. Site usage is described further below.

In December 1938, the New York State Department of Public Works (NYSDPW; the precursor agency to NYSDOT) reportedly obtained the Site property from a private landowner. The NYSDPW in turn sold the property to the United States Army Corps of Engineers (USACOE) (under the Department of Commerce Bureau of Public Roads) in November 1948. The USACOE used the Site as a borrow source for sand and gravel for an unknown length of time. The borrow materials were reportedly used, at least in part, for construction of the Arkport Dam approximately three miles northwest of the Site. The NYSDPW then re-acquired the property in October 1960. The NYSDOT was created in 1968 and replaced the NYSDPW. Therefore, NYSDOT and its precursor agency owned the Site from 1938 to 1948 and from 1960 to the present.

NYSDOT used the Site for a variety of activities. Anecdotal evidence suggests that Site access was not fenced and therefore uncontrolled for a long period of time, and that the public

used the former borrow pit for disposal of trash. NYSDOT also reportedly used the Site during the 1960s through 1970s for filling and burial of miscellaneous highway-related wastes, including soil, trees and other wood, metallic materials, waste asphalt, crack sealant, tar and intact or damaged/crushed 55-gallon drums. This included numerous drums of unused white and yellow road-marking paint, which are now known to have contained volatile organic compounds (VOCs), lead, and other contaminants at hazardous levels.

The current chain-link fence and locking gate that now surrounds the Site was reportedly installed circa (ca.) 1998, and between that time and roughly 2014 when environmental investigation activities began, NYSDOT's primary use of the Site was for storage and staging of highway-related equipment and construction materials.

~~2.1.1 2.3.1 PAST USES AND OWNERSHIP~~

~~2.1.2 2.3.2 PHASE I AND PHASE II REPORTS~~

~~2.1.3 2.3.3 SANBORN MAPS~~

~~All Sanborn Maps available for this Site were reviewed prior to preparation of the RAWP.~~

2.2 GEOLOGIC AND HYDROGEOLOGIC ~~CONDITIONS~~SETTING

The Site is located in an upland location above the Canisteo River Valley, which sits at an average elevation of 1,170 ft amsl. The majority of the Site sits at an elevation range from approximately 1,200 to 1,230 ft amsl.

The south-flowing Canisteo River, oriented roughly north-northwest/south-southeast is a stream valley typical of the Appalachian Plateau Physiographic Province in which the Site is situated. This region is characterized by uplands at elevations up to approximately 2,000 ft amsl, with a relatively dense distribution of stream valleys in roughly dendritic patterns. The entire region has been heavily glaciated, resulting in steep slopes and narrow to broad, deeply incised bedrock valleys. During and after retreat of the last glacier from the region, glacial meltwater streams and recent streams have deposited thick sequences of glaciofluvial and alluvial gravels,

sands, and silts over bedrock in the generally north-south valleys. In many areas, kame and kame terrace deposits were formed adjacent to and along the edges of the retreating ice body; these deposits remain today. Smaller post-glacial tributary streams have advanced upland via erosion from the larger stream valleys to form narrow, steep ravines at sharp angles to the main valleys, and in turn forming generally coarse, granular deltaic deposits as they exit the ravines.

The Site appears to be part of a mapped glacial kame deposit (NYS Geologic Survey, 1986). Kame deposits are characterized primarily by highly variable mixtures of sand, gravel, cobbles and boulders, and often are up to 100 ft thick. Such granular deposits were reportedly mined from the Site from the late 1940s to approximately 1960, prior to the period when disposal of various materials occurred. Seeley Creek, flows out of its incised ravine and towards the west, within approximately 150 ft of the southern end of the Site, joining the Canisteo River approximately 0.5 mi. southwest of the Site. The creek has developed an incised bedrock meander that has formed a vertical rock outcrop on private property approximately 500 ft southeast of the southern end of the Site and has also developed a transitional deltaic deposit as it enters the main river valley south and west of the Site. Based on a review of historical topographic maps dating to 1918, the current stream course does not appear to have significantly changed in the last century.

Geologic mapping literature (NYS Geologic Survey, 1970; Pepper, J., 1954) indicates the bedrock unit underlying the Site is likely to be the Devonian-aged Wiscoy Formation, which is generally described as a sandstone, with lesser beds of shale and black shale. Overlying the bedrock in most areas is a unit of dense, basal or meltout/flow till consisting of a wide range of particle sizes.

The Canisteo River Valley contains a relatively thick sequence of stratified glacial drift consisting primarily of glacial outwash-related sand and gravel. These deposits are in turn overlain by thinner more recent stream-deposited alluvium consisting of additional silt, sand and gravel deposits and floodplain overbank deposits of primarily silt and fine sand. Underlying the outwash deposits is a thick sequence of glaciolacustrine (deposited in proglacial lakes) silt and fine sand. The depth to bedrock beneath the Canisteo River Valley in the Study Area is likely to be as much as 200 ft or greater.

The combined outwash and alluvial sand and gravel deposits represent a regional unconsolidated groundwater aquifer, which serves as a drinking water source for both private and municipal entities (Miller, et al, 1990). Saturated thicknesses in this aquifer in the vicinity of the Site and the City of Hornell Water Supply Wells is estimated to range from 40 to 60 ft. This saturated thickness lessens significantly in the lateral regions of the valley, closer to the uplands. Regionally, groundwater flow direction in the valley-fill aquifer in the vicinity of the Site is generally southward along the valley axis. In the uplands, groundwater generally flows towards the valley, resulting in groundwater flow to the south and southwest across the Site.

Figures 5a and 5b present recent groundwater contour and interpreted flow direction maps. Conceptual geologic cross-sections are shown on the Figure 6 (a-c) series. Note that the cross-section transect extends across the Study Area and depicts recent groundwater sampling results as described in subsequent sections. The monitoring wells and gauging data depicted on the referenced figures are described in subsequent sections. The reader is referred to the RIR (Stantec, 2024), which presented a comprehensive description of onsite and Study Area-wide geologic and hydrogeologic conditions.

2.3 SUMMARY OF INVESTIGATIONS AND RELATED ACTIVITIES

The following sub-sections summarize the previous investigations and remedial activities performed at the Site to date. The reader is referred to the cited references and Tables 1 and 2 for additional details. Table 3 provides a monitoring well construction summary for the Site and offsite Study Area. Table 4 provides a summary of gauging data obtained from the monitoring well network during the period 2020 through 2022. Surveyed top-of-well casing elevations were used to establish groundwater elevations.

2.3.1 NYSDEC CARQUEST INVESTIGATION

NYSDEC provided NYSDOT and Stantec with information related to its initial investigations into the presence of trichloroethene (trichloroethylene or TCE) in the City of Hornell Water Supply Wells, which are located approximately 0.5 miles south of the Site (Figure 1). NYSDEC, in conjunction with the NYSDOH, investigated this groundwater issue during the 2009 to 2013 timeframe. Although NYSDEC did not generate a report summarizing the

investigation methodologies or results, Stantec was provided with field boring and well logs, sampling information, laboratory reports for groundwater samples, and NYSDEC's "working" drawings (pdf files) of the Site and surrounding area where investigations and sampling were performed.

NYSDEC and NYSDOH initiated investigations in 2009 to assess the TCE source and extent of contamination. A full summary of these investigations is presented in the RIR (Stantec, 2024). Investigation locations are depicted on Figure 7. Ultimately, the investigations progressed onto the Site, where TCE was detected in onsite groundwater in NYSDEC's July and September 2013 sampling events. As a result of the investigation findings, NYSDEC indicated in a letter to NYSDOT dated May 19, 2014 that it suspected hazardous waste had been disposed at the Site and therefore the Site could potentially be listed on the Registry. The Site was entered into the NYSDEC's Registry tracking system, was assigned Site #851045, and given a "P" (Potential) classification. NYSDOT subsequently took over the investigation to further characterize environmental conditions at the Site. The Site retained a "Non-Registry" status since it was instead accepted into the BCP (see Section 2.3.4 below). As investigation work progressed, it was re-classified to "A" (Active) status; this classification still applies.

It should be noted that several of the NYSDEC offsite monitoring wells were decommissioned prior to NYSDOT and Stantec commencing work on the project. The NYSDEC Carquest Investigation wells that were decommissioned are listed in Table 3 as part of the monitoring well inventory for the Site and Study Area; however, decommissioning details or dates were not provided by NYSDEC.

Note that the former Carquest property, which is also the location of PW-16 has been operating as an agricultural product supply company since 2018 (currently Bovine Supply Plus) (see Figure 7). Historical investigations conducted by the NYSDEC are referred to in this Report as the NYSDEC Carquest Investigations. References to the property itself will include the qualifier "former" and/or utilize site markers PW-16/MW-18.

2.3.2 NYSDOT SITE CHARACTERIZATION INVESTIGATIONS

NYSDOT took over investigation of the Site in early 2014 after NYSDEC's offsite Carquest investigations had progressed onto the Site and TCE was detected in Site groundwater.

Historical anecdotal information obtained by NYSDOT indicated that an unknown number of partially full or full drums of highway lane marking paint were likely buried in the northern portion of the Site in the late 1970s, and that a smaller number of other drums potentially containing pesticides may also have been buried onsite at other various locations. As described further in Section 2.3.3, approximately 627 intact, partial drums, or drum carcasses were recovered during the IRM excavations and removed from the Site.

Initial NYSDOT investigations included re-sampling of the NYSDEC onsite wells; research of NYSDOT records relative to Site ownership history; inspection of historical aerial photos at NYSDOT's Hornell offices; a geophysical (electromagnetic) survey of the majority of the Site; a sitewide passive soil gas (PSG) survey; gauging of existing Site monitoring wells; additional low-flow groundwater sampling of onsite wells; a program of onsite test pits; and analysis of seven soil samples for VOCs.

Upon review of data generated by these tasks, further discussions between NYSDOT and NYSDEC in 2014 resulted in a request from NYSDEC that additional formal SC investigations be performed. Accordingly, Stantec prepared the *Revised Site Characterization Work Plan (SCWP), Miller Hill Yard, NYSDEC Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York*, dated April 2015 (Stantec, 2015). The SCWP was formally approved by NYSDEC on June 10, 2015; however, NYSDEC gave advanced approval in 2014 to initiate the proposed onsite geophysical and PSG surveys (see task list above). Those surveys were performed during the timeframe June through November 2014 and the results were summarized in the SCWP. This work plan included a description of the preliminary investigative tasks completed to that point and a summary of the findings, as well as the following additional SC investigations to be performed during the period April 2014 through April 2016: supplemental gauging and groundwater sampling of previously installed onsite wells; excavation of test pits at locations of geophysical anomalies; drilling of test borings and sampling of subsurface soils, based on previous groundwater sampling and the PSG results; surface soil sampling; installation and development of monitoring wells; laboratory analysis of soil and groundwater; hydraulic conductivity testing; and location and elevation survey of the wells.

Figure 8 shows the locations of onsite surface and subsurface explorations (test borings, test pits, monitoring wells, surface soil samples, etc.) performed during this SC phase of work.

Tables 5a and 5b summarize the SC soil and groundwater samples obtained and analyses performed, Table 6 summarizes the analytical results of soil samples collected during SC, and Table 7 summarizes the analytical results of groundwater samples collected during the SC as well as during other (future) onsite investigations described in subsequent sections. An SC-specific report summarizing the results of the additional SC investigations was not generated when the work was complete. It was instead decided by NYSDOT at that time to immediately pursue an onsite IRM to attempt to locate, excavate and remove drums from the initial suspected drum burial area. As such, the primary SC findings were summarized in 1) the *Interim Summary Report and Work Plan, Miller Hill Facility Site Investigation, 7578 State Route 21, Hornell, NY*, dated July 3, 2014 (Stantec, 2014); and 2) *the Interim Remedial Measure Drum Removal Work Plan, Miller Hill Yard, NYSDEC Site #851045*, dated January 2016 (Stantec, 2016a).

In 2016, NYSDOT began the planning and design for an IRM program to excavate and remove buried drums. As part of the design process, a supplemental program of focused test pit excavation was performed in April 2016. A total of 26 test pits (see locations, Figure 8) were excavated in a grid-like layout roughly centered on the location of previous test pit TP-101A where paint drums had been encountered. Each of these test pits (excavated to depths between 7 and 20 ft bgs) encountered significant volumes of miscellaneous fill materials mixed in with soils. Although several crushed or partial drums were encountered, no additional drums containing liquid paint were encountered. Five samples were submitted for laboratory analysis for VOCs, semi-volatile organic compounds (SVOCs), pesticides/herbicides, metals, cyanide, and polychlorinated biphenyls (PCBs).

2.3.3 INTERIM REMEDIAL MEASURES

Three IRMs were implemented to address the impacts to soil and groundwater identified by the previous investigations.

2.3.3.1 IRM NO. 1: WATER TREATMENT PLANT – CITY OF HORNELL WATER SUPPLY WELLS

The City of Hornell intermittently operates two groundwater supply wells (City Well #1 and City Well #2) as a supplement to the City's primary water supply system, which is sourced with

treated surface water. Due to the presence of TCE in the City of Hornell Water Supply Wells (as discussed above), Stantec, on behalf of NYSDOT designed a treatment plant for City Wells #1 and #2 to remove VOCs detected in the water. NYSDOT funded the design and construction of the treatment plant. Design and construction were performed concurrently with the SC investigations, as the first remedial action taken for the Site by NYSDOT.

The plant, which was constructed within approximately 400-450 ft of the water wells, has a capacity of 2,000,000 gallons per day (GPD) and includes four 20,000-lb. granular-activated-carbon (GAC) vessels. Design and construction were performed primarily during the period December 2014 through May 2016. The plant was commissioned in July 2016 and continues to be operated by the City Water Department at the time of preparation of this RAWP. Since inception, the plant has successfully removed VOCs from the groundwater supply.

The construction and commissioning of the treatment system was documented in a Stantec report titled *Project Completion Report – NYSDOT Hornell Environmental Remediation Project, Carbon & Cartridge Filtration, Process Addition/Building for TCE Removal*, dated June 2016. NYSDOH approved the system certification on July 20, 2016 (Stantec, 2016b).

A summary of the groundwater analytical data for the City of Hornell Water Supply Wells is provided in the AAR (AAR; Stantec, 2025).

2.3.3.2 IRM NO. 2: DRUM AND WASTE REMOVAL

In July 2015, the SC investigations encountered several buried 55-gallon steel drums of white road-marking paint (still in liquid form) in the northern portion of the Site. In response to this discovery, NYSDOT and Stantec designed and implemented a source-area drum and waste-removal project. The work scope was detailed in the *Interim Remedial Measure Drum Removal Work Plan, Miller Hill Yard, NYSDEC Site #851045* dated January 2016 (Stantec, 2016a).

An area of approximately 17,500 square footage (sq ft) in the northern portion of the Site (see Figure 9) was excavated and approximately 493 paint drums or drum carcasses, paint-impacted soil and other waste materials and debris (approximately 2,970 tons) were removed and disposed offsite. The work was performed during the period March through December 2017. Waste streams included both non-hazardous and hazardous wastes. The Drum Removal IRM

activities and results were summarized in the *IRM Construction Completion Report* (IRMCCR) prepared by Stantec, dated May 2018 (Stantec, 2018a). This report was submitted to NYSDEC for review and approval: NYSDEC provided a letter accepting the report in July 2018.

A total of 30 confirmation soil samples were obtained from the excavation sidewalls and bottom and were analyzed to evaluate the presence of residual soil impacts. Samples from the northern and eastern sidewalls indicated that concentrations of soil contamination remaining after excavation were below NYSDEC Protection of Groundwater (POGW) Soil Cleanup Objectives (SCOs) (NYSDEC, 2006) for VOC compounds, and below Commercial Use (CU) SCOs (NYSDEC, 2006) for all other contaminant classes; however, samples from the northeastern corner and southern sidewall exhibited exceedances of some applicable SCOs (NYSDEC, 2006).

Due to expiration of the Term Contract under which NYSDOT's remedial contractor was operating, work on this IRM was ceased at the end of 2017. The excavation was backfilled, except for a narrow 'trench' along the eastern side. NYSDOT planned to complete additional excavation in these impacted areas under a new contract as a separate IRM program. IRM No. 3 was then executed in 2018, as described in the next sub-section.

2.3.3.3 IRM NO. 3: ADDITIONAL SOURCE MATERIAL EXCAVATIONS 3-01 THROUGH 3-04

This IRM consisted of additional excavation of impacted soils and waste materials across the Site that were considered to be soil source areas identified during the SC that were not excavated during IRM No. 2. The initial excavations (3-01 and 3-02; see Figure 9) were extensions of the Drum Removal excavation described above, where residual contamination at concentrations above applicable SCOs (NYSDEC, 2006) were identified. In addition, to further address other possible onsite source areas, two additional excavations (3-03 and 3-04; see Figure 9) were performed across the Site during 2018 and 2019.

Approximately 11,200 tons of impacted soil and other miscellaneous wastes, including approximately 134 intact or partial drums were removed and disposed from these areas and disposed offsite. This total included both hazardous and non-hazardous waste streams.

A total of 131 discrete (VOC) and 122 composite confirmatory sidewall and bottom samples were obtained and analyzed during IRM No. 3.

The work was essentially complete in August 2019. Details and results of this IRM were summarized in the *Interim Remedial Measure No. 3 Construction Completion Report* (IRM3CCR) prepared by Stantec, dated October 2020 (Stantec, 2020a). This report was submitted to NYSDEC for review and approval: NYSDEC provided a letter accepting the report in November 2020.

2.3.3.4 POINT-OF-ENTRY TREATMENT SYSTEM INSTALLATIONS

Due to historical and recent detection of VOCs in one private commercial water supply well and two private residential wells (the former Carquest property and two adjacent residences) located generally downgradient of the Site, NYSDOT arranged for installation of point-of-entry treatment (POET) systems at these locations. The systems were installed in March 2020, and follow-up sampling of the treated water has been performed. The results indicate that the systems have been effective in removing/reducing VOCs from these private water supplies such that effluent samples collected to date have been non-detect (below quantitation limits) for TCE thereby meeting drinking water standards.

2.3.4 ACCEPTANCE INTO THE BROWNFIELD CLEANUP PROGRAM

Concurrent with the later stages of the SC investigation and the Drum Removal IRM program (IRM No. 2), discussions between Stantec, NYSDOT and NYSDEC relative to possible entry of the Site into the NYSDEC BCP began in mid-2016. Consequently, a BCP application for the Site was prepared by Stantec and submitted to NYSDEC in October 2016. NYSDEC initially deemed the Application incomplete and required revisions, resulting in submittal of a revised Application in January 2017. The Site was accepted into the BCP (July 2018) and a BCA between NYSDEC and NYSDOT was executed in September 2018. Although the SCWP activities and the Drum Removal IRM program (IRM No. 2) were essentially complete at the time the Site entered into the Program, it was clear that further investigations would be needed to complete a formal RI program. Under the Agreement, NYSDOT is a Participant as defined in Environmental Conservation Law (ECL) 27-1405(1)(a). Investigation and remediation activities

subsequent to the execution of the Agreement have been performed pursuant to the Standard BCP clauses appended to the Agreement.

2.3.5 REMEDIAL INVESTIGATION

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved RI Work Plan (RIWP) dated June 2018 (Stantec, 2018b) and a Supplemental Remedial Investigation Work Plan (SRIWP) dated November 2020 (Stantec, 2020b). The investigation was conducted between November 2018 and June 2021. The RIR was submitted to NYSDEC on November 19, 2021 and approved by NYSDEC on December 7, 2021. After RIR approval Stantec performed a Soil Vapor Intrusion (SVI) investigation program in December 2022 in accordance with the approved Soil Vapor Intrusion Work Plan (SVIWP), dated February 2, 2022. Results of the SVI investigation were presented in a separate draft SVI Investigation Report submitted to NYSDEC on April 18, 2023 (Stantec, 2023). In an email to NYSDOT on August 29, 2023, NYSDEC requested that the RIR be revised to incorporate the SVI investigation report and to move forward with the Alternatives Analysis. The revised RIR dated May 28, 2024 was approved by the Departments via e-mail on May 21, 2024 (Stantec, 2024).

The RI program generally included: onsite surface soil sampling; sampling of 32 offsite private water supply wells and resampling of select locations; re-development of offsite monitoring wells previously installed by NYSDEC; well gauging and groundwater sampling of existing onsite and offsite wells; drawdown monitoring at five existing offsite wells during a scheduled pumping event on the City of Hornell Water Supply Wells; installation of seven additional offsite and five additional onsite monitoring wells; well gauging and groundwater sampling of newly-installed wells for VOCs; a comprehensive gauging event including a total of 34 onsite and offsite monitoring wells; and the SVI investigation referenced above.

Tables 8a and 8b summarize the RI soil and groundwater samples obtained and analyses performed. Analytical results are tabulated in Table 7 (onsite groundwater), Table 9 (offsite groundwater), and Table 10 (RI surface soil).

2.3.6 SUPPLEMENTAL GROUNDWATER MONITORING EVENT (NOVEMBER – DECEMBER 2022)

A supplemental gauging and sampling program was conducted in November-December 2022 to collect additional groundwater monitoring data to evaluate any changes in onsite and offsite conditions. During the program, 34 wells were gauged and 23 were sampled for VOCs. Table 11 summarizes samples and types of analyses for the supplemental groundwater event. Analytical results are incorporated into Table 7 (onsite groundwater) and Table 9 (offsite groundwater). Groundwater elevations onsite and in most offsite wells were relatively the same as the 2020 event, however; the groundwater elevation in MW-11 was approximately 7 ft lower in elevation, likely indicating the City of Hornell Water Supply Wells were being utilized at the time of the 2022 gauging event.

~~2.3.7 2.1.1 BORINGS AND WELLS~~

~~2.3.8 2.1.2 SAMPLES COLLECTED~~

~~2.1.3 CHEMICAL ANALYTICAL WORK PERFORMED~~

~~2.3.9 2.1.X [GEOPHYSICAL WORK, TEST PITS, OTHER]~~

~~2.1.4 BEST MANAGEMENT PRACTICES~~

~~2.3.10 2.1.X DOCUMENTATION~~

~~Below is a summary of RI findings.~~

2.4 CONTAMINATION CONDITIONS

2.4.1 IDENTIFICATION OF STANDARDS, CRITERIA AND GUIDANCE FOR EVALUATION OF SAMPLE ANALYTICAL RESULTS

This section describes the Standards, Criteria and Guidance (SCGs) used for comparison of contaminants of concern (CoC) concentration results for sampled/analyzed media at the Site.

- The applicable SCGs used for evaluation of the Site investigation results include water quality standards and guidance values published by the NYSDEC Division of Water and SCOs published by the NYSDEC Division of Environmental Remediation, in accordance with NYSDEC's *Technical Guidance for Site Investigation and Remediation*, (DER-10) issued in May 2010.

The SCGs were provided by:

- *Commissioner Policy (CP)-51: Soil Cleanup Guidance*, NYSDEC, October 21, 2010;
- *Technical and Operational Guidance Series (TOGS) 1.1.1, [Class GA] Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations,* NYSDEC, October 1993, Reissued June 1998 (with addenda dated April 2000, and June 2004)[2]; and
- 6 NYCRR Part 375-6 SCOs, NYSDEC, Division of Environmental Remediation, December 14, 2006[3].

As described in the RIR, investigation and confirmatory soil results were compared to CU SCOs for all contaminant classes except VOCs, as approved by NYSDEC in a letter from NYSDEC's General Counsel to NYSDOT's internal counsel dated September 13, 2018 due to the decades-long history of the Site for commercial/industrial purposes. For VOCs, POGW SCOs were applied for soil results comparison, due to the known offsite migration of VOCs in groundwater.

2.4.2 SUMMARY OF ONSITE SOIL/FILL CONTAMINATION

Based on the analytical datasets summarized in the RIR, the following summarizes the nature of the onsite soil impacts and the locations that are known to remain onsite. Tables 6 and

[2] Since the time that the investigations were completed and the reporting accepted by NYSDEC, a new TOGS addenda relating to emerging contaminants was issued in February 2023. Analytical screening tables include SCGs effective as of the date of sampling, analysis, and initial reporting.

[3] Since the time that the investigations were completed and the reporting accepted by NYSDEC, revised Part 375 SCOs became effective as of December 31, 2025. Analytical screening tables include SCGs effective as of the date of sampling, analysis, and initial reporting.

10 present the analytical results for the SC and RI soil samples and includes a comparison to applicable SCOs at the time of the investigation(s) and reporting (prior to the effective date of the new 2025 SCOs). Revisions to the findings is provided here, where warranted, to describe changes based on a review of the historical data compared to the recently revised SCOs effective December 31, 2025. Exceedances of the applicable SCOs (POGW SCOs for VOCs and CU SCOs for other contaminant classes) were identified in subsurface soil for petroleum and chlorinated VOCs as well as metals. ~~Table [x] shows exceedances from Track 1 Unrestricted SCOs for all soil/fill at the Site.~~ Figure 9 is a spider map that shows the location and summarizes the identified, remaining exceedances of applicable SCOs for onsite ~~from Track 1 Unrestricted SCOs for all~~ soil/fill, following implementation of the IRM excavation programs, including the limited number of confirmatory samples exhibiting SCO exceedances. The IRM excavation limits are included on Figure 9 to support the discussion of post-IRM remaining contamination.

2.4.2.1 VOCS~~SUMMARY OF SOIL/FILL DATA~~

Throughout the various investigation sampling programs several petroleum and chlorinated VOCs have been identified in the source paint material and adjacent impacted soil/fill samples at concentrations exceeding SCOs, which ultimately lead to the design and implementation of the IRM excavations. With respect to actual soil samples (as opposed to drummed liquid paint waste), the following VOCs were reported at concentrations exceeding POGW SCOs:

- Acetone in two borings[4] B-104S and B-110. The soil/fill surrounding both locations were removed as part of IRM#3 excavations; as such, neither location remains onsite.
- Benzene in two test pits TP-101 and TP-218. Both locations were part of the IRM#2 excavation area; therefore, the impacted fill no longer remains onsite. Additionally, benzene was encountered in one of the sidewall samples (SW-10) collected along the southern IRM#2 excavation side-slopes.

[4] During preparation of this RAWP, the SC data were reviewed against the revised SCOs effective December 31, 2025. A third soil boring (B-104D) exhibited a soil acetone concentration (31 µg/kg) exceeding the revised, lower SCO of 30 µg/kg). As described above, the soil/fill surrounding this location was removed as part of IRM#3 and no longer remains onsite.

- Ethylbenzene was encountered in one of the sidewall samples (SW-10) collected along the southern IRM#2 excavation side-slopes.
- Xylene in test pit TP-218. This location was part of the IRM#2 excavation area; therefore, the impacted fill no longer remains onsite. Additionally, m/p-xylene and o-xylene were encountered in one of the sidewall samples (SW-10) collected along the southern IRM#2 excavation side-slopes.
- 2-butanone at three locations: Test pits TP-A, TP-E, and TP-F (note that TP-E is the only location remaining onsite as the soil fill surrounding the other investigation locations was excavated during one or both IRMs).
- Chlorinated volatile organic compounds (CVOCs) including 1,2-dichloroethane (1,2-DCA), cis-1,2-dichloroethene or cis-1,2-dichloroethylene (cis-1,2-DCE), and TCE in two test pits TP-E and TP-F (note that TP-E is the only location remaining onsite as the soil fill surrounding location TP-F was excavated during IRM#3).

2.4.2.2 METALS~~COMPARISON OF SOIL/FILL WITH SCGS~~

Arsenic is the only metal reported in subsurface soil investigation samples at a concentration exceeding the CU SCO. This exceedance was identified in the sample collected from test pit TP-101 which no longer remains onsite. Consistent with typical industry applications of SCOs, this summary discounts the common occurrence of metals such as aluminum, calcium, iron, and magnesium as they are not considered to be related to an environmental release or historical Site use but instead are considered representative of background-level concentrations of naturally occurring metals.

2.4.2.3 SOURCE CONTAMINATION

Initial SC investigations encountered several buried 55-gallon steel drums of road-marking paint (still in liquid form) in the northern portion of the Site. In response to this discovery, NYSDOT and Stantec designed and implemented a source-area drum and waste-removal project (IRM#2). An area of approximately 17,500 sq ft in the northern portion of the Site (see Figure 9) was excavated and approximately 493 paint drums or drum carcasses, paint-impacted soil and

other waste materials and debris (approximately 2,970 tons) were removed and disposed offsite. Waste streams included both non-hazardous and hazardous wastes.

Additional excavation of impacted soils and waste materials across the Site that were considered to be remaining soil source areas were implemented under IRM#3. The initial excavations (3-01 and 3-02; see Figure 9) were extensions of the IRM#2 excavation described above, where residual contamination at concentrations above applicable SCOs were identified. To further address other possible onsite source areas, two additional excavations (3-03 and 3-04; see Figure 9) were performed. Approximately 11,200 tons of impacted soil and other miscellaneous wastes, including approximately 134 intact or partial drums were removed and disposed from these areas and disposed offsite. This total included both hazardous and non-hazardous waste streams.

Analytical results indicated the paint material contained chlorinated (namely, TCE) and petroleum (namely, benzene) VOCs as well as lead, and is the presumed source of onsite groundwater contamination. Following implementation of the IRM excavations, and demonstrative confirmatory sampling, the source area (including the paint waste itself as well as adjacent impacted soil and fill debris) has been removed from the Site.

2.4.2.4 POST-IRM REMAINING CONTAMINATION

Based on the results of IRM confirmatory soil sampling and the broader investigation dataset, minor exceedances of the applicable SCOs (POGW SCOs for VOCs and Commercial [CU] SCOs for other contaminant classes) are known to remain onsite, as described below and depicted on Figure 9:

- **Arsenic:** Excavation 3-01, single sample in the West Sidewall, 17 milligrams per kilogram (mg/kg) vs. the CU SCO of 16 mg/kg; and Excavation 3-03, floor composite, 18 mg/kg vs. the CU SCO of 16 mg/kg. Arsenic has not been identified in groundwater above guidance values at the Site and is not considered a Site CoC; therefore, remediation of these two remaining arsenic soil exceedances is not warranted for a Track 4 Commercial Use clean-up. It is further noted that these samples were collected at depths greater than 1 feet below ground surface (ft bgs).

- **Hexavalent Chromium:** One confirmatory sidewall sample from IRM#2 was reported to have a concentration of 16 mg/kg, which met the CU SCO of 19 mg/kg at the time of the IRM and subsequent RI reporting. The current (as of the revisions effective December 31, 2025) CU SCO is 11 mg/kg thus this location is considered additional remaining contamination. Because of the sample depth (greater than 5 ft bgs), and the absence of chromium impacts in Site groundwater above SGVs, the revised exceedance does not warrant remediation.

- **Cadmium:** One confirmatory sidewall sample from IRM#2 was reported to have a concentration of 4.3 mg/kg, which met the CU SCO of 9.3 mg/kg at the time of the IRM and subsequent RI reporting. The current (as of the revisions effective December 31, 2025) CU SCO is 3.7 mg/kg thus this location is considered additional remaining contamination. Because of the sample depth (greater than 5 ft bgs), and the absence of cadmium impacts in Site groundwater above SGVs, the revised exceedance does not warrant remediation.

- **Acetone:** Excavation 3-02 (six samples, one West Sidewall sample at 57 micrograms per kilogram (µg/kg), two East Sidewall samples at 110 µg/kg, and three Floor samples ranging from 36 to 49 µg/kg); Excavation 3-03 (two samples, Floor at 71 µg/kg and Sidewall at 47 µg/kg); and Excavation 3-04 (single sample, East Sidewall at 53 µg/kg). The UU/POGW SCO was 50 µg/kg at the time the excavations, analyses, and reporting occurred; the current (as of the revisions effective December 31, 2025) UU/POGW SCO is 30 µg/kg. Acetone has not been widely identified in groundwater at the Site and is not considered a CoC; therefore, remediation of the remaining acetone soil exceedances is not warranted for a Track 4 Commercial Use clean-up. Acetone standards and guidance value (SGV) exceedances in groundwater have generally been limited to historical datasets and are assumed to be a laboratory cross-contamination artifact. Furthermore, the soil samples were generally collected at depths more than 5 ft above the water table.

- **2-butanone:** Test pit TP-E at 170 µg/kg versus the Unrestricted Use (UU)/POGW SCO of 120 µg/kg (Note: the new UU/POGW SCO as of December 31, 2025 is 100 µg/kg). 2-butanone has not been identified in groundwater at the Site and is not considered a CoC; therefore, remediation of this single remaining 2-butanone soil exceedance is not

warranted for a Track 4 Commercial Use clean-up. It is noted that TP-E, where this 2-butanone exceedance was identified, is the target of the supplemental soil removal included in the final remedy and described in this RAWP; as such, the 2-butanone impacts may be addressed as part of the Remedial Action.

- **TCE:** Excavation 3-03, single sample in the West Sidewall, 920 µg/kg; and test pit TP-E, single sample, 1,500 µg/kg. The UU/POGW SCO is 470 µg/kg. TCE is the project's primary CoC given its occurrence in groundwater both onsite and offsite. However, the soil concentrations of TCE at these locations are well below the CU SCO of 200,000 µg/kg (Note: the new UU/POGW SCO as of December 31, 2025 is 54,000 µg/kg which does not change the original screening evaluations). Furthermore, the soil samples were collected at depths more than 5 ft above the water table. As such, these discrete residual soil impacts were not considered to be a significant remaining soil source contributing to dissolved TCE in groundwater requiring further investigation, pending additional monitoring data and evaluation of the potential for natural attenuation without additional soil removal. Removal of these soil exceedances is being considered as part of this AAR to evaluate the potential benefits of additional soil removal to address residual soil contamination that may be contributing to onsite groundwater exceedances.
- Other CVOCs including **1,2-DCA and cis-1,2-DCE:** TP-E, single sample, concentrations of 280 and 690 µg/kg, respectively. The respective UU/POGW SCOs are 20 and 250 µg/kg (Note: the new UU/POGW SCO for cis-1,2-DCE as of December 31, 2025 is 190 µg/kg which does not change the original screening evaluations). Both of these VOCs have been reported at concentrations in onsite groundwater in excess of SGVs and are considered Site CoCs. These compounds have not been reported in offsite groundwater samples at concentrations above SGVs. Additionally, the soil concentrations are well below the CU SCOs of 30,000 µg/kg for 1,2-DCA and 500,000 µg/kg for cis-1,2-DCE. Furthermore, the soil sample was collected at a depth more than 5 ft above the water table. As such, these discrete residual soil impacts were not considered to be a significant remaining soil source contributing to the groundwater plume requiring further investigation, pending additional monitoring data and evaluation of the potential for natural attenuation without additional soil removal. Removal of these soil exceedances

was considered as part of the AAR to evaluate the potential benefits of additional soil removal to address residual soil and groundwater exceedances.

- Benzene, ethylbenzene, and m/p/o-xylenes were identified in one of the southern sidewall samples (SW-10) of the IRM#2 excavation. Based on the location of the confirmatory soil sample, and the sloping sides of the nearly overlapping IRM#3 excavation, it is possible that this soil remains. The concentrations reported in the confirmatory sample met the CU SCO (2006) but exceeded the POGW SCO (2006). Because the onsite groundwater has not exhibited petroleum contamination above standards, it is assumed that this contamination is localized especially considering the extensive excavations performed directly adjacent to the side-slope where the sample was collected. The December 31, 2025 revised SCOs included a lower CU SCO for benzene (20 mg/kg), which is slightly exceeded by the reported concentration in the sample (39.3 mg/kg). This area does not warrant further remediation due to: (1) the extensive surrounding excavations and nearby confirmatory sampling results; (2) the depth of the sample greater than 5 ft bgs; and (3) the absence of petroleum impacts to groundwater indicating the potential for the sample to represent a discrete location of remaining contamination.

2.4.3 ON-~~SITE~~ SITE AND OFF-~~S~~SITE GROUNDWATER CONTAMINATION

~~A table that indicates exceedances of Class GA Ambient Water Quality Standards (AWQS) in monitoring wells prior to the remedy is shown in Table [x]. A spider map that indicates the location(s) of and summarizes exceedances of AWQS prior to the remedy is shown in Figure [x].~~

2.4.3.1 SUMMARY OF ONSITE GROUNDWATER IMPACTS~~DATA~~

Based on the groundwater analytical results from several sampling rounds spanning nearly a decade as reported in the RIR, onsite groundwater SGV exceedances are limited to TCE, cis-1,2-DCE, and 1,2-DCA. The most recent sampling events in 2020, 2021, and 2022 further demonstrate that onsite groundwater impacts are delineated with SGV exceedances concentrated in the southern portion of the Site and along the southwestern [downgradient] property line. Table 7 summarizes the analytical results of onsite groundwater investigation samples. Figure 10 depicts the spatial distribution and sampling history for the three primary CoCs in onsite groundwater. The NYSDEC Carquest Investigation (2013) groundwater samples were reportedly

collected using passive diffusion bag (PDBs). This dataset is not incorporated into Figure 10 with the balance of NYSDOT/Stantec groundwater data collected using low-flow methodologies; however, the analytical tables are comprehensive (see Table 7). It is noted that most of the concentrations reported in the 2013 dataset were generally greater than those reported in later sampling rounds.

2.4.3.2 SUMMARY OF OFFSITE ~~COMPARISON OF~~ GROUNDWATER IMPACTS

Based on the analytical datasets summarized in the RIR as well as the supplemental event in November-December 2022, TCE remains the only identified groundwater CoC in the offsite Study Area, based mostly on historical findings and confirmed during recent groundwater sampling events as the only compound exceeding SGVs in offsite wells. Table 9 summarizes the analytical results of offsite groundwater samples collected during Site investigations. However, the updated groundwater data indicates that the present TCE impacts are minor compared to the initial plume mapped in 2013. Specifically, only one TCE exceedance in the offsite plume was identified during the recent (2019-2022) groundwater sampling events: private well PW-16 at a concentration of 5.1 µg/L, only slightly exceeding the Standards and Guidance Value/Maximum Contaminant Level (SGV/MCL) of 5 µg/L. Private well PW-16 is located on the Former Carquest property and is one of the locations now equipped with a POET system.

The Study Area-wide TCE detections in groundwater are depicted on Figure 11. Locations with TCE detections (not necessarily exceedances) form a narrow, roughly north-south trending line extending from MW-18/PW-16 southward to the City of Hornell Water Supply Wells. The plume conditions in the property directly adjacent to and south of the Site are unknown given that the NYSDOT has not yet established a legal basis for entering the property and therefore offsite permission access has not yet been obtained, resulting in the inability to install additional downgradient offsite wells. It is noted that there are several wells located along this potential flow path that have not shown similar detections such as MW-5, MW-7, and MW-3D. Similarly, there are several non-detect TCE results between MW-105 (most downgradient “Site” well) and MW-18. These plume “gaps” emphasize the complexity of the plume, which is potentially influenced by pumping wells, well placement and localized heterogeneity, Seeley Creek, and additional sources of groundwater contamination.

2.4.4 ~~ON-SITE AND OFF-SITE~~ SUMMERY OF OFFSITE SOIL VAPOR INTRUSION INVESTIGATION ~~CONTAMINATION~~

The data collected for this phase of the investigation was obtained from the two participating adjacent residences. Five other properties were included in the SVI Investigation Work Plan (Stantec, 2022) but did not respond to the request to conduct sampling on their properties. Sampling at the other five properties may still be implemented should the property owners contact NYSDOT and request to move forward with sampling in the future.

Based on the NYSDOH SVI Guidance Matrices and results of the December 2022 sampling, no further action related to potential SVI at either structure that received sampling was recommended. The sub-slab vapor (SSV) concentrations of chlorinated VOCs were generally low or non-detect, and the Indoor Air (IA) results for TCE and tetrachloroethene (PCE) did not exceed the ambient air guideline values (AGVs) published in the NYSDOH SVI Guidance.

~~*2.4.4.1 2.5.6.1 COMPARISON OF SOIL VAPOR WITH SCGS*~~

~~A table of soil vapor data collected prior to the remedy is shown in Table [x]. A spider map that indicates the location(s) of and summarizes soil vapor data prior to the remedy is shown in Figure [x].~~

2.4.5 DESCRIPTION OF AREAS OF CONCERN

Impacted soil and groundwater were identified at the Site. CoC presence was identified through various investigations at levels that warranted interim remedial actions; additionally, a remedial program is required to address chlorinated volatile organic compound (CVOC)-impacted soil and groundwater at the Site that remained after the IRMs were completed.

More specifically, the types of CoCs within impacted media at specific areas onsite include:

- Potential onsite remaining CVOC-impacted soil in an area located upgradient of MW-16S/D and MW-201 in the vicinity of former test pits TP-D and TP-E and the west wall of IRM Excavation 3-03; and
- CVOC-impacted groundwater in onsite monitoring wells located on the southern downgradient property boundary.

Additionally, CVOCs (TCE) has been identified in offsite groundwater within the Study Area (between the southern site boundary and PW-16/MW-18).

2.4.6 CONCEPTUAL SITE MODEL ~~OF SITE CONTAMINATION~~

The investigation results and findings presented in this Section are the basis for a working conceptual site model (CSM) comprised of the following items:

- At the Site, groundwater first occurs in glacial overburden primarily in the kame deposit, and the saturated zone extends into underlying till. Groundwater was encountered above native soil in the deeper reaches of some IRM excavations where fill depths were greatest. Regionally, the glacial valley-fill aquifer is a high-potential zone of groundwater with greater relative saturated thickness and coarse, transmissive deposits.
- At the Site, groundwater flows steeply southwest under gravity head towards the valley (see Figures 5a and 5b). Regional overburden groundwater flows generally southward along the valley axis, and slightly westward towards the Canisteo River, at a subdued horizontal gradient mirroring the topography.
- Infiltrating precipitation recharges the overburden with well pairs indicating downward vertical gradients. Onsite downward gradients are strong, particularly compared to the vertical gradients offsite where it is assumed that precipitation is a smaller component of overall valley-fill recharge.
- Based on the significant differences in groundwater contours in the vicinity of the City of Hornell Water Supply Wells depicted on Figure 5a (2021) (no pumping) and Figure 5b (2022) (presumed pumping), pumping of the City wells appears to modify the potential groundwater flow paths downgradient of the Site within the estimated limits of the area of influence mapped during the RI.
- The effect of Seeley Creek on the water table and groundwater flow in general is uncertain but there may be a losing component from the stream to the water table via infiltration through the deltaic deposits between the Site and the valley-fill aquifer closer to Canisteo River. Directly south of the Site, Seeley Creek appears “disconnected” from the water table (see Figures 6a, 6b and 6c).

- Previously identified onsite soil sources of contamination have been mitigated through two IRM excavation programs that targeted identified areas of buried drums of road-marking-paint and adjacent impacted fill and other waste materials. Onsite groundwater impacts are limited to CVOCs in the southern half of the Site. CVOCs at the Site, namely TCE, appear to be migrating offsite onto the adjacent property to the south.

- Offsite monitoring and private well sampling events indicate that TCE is the only VOC exceeding SGVs in offsite groundwater – and the extent of the TCE impacts are generally delineated (with the exception of the Harwood Burch property directly south of the Site). Based on the 2019-2022 sampling data, only one TCE exceedance in the offsite plume was identified: private well PW-16 at a concentration of 5.1 µg/l (see Figure 11). Therefore, the present TCE impacts following the IRMs are minor compared to the initial plume mapped in 2013.

- The City of Hornell Water Supply Wells were first found to be impacted by TCE in 2007. Based on the groundwater flow contours indicating southwesterly flow in the vicinity of the Site, it is possible that the TCE in groundwater migrating offsite was captured in the City wells due to pumping. As discussed above, the present offsite TCE impacts are minor with only one SGV exceedance at private well PW-16, which is located on the Former Carquest Site property. The concentration of TCE in City Well #2 has not exceeded the SGV to date; and the TCE in City Well #1 (influent) has generally decreased and potentially stabilized at concentrations at or below the SGV since the peak concentration was observed in May 2014.

- Apparent "gaps" (see Figure 11) in the length of the plume may be attributable to localized flow regimes influenced by pumping, well screen placement, localized heterogeneity, and/or other potential sources of contamination more directly upgradient of the City of Hornell Water Supply Wells.

2.5 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

2.5.1 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

A qualitative human health exposure assessment: 1) identifies CoC nature and extent; 2) identifies and evaluates actual or potential exposure pathways; 3) characterizes the potentially exposed receptors (residents, workers, recreational users, etc.); and 4) identifies how actual and/or potential exposure pathways might be eliminated or mitigated.

2.5.1.1 COC NATURE AND EXTENT

The nature and extent of CoCs identified at the Site have been described in the foregoing sections of this RAWP. The primary CoC is TCE, which has been identified in onsite and offsite Study Area groundwater monitoring wells, City of Hornell Water Supply Wells, and private water wells, although concentrations in offsite wells appear to have decreased below SGVs in many locations over the course of the investigations.

2.5.1.2 HUMAN HEALTH EXPOSURE PATHWAYS

Possible routes through which potential human receptors can be exposed to CoCs include:

- *Inhalation of volatile substances* released from soil, soil vapor and/or groundwater (residents, visitors, patrons, remediation worker, construction worker, utility worker, occupational worker, etc.).
    - Exposures to residents, visitors, and patrons in the offsite Study Area may occur through vapor intrusion into occupied structures. As required by NYSDEC and NYSDOH, an SVI investigation was performed on December 20, 2022 in select portions of the offsite Study Area that were identified as potential receptors based on the type of structure and the proximity to VOC-impacted groundwater. Only two of the seven properties included in the SVIWP were able to be sampled.
    - Onsite SVI is not considered a complete pathway given the absence of an occupied structure. However, should future use of the Site include development

plans with occupied structures, the potential for SVI must be investigated and the exposure risks mitigated.

- Exposures to construction, utility or remediation workers could occur during ground-intrusive, soil-disturbing activities such as excavation for Site development or remediation including excavation that may extend below the water table. Onsite, these potential exposures to remediation, construction and utility workers will be mitigated in accordance with requirements of the Site Management Plan (SMP) by use of environmental air monitoring equipment during soil-disturbing activities, use of Biosolve (or equivalent) foam to suppress vapors, and personal protective equipment (PPE) to the extent needed. Offsite, depth to water is generally greater than 10 ft bgs, except for two locations MW-1D and MW-11, where depth to water is only approximately 2 ft bgs. The water table in the valley is generally at elevations 1,160-1,165 ft amsl. Given the depth to water, and the plume concentrations offsite, the exposure risks are minimal assuming most offsite non-remediation work would be limited to the upper vadose zone.

- *Contact with or ingestion of contaminated groundwater* by residents served by the City supply wells, private water well owners/residents, or remediation/monitoring personnel.

    - With respect to the City of Hornell Water Supply Wells, IRM#1 addressed this exposure pathway through installation of a water treatment system which is continually operated and periodically monitored by City personnel.

    - With respect to private wells in the Study Area, known users of groundwater have been identified and their water tested as part of the RI. Due to historical and recent detection of VOCs in one private commercial water supply well and two private residential wells (the former Carquest property and two adjacent residences) located generally downgradient of the Site, NYSDOT arranged for installation of POET systems at these locations. These systems will remain in place and will be maintained and periodically sampled by NYSDOT until NYSDEC/NYSDOH authorize their removal.

- Monitoring wells or other future potential wells related to remediation or monitoring remain covered when not being accessed for sampling by trained personnel.

Exposure risks will also be reduced by addressing the onsite groundwater contamination through a remedial program that will minimize and monitor further offsite contaminant migration.

2.5.1.3 SUMMARY

Potential current and future exposures are summarized as follows:

- Vapor inhalation exposure pathways for occupants of select offsite Study Area structures may be addressed through a supplemental SVI investigation, should the remaining property owners contact NYSDOT and request to move forward with sampling.
- Exposure pathways involving vapor inhalation during construction, remediation, or utility work would be expected to be temporary, limited to periods of excavation/ground-intrusive activities or groundwater sampling, and mitigated with required SMP controls.
- Direct exposure by way of ingestion or dermal contact with impacted groundwater was addressed through IRM#1 and the RI private well sampling program, which ultimately led to POET system installations at select properties.

In addition to the POET system installations, implementation of appropriate Site controls will allow for control of these potential exposures.

2.5.2 FISH & WILDLIFE REMEDIAL IMPACT ANALYSIS

A Fish & Wildlife Remedial Impact Analysis was not required. As described in the RIR (Stantec, 2024), NYSDEC guidance regarding evaluations of fish and wildlife exposure assessment focuses attention on sensitive ecological receptors. Inquiries with the NYSDEC Natural Heritage Program and the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool did not identify any significant habitats on the Site.

The USFWS has identified the Site as being within the range of the threatened Northern Long-Eared bat (NLEB). There is no known habitat onsite and limited potential habitat in the immediate vicinity of the Site that would support the NLEB. In accordance with federal rule for the protection of NLEB habitat, any proposed removal of trees with a 3-inch diameter-at-breast-height or greater may require the implementation of conservation measures, including seasonal removal of trees, to minimize disturbance to potential bat habitat.

2.6 SIGNIFICANT THREAT

A significant threat determination to human health and the environment has not yet been made. Upon determination, notice will be provided for public review.

2.7 REMEDIAL ACTION OBJECTIVES

The general remedial goal for sites in the NYS Brownfield Cleanup Program is to eliminate or mitigate significant threats to the public and the environment posed by the Site contaminants through the proper application of scientific and engineering principles. Accordingly, the identified sources of contamination at the Site have been or will be eliminated or mitigated, as feasible, to a condition acceptable to the NYSDEC under the BCP using appropriate remedial technologies, engineering controls (ECs) and institutional controls (ICs).

Based on the results of the Remedial Investigation (and other related preceding investigations described earlier in this section), the following Remedial Action Objectives (RAOs) have been identified for this Site.

2.7.1 GROUNDWATER

RAOs for Public Health Protection

- Prevent ingestion of groundwater containing contaminants (associated with Site CoCs) at levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

RAOs for Environmental Protection

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

2.7.2 SOIL

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

~~2.7.3 SURFACE WATER~~

~~RAOs for Public Health Protection~~

- ~~Prevent ingestion of contaminated water.~~
- ~~Prevent contact or inhalation of contaminants from impacted water bodies.~~
- ~~Prevent surface water contamination that may result in fish advisories.~~

~~RAOs for Environmental Protection~~

- ~~Restore surface water to ambient water quality standards for each contaminant of concern.~~

- ~~Prevent impacts to biota due to ingestion/direct contact with contaminated surface water that would cause toxicity or bioaccumulation through the marine or aquatic food chain.~~

~~2.7.4 SEDIMENT~~

~~RAOs for Public Health Protection~~

- ~~Prevent direct contact with contaminated sediments.~~
- ~~Prevent surface water contamination that may result in fish advisories.~~

~~RAOs for Environmental Protection~~

- ~~Prevent release(s) of contaminant(s) from sediments that would result in surface water levels in excess of (ambient water quality criteria).~~
- ~~Prevent impacts to biota due to ingestion/direct contact with contaminated sediments that would cause toxicity or bioaccumulation through the marine or aquatic food chain.~~
- ~~Restore sediments to pre-release/background conditions to the extent feasible.~~

~~2.7.5~~2.7.3 SOIL VAPOR

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the Site. (Note: Not currently applicable, as of the date of this RAWP, unless buildings are constructed on the Site in the future, and would then be addressed through institutional controls.)

3.0 Description of Remedial Action Plan

3.1 EVALUATION OF REMEDIAL ALTERNATIVES

The reader is referred to the AAR, submitted under separate cover, for a detailed discussion of the evaluation of remedial alternatives (Stantec, 2025). The AAR was approved by the Departments on December 16, 2025.

3.2 SELECTION OF THE PREFERRED REMEDY

A summary of the selected remedy is presented below based on the evaluation of alternatives presented in the AAR (Stantec, 2025).

Based on the nature and extent of contamination and Site geologic and hydrogeologic conditions, the remedial technologies selected to address the Site impacts and achieve a Track 4 CU clean-up include: a targeted supplemental soil excavation (Section 3.2.1), installation of an additional pair of downgradient offsite monitoring wells to support long-term groundwater monitoring (Section 3.2.2), and Site controls. Section 7.0 describes required ECs and Section 9.0 describes required ICs.

3.2.1 SOIL COMPONENT OF THE REMEDY

The selected remedy component to target soil impacts includes excavation and offsite disposal of CVOC-impacted soils from remaining potential source areas located in the area between the western portion of IRM #3 Excavation 3-03 and the area west of TP-E that exceeds Site SCGs based on previous sampling results. Figure 12 depicts the approximate conceptual excavation area associated with the selected soil remedy. The proposed excavation limits will be refined as part of the design-stage field program (see Section 4.5) and subject to field screening and confirmatory sampling results during the final excavation program (see Sections 5.2 and 5.4.1). Based on prior source area excavations, there is the potential that paint waste may be encountered and require further management for disposal.

3.2.2 GROUNDWATER COMPONENT OF THE REMEDY

Due to the long history of commercial usage and disposal activities on the Site, CVOCs are present both in onsite and, to a limited extent, offsite downgradient groundwater. Groundwater sampling data presented in the RIR indicated that onsite groundwater impacts are limited to the southern portion of the Site and along the southwestern [downgradient] property line; TCE is the only groundwater CoC in the offsite Study Area; and that the offsite TCE impacts are minor compared to the plume initially mapped in 2013. Two IRM excavation programs performed between 2017 and 2019 addressed the majority of the onsite source material for the groundwater plume, and offsite contaminant levels have largely declined below applicable SGVs. Remaining groundwater contamination, and the potential human exposure through ingestion, has been addressed through the installation of an offsite water treatment plant for the City of Hornell Water Supply Wells between 2014 and 2016 as well as the installation of POET systems at three impacted offsite private wells in 2020.

Since the proposed use of the Site will continue to remain commercial, the preferred groundwater remedy is a continued long-term monitoring program to document that the remedial activities completed to date will continue to be protective of human health and the environment. The preferred groundwater remedy is proposed to be paired with additional potential source soil area removal (see Section 3.2.1) and is anticipated to result in improved groundwater quality near the downgradient property boundary. Long-term groundwater monitoring will allow for the continued monitoring of the groundwater conditions in response to supplemental soil excavations. Table 12 summarizes the proposed long-term monitoring program to be baselined as part of this RAWP following installation of the new wells described below. Figure 13 depicts the Study Area monitoring network and proposed long-term monitoring network. Details of the monitoring program as presented in this RAWP (see Section 4.5) may be modified in the SMP based on new information obtained during the design-stage field program, and on an ongoing basis subject to groundwater sampling results (and NYSDEC approval).

In an effort to address the unknown plume conditions in the property directly adjacent and to and south of the Site, a new offsite well pair (MW-306S/D; see Figure 13 for approximate location) is proposed to be installed and included in the long-term monitoring program. The proposed new offsite well pair would be located between MW-304S/D and MW-7 if NYSDOT

can obtain access permission and the proposed well installation and sampling on that property can proceed. Otherwise, the new well pair will be installed in the Right-of-Way (ROW).

~~**3.2.1 ZONING;**~~

~~Note: add text to this and all following sub-sections.~~

~~**3.2.3 3.2.2 APPLICABLE COMPREHENSIVE COMMUNITY MASTER PLANS OR LAND USE PLANS**~~

~~**3.2.4 3.2.3 SURROUNDING PROPERTY USES**~~

~~**3.2.5 3.2.4 CITIZEN PARTICIPATION**~~

~~**3.2.6 3.2.5 ENVIRONMENTAL JUSTICE**~~

~~**3.2.7 3.2.6 PROXIMITY TO NATURAL RESOURCES**~~

~~**3.2.8 3.2.11 OFF-SITE GROUNDWATER IMPACTS**~~

~~**3.2.9 3.2.12 PROXIMITY TO FLOODPLAINS**~~

~~**3.2.10 3.2.13 CURRENT INSTITUTIONAL CONTROLS**~~

3.3 SUMMARY OF SELECTED REMEDIAL ACTIONS

1. Delineation of the limits of remaining soil/fill exhibiting CVOC concentrations exceeding POGW SCOs;
2. Excavation of identified remaining soil/fill exhibiting CVOC concentrations exceeding POGW SCOs ~~listed in Table [x]~~;
3. Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during any intrusive Site work;

4. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track 4 Commercial Use and Protection of Groundwater SCOs;

5. Appropriate off-~~S~~site disposal of all excavated material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;

6. Import of materials to be used for backfill and cover in compliance with: (1) Commercial Use and Protection of Groundwater SCOs ~~chemical limits~~ and other specifications included in Chapter 5 of DER-10 ~~Table [x]~~, (2) all Federal, State and local rules and regulations for handling and transport of material, and (3) NYSDOT construction specifications;

7. ~~Construction and maintenance~~ Maintenance of a site cover consisting of existing surface cover materials including non-impacted soil, imported stone from IRM backfill activities, and compacted roadbed materials to prevent human exposure to residual contaminated soil/fill remaining under the Site;

8. Installation, development, survey, gauging, and sampling of two new downgradient off-site monitoring wells to support the long-term monitoring component of the selected remedy. The sampling of these will also be complemented with gauging/sampling with the balance of the proposed long-term monitoring network.

9. Recording of an Environmental Easement, including Institutional Controls, to prevent future exposure to any residual contamination remaining at the Site (a copy of the Environmental Easement will be provided as an appendix to the Site Management Plan ~~in Appendix [x]~~);

10. Publication of a Site Management Plan for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

11. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP and the NYSDEC-issued Decision Document ~~[add IRMs if appropriate]~~. All deviations from the RAWP and/or Decision Document will be promptly reported to NYSDEC for approval and fully explained in the Final Engineering Report (FER).

4.0 Remedial Action Program

The Preferred Remedy achieves protection of public health and the environment for the intended use of the property. ~~The remedial plan will achieve the Remedial Action Objectives established for the project. The remedial plan is effective in both the short-term and long-term and reduces mobility, toxicity, and volume of contaminants. The remedial plan is cost-effective, able to be implemented, and uses standards and methods that are well-established in the industry.~~

To successfully achieve the Preferred Remedy, the remedial action program will be implemented. This section describes the preparation of necessary governing documents, general remedial construction information, Site preparation, and reporting procedures.

The federal and state standards, criteria, and guidance documents that may be applicable to this project are listed in Section 12.0 and will be consulted and adhered to as applicable. The following website stores NYSDEC Remediation Guidance and Policy Documents: Remediation Guidance And Policy Documents - NYSDEC.

4.1 GOVERNING DOCUMENTS

Several documents, listed below and summarized in the following sections, govern the management of the Remedial Action implementation.

- The Site-Specific Health and Safety Plan (HASP), which describes health and safety protocols to be followed by Stantec personnel during remedial activities, is included as Appendix A.
- The Quality Assurance Project Plan (QAPP), which describes sampling and analytical methods for sampling, is included as Appendix B.
- The Soil/Materials Management Plan (SoMP), which describes how soils and materials will be managed during remedial actions, is discussed in Section 5.4.
- The Community Air Monitoring Plan (CAMP), which describes protocols for air monitoring to protect the surrounding community, is included as Appendix C.

- The Citizen Participation Plan (CPP), which describes NYSDEC's activities to involve the public to improve the process of investigating and cleaning up contaminated sites, is included as Appendix D.

The following sections summarize these documents, which are included as appendices to, or sections within, this RAWP.

~~4.1.1 STANDARDS, CRITERIA AND GUIDANCE (SCGS)~~

~~4.1.2~~4.1.1 SITE SPECIFIC HEALTH & SAFETY PLAN (HASP)

The HASP, which describes health and safety protocols to be followed by Stantec personnel during remedial activities, is included as Appendix A. The remedial Contractor will prepare a HASP to cover its personnel and subcontractors.

All remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal Occupational Safety and Health Administration (OSHA).

The Participant and associated parties preparing the remedial documents submitted to the State and those performing the construction work, are completely responsible for the preparation of an appropriate HASP and for the appropriate performance of work according to that plan and applicable laws.

The HASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

~~The Site Safety Coordinator will be [identify by name]. A resume will be provided to NYSDEC prior to the start of remedial construction.~~

Although not anticipated, if needed, confined space entry will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses.

~~4.1.3~~4.1.2 QUALITY ASSURANCE PROJECT PLAN (QAPP)

The QAPP is included as Appendix B.

The QAPP describes quality assurance and quality control procedures to ensure that the proposed remedy accomplishes the remedial goals and is completed in accordance with the design specifications. This document includes proposed sampling and analytical methods for sampling.

~~4.1.4 CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)~~

~~4.1.5~~4.1.3 SOIL/MATERIALS MANAGEMENT PLAN (SOMP)

This document is built into the body of the RAWP in Section 5.4 and includes detailed plans for managing all soils/materials that are disturbed at the Site, including excavation, handling, storage, transport and disposal. It also includes description of the controls and practices that will be implemented with these efforts to facilitate effective, nuisance-free performance in compliance with all applicable Federal, State and local laws and regulations.

~~4.1.6 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) [OR EROSION AND SEDIMENT CONTROL PLAN (ESCP)]~~

~~The erosion and sediment controls will be in conformance with requirements presented in the New York State Standards and Specifications for Erosion and Sediment Control. It is also further discussed in section 5.4.10.~~

~~4.1.7~~4.1.4 COMMUNITY AIR MONITORING PLAN (CAMP)

The CAMP is included as Appendix C.

The CAMP describes the methodology for real-time air monitoring for VOCs and particulates in air at the perimeter of the work area. Continuous monitoring will be performed for all onsite ground-intrusive activities (e.g., drilling/excavation) and during the handling of contaminated or potentially contaminated material. During offsite ground-intrusive activities, a modified CAMP will be implemented as follows:

- Ambient air monitoring for volatiles using a PID will be performed at the upwind and downwind boundaries of offsite work areas during drilling activities.

- Observations of visual dust leaving the work area will be recorded and mitigated using dust suppression controls if warranted.

Other work activities that are not ground-intrusive (i.e., well gauging, sampling, development, and survey) do not require continuous monitoring. Periodic VOC monitoring as described in the CAMP may be implemented if warranted as determined by the Remedial Engineer.

~~4.1.8 CONTRACTORS SITE OPERATIONS PLAN (SOP);~~

~~The Remedial Engineer has reviewed all plans and submittals for this remedial project (including those listed above and contractor and sub-contractor document submittals) and confirms that they comply with this RAWP. The Remedial Engineer is responsible to ensure that all later document submittals for this remedial project, including contractor and sub-contractor document submittals, comply with this RAWP. All remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.~~

~~A detailed remedial construction design document will be submitted to NYSDEC for approval in [date].~~

~~4.1.9~~4.1.5 CITIZEN PARTICIPATION PLAN (CPP)

A certification of mailing will be sent by the Participant to the NYSDEC project manager following the distribution of all Fact Sheets and notices that includes: (1) certification that the Fact Sheets were mailed, (2) the date they were mailed; (3) a copy of the Fact Sheet, (4) a list of recipients (contact list); and (5) a statement that the repository was inspected ~~on [specific date] and~~to confirm that it contained all of applicable project documents.

No changes will be made to approved Fact Sheets authorized for release by NYSDEC without written consent of the NYSDEC. No other information, such as brochures and flyers, will be included with the Fact Sheet mailing.

An updated version of the approved Citizen Participation Plan for this project is attached in Appendix D.

Document repositories have been established at the following locations and contain all applicable project documents.

Town of Fremont, NY Offices
8217 Cream Hill Road, Arkport, NY 14807
(607) 324-7786
1:00 – 4:00 PM (Tuesday), 6:00 – 8:00 PM (Wednesday), 9:00 AM – 12:00 PM (Friday)

Hornell Public Library
64 Genesee Street, Hornell, NY 14843
(607) 324-1210
12:00 – 7:00 PM (Monday, Tuesday, Thursday), 9:00 AM – 7:00 PM (Wednesday), 1:00 – 5:00 PM (Friday), 10:00 AM – 2:00 PM (Saturday)

In addition, an electronic repository can be accessed via DECInfo Locator at the following link: NYSDEC | DER Environmental Remediation Databases

4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION

4.2.1 PROJECT ORGANIZATION

~~An organization chart is included in Figure [x].~~

~~Resumes~~Descriptions of key project personnel involved in the Remedial Action are included in the QAPP (Appendix B).

4.2.2 REMEDIAL ENGINEER

The Remedial Engineer for this project will be Brandon Gallagher, of Stantec Consulting Services Inc. and his designated representatives. The Remedial Engineer is anticipated to change during the remedial action program, subject to NYSDOT contracts. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the Site (NYSDEC BCA Index No. C851045-04-17 Site No. C851045). The Remedial Engineer will certify in the Final Engineering Report that the remedial activities were observed by qualified environmental professionals or experienced field geologists/engineers/scientists under [his/her] supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

The Remedial Engineer and his/her designated representatives will coordinate the work of other contractors and subcontractors involved in all aspects of remedial construction, including soil excavation, stockpiling, characterization, removal and disposal, air monitoring, emergency spill response services, import of back fill material, and management of waste transport and disposal. The Remedial Engineer or his/her designated representatives will be responsible for all appropriate communication with NYSDEC and NYSDOH.

The Remedial Engineer will review all pre-remedial plans submitted by contractors for compliance with this RAWP and will certify compliance in the Final Engineering Report.

The Remedial Engineer will provide the certifications listed in Section 10.1 in the FER.

4.2.3 REMEDIAL ACTION CONSTRUCTION SCHEDULE

Discussion of the schedule for performance of the remedial work is included in Section 11.0.

4.2.4 WORK HOURS

The hours for operation of remedial construction will conform to the Town of Fremont ~~Department of Buildings (DOB)~~ construction code requirements ~~or according to specific variances issued by that agency~~. According to the Town's Code Officer, construction working hours begin at 7:00 AM. Constructions activities will be limited to 7:00 AM to 6:00 PM unless alternative hours are approved by NYSDEC and the Town of Fremont. NYSDEC will be notified by the Participant or their Remedial Engineer of any variances issued by Department of Buildings (DOB). NYSDEC reserves the right to deny alternate remedial construction hours.

4.2.5 SITE SECURITY

The Site is surrounded by a chain-link fence with a locking gate. Designated representatives will have access to the Site, and the gate is to remain locked when the Site is vacant.

4.2.6 TRAFFIC CONTROL

The Contractor will provide a worker(s) at the Site entrance with flaggers, when deemed necessary, to facilitate safe entry and exit of vehicles.

4.2.7 CONTINGENCY PLAN

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will also be included in daily and monthly progress reports when applicable. Further details are provided in Section 5.4.11.

4.2.8 WORKER TRAINING AND MONITORING

Site workers involved with the handling of contaminated materials will have up-to-date OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) certification and medical monitoring. All workers will be subject to Site-specific safety training. Attendance at a daily safety briefing will be mandatory for all workers.

4.2.9 AGENCY APPROVALS

The RAWP will be performed following approval by the NYSDEC and per requirements of the BCP. Other local permits or government approvals required for the remedial construction activities will be obtained prior to the start of remedial construction by the General Contractor, if necessary.

~~The Participant has addressed all SEQRA requirements for this Site. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction.~~

~~The planned end use for the Site is in conformance with the current zoning for the property as determined by [local zoning or planning agency, i.e., New York City Department of City Planning] [or: Evidence to show that the planned use conforms to zoning designations will be provided to the NYSDEC prior to issuance of a COC.] A Certificate of Completion will not be issued for the project unless conformance with zoning designation is demonstrated.~~

~~A complete list of all federal, state and local governmental permits, certificates or other approvals or authorizations required to perform the remedial and development work is attached in Table [x]. This list includes a citation of the law, statute or code to be complied with, the~~

originating agency, and a contact name and phone number in that agency. This list will be updated in the Final Engineering Report.

All planned remedial or construction work in regulated wetlands and adjacent areas will be specifically approved by the NYSDEC Division of Natural Resources to ensure that it meets the requirements for substantive compliance with those regulations prior to the start of construction. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

4.2.9 NYSDEC BCP SIGNAGE

A project sign will be erected at the main entrance to the Site prior to the start of any remedial activities. The sign will indicate that the project is being performed under the New York State Brownfield Cleanup Program. The sign will meet the detailed specifications provided by the NYSDEC Project Manager and contained in Appendix [x].

4.2.10 PRE-CONSTRUCTION MEETING WITH NYSDEC

4.2.9 EMERGENCY CONTACT INFORMATION

A preliminary n emergency contact sheet with names and phone numbers is included in Table [x]the HASP, presented in Appendix A. The list will be updated prior to the start of major construction activities. That document contact sheet will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency.

4.2.10 REMEDIAL ACTION COSTS

The total estimated cost of the Remedial Action is [insert value]. An itemized and detailed summary of estimated costs for all remedial activity is attached as Appendix [x]. This will be revised based on actual costs and submitted as an Appendix to the Final Engineering Report.

4.2.10 GREEN AND SUSTAINABLE REMEDIATION ~~AND CLIMATE RESILIENCY~~

In accordance with NYSDEC requirements and DER-31, green and sustainable remediation (GSR) components were considered during the alternatives analysis process.

To calculate the estimated environmental footprint for the chosen alternatives, SiteWise™ (Version 3.2), an Excel-based tool developed by Battelle, the U.S. Navy, and the U.S. Army Corps of Engineers was used. SiteWise™ assesses sustainability metrics such as greenhouse gas emissions, energy and water use, air pollutants, resource consumption, and accident risk. This tool breaks down remediation activities into phases, including investigation, construction, operation, and monitoring, allowing for a detailed footprint analysis and identification of high-impact activities.

Chosen alternatives for the soil alternative and the groundwater alternative were evaluated in SiteWise™ as two separate components. The discussion and results of the final output of the tool is presented in the AAR (Stantec, 2025).

GSR components will continue to be evaluated, where applicable, during the remedial action activities and throughout site management. Best practices will be considered during remedial action implementation to meet or improve upon the calculated footprint. GSR metrics determined during the design process will be tracked using the Summary of Green Remediation Metrics for Remedial Action/Site Management checklist included in Appendix E and will be included in monthly reports.

4.3 SITE PREPARATION

4.3.1 MOBILIZATION

Preparation and pre-field work activities include an underground utility clearance of public utilities through ~~DigSafe~~ UDig NY. As necessary, the ~~DigSafe~~ UDig NY public utility clearance process will be supplemented by a private underground utility location effort to identify, where possible, other onsite underground utility lines. Prior to the start of the remedial action, erosion and sediment controls (ESCs), stabilized construction entrances, the equipment and materials staging area, and the decontamination area will be assembled onsite. The HASP (Appendix A)

will be reviewed prior to the commencement of work, and tailgate meetings will be conducted at the start of each day in the field.

4.3.2 MONITORING WELL SAFEGUARDING AND/OR ~~/ VAPOR PROBE~~ DECOMMISSIONING

Existing onsite groundwater monitoring wells will either be protected during remediation ~~and development~~ for use in post-remedial monitoring or will be properly decommissioned in accordance with NYSDEC Commissioners Policy CP-43. The only exception to this is if the full length of the well is to be excavated during remediation.

~~Similarly, existing soil vapor probes will be properly decommissioned unless they are to be fully removed during remediation or used for post-remedial monitoring.~~

4.3.3 EROSION AND SEDIMENTATION CONTROLS

Best Management Practices will be employed for ESCs including silt fence, berms and lined material stockpiles, stabilized construction entrances, vehicle decontamination and dust control measures. Existing concrete and asphalt surfaces will be kept free of loose soil to minimize the amount of potentially mobile sediment into the combined sewer.

A Truck Wash Station will be installed and operated onsite and is anticipated to be situated near the exit of the Site, as determined in the field by the Contractor at the time of construction. The Remedial Engineer will be responsible for ensuring through visual observation that outbound trucks are cleaned at the Truck Wash Station before leaving the Site until the remedial construction is complete.

4.3.4 STABILIZED CONSTRUCTION ENTRANCE(S)

The Remedial Engineer will be responsible for ensuring that egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during Site remediation. Locations where vehicles enter or exit the Site shall be inspected daily for evidence of offsite sediment tracking. Cleaning of the adjacent streets will be performed as needed by the Contractor to maintain a clean condition with respect to Site-derived materials.

4.3.5 UTILITY MARKER AND EASEMENTS LAYOUT

The Participant and its contractors are solely responsible for the identification of utilities that might be affected by work under the RAWP and implementation of all required, appropriate, or necessary health and safety measures during performance of work under this RAWP. The Participant and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Participant and its contractors must obtain any local, State or Federal permits or approvals pertinent to such work that may be required to perform work under this RAWP. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. It has been determined that no risk or impediment to the planned work under this Remedial Action Work Plan is posed by utilities or easements on the Site. Based on the location of the proposed work, it is not likely that utilities will be encountered. A Ground Penetrating Radar survey (GPRS) will be completed prior to the installation of the five onsite borings and two offsite wells. The Contractor will be responsible for the identification and protection of all existing utilities at the Site and will contact ~~DigSafe~~ UDig ~~New York~~NY prior to the start of work, although the proposed work is not nearby the right of way.

4.3.6 SHEETING, ~~AND~~ SHORING, AND BENCHING

Appropriate management of structural stability of on-~~S~~site or off~~s~~-~~S~~ite structures during on-~~S~~site activities include excavation is the sole responsibility of the Participant and its contractors. The Participant and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Participant and its contractors must obtain any local, State or Federal permits or approvals that may be required to perform work under this RAWP. Further, the Participant and its contractors are solely responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved RAWP.

4.3.7 EQUIPMENT AND MATERIAL STAGING

An Equipment and Material Staging Area will be designated in a portion of the Site away from areas that will require remediation.

4.3.8 DECONTAMINATION AREA

Decontamination Areas and Truck Wash Station Decontamination Areas will be designated in portions of the Site near the areas that require remediation. The Decontamination Areas will be equipped with Alconox and water to wash equipment after handling impacted or potentially impacted material. Steam cleaning will be used for drill rigs, excavation buckets and other large equipment.

4.3.9 SITE FENCING

In addition to the Site perimeter fence, the Contractor shall erect and maintain orange construction fencing surrounding open subsurface excavations until excavations have been backfilled to surrounding grade.

4.3.10 DEMOBILIZATION

After the completion of the remedial action, ESCs, Stabilized Construction Entrances, the Equipment and Materials Staging Area, and the Decontamination Area will be dismantled and removed for proper offsite disposal. Excess material (sweepings, hay bales, general refuse, decontamination materials, etc.) will be disposed of in accordance with applicable rules and regulations.

Equipment will be properly decontaminated before removal from the Site.

4.4 REPORTING

All daily and monthly Reports will be included in the Final Engineering Report.

4.4.1 DAILY REPORTS

Daily reports will be electronically submitted to NYSDEC and NYSDOH Project Managers by ~~noon~~ 5:00 PM of each day following the reporting period and will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to ~~alpha-numeric~~a site location map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP finding, including excursions;
- Photographs of site activities;
- An explanation of notable Site conditions.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RAWP or other sensitive or time critical information. However, such conditions must also be included in the daily reports. Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

Daily Reports will include a description of daily activities keyed to an alpha-numeric map for the Site that identifies work areas. These reports will include a summary of CAMP results, odor and dust excursions and corrective actions, and all complaints received from the public.

An example Site map ~~that shows a predefined alpha-numeric grid for use in~~that will be used to ~~identif~~identify ~~ying~~ locations described in reports submitted to NYSDEC is attached in Figure 2.

The NYSDEC assigned ~~project~~ BCP Site number will appear on all reports.

4.4.2 MONTHLY REPORTS

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10th day of each month following the reporting period and will include:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (e.g., tons of material exported and imported);

- Description of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and,
- An update of the remedial schedule including the approximate percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.
- Tracking of GSR metrics determined during the design process should be included in monthly reports. The Summary of Green Remediation Metrics for Remedial Action/Site Management checklist included in Appendix E will be used for tracking and will be included in monthly reports.

4.4.3 OTHER REPORTING

Photographs will be taken of all remedial activities and submitted to NYSDEC in digital (JPEG) format. Photos will illustrate all remedial program elements and will be of acceptable quality. Representative photos of the Site prior to any Remedial Actions will be provided. Representative photos will be provided of each contaminant source, source area and Site structures before, during and after remediation. Photos will be included in the daily reports as needed, and a comprehensive collection of photos will be included in the FER.

Progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the FER, including a comparison to the goals established during the remedial program. Regular updates to the metrics used (Spreadsheets for Environmental Footprint Analysis [SEFA], SiteWise™ or otherwise approved method) should be included.

~~The Climate Screening process and results will be documented in the form of a completed checklist and brief letter report. If the Climate Screening results indicate that a CVA is necessary, a complete CVA Report will be developed. The CVA Report will be included as an Appendix or Attachment in relevant documents and/or submitted as a standalone report.~~

Job-site record keeping for all remedial work will be appropriately documented. These records will be maintained on ~~S~~site at all times during the project and be available for inspection by NYSDEC and NYSDOH staff.

4.4.4 COMPLAINT MANAGEMENT PLAN

Public complaints will be discussed with the NYSDEC Project Manager. The Contractor will be responsible to resolve the issue once a solution is developed. In the event of a health-related public complaint, the NYSDEC and NYSDOH Project Managers must be notified as soon as possible, or within 24 hours of the occurrence.

4.4.5 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

A deviation from the RAWP may be required under the following conditions:

- Unexpected subsurface conditions are encountered including previously undetected structures or soil characteristics;
- Confirmatory endpoint sampling reveals a greater extent of impact than expected;
- Confirmatory endpoint sampling reveals contaminants other than those expected; or
- Project delays caused by outside parties.

Any unexpected condition will be reported to the NYSDEC Project Manager immediately and a proposed deviation to the RAWP will be submitted for approval as soon as possible. The proposed deviation plan will include details of the proposed changes and their effect on the overall remedy.

4.5 DESIGN-STAGE FIELD PROGRAM

Prior to the onsite soil excavation program, a design-stage field program will be implemented, as described in the following section and reported in an addendum to this RAWP, to refine the remedy if needed.

4.5.1 SOIL EXCAVATION DELINEATION

A soil boring delineation program will be implemented prior to excavation of potentially CVOC-impacted soils to refine the potential lateral and vertical limits. The program will consist of five soil borings advanced to the top of the water table at an anticipated maximum depth of approximately 25 feet to delineate the excavation area. The program will also include sampling to support waste characterization of the materials that will be excavated. The previous investigation locations with residual CVOC impacts above POGW SCOs were associated with samples collected at 6 and 12 ft bgs (see Figure 12). Therefore, the final drilling (and future excavation) depths will be determined on a case-by-case basis based on field/analytical results, including reaching of the water table, and will be reported in the RAWP addendum (or FER). Based on onsite gauging data in nearby wells, depth to water ranges from 12-16 ft bgs near MW-106S/D-R on the east (and upgradient) side of the proposed excavation area and from 26-32 ft bgs near MW-201 and MW-16S/D on the west (and downgradient) side of the excavation area.

During ~~subsurface intrusive operations~~ground-intrusive activities (i.e., drilling/excavation), Stantec will implement the CAMP (Appendix C), as described in ~~Appendix C~~Section 4.1.4. A Geoprobe® direct push rig will be used for borings, and soil samples will be obtained continuously to the target bottom depth using split-spoons or Macro-core® samplers. Soils will be field screened for the presence of VOCs with a PID equipped with a 10.6 electron-volt (eV) lamp. Odors and visible physical characteristics will be described and classified, and the results of field observations will be recorded on soil boring logs. Soils will be collected for headspace screening of VOCs approximately every 1 to 2 feet, or more frequently if elevated readings are observed during screening.

One sample from each boring will be selected and submitted to the laboratory for analysis. Sample depths will be chosen based on visual observations and field screening relative to potential contaminant presence. The actual number of soil samples and analysis parameters for each soil sample will depend on the field observations. If a need for additional delineation samples is identified in the field based on significant PID readings, staining, odors, etc., additional samples may be collected. The samples will be analyzed for TCL VOCs plus up to 10 tentatively identified compounds (TICs) (Method 8260).

Additionally, at least one sample will be collected from the delineation boring soil cuttings that will be containerized in 55-gallons drums, as described in Section 4.5.8. The soil will be analyzed for the purpose of waste characterization to confirm that the material is not hazardous by characteristic and would be acceptable for landfill disposal.

Sampling and analytical activities will be conducted in accordance with standard environmental sampling and analytical guidelines and protocols contained in the QAPP, including collection and analysis of field quality control samples, as presented in Appendix B. Samples will be submitted to, and all analyses will be performed by, a NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory. All sampling data will be submitted to NYSDEC in the appropriate EQuIS Electronic Data Deliverable (EDD) format pursuant to DER-10. Should the analytical results indicate that a "step out" of the borings is needed then the data would not be subject to data validation/Data Usability Summary Report (DUSR) preparation as it will eventually be incorporated into the excavation total (screening level data points). Only remaining (post-remedial excavation) results will go through the DUSR preparation process.

4.5.2 GROUNDWATER MONITORING WELL INSTALLATION

In an effort to address the unknown plume conditions in the property directly adjacent to and south of the Site, a new offsite well pair (MW-306S/D; see Figure 13 for approximate location) is proposed to be installed and included in the long-term monitoring program. The proposed new offsite well pair would be located between MW-304S/D and MW-7 if NYSDOT can obtain access permission and the proposed well installation and sampling on that property can proceed. Otherwise, the new well pair will be installed in the ROW.

Prior to the start of drilling, access agreements/permits will be obtained, a work zone traffic control (WZTC) Plan prepared and implemented for working within community ROWs, and an underground utility clearance of public utilities will be conducted through ~~DigSafe~~ UDig NY. The ~~DigSafe~~ UDig NY public utility clearance process will be supplemented by a private underground utility location effort to identify, where possible, other underground utility lines and structures. It is anticipated that soft-digging techniques and private utility clearance will be implemented by the drilling contractor to assess for the presence of subsurface utilities. Prior to

installation of the wells, a property line survey will be conducted to confirm installation of the wells in the ROW or the permitted property.

Using a hollow stem auger, the shallow well will be installed at approximately 45 feet bgs, and the deep well at approximately 60 feet bgs. Continuous sampling will not be performed. The final depth of the well will be based on observations of saturated soils indicating the water table. The monitoring wells will be constructed using 2-inch diameter Schedule 40 polyvinyl chloride (PVC) with 0.010-inch slotted well screen. Screen lengths may be adjusted in the field if warranted but are estimated to be 10 feet. Sand packs will extend approximately 2 feet above the well screens and will be capped with an approximately 2-3-foot-thick bentonite seal. The remaining annulus will be filled to ground surface with grout. A protective surface casing (stickup) with a padlock will be installed, sealed, and mounted in place with concrete. An inner cap will be installed on the well riser. Surface and casing elevations and horizontal location coordinates for the new groundwater monitoring wells will be surveyed under the direction of a NY Professional land surveyor.

4.5.3 GROUNDWATER MONITORING WELL DEVELOPMENT

After allowing the bentonite seals to expand for a minimum of 48 hours following well installation, the monitoring wells will be developed in an effort to (1) cleanse them of suspended sediments so that turbidities are reduced to the maximum extent practicable, (2) recover any drilling fluids lost during drilling, and (3) establish a hydraulic connection between the well and the surrounding aquifer formation. The screen intervals will be surged and a minimum of three well volumes plus 110% of the volume of water lost during drilling will be removed, if feasible depending on the recovery characteristics of the formation. Wells will be developed using a submersible or Waterra pump. Turbidity will be qualitatively monitored throughout the well development process. An attempt will be made to reduce turbidity below 50 nephelometric turbidity units (NTUs), however, well development will be considered complete after the appropriate volume has been removed.

4.5.4 GROUNDWATER ELEVATION MEASUREMENT

After well development and survey activities are complete, one round of water level gauging (depth to water [DTW] measurements) including the two newly-installed wells and the 35

existing wells will be performed. Prior to groundwater sampling, the static water level will be measured in each well. Static water levels will be measured to the nearest 0.01 ft on the same day in each well using electronic water level indicators. Water levels will be measured from surveyed PVC well risers. To allow for equilibration with intrinsic groundwater conditions prior to performing the first water level measurement event, the newly-installed wells will be allowed to equilibrate for at least one week following completion of well development.

4.5.5 GROUNDWATER SAMPLING

Following the water level gauging event, a baseline sampling event including the two newly installed wells and the 19 existing long-term monitoring wells will occur a minimum of one week after the completion of well development to allow groundwater conditions to sufficiently stabilize. This event will mirror the events for the anticipated long-term monitoring suite of wells (and parameters) to be described in the SMP. Table 12 summarizes the proposed long-term groundwater monitoring program (locations and analytical parameters/methods) which will be followed for this baseline sampling event.

The sampling will be completed using low-flow methodology provided there is sufficient water produced by each well. If there is not sufficient recharge in a well for low-flow sampling procedures, the well will be purged of at least three well volumes (if reasonably possible) with monitoring and stabilization of pH, temperature, and specific conductance, or until the well goes dry although it is not considered likely given the sand lithology of the deep groundwater zone.

For low-flow sampling, wells will be purged and sampled utilizing low flow methods and a flow-through cell. Water quality field parameters (i.e., pH, temperature, specific conductivity, oxidation reduction potential, dissolved oxygen, and turbidity) will be monitored and stabilized during purging. Turbidity need not be stable, but a value of 50 NTU or less will be attempted prior to collection of samples for monitored natural attenuation (MNA) parameters. If the other parameters are stable and a value less than 50 NTUs cannot be achieved within one hour of starting the purge, total and filtered samples will be collected for the MNA parameters analyses. Filtration will be accomplished with a 0.45 micron in-line filter. Both the filtered and unfiltered samples will be submitted on hold until a determination by the geochemist is made regarding which is recommended for analysis or if both should be analyzed (this will be dependent on the

observed geochemical conditions as recorded during groundwater sampling and the anticipated CVOC concentrations at the specific well location).

4.5.6 GROUNDWATER ANALYTICAL PROGRAM

Analytical parameters planned for the baseline sampling event include VOCs at all included wells and MNA parameters (Alkalinity, Iron/Dissolved Iron, Nitrogen-Nitrate-Nitrite, Sulfate, Sulfide, Chloride, Total Organic Carbon, Ethane/Ethene, and Methane) at the onsite included wells. Field quality assurance/quality control (QA/QC) samples to be collected include field duplicates, trip blanks, rinsate blanks, and matrix spike/matrix spike duplicate analyses. Field duplicates and matrix spike/matrix spike duplicates will be collected at a rate of one per 20 field samples. A trip blank will accompany each shipment of aqueous samples scheduled for analysis of VOCs. One rinsate blank will be collected for each type of non-dedicated sampling equipment used. The rinse blank will be collected by pouring deionized water (provided by the lab as VOC-free) over decontaminated equipment.

Sampling and analytical activities will be conducted in accordance with standard environmental sampling and analytical guidelines and protocols contained in the QAPP, including collection and analysis of field quality control samples, as presented in Appendix B. Samples will be submitted to, and all analyses will be performed by, a NYSDOH ELAP-certified laboratory. All sampling data will be submitted to NYSDEC in the appropriate EQuIS EDD format pursuant to DER-10 following data usability review and preparation of a DUSR/qualified dataset.

4.5.7 DECONTAMINATION

Sampling methods and equipment have been chosen to minimize the need for decontamination. All non-dedicated equipment will be decontaminated prior to and following each use. Decontamination of drilling and excavation equipment will be accomplished with a steam cleaner. Decontamination of smaller equipment (such as Macrocores, split spoons, and hand-sampling tools) will consist of a wash with Alconox (or equivalent) solution and a potable water rinse. Non-dedicated groundwater sampling equipment will be decontaminated between wells with an Alconox and distilled water wash followed by a distilled water rinse. Following

decontamination, direct contact between sampling equipment and the ground surface will not be permitted.

4.5.8 INVESTIGATION-DERIVED WASTE (IDW)

Investigation-derived waste (IDW) materials will be handled, containerized, and disposed of in accordance with DER-10 guidance. Soil cuttings will be containerized and temporarily stored onsite in 55-gallon drums until offsite disposal is arranged. Well development, decontamination, and purge water will be containerized and temporarily stored onsite in 55-gallon drums until offsite disposal is arranged. Alternatively, a poly storage tank may be used in lieu of drums.

5.0 Remedial Action: Material Removal from Site

This section describes the materials that will be excavated from the Site as well as the plan for confirming excavation limits and soil/materials management practices under the proposed Remedial Action. These descriptions include a figure that identifies the excavation area, estimated excavation volumes, and tables of analytical results to indicate the expected contaminant concentrations to be removed. Also included are descriptions of the SCOs for each CoC, the post-remediation soil sampling plan, and a soil and materials management plan.

The soil and other materials that will be excavated, removed from the Site, and transported for appropriate offsite disposal include the following:

- All identified CVOC-impacted soils from remaining potential source areas located in the area between the western portion of IRM #3 Excavation 3-03 and the area west of TP-E that exceeds Site SCGs based on previous sampling results; and
- Other materials, including paint (if encountered), concrete and asphalt (if encountered), groundwater, decontamination water, and other materials (if encountered) generated during the proposed remediation activities.

The proposed excavation area is shown on Figure 12 and associated estimated volumes are presented in Section 5.3.

5.1 SOIL & GROUNDWATER CLEANUP OBJECTIVES

The Soil and Groundwater Cleanup Objectives for this Site are listed below.

The applicable SCGs to be used for evaluation of the design-stage field program, end-point excavation confirmatory soil sampling, and groundwater monitoring results include water quality standards and guidance values published by the NYSDEC Division of Water and SCOs published by the NYSDEC Division of Environmental Remediation, in accordance with NYSDEC's Technical Guidance for Site Investigation and Remediation, (DER-10) issued in May 2010.

The SCGs are provided by:

- Commissioner Policy CP51: Soil Cleanup Guidance, NYSDEC, October 21, 2010 (proposed June 2024 revisions);
- Technical and Operational Guidance Series (TOGS) 1.1.1, [Class GA] Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, NYSDEC, October 1993, Reissued June 1998 (with addenda dated April 2000, June 2004, and February 2023[5]); and
- NYCRR Part 375-6 SCOs, NYSDEC, Division of Environmental Remediation, revision effective December 31, 2025[6].

Soil and materials management on ~~S~~site and off ~~S~~site will be conducted in accordance with the Soil/Materials Management Plan as described below in Section 5.4.

Tables 6 and 10 present the analytical results for the SC and RI soil samples and includes a comparison to applicable SCOs proposed for this Remedial Action. Figure 9 is a spider map that shows locations of the soil samples which represent identified, remaining (post-IRM) exceedances of the SCOs proposed for this Remedial Action. As described earlier in Section 2.4.1 and in the approved RIR, the applicable SCOs for this Site are CU SCOs for all contaminant classes except VOCs, and POGW SCOs for VOCs.

~~UST closures will, at a minimum, conform to criteria defined in DER-10.~~

5.2 REMEDIAL PERFORMANCE EVALUATION (POST EXCAVATION END-POINT SAMPLING)

This section includes a discussion of endpoint sampling for soil. The long-term groundwater monitoring planned for the Site will be described in the SMP. The baseline sampling event

[5] Since the time that the investigations were completed and the reporting accepted by NYSDEC, a new TOGS addenda relating to emerging contaminants was issued in February 2023. Analytical screening tables include SCGs effective as of the date of sampling, analysis, and initial reporting.

[6] Since the time that the investigations were completed and the reporting accepted by NYSDEC, revised Part 375 SCOs became effective as of December 31, 2025. Analytical screening tables include SCGs effective as of the date of sampling, analysis, and initial reporting.

including the proposed new downgradient well pair (plus select existing wells) is described in Section 4.5.2.

5.2.1 END-POINT SAMPLING FREQUENCY AND METHODOLOGY

Endpoint soil sampling frequency for excavations will be performed in accordance with Section 5.4 of DER-10.

For soil excavations of:

- Less than 20 ft. in perimeter, one (1) sidewall sample; and
- Greater than 20 ft. in perimeter, one (1) sample from the bottom of each sidewall for every 30 ft. of sidewall.

In an excavation where multiple layers of contamination have been visually or analytically identified, additional sidewall samples in the horizon in which contamination was identified will be collected.

When VOC endpoint samples are collected from the bottom of an excavation, if samples are collected, they will be taken:

- Within 24 hours of excavation from the 0 in. to 6 in. interval at the excavation floor; and
- After 24 hours at 6 in. to 12 in. below the excavation floor.

Endpoint sample results will be compared with the SCGs summarized in Section 5.1. If endpoint samples are above SCGs then the excavation area will be expanded in the required direction, and the endpoint sampling repeated, depending on the feasibility to expand the excavation given Site constraints.

~~5.2.2 METHODOLOGY~~

~~5.2.3 REPORTING OF RESULTS~~

~~5.2.4~~5.2.2 QA/QC

Sampling and analytical activities will be conducted in accordance with standard environmental sampling and analytical guidelines and protocols contained in the QAPP, presented in Appendix B.

~~5.2.5~~5.2.3 DUSR ~~AND EDDS~~

Analytical data collected as post-excavation endpoint sampling will undergo a data usability evaluation in accordance with the NYSDEC's "Guidance for the Development of Data Usability Summary Reports," revised 1997 and DER-10. Analytical summary tables will be prepared that summarize the data and compare them to applicable New York State Standards, Objectives, and Guidance. Refer to the QAPP in Appendix B for further details on DUSRs.

~~5.2.6~~5.2.4 REPORTING OF END-POINT DATA IN FER

Chemical labs used for all end-point sample results and contingency sampling will be NYSDOH ELAP certified.

End point sampling, including bottom and side-wall sampling, will be performed in accordance with DER-10 sample frequency requirements, as listed in Section 5.2.1. ~~Side-wall samples will be collected a minimum of every [insert number] linear feet. Bottom samples will be collected at a rate of one for every [insert number] square feet from the base of the remedial excavation.~~ The FER will provide a tabular and map summary of all end-point sample results and exceedances of SCOs.

Sampling data will be submitted to NYSDEC in the appropriate EQuIS Electronic Data Deliverable format pursuant to DER-10.

5.3 ESTIMATED MATERIAL REMOVAL QUANTITIES

The quantities reported in this section are estimates. Final quantities will be reported in the FER.

The estimated quantity of soil/fill to be removed from the Site is approximately 2,596 cubic yards. The estimated quantity of soil to be imported into the Site for backfill is approximately 2,466 cubic yards and the asphalt cover is approximately 130 cubic yards. ~~The estimated quantity of soil/fill expected to be reused/relocated on Site is [X] tons/cubic yards.~~ It is estimated that none of the soil/fill will be reused/relocated on Site.

The lateral (and vertical) extent of the excavation areas, and corresponding volume estimates, will be refined during the design-stage field program described in Section 4.5. The lateral (and vertical) extent of the excavations may also change following the initial excavation based on endpoint sampling results if the results show grossly contaminated source material soils remains present. Additional soil may be excavated and removed from the Site to create sloped sidewalls or benches for the excavations. The final quantities will be reported in the FER.

5.4 SOIL/MATERIALS MANAGEMENT PLAN

The following sections include descriptions of how soils and materials will be managed during remedial actions, including the design-stage field program activities described in Section 4.5.

5.4.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional or experienced field geologist/engineer/scientist under the direction of the Remedial Engineer during all remedial and development excavations into known or potentially contaminated material. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy, ~~and during development phase, such as excavations for foundations and utility work,~~ prior to issuance of the COC.

~~All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. This information will be provided on maps in the FER.~~

Screening will be performed by qualified environmental professionals or experienced field geologist/engineer/scientist under the direction of the Remedial Engineer. Descriptions of key project personnel ~~Resumes will be provided for all personnel~~ responsible for field screening (e.g., those representing the Remedial Engineer) of invasive work for unknown contaminant sources during remediation and development work are included in the QAPP (Appendix B).

5.4.2 STOCKPILE METHODS

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. At a minimum, a storm event should be considered a rainfall of three inches or greater in 12 hours. Judgement should be used to evaluate water infiltration, nearby waterbodies where runoff is likely, and engineering controls that may be affected.

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

Soil stockpiles will be continuously encircled with silt fences. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Water will be ~~be~~ made available on-site at suitable supply and pressure for use in dust control.

5.4.3 MATERIALS EXCAVATION AND LOAD OUT

The Remedial Engineer, a qualified environmental professional, or experienced field geologist/engineer/scientist under the direction of the Remedial Engineer ~~under his/her supervision~~ will oversee all invasive work and the excavation and load-out of all excavated material.

The Participant and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

~~The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. It has been determined that no risk or impediment to the planned work under this Remedial Action Work Plan is posed by utilities or easements on the Site.~~

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

Vehicles leaving the Site will not be overloaded. The Remedial Engineer's representative will make reasonable efforts to ensure that vehicles are not loaded beyond their NYSDOT weight rating and that all material is secured beneath the truck bed cover.

A truck wash will be operated on ~~S~~site. The Remedial Engineer will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the remedial construction is complete.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off~~-Site~~ site sediment tracking.

The Remedial Engineer will be responsible for ensuring that all egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site -derived materials.

The Participant and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all invasive work and~~,~~ the structural integrity of excavations~~, and for structures that may be affected by excavations (such as building foundations and bridge footings).~~ .

~~The Remedial Engineer will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this Remedial Action Work Plan.~~

~~Each hotspot and structure to be remediated (USTs, vaults and associated piping, transformers, etc.) will be removed and end-point remedial performance sampling completed before excavations related to Site development commence proximal to the hotspot or structure.~~

~~Development related~~Post-excavation grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this plan.

Mechanical processing of historical fill and contaminated soil on ~~-S~~site is prohibited.

~~All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. The survey information will be shown on maps to be reported in the FER.~~

5.4.4 MATERIALS TRANSPORT OFF-~~S~~SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

~~Truck transport routes are as follows [describe route and provide map]. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes.~~

~~Proposed in-bound and out-bound truck routes to the Site are shown in Figure [x]. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off- Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport; [(g) community input [where necessary]]~~

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed on-~~S~~site in order to minimize off-s~~S~~ite disturbance. Off-~~S~~site queuing will be prohibited.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas or mesh truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the Site. Truck wash waters will be collected and disposed of off-~~S~~site in an appropriate manner.

5.4.5 MATERIALS DISPOSAL OFF-~~S~~SITE

~~The disposal locations are [list disposal locations].~~ Disposal locations will be established at a later date and will be reported to the NYSDEC Project Manager.

The total quantity of material expected to be disposed off-~~S~~site is approximately 3,504 tons of non-hazardous waste, 389 tons of hazardous waste, and 5 tons of decontamination, purge, and development water.

The total quantity of material expected to be disposed of offsite will be refined during the design-stage field program described in Section 4.5 and following the initial excavation based on endpoint sampling results if the results show grossly contaminated source material soils remains present. Additional soil may also be excavated and removed from the Site to create sloped sidewalls or benches for the excavations. The final quantities will be reported in the FER.

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-~~S~~site management of materials from this Site is prohibited without formal NYSDEC approval.

Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360.15 Registration Facility).

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of

material derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or BCP Participant to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

Non-hazardous historic fill and contaminated soils taken off-Ssite will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360.2. The Remedial Engineer is responsible for assuring material is properly characterized and determining the appropriate disposal methods based on the characterization results.

Historical fill and contaminated soils from the Site are prohibited from being disposed at Part 360.15 Registration Facilities (also known as Soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the NYSDEC Division of Materials Management (DMM) to be Construction and Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC DMM. This material is prohibited from being sent or redirected to a Part 360-15 Registration Facility. In this case, as dictated by DMM, special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation Site, that the soil material is contaminated and that it must not be redirected to on-Ssite or off-Ssite Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

The FER will include an accounting of the destination of all material removed from the Site during this Remedial Action, including excavated soil, contaminated soil, historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with

disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

Bill of Lading system or equivalent will be used for off-~~S~~site movement of non-hazardous wastes and contaminated soils. This information will be reported in the FER.

Hazardous wastes derived from on-~~S~~site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, State and Federal regulations.

Waste characterization sampling will be performed exclusively for the purposes of off-~~S~~site soil disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws rules and regulations and facility-specific permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC associated with waste characterization activities will be reported in the FER. All data available for soil/material to be disposed at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt. Waste characterization data will be used solely for complying with requirements for off-site disposal. Waste Characterization sampling cannot be utilized for:

- Delineating the extent of contamination required for remediation at a Site.
- Replacing or substituting data collected as part of Site Characterization and/or Remedial Investigation.
- Replacing or substituting confirmation or documentation sampling as described in NYSDEC DER-10, Section 5.4.
- To modify remedial decisions as formalized in a NYSDEC approved Decision Document or Record of Decision.

5.4.6 MATERIALS REUSE ON-~~S~~SITE

Onsite materials reuse is not anticipated. The following requirements are included if material reuse onsite becomes feasible and is preferred by the NYSDOT/Remedial Contractor, subject to review by the Remedial Engineer and NYSDEC approval.

Chemical criteria for on-Ssite reuse of material must meet the lower of Commercial Use and Protection of Groundwater SCOs. The Remedial Engineer will ensure that procedures defined for materials reuse in this RAWP are followed and that unacceptable material will not remain on-Ssite.

A "Request to Import/Reuse Fill Material" form will be filed with the NYSDEC project manager for review and approval prior to material reuse on the siteSite. A copy of the form is presented in Appendix E. Acceptable demolition material proposed for reuse on-Ssite, if any, will be sampled for asbestos.

Concrete crushing or processing on-Ssite is prohibited, unless NYSDEC has specifically approved on-site processing and reuse of acceptable demolition material.

Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse on-Ssite.

Contaminated on-Ssite material, including historic fill and contaminated soil, removed for grading or other purposes will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. This will be expressed in the Site Management Plan (SMP).

5.4.7 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Liquids discharged into the New York City sewer system will be addressed through approval by NYCDEP.

Dewatered fluids will not be recharged back to the land surface or subsurface of the Site. Dewatering fluids will be managed off-Ssite.

Discharge of water generated during remedial construction to surface waters (i.e. a local pond, stream, river and/or storm sewer) is prohibited without a State Pollutant Discharge Elimination System (SPDES) permit.

5.4.8 DEMARCATION

After the completion of soil removal and any other invasive remedial activities and prior to backfilling, a land survey will be performed by a New York State licensed surveyor. The survey will define the top elevation of residual contaminated soils. A physical demarcation layer, consisting of orange snow fencing material or equivalent material will be placed on this surface to provide a visual reference. This demarcation layer will constitute the top of the 'Residuals Management Zone', the zone that requires adherence to special conditions for disturbance of contaminated residual soils defined in the SMP. The survey will measure the grade covered by the demarcation layer before the placement of cover soils, pavement and sub-soils, structures, or other materials. This survey and the demarcation layer placed on this grade surface will constitute the physical and written record of the upper surface of the 'Residuals Management Zone' in the SMP. A map showing the survey results will be included in the FER and the SMP.

5.4.9 BACKFILL FROM OFF-~~S~~SITE SOURCES

All materials proposed for import onto the Site will be approved by the Remedial Engineer and will be in compliance with provisions in this RAWP prior to receipt at the Site.

Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site. Solid waste will not be imported onto the Site.

The FER will include the following certification by the Remedial Engineer: "I certify that all import of soils from off-~~S~~site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan".

All imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. These NYSDEC approved backfill or cover soil quality objectives are the lower of the protection of groundwater or the protection of public health soil cleanup objectives for Commercial Use as set forth in Table 375-6.8(b) of 6 NYCRR Part 375~~ and listed in Tables [x]~~. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

Soils that meet 'general fill' requirements under 6 NYCRR Part 360.13, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this RAWP should be construed as an approval for this purpose.

A "Request to Import/Reuse Fill Material" form will be filed with the NYSDEC project manager for review and approval prior to import to the site. A copy of the form is presented in Appendix E.

5.4.10 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event during active construction, until excavations are stabilized, and receive final cover. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the RAWP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the remedial construction area.

5.4.11 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during on-Site remedial excavation or development related construction, sampling will be performed on

product, sediment and surrounding soils, etc. in accordance with DER-10. Chemical analytical work will be for full scan parameters (target analyte list [TAL] metals; target compound list [TCL] volatiles and semi-volatiles, TCL pesticides, PCBs and Per- and Polyfluoroalkyl Substances (PFAS). Analyses will not be otherwise limited without NYSDEC approval.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and ~~periodic electronic media~~monthly reports submitted electronically to the NYSDEC Project Manager.

5.4.11.1 *Extreme Storm Preparedness and Response Contingency Plan*

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the Participant will undertake the following steps for site preparedness prior to the event and response after the event.

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from excavated areas, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, hay bales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to NYSDEC at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911.

Petroleum spills will be reported to NYSDEC within 2 hours of identification and consistent with State regulations. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed.

Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Stormwater control systems and structures will be inspected and maintained as necessary.

If soil or fill materials are discharged off site to adjacent properties, property owners and NYSDEC will be notified, and corrective measure plan designed to remove and clean dislocated material will be submitted to NYSDEC and implemented following approval by NYSDEC and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of NYSDEC.

If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYSDEC's spill hotline at (800) 457-7362 within statutory defined timelines. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYSDEC.

Storm Response Reporting

A site inspection report will be submitted to NYSDEC at the completion of site inspection. An inspection report will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the NYSDEC project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number.

Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYSDEC; description of corrective actions; schedule for corrective actions.

This report should be completed and submitted to NYSDEC project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.4.12 COMMUNITY AIR MONITORING PLAN

The CAMP will follow the guidance set forth in Appendix 1A and 1B of DER-10, the Generic Community Air Monitoring Plan, which is presented in Appendix C.

Monitoring locations will be placed downwind of designated work areas and will be moved as needed to account for changes in wind direction or the work location. ~~A map~~Maps showing the location of ~~fixed and mobile~~ the sampling stations ~~is shown in Figure [x].~~will be included in the daily reports.

Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report.

5.4.13 ODOR AND, DUST ~~AND NUISANCE~~ CONTROL PLAN

This section discusses the plans that will be implemented to control odor and dust during remediation activities. If other nuisances are encountered, they will be reported to NYSDEC, and a mitigation plan will be prepared by the Remedial Engineer and the contractor. In the event of a health-related public complaint, the NYSDEC and NYSDOH Project Managers must be notified as soon as possible, or within 24 hours of the occurrence.

The FER will include the following certification by the Remedial Engineer: "I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan."

5.4.13.1 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off~~-S~~site. Specific odor control methods to be used on a routine basis will include odor masking, containment, and counteraction. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Participant's Remedial Engineer, who is responsible for certifying the FER.

All necessary means will be employed to prevent on- and off~~-S~~site nuisances. P~~At a minimum, p~~rocedures ~~will~~ may include one or more of the following: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off~~-S~~site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to ons~~-S~~ite conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering excavation and

handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

5.4.13.2 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-~~S~~site work will include, at a minimum, the items listed below:

- Water will be made available on-site at suitable supply and pressure for use in dust control.
- ~~Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.~~
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-~~S~~site roads will be limited in total area to minimize the area required for water spraying.

~~*5.4.13.3 OTHER NUISANCES*~~

~~A plan for rodent control will be developed and utilized by the contractor prior to and during Site clearing and Site grubbing, and during all remedial work.~~

~~A plan will be developed and utilized by the contractor for all remedial work and will conform, at a minimum, to NYCDEP noise control standards.~~

6.0 Residual Contamination to Remain On-Ssite

Since residual contaminated soil [and groundwater/soil vapor] will exist beneath the Site after the remedy is complete, Engineering and Institutional Controls (ECs and ICs) are required to protect human health and the environment. These ECs and ICs are described hereafter. Long-term management of EC/ICs and of residual contamination will be executed under a Site specific Site Management Plan (SMP) that will be developed and included in the FER.

ECs will be implemented to protect public health and the environment by appropriately managing residual contamination. The Controlled Property (the Site) will have one primary EC system: (1) a composite cover system consisting of existing surface cover materials including non-impacted soil, imported stone from IRM backfill activities, and compacted roadbed materials.

The FER will report residual contamination on the Site in tabular and map form. This will include presentation of exceedances of both Track 1 (Unrestricted Use SCOs) and Track 4 (applicable SCOs).

6.1 SOIL

After the Remedial Action is complete, minor exceedances of the applicable SCOs (POGW SCOs for VOCs and Commercial [CU] SCOs for other contaminant classes) will remain onsite, as described below. Referenced excavation areas and sample locations are depicted on Figure 9.

- **Arsenic:** Excavation 3-01, single sample in the West Sidewall, 17 milligrams per kilogram (mg/kg) vs. the CU SCO of 16 mg/kg; and Excavation 3-03, floor composite, 18 mg/kg vs. the CU SCO of 16 mg/kg. Arsenic has not been identified in groundwater above guidance values at the Site and is not considered a Site CoC; therefore, remediation of these two remaining arsenic soil exceedances is not warranted for a Track 4 Commercial Use clean-up. It is further noted that these samples were collected at depths greater than 1 ft bgs.
- **Hexavalent Chromium:** One confirmatory sidewall sample from IRM#2 was reported to have a concentration of 16 mg/kg, which met the CU SCO of 19 mg/kg at the time of the

IRM and subsequent RI reporting. The current (as of the revisions effective December 31, 2025) CU SCO is 11 mg/kg thus this location is considered additional remaining contamination. Because of the sample depth (greater than 5 ft bgs), and the absence of chromium impacts in Site groundwater above SGVs, the revised exceedance does not warrant remediation.

- **Cadmium:** One confirmatory sidewall sample from IRM#2 was reported to have a concentration of 4.3 mg/kg, which met the CU SCO of 9.3 mg/kg at the time of the IRM and subsequent RI reporting. The current (as of the revisions effective December 31, 2025) CU SCO is 3.7 mg/kg thus this location is considered additional remaining contamination. Because of the sample depth (greater than 5 ft bgs), and the absence of cadmium impacts in Site groundwater above SGVs, the exceedance does not warrant remediation.

- **Acetone:** Excavation 3-02 (six samples, one West Sidewall sample at 57 µg/kg, two East Sidewall samples at 110 µg/kg, and three Floor samples ranging from 36 to 49 µg/kg); Excavation 3-03 (two samples, Floor at 71 µg/kg and Sidewall at 47 µg/kg); and Excavation 3-04 (single sample, East Sidewall at 53 µg/kg). The UU/POGW SCO was 50 µg/kg at the time the excavations, analyses, and reporting occurred; the current (as of the revisions effective December 31, 2025) UU/POGW SCO is 30 µg/kg. Acetone has not been widely identified in groundwater at the Site and is not considered a CoC; therefore, remediation of the remaining acetone soil exceedances is not warranted for a Track 4 Commercial Use clean-up. Acetone SGV exceedances in groundwater have generally been limited to historical datasets and are assumed to be a laboratory cross-contamination artifact. Furthermore, the soil samples were generally collected at depths more than 5 ft above the water table.

- **2-butanone:** Test pit TP-E at 170 µg/kg versus the UU/POGW SCO of 120 µg/kg. 2-butanone has not been identified in groundwater at the Site and is not considered a CoC; therefore, remediation of this single remaining 2-butanone soil exceedance is not warranted for a Track 4 Commercial Use clean-up. It is noted that TP-E, where this 2-butanone exceedance was identified, is the target of the supplemental soil removal

included in the final remedy and described in this RAWP; as such, the 2-butanone impacts may not remain post-Remedial Action.

- Benzene, ethylbenzene, and m/p- and o-xylenes were identified in one of the southern sidewall samples (SW-10) of the IRM#2 excavation. Based on the location of the confirmatory soil sample, and the sloping sides of the nearly overlapping IRM#3 excavation, it is possible that this soil remains. The concentrations reported in the confirmatory sample met the CU SCO (2006) but exceeded the POGW SCO (2006). Because the onsite groundwater has not exhibited petroleum contamination above standards, it is assumed that this contamination is localized especially considering the extensive excavations performed directly adjacent to the side-slope where the sample was collected. The December 31, 2025 revised SCOs included a lower CU SCO for benzene (20 mg/kg), which is slightly exceeded by the reported concentration in the sample (39.3 mg/kg). This area does not warrant further remediation due to: (1) the extensive surrounding excavations and nearby confirmatory sampling results; (2) the depth of the sample greater than 5 ft bgs; and (3) the absence of petroleum impacts to groundwater indicating the potential for the sample to represent a discrete location of remaining contamination.

6.2 GROUNDWATER/SOIL VAPOR

Following implementation of the supplemental soil removal program, CVOC impacts to groundwater are expected to dissipate over time, which will be tracked through the long-term groundwater monitoring program.

Residual groundwater contaminants that may remain onsite include TCE, cis-1,2-DCE, and 1,2-DCA in the southern portion of the Site and along the southwestern [downgradient] property line. Based on the most recent sampling event in 2022, residual groundwater contaminants that may remain onsite include TCE limited to the section of the Study Area between the Site and the Former Carquest Site. Long-term groundwater monitoring will monitor attenuation through time following onsite soil removal activities. Additionally, continued operation of the three offsite private property POET systems and the City of Hornell Water Supply Wells treatment plant (until influent CVOC sampling results indicate treatment is not required and NYSDOH approves

of the system termination) will mitigate potential exposure of TCE-impacted groundwater through drinking water.

Given the residual groundwater contamination, the potential for soil vapor impacts is expected to remain following implementation of remedial actions. Should a building be constructed onsite, the SMP will require SVI investigation(s) and mitigation, if necessary. Soil vapor impacts, where present, are anticipated to attenuate with time as groundwater conditions continue to improve following completion of remedial actions. Results of the offsite SVI investigation performed in December 2022 at the two adjacent properties who allowed sampling indicated that mitigation at those structures were not required.

7.0 Engineering Controls

After the remedy is complete, the Site will have residual contamination remaining in place. Engineering Controls (ECs) for the residual contamination have been incorporated into the remedy to render the overall Site remedy protective of public health and the environment.

7.1 SITE COVER SYSTEM

Exposure to residual contaminated soils will be prevented by the existing non-impacted surface cover of the Site and will be maintained as the engineered cover system subject to the requirements of a required EC. This site cover system will be comprised of the existing surface cover materials consisting of non-impacted soil, imported stone from IRM backfill activities, and compacted roadbed materials. Soil remaining below the top one foot of existing cover materials does not necessarily contain contaminants at concentrations in excess of CU SCOs and in some locations there may be no appreciable impacts to soil left in place. The existing cover system designation will allow a mechanism for the SMP to govern ground-intrusive work at the Site that might encounter residual contamination to ensure proper excavated material management and health and safety protocols that would be protective of both onsite workers as well as downgradient communities.

Should modifications to the existing non-impacted cover materials be recommended, green remediation BMPs for designing and installing a conventional cover system include:

- Design in ways that mimic rather than alter the site's natural setting, to improve the cover's long-term performance and protect ecosystem services such as potable water, wildlife habitat, and carbon storage;
- Design a cover accounting for potential effects of climate change, which could involve changes in onsite soil development or increased vulnerability to flooding;
- Use uncontaminated soil or sediment from onsite excavation instead of imported soil/sediment for the cover's frost prevention and erosion control layers; similarly, uncontaminated sand, gravel, and rocks from onsite instead of offsite areas may be used for drainage;

- Apply low impact development strategies such as installing earthen berms to manage stormwater;
- Choose geotextile fabric or drainage tubing composed of 100% recycled materials rather than virgin materials for lining, erosion control, and drainage;
- Select materials with biobased content for daily activities during cover construction;
- Use clean fuel and emission control technologies for routine field vehicles and machinery such as backhoes and bulldozers to reduce fuel consumption and emission of air pollutants such as GHGs and particulate matter; and
- Investigate onsite solar and wind resources to power equipment such as leachate pumps and flare units.

For alternative cover designs:

- Consider using asphalt rubber (containing recycled tires) where the cover system includes a layer of asphalt;
- Substitute concrete with high albedo pavement, which reflects sunlight and heat away from the cover surface and may aid growth of nearby vegetation; and
- Consider using concrete containing a high percentage of industrial waste by-products as a substitute for cement, if tests show no contaminant leaching.

In addition to BMPs that apply to conventional covers, BMPs for designing and installing an EC cover include:

- Choose recycled (crushed) concrete for biobarriers or capillary breaks instead of natural rock;
- Select native drought-resistant plants for the upper vegetative layer to reduce maintenance needs;
- Preserve biodiversity and related ecosystem services by installing a suitable mix of native shrubs, grasses, and forbs; and
- Use non-synthetic amendments such as compost instead of chemical fertilizers if the soil or vegetation is found to need supplementation over time.

~~A diagram showing the design detail for each cover type is shown in Figure [x].~~

A map showing the spatial ~~aerial~~ distribution of each of the cover types following implementation of this RAWP will be included in the FER based on updated survey data following implementation of the remedy.

An Excavation Plan will be included in the Site Management Plan and will outline the procedures to be followed if the site cover system and underlying residual contamination are disturbed after the Remedial Action is complete.

The components of the site cover system will be documented in the FER. Maintenance of this Site cover system will be described in the SMP.

7.2 OFFSITE ENGINEERING CONTROLS

Selection of the remedy assumed continued operation of two offsite engineering controls until sampling results indicate treatment is no longer required subject to NYSDEC/NYSDOH approval. The offsite groundwater treatment systems described in the following sections are not owned by the NYSDOT, therefore access to the systems for inspection and sampling is contingent upon owner access permission. NYSDOT will attempt to fulfill the SMP requirements pertaining to operation, maintenance, and monitoring of the offsite Engineering Controls to the extent practicable as limited by different ownership.

7.2.1 POET SYSTEMS

As described in Section 2.3.3.4, NYSDOT arranged for installation of POET systems in one private commercial water supply well and two private residential wells (the former Carquest property and two adjacent residences) located generally downgradient of the Site, to address historical VOC detections. The systems were installed in March 2020. Results of follow-up sampling indicate that the systems have been effective in removing/reducing VOCs from these private water supplies such that effluent samples collected to date have been non-detect (below quantitation limits) for TCE thereby meeting drinking water standards.

The POET system wells are identified as PW-16, PW-17, and PW-18, locations as depicted on Figure 11. A schematic of the POET system installation as presented in the RIR is included as Figure 14. Additional details regarding the POET system sampling, inspection, and maintenance approach will be included in the SMP.

7.2.2 CITY OF HORNELL WATER SUPPLY WELLS TREATMENT SYSTEM

As described in Section 2.3.3.1, NYSDOT funded the design and installation of an offsite water treatment plant for the City of Hornell Water Supply Wells. Design and construction were performed primarily during the period December 2014 through May 2016. The plant was commissioned in July 2016 and continues to be operated by the City Water Department as of the time of preparation of this RAWP. Since inception, the plant has successfully removed VOCs from the groundwater supply.

The construction and commissioning of the treatment system was documented in a Stantec report titled *Project Completion Report – NYSDOT Hornell Environmental Remediation Project, Carbon & Cartridge Filtration, Process Addition/Building for TCE Removal*, dated June 2016. NYSDOH approved the system certification on July 20, 2016 (Stantec, 2016b).

The approximate location of the treatment plant is depicted on Figure 1. Details relating to NYSDOT has released operations of the system to the City of Hornell. The system will continue to be maintained and periodically sampled by the City of Hornell. Inspections by NYSDOT's Remedial Engineer will be included as part of the Site Management Plan and Periodic Review Reporting.

8.0 Criteria for Completion of Remediation/Termination of Remedial Systems

8.1 COMPOSITE COVER SYSTEM

The composite cover system is a permanent control, and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity as defined by the SMP.

NYSDOT may elect to incorporate additional material types (i.e., pavement) into the existing surface cover so long as no residual contamination is exposed during the process and that the system will function as required. Proposed modifications to the cover system would be subject to the requirements of the SMP including proper notifications and materials management pursuant to the Excavation Work Plan (as appended to the SMP).

8.2 OFFSITE TREATMENT SYSTEMS

Selection of the remedy assumed continued operation of two offsite engineering controls until sampling results indicate treatment is no longer required subject to NYSDEC/NYSDOH approval. The offsite groundwater treatment systems described in the following sections are not owned by the NYSDOT, therefore access to the systems for inspection and sampling is contingent upon owner access permission. NYSDOT will attempt to fulfill the SMP requirements pertaining to termination of treatment systems to the extent practicable as limited by different ownership.

8.2.1 POET SYSTEMS

The three offsite POET systems described in Section 2.3.3.4 will remain in place and will be maintained and periodically sampled by NYSDOT until influent CVOC sampling results indicate treatment is not required (contingent on pending NYSDEC/NYSDOH requirements that will be included in the Site Management Plan). Because these systems are installed on privately owned wells on private property, NYSDOT cannot compel the property owners to permit access for inspection, maintenance, and sampling; further, the property owners may elect to stop use of the installed POET systems without notification or prior approval from NYSDEC/NYSDOH. NYSDOT will notify NYSDEC/NYSDOH if intent to discontinue treatment is received.

8.2.2 CITY OF HORNELL WATER SUPPLY WELLS TREATMENT SYSTEM

The offsite water treatment plant for the City of Hornell Water Supply Wells described in Section 2.3.3.1 is assumed to remain in place until influent CVOC sampling results indicate treatment is not required (contingent on pending NYSDEC/NYSDOH requirements that will be included in the Site Management Plan) or the City of Hornell abandons use of the City of Hornell Water Supply Wells as a municipal drinking water source. Collaboration with the City of Hornell is expected to continue. However, because NYSDOT released ownership of the system to the City of Hornell, NYSDOT cannot compel them to share sampling results, enforce maintenance schedules, or permit access for inspection.

8.3 Groundwater Monitoring

Groundwater monitoring activities to assess the performance of the remedy, or natural attenuation following the removal of contaminant sources, will continue, as determined by NYSDOH and NYSDEC, until residual groundwater concentrations are found to be below NYSDEC standards or have become asymptotic over an extended period. Monitoring will continue until permission to discontinue is granted in writing by NYSDEC and NYSDOH. Monitoring activities will be outlined in the Monitoring Plan of the SMP. It is anticipated that, following remediation, a minimum of eight quarterly monitoring events will be performed.

9.0 Institutional Controls

After the remedy is complete, the Site will have residual contamination remaining in place. Engineering Controls (ECs) for the residual contamination have been incorporated into the remedy to render the overall Site remedy protective of public health and the environment. Two elements have been designed to ensure continual and proper management of residual contamination in perpetuity: an Environmental Easement and a Site Management Plan (SMP).

~~All as-built drawings, diagrams, calculation and manufacturer documentation for treatment systems will be presented in the FER.~~ A Site -specific Environmental Easement will be recorded with Steuben County to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC. It requires that the grantor of the Environmental Easement and the grantor's successors and assigns adhere to all Engineering and Institutional Controls (ECs/ICs) placed on this Site by this NYSDEC-approved remedy. ICs provide restrictions on Site usage and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. The SMP describes appropriate methods and procedures to ensure compliance with all ECs and ICs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

9.1 ENVIRONMENTAL EASEMENT

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left onsite after the Remedial Action is complete. As part of this remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with Steuben County. The Environmental Easement will be submitted as part of the Final Engineering Report.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with Steuben County before the Certificate of Completion can be issued by NYSDEC. A series of Institutional Controls are required under this remedy to implement, maintain and monitor these Engineering Control systems, prevent future exposure to

residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to Commercial/Industrial) use(s) only. These Institutional Controls are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. Institutional Controls can, generally, be subdivided between controls that support Engineering Controls, and those that place general restrictions on Site usage or other requirements. Institutional Controls in both of these groups are closely integrated with the SMP, which provides all of the methods and procedures to be followed to comply with this remedy.

The Institutional Controls that support Engineering Controls are:

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- A site cover system consisting of existing surface cover materials including non-impacted soil, imported stone from IRM backfill activities, and compacted roadbed materials must be inspected, certified and maintained as required in the SMP;
- ~~A [soil vapor mitigation] system consisting of [a sub-slab depressurization system under all building structures] must be inspected, certified, operated and maintained as required by the SMP;~~
- All [onsite] Engineering Controls on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP. Offsite Engineering Controls, not controlled or under ownership of NYSDOT, will be sampled/inspected at the frequency and in a manner defined in the SMP, assuming access is granted.
- Groundwater ~~and other environmental or public health~~ monitoring must be performed as defined in the SMP;
- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP;
- Onsite environmental monitoring devices, including ~~but not limited to, [~~groundwater monitoring wells ~~and soil vapor probes]~~, must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP;

- Engineering Controls may not be discontinued without an amendment or extinguishment of the Environmental Easement.

Adherence to these Institutional Controls for the Site is mandated by the Environmental Easement and will be implemented under the SMP (discussed in the next section). The Controlled Property (Site) will also have a series of Institutional Controls in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- Vegetable gardens and farming on the Controlled Property are prohibited;
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;
- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the SMP;
- The Controlled Property may be used for Commercial (or Industrial) use only, provided the long-term Engineering and Institutional Controls included in the SMP are employed;
- The Controlled Property may not be used for a higher level of use, such as residential or restricted residential use without an amendment or extinguishment of this Environmental Easement;
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This annual statement must be certified by an expert that the NYSDEC finds acceptable, such as a person or firm meeting their definition of a Qualified Environmental Professional (QEP).

9.2 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the FER and issuance of the Certificate of Completion (COC) for the Remedial Action. The SMP is submitted as part of the FER but will be written in a manner that allows its removal and use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the SMP are performed.

The SMP should include methods to incorporate and track GSR. Measures should be taken to maintain a cost-effective, protective remedy that remains conscientious of the Site's environmental footprint. At a minimum, the following should be assessed: waste generation, energy usage, emissions, and water usage.

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development and implementation of monitoring systems and a Monitoring Plan; (3) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); (4) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (5) defining criteria for termination of treatment system operation.

To address these needs, this SMP will include four plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation and the guidelines provided by NYSDEC including the SMP document template.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. The certification period will be annually, until a modified (i.e., reduced) frequency is proposed by NYSDOT or NYSDOT's representative and subsequently approved by the Departments. The SMP will be based on the certifying period relative to the date of issuance of the COC. The first submission will be due 16 months after the issuance of the COC, and annually (or at another frequency as approved by NYSDEC) thereafter.

The SMP in the FER will include a monitoring plan for groundwater at the downgradient Site perimeter to evaluate Site-wide performance of the remedy. The existing monitoring well network plus the additional well pair installed as part of this Remedial Action includes a distribution of well locations that sufficiently address (1) onsite, (2) downgradient (including the area immediately downgradient of all source remediation areas for the purpose of evaluation of the effectiveness of the remedy that is implemented), and (3) offsite Study Area-wide groundwater monitoring.

No exclusions for handling of residual contaminated soils will be provided in the SMP. All handling of residual contaminated material will be subject to provisions contained in the SMP.

10.0 Final Engineering Report

A Final Engineering Report (FER) will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site during implementation of this RAWP including the surveyed map(s) of all sources. The FER will include as-built drawings for all constructed elements, ~~calculation and manufacturer documentation for treatment systems,~~ certifications, manifests, bills of lading as well as the complete SMP. The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling, and chemical analysis performed as part of the Remedial Action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. The FER will be prepared in conformance with DER-10.

~~Where determined to be necessary by NYSDEC, a Financial Assurance Plan will be required to ensure the sufficiency of revenue to perform long-term operations, maintenance and monitoring tasks defined in the Site Management Plan and Environmental Easement. This determination will be made by NYSDEC in the context of the FER review.~~

The FER will include written and photographic documentation of all remedial work performed under this remedy.

~~The FER will include an itemized tabular description of actual costs incurred during all aspects of the Remedial Action.~~

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the Track 1 Unrestricted Use SCO in 6NYCRR Part 375-6. A table that shows exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action and a map that shows the location and summarizes exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP and must provide an explanation for why the material was not removed as part of the Remedial Action. A table that shows residual contamination in excess of Site SCOs and a map that shows residual contamination in excess of Site SCOs will be included in the FER.

The FER will include an accounting of the destination of all material removed from the Site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

The FER must include a discussion of the green remediation practices/technologies employed throughout the remedial program, which will include a final footprint analysis using a DER accepted model (e.g., SiteWise™), and any tracking methods used through the construction including restoration activities.

Before approval of a FER and issuance of a COC, all project reports must be submitted in digital form on electronic media (PDF).

10.1 CERTIFICATIONS

The following certification will appear in front of the Executive Summary of the FER. The FER will be prepared, stamped and the following certification signed by an individual licensed or otherwise authorized in accordance with article 145 of the education law to practice the profession of engineering. The certification will include the following statements:

I, _____, am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Action Work Plan was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Action Work Plan.

I certify that all use restrictions, Institutional Controls, onsite Engineering Controls , and/or any operation and maintenance requirements applicable to the Site are contained in an

environmental easement (EE) created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by Department.

~~I certify that any financial assurance mechanisms required by the Department pursuant to Environmental Conservation Law have been executed.~~

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as Owner's Designated Site Representative for the site.

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

11.0 Schedule

Timing of the implementation of this RAWP is dependent on engagement of a remedial construction contractor through the NYSDOT project bidding, award, and contracting process. The duration of the work will depend on the extent of waste material presence and volumes, approval of a disposal site(s) and other factors, as will be described in a RAWP Addendum following completion of the design-stage field program.

NYSDEC will be notified approximately two weeks in advance of commencement of each stage of the Remedial Action field activities and will be kept informed via periodic email updates as the work progresses in accordance with the reporting requirements outlined in Section 4.4.

A proposed summary of work elements (i.e., tasks) and associated schedule is presented in Table 13 and includes estimated timeframes/deliverables up to the NYSDOT remedial contractor bidding process. Finalized scheduling is dependent on the engagement of a remedial contractor(s) but the preceding tasks (i.e., the design-stage field program) will dictate their own scheduling requirements (i.e., survey of the additional proposed monitoring wells will occur after the anticipated installation date).

The schedule will be projected outward to include anticipated timing of the FER, SMP, and EE package submissions once the NYSDOT has selected a remedial contractor to complete the Remedial Action. The updated schedule will be submitted under separate cover as part of a second RAWP addendum or monthly progress report.

12.0 References

12.1 FEDERAL STANDARDS, CRITERIA, AND GUIDANCE

1. 29 Code of Federal Regulations (CFR) Part 1910.120 - Hazardous Waste Operations and Emergency Response.
2. 29 CFR Part 1926, Subpart D, Section 1926.65 – Safety and Health Regulations for Construction, Occupational Health and Environmental Controls, Hazardous Waste Operations and Emergency Response.
3. U.S. EPA OSWER Directive 9200.4-17 - Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (December 1997).

12.2 NEW YORK STATE STANDARDS, CRITERIA, AND GUIDANCE

1. 6 NYCRR Part 364 – Waste Transporter Permits.
2. 6 NYCRR Part 360 – Solid Waste Management Facilities.
3. 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes.
4. 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities.
5. 6 NYCRR Part 375 – Environmental Remediation Programs.
6. 6 NYCRR Part 750 – State Pollutant Discharge Elimination System (SPDES) Permits.
7. 12 NYCRR Part 56 – Asbestos.
8. Commissioner Policy CP-43: Groundwater Monitoring Well Decommissioning Policy. NYSDEC, November 3, 2009.
9. Commissioner Policy CP-51: Soil Cleanup Guidance. NYSDEC, October 21, 2010 (proposed June 2024 revisions).
10. DER-10: Technical Guidance for Site Investigation and Remediation. NYSDEC, May 3, 2010.
11. DER-31: Green Remediation. NYSDEC, August 11, 2010 (proposed September 2025 revisions).

12. Environmental Conservation Law (ECL) Article 27 Title 14 – Brownfield Cleanup Program.

13. Environmental Conservation Law (ECL) Article 71 Title 36 – Environmental Easements.

14. Generic Community Air Monitoring Plan. NYSDOH, May 2010.

15. *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. NYSDOH, October 2006 (including notable updates September 2013, August 2015, May 2017, and February 2024 as posted online: health.ny.gov/environmental/indoors/vapor_intrusion/update.htm).

16. *Guidance for the Development of Data Usability Summary Reports*. NYSDEC, revised 1997.

17. New York State Education Law, Title VIII, Article 145 – Professional Engineering, Land Surveying and Geology.

18. New York State Standards and Specifications for Erosion and Sediment Control. NYSDEC, November 2016.

19. *Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances under NYSDEC's Part 375 Remedial Programs*. NYSDEC, April 2023.

20. TAGM 3028 - "Contained In" Criteria for Environmental Media: Soil Action Levels. NYSDEC, August 1997. (TAGM series being replaced by DER series. See website for details related to contained-in determinations: Contained-in Determinations - NYSDEC)

21. *Technical and Operational Guidance Series (TOGS 1.1.1) Memorandum: Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*. NYSDEC Division of Water, October 22, 1993, Reissued June 1998, and addenda dated April 2000, June 2004, and February 2023.

12.3 OTHER REFERENCES

1. Miller, et al, 1990. Geohydrology of the Surficial Aquifer in the Hornell Area, in Steuben and Allegany Counties, New York, Water Resources Investigation Report 89-4053 (7 Plates), Todd S. Miller.

2. NYS Geologic Survey, 1970. Bedrock Geologic Map of New York, Finger Lakes Sheet, Map and Chart Series #15, Rickard et al, 1970.

3. NYS Geologic Survey, 1986. Surficial Geologic Map of New York, Finger Lakes Sheet, Map and Chart Series #40, Muller et al, 1986.

4. Pepper, J., 1954. Bedrock Geology of the Hornell Quadrangle, New York: U.S. Geological Survey Geologic Quadrangle 37.

5. Stantec, 2014. Interim Summary Report and Work Plan, Miller Hill Facility Site Investigation, 7578 State Route 21, Hornell, NY, D0310598, PIN: S000.16. July 3, 2014.

6. Stantec, 2015. Revised Site Characterization Work Plan, Miller Hill Yard, NYSDEC Site #851045, 7578 State Route 21, Fremont, Steuben County, New York. April 22, 2015.

7. Stantec, 2016a. Interim Remedial Measure, Drum Removal Work Plan, Miller Hill Yard, NYSDEC Site #851045, 7578 State Route 21, Fremont, Steuben County, New York. January 13, 2016.

8. Stantec, 2016b. Project Completion Report – NYSDOT Hornell Environmental Remediation Project, Carbon & Cartridge Filtration, Process Addition/Building for TCE Removal. June 2016.

9. Stantec, 2018a. Construction Completion Report, Interim Remedial Measure - Drum Removal, Miller Hill Yard, NYSDEC Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York. May 21, 2018.

10. Stantec, 2018b. Remedial Investigation Work Plan, NYSDOT Miller Hill Yard, NYSDEC Site #851045, 7578 State Route 21, Fremont, Steuben County, New York. June 2018.

11. Stantec, 2020a. Interim Remedial Measure No. 3, Construction Completion Report, Miller Hill Yard NYSDEC Site #C851045 7578 State Route 21 Fremont, Steuben County, New York. October 26, 2020.

12. Stantec, 2020b. Supplemental Remedial Investigation Work Plan, NYSDOT Miller Hill Yard Site, NYSDEC Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York. November 11, 2020.

13. Stantec, 2022. Soil Vapor Intrusion Investigation Work Plan, NYSDOT Former Miller Hill Yard Site, BCP Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York. February 2022.

14. Stantec, 2023. Soil Vapor Intrusion Investigation Report, NYSDOT Former Miller Hill Yard Site, BCP Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York. April 2023/September 2023.

15. Stantec, 2024. Revised Remedial Investigation Report, NYSDOT Former Miller Hill Yard Site, BCP Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York. May 2024.

16. Stantec, 2025. Alternatives Analysis Report, NYSDOT Former Miller Hill Yard Site, Brownfield Cleanup Program Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York. September 8, 2025.

Attachments

TABLES

Table 1
Summary of Previous Environmental Documents
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

DRAFT

Date	Document Type	Title	General Content
Investigation-Related Documents			
2014.07.03	Report/Work Plan	*Interim Summary Report and Work Plan, Miller Hill Facility Site Investigation, 7578 State Rt. 21, Hornell, New York* , D0310598, PIN: S000.16	Summarized geophysical survey results and groundwater confirmation sampling; proposed additional subsurface investigations (test pits, borings, soil and groundwater sampling/analysis).
2015.04.22	Letter	*Response to NYSDEC Comments on Draft Site Characterization Work Plan,* NYSDOT Miller Hill Yard, Fremont, NY, NYSDEC Site #851045	Specific responses to NYSDEC's comments on Draft Site Characterization Work Plan.
2015.04.22	Work Plan	*Revised Site Characterization Work Plan, Miller Hill Yard, NYSDEC Site #851045, 7578 State Route 21, Fremont, Steuben County, New York* (Final; Draft was submitted Sept 2014)	Summarized previous groundwater sampling results (April 2014), geophysical survey (June 2014) results, test pit program (July 2014), passive soil gas survey (November 2014), and proposed Site Characterization investigations. Also included supporting plans: Quality Assurance Protection Plan, Health and Safety Plan, and Community Air Monitoring Plan.
2015.09.05	Work Plan	*Work Plan - Supplemental Groundwater Sampling, NYSDOT Miller Hill Site ("Old Yard"), 7578 State Rt. 21, Site Code #851045*	Summarized geophysical survey results and groundwater confirmation sampling.
2016.02.03	Letter	*Work Plan Modification—Supplemental Test Pits/IDW Removal , NYSDOT Miller Hill Site, 7578 State Rt. 21, Site Code #851045*	Proposed supplemental test pit program for Paint Drum Area, with additional soil and groundwater analyses.
2016.04.01	Report	*DRAFT Miller Hill Yard, Site Characterization Preliminary Summary*	Summarized results of 2015 Site Characterization activites and findings.
2016.06.10	Letter	*Miller Hill Yard, Site Characterization, Hydraulic Conductivity Test Results*	Summarized 2016 hydraulic conductivity testing results.
2016.08.05	Report	*DRAFT Summary of Supplemental Test Pit Excavation, NYSDOT Miller Hill Yard Site, 7578 State Rt. 21, Site Code #851045*	Summarizes results of supplemental test pit program to attempt to delineate drum locations.
2018.06.25	Work Plan	*Remedial Investigation Work Plan, NYSDOT Miller Hill Yard, NYSDEC Site #851045, 7578 State Route 21, Fremont, Steuben County, New York*	Describes proposed investigation activities relative to offsite environmental conditions that may be a result of groundwater contamination known to exist on the Site and in City of Hornell water supply wells, and supplemental onsite investigation to further characterize Site conditions and facilitate additional remedial actions.
2020.11.13	Work Plan	*Supplemental Remedial Investigation Work Plan, NYSDOT Miller Hill Yard Site NYSDEC Site #C851045 7578 State Route 21, Fremont, Steuben County, New York*	Described proposed program of installation and sampling of new offsite monitoring wells.
2022.02.02	Work Plan	*Soil Vapor Intrusion Investigation Work Plan, NYSDOT Former Miller Hill Yard Site, BCP Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York*	Summarizes the further evaluation of the potential for SVI to occur in occupied offsite structures identified as being in close proximity to the offsite groundwater TCE plume
2023.04.11	Letter	*Supplemental Groundwater Gauging and Sampling Event, November-December 2022*	Summarized investigation activities, methods, and results of a supplemental groundwater gauging and sampling event.
2023.09.18	Report	*Soil Vapor Intrusion Investigation Report, NYSDOT Former Miller Hill Yard Site, BCP Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York.* (Final, Draft was submitted April 18, 2023).	Summarizes results of the SVI investigation field program.
2024.01.02	Report	*Revised Remedial Investigation Report, NYSDOT Former Miller Hill Yard Site, BCP Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York*	Summarized historical investigations, previous interim remedial measures, and remedial investigation activities (including incorporation of the offsite soil vapor intrusion investigation), findings, and recommendations.
Interim Remedial Measures-Related Documents			
2015.04.17	Report	*City of Hornell Water Supply Wells, Additional of Carbon Filtration Treatment, Design Package and Plans & Specifications*	System design basis and construction plans and specifications.
2016.01.13	Work Plan	*Interim Remedial Measure, Drum Removal Work Plan, Miller Hill Yard, NYSDEC Site #851045, 7578 State Route 21, Fremont, Steuben County, New York* (Final; Draft sent Sep. 9, 2015)	Described proposed program to remove drums, impacted soil and potential related wastes.
2016.06.07	Report	*Project Completion Report, Carbon & Cartridge Filtration Process Additions/Building for TCE Removal, (C) Hornell, Steuben County* , BWSP Logbook #19359, PWS#5001215	System design basis and construction plans and specifications.
2018.03.09	Work Plan	*Interim Remedial Measure No. 3 Work Plan, Miller Hill Yard, NYSDEC Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York*	Described proposed program to remove source-area, impacted soil, drums and related wastes.
2018.05.21	Report	*Construction Completion Report, Interim Remedial Measure - Drum Removal, Miller Hill Yard, NYSDEC Site #C851045, 7578 State Route 21, Fremont, Steuben County, New York.*	Summarized excavation and drum removal IRM activities, waste disposal and analytical results.
2019.03.15	Work Plan	*Miller Hill Yard - BCP Site #851045, Offsite Private Well Sampling Plan* (Included Contingency Plan)	Described proposed sampling program and potential Point-of-Entry Treatment system installation.
2020.10.26	Report	*Interim Remedial Measure No. 3, Construction Completion Report, Miller Hill Yard NYSDEC Site #C851045 7578 State Route 21 Fremont, Steuben County, New York*	Summarized IRM-3 excavation activities, waste disposal and analytical results.
Remedy Selection/Implementation-Related Documents			
2025.09.08	Report	*Alternatives Analysis Report, NYSDOT Former Miller Hill Yard Site, Brownfield Cleanup Program Site #C851045 7578 State Route 21, Fremont, Steuben County, New York*	Analysis of potential alternatives for final remedy to address remaining contamination and selection of preferred final remedy.

Table 2
Summary of Field Events
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

DRAFT

FIELD EVENT / TASK	APPROXIMATE TIMEFRAME	REMARKS
NYSDEC Carquest Investigation	2009 - 2013	Installation and sampling of 19 offsite and 6 onsite monitoring wells; minimal soil sample analyses; sampling of 14 private water supply wells.
Site Characterization (SC) Phase (Pre-BCP)		
Groundwater gauging and sampling - initial onsite round	Apr 2014	Previously-installed NYSDEC Montoring Wells (6 Total).
Geophysical survey	Jun 2014	Electromagnetic Survey.
Initial test pit excavation and soil sampling	Jul 2014	Locations (7): TP-A through TP-G.
Passive soil gas survey	Nov 2014	114 Beacon samplers deployed.
Groundwater gauging and sampling - 2nd onsite round	Sep 2014	NYSDEC previously-installed montoring wells (6 Total).
Supplemental test pit excavation and soil sampling	Jul 2015	Locations (6): TP-101A/B, TP-102, TP-103, and TP-103A/B.
Test borings/subsurface soil sampling	Jul-Nov 2015	Locations (13): B-101 through B-111.
Monitoring well installation and development	Jul-Nov 2015	Locations (8): MW-101, MW-102, MW-103, MW-104S/D, MW-105, and MW-106S/D.
Surface soil sampling	Aug 2015	Locations (6): SS-1 through SS-6.
Groundwater gauging and sampling - 3rd onsite round	Dec 2015	New SC wells and previous NYSDEC wells.
Hydraulic conductivity (slug) testing	Apr 2016	Four wells: MW-101, MW-103, and MW-106S/D.
Supplemental test pit excavation (apparent buried drum area) and soil sampling	Apr 2016	26 test pits to attempt to delineate buried drums.
Interim Remedial Measure - Drum Removal (Referred to as IRM No. 2) [see note 1]	Mar - Dec 2017	Single Excavation. Decommissioned 1 NYSDEC well.
Interim Remedial Measure No. 3	Sep 2018 - Sep 2019	Four Excavations. Decommissioned 1 NYSDEC well and 5 Site Characterization wells; replaced (6) decommissioned wells.
Remedial Investigation (BCP)		
Onsite surface soil sampling	Nov 2018	35 sample locations (5 from each of 7 areas, composited)
Private well sampling	Jun-Sep 2019	29 locations; included resampling of 6 private wells.
Re-development of NYSDEC offsite monitoring wells	Dec 2019	Re-developed 10 offsite wells.
Groundwater sampling - existing onsite and offsite monitoring wells	Jan 2020	21 wells total: 11 onsite and 10 offsite; included emerging contaminants sampling at three onsite locations: MW-102, MW-103, and MW-16D.
Groundwater sampling (at two locations inaccessible in January 2020)	Mar 2020	MW-105 and MW-20.
Groundwater drawdown monitoring for City supply wells; Point-of-Entry Treatment (POET) system sampling	Jul 2020	Transducers in 5 offsite monitoring wells: MW-3D, MW-5, MW-7, MW-11, and MW-18; effluent sampling at PW-16, PW-17, and PW-18 POET systems.
Monitoring well installation - onsite and offsite	Jan - Mar 2021	7 offsite wells (MW-301S/D, MW-302, MW-303, MW-304S/D, and MW-305); 5 new onsite wells (MW-201 through MW-205).
Groundwater gauging and sampling - new onsite and offsite monitoring wells; POET system sampling	March 2021	7 offsite wells (MW-301S/D, MW-302, MW-303, MW-304S/D, and MW-305); 5 new onsite wells (MW-201 through MW-205); effluent sampling at PW-16 and PW-18 POET systems; effluent re-sample and influent sample at PW-18.
POET system sampling	May 2021	Influent and effluent sampling at PW-17 POET system.
Comprehensive groundwater gauging event	June 2021	17 offsite wells; 17 onsite wells (MW-105 excluded due to access issues).
POET system sampling	Nov - Dec 2021	Influent, mid-carbon, and effluent sampling at PW-16, PW-17, and PW-18 (plus re-sample) POET systems.
POET system sampling	May - Aug 2022	Influent, mid-carbon, and effluent sampling at PW-16, PW-17, and PW-18 POET systems.
Supplemental groundwater gauging and sampling event	Nov - Dec 2022	33 wells gauged, including 16 offsite wells and 17 onsite wells. 23 wells sampled including 12 offsite wells (MW-5, MW-12, MW-7, MW-13, MW-18, MW-301D, MW-301S, MW-302, MW-303, MW-304D, MW-304S, and MW-305); and 11 onsite wells (MW-15-R, MW-16D, MW-16S, MW-17, MW-104S-R, MW-104D-R, MW-201, MW-202, MW-203, MW-204, and MW-205).
Soil vapor intrusion (SVI) investigation	Dec 2022	Collection of indoor air, sub-slab vapor, and outdoor ambient air samples for laboratory analysis, pre- and post-sample helium leak testing, and completion of a limited chemical inventory and building questionnaire. The SVI investigation activities were performed at two structures where property owner approval was obtained.
POET system sampling	Jul - Aug 2024	Influent, mid-carbon, and effluent sampling at PW-16, PW-17, and PW-18 POET systems.
POET system sampling	Oct 2025	Influent, mid-carbon, and effluent sampling at PW-16, PW-17, and PW-18 POET systems.

Notes

1. IRM No. 1 was the design and installation of an offsite carbon water treatment plant for the City of Hornell water supply wells.

Table 3
Monitoring Well Construction Summary
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

DRAFT

Well ID	Installed By	Description	Survey Data[1]						Construction Information[2]								
			Source[3]	Northing	Easting	Ground Surface Elevation	TOOC Elevation	TOIC Elevation	Well Diameter (in)	Seal Interval	Sandpack Interval	Screen Interval	Screen Length (ft)	Source[3]	Reference Elevation[4]	TOS Elevation[4]	BOS Elevation[4]
ONSITE WELLS																	
MW-15-R	Stantec	IRM replacement	2	864254.7	527627.5	1207.52	1209.95	1209.82	2	15.6 - 17.6	17.6 - 30.0	19.6 - 29.6	10	2	1207.5	1187.9	1177.9
MW-16D	NYSDEC	--	2	864431.1	527440.6	1205.86	1208.96	1208.65	2	30.0 - 38.0	38.0 - 50.0	40.0 - 50.0	10	2	1205.9	1165.9	1155.9
MW-16S	NYSDEC	--	2	864432.3	527442.4	1205.90	1208.93	1208.70	2	13.0 - 18.0	18.0 - 30.0	20.0 - 30.0	10	2	1205.9	1185.9	1175.9
MW-17	NYSDEC	--	2	864708.6	527359.3	1207.13	1210.15	1210.05	2	20.0 - 28.0	28.0 - 40.0	30.0 - 40.0	10	2	1207.1	1177.1	1167.1
MW-20	NYSDEC	--	2	864547.1	527677.5	1220.53	1223.84	1223.55	2	5.0 - 11.0	11.0 - 13.0	13.0 - 23.0	10	2	1220.5	1207.5	1197.5
MW-101-R	Stantec	IRM replacement	2	865056.4	527391.2	1232.05	1234.77	1234.66	2	15.5 - 17.5	17.5 - 29.5	19.5 - 29.5	10	2	1232.1	1212.6	1202.6
MW-102	Stantec	SC installation	2	864772.1	527382.0	1209.80	1209.80	1209.42	2	16.0 - 18.0	18.0 - 32.0	20.0 - 30.0	10	2	1209.8	1189.8	1179.8
MW-103	Stantec	SC installation	2	864636.4	527566.6	1212.34	1215.04	1214.61	2	10.4 - 13.0	13.0 - 29.8	15.5 - 25.5	10	2	1212.3	1196.8	1186.8
MW-104D-R	Stantec	IRM replacement	2	864596.2	527358.6	1207.74	1210.05	1210.05	2	31.0 - 33.0	33.0 - 50.0	35.0 - 50.0	15	2	1207.7	1172.7	1157.7
MW-104S-R	Stantec	IRM replacement	2	864596.2	527369.9	1208.03	1210.41	1210.35	2	16.1 - 18.1	18.1 - 30.1	20.1 - 30.1	10	2	1208.0	1187.9	1177.9
MW-105	Stantec	SC installation	2	864232.7	527552.7	1195.86	1197.68	1197.74	2	6.0 - 8.0	8.0 - 21.0	10.0 - 20.0	10	2	1195.9	1185.9	1175.9
MW-106D-R	Stantec	IRM replacement	2	864390.4	527610.0	1208.70	1211.07	1211.03	2	27.0 - 29.0	29.0 - 40.0	30.0 - 40.0	10	2	1208.7	1178.7	1168.7
MW-106S-R	Stantec	IRM replacement	2	864396.4	527615.1	1208.96	1211.28	1211.13	2	16.0 - 18.0	18.0 - 30.0	20.0 - 30.0	10	2	1209.0	1189.0	1179.0
MW-201	Stantec	RI installation	3	864345.5	527493.8	1206.01	1207.16	1206.93	2	29.0 - 32.0	32.0 - 47.0	37.0 - 47.0	10	3	1206.0	1169.0	1159.0
MW-202	Stantec	RI installation	3	864274.5	527574.6	1206.01	1209.02	1208.82	2	29.0 - 32.0	32.0 - 47.0	37.0 - 47.0	10	3	1206.0	1169.0	1159.0
MW-203	Stantec	RI installation	3	864236.8	527615.4	1206.53	1209.38	1209.09	2	29.0 - 32.0	32.0 - 47.0	37.0 - 47.0	10	3	1206.5	1169.5	1159.5
MW-204	Stantec	RI installation	3	864216.9	527680.9	1208.50	1211.46	1211.22	2	29.0 - 32.0	32.0 - 47.0	37.0 - 47.0	10	3	1208.5	1171.5	1161.5
MW-205	Stantec	RI installation	3	864291.0	527664.2	1208.83	1211.85	1211.63	2	29.0 - 32.0	32.0 - 47.0	37.0 - 47.0	10	3	1208.8	1171.8	1161.8
Decommissioned Onsite Wells																	
MW-15	NYSDEC	decommissioned	1	864251.9	527630.3	1207.10	1210.10	1210.00	2	0.0 - 13.0	13.0 - 30.0	15.0 - 30.0	15	1	1207.1	1192.1	1177.1
MW-19	NYSDEC	decommissioned	1	864939.3	527425.4	1225.90	1228.90	1228.70	2	8.0 - 13.0	13.0 - 30.0	15.0 - 30.0	15	1	1225.9	1210.9	1195.9
MW-101	Stantec	SC installation; decommissioned	1	865052.9	527394.9	1232.50	1234.80	1234.80	2	16.0 - 18.0	18.0 - 32.5	20.0 - 30.0	10	1	1232.5	1212.5	1202.5
MW-104D	Stantec	SC installation; decommissioned	1	864591.0	527360.4	1207.70	1210.10	1210.10	2	30.5 - 33.0	33.0 - 50.3	35.0 - 50.0	15	1	1207.7	1172.7	1157.7
MW-104S	Stantec	SC installation; decommissioned	1	864591.4	527369.5	1207.80	1210.40	1210.40	2	16.0 - 18.0	18.0 - 30.5	20.5 - 30.5	10	1	1207.8	1187.3	1177.3
MW-106D	Stantec	SC installation; decommissioned	1	864386.1	527612.9	1208.60	1211.45	1211.25	2	25.0 - 28.0	28.0 - 40.0	30.0 - 40.0	10	1	1208.6	1178.6	1168.6
MW-106S	Stantec	SC installation; decommissioned	1	864390.5	527619.3	1208.90	1211.47	1211.25	2	15.0 - 18.0	18.0 - 31.0	20.0 - 30.0	10	1	1208.9	1188.9	1178.9

See last page for notes and a list of abbreviations.

Table 3
Monitoring Well Construction Summary
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

DRAFT

Well ID	Installed By	Description	Survey Data[1]						Construction Information[2]								
			Source[3]	Northing	Easting	Ground Surface Elevation	TOOC Elevation	TOIC Elevation	Well Diameter (in)	Seal Interval	Sandpack Interval	Screen Interval	Screen Length (ft)	Source[3]	Reference Elevation[4]	TOS Elevation[4]	BOS Elevation[4]
OFFSITE WELLS																	
MW-1D	NYSDEC	--	2	860408.7	527546.6	1162.37	1165.32	1165.02	2	46.0 - 52.9	52.9 - 64.8	54.8 - 64.8	10	2	1162.4	1107.6	1097.6
MW-3D	NYSDEC	--	2	861781.1	527714.7	1187.31	1190.25	1190.02	2	55.5 - 60.5	60.5 - 73.9	63.9 - 73.9	10	2	1187.3	1123.4	1113.4
MW-5	NYSDEC	--	2	862478.6	527579.6	1192.92	1195.88	1195.75	2	50.1 - 55.2	55.2 - 77.4	57.4 - 77.4	20	2	1192.9	1135.5	1115.5
MW-6	NYSDEC	--	2	862970.9	527237.2	1189.10	1191.95	1191.82	2	24.5 - 29.7	29.7 - 41.4	31.4 - 41.4	10	2	1189.1	1157.7	1147.7
MW-7	NYSDEC	--	2	863885.4	527088.5	1191.23	1194.10	1193.93	2	42.0 - 47.1	47.1 - 59.4	49.4 - 59.4	10	2	1191.2	1141.8	1131.8
MW-11	NYSDEC	--	2	861418.1	527568.4	1163.61	1165.94	1165.80	2	na	na	na	na	na	na	na	na
MW-12	NYSDEC	--	2	862975.0	527243.2	1188.41	1191.40	1191.14	2	na	na	na	na	na	na	na	na
MW-13	NYSDEC	--	2	863546.7	527159.1	1190.99	1190.99	1190.61	2	na	na	na	na	na	na	na	na
MW-14	NYSDEC	--	2	862955.2	526397.8	1177.06	1177.06	1176.78	2	na	na	na	na	na	na	na	na
MW-18	NYSDEC	--	2	863656.5	527282.1	1192.44	1192.42	1192.00	2	na	na	na	na	na	na	na	na
MW-301D	Stantec	RI Installation	3	863208.6	526872.7	1185.22	1185.22	1184.76	2	40.8 46.7	46.7 60.0	49.0 59.0	10	3	1185.2	1136.2	1126.2
MW-301S	Stantec	RI Installation	3	863201.6	526880.3	1185.17	1185.17	1184.71	2	28.6 33.0	33.0 46.0	35.0 45.0	10	3	1185.2	1150.2	1140.2
MW-302	Stantec	RI Installation	3	862605.9	527493.1	1192.60	1192.60	1192.15	2	27.4 30.7	30.7 43.0	33.0 43.0	10	3	1192.6	1159.6	1149.6
MW-303	Stantec	RI Installation	3	863325.7	527178.8	1191.04	1191.04	1190.74	2	25.0 30.0	30.0 45.0	35.0 45.0	10	3	1191.0	1156.0	1146.0
MW-304D	Stantec	RI Installation	3	864017.7	527396.5	1195.36	1198.13	1197.98	2	42.0 45.0	45.0 60.0	50.0 60.0	10	3	1195.4	1145.4	1135.4
MW-304S	Stantec	RI Installation	3	864017.6	527390.1	1195.16	1198.12	1197.85	2	25.0 30.0	30.0 45.0	35.0 45.0	10	3	1195.2	1160.2	1150.2
MW-305	Stantec	RI Installation	3	863350.8	527945.8	1256.81	1256.81	1256.63	2	20.0 25.0	25.0 40.0	30.0 40.0	10	3	1256.8	1226.8	1216.8
Decommissioned Offsite Wells																	
MW-1S	NYSDEC	decommissioned	na	na	na	na	na	na	2	3.0 - 4.0	4.0 - 15.0	5.0 - 15.0	10	na	na	na	na
MW-2D	NYSDEC	decommissioned	na	na	na	na	na	na	2	12.6 - 17.5	17.5 - 30.1	20.1 - 30.1	10	na	na	na	na
MW-2S	NYSDEC	decommissioned	na	na	na	na	na	na	2	41.5 - 46.5	46.5 - 58.4	48.4 - 58.4	10	na	na	na	na
MW-3S	NYSDEC	decommissioned	na	na	na	na	na	na	2	22.7 - 28.0	28.0 - 40.0	30.0 - 40.0	10	na	na	na	na
MW-4D	NYSDEC	decommissioned	na	na	na	na	na	na	2	59.0 - 64.5	64.5 - 76.0	66.0 - 76.0	10	na	na	na	na
MW-4S	NYSDEC	decommissioned	na	na	na	na	na	na	2	17.0 - 22.1	22.1 - 34.4	24.4 - 34.4	10	na	na	na	na
MW-8	NYSDEC	decommissioned	na	na	na	na	na	na	2	22.5 - 27.5	27.5 - 42.0	32.0 - 42.0	10	na	na	na	na
MW-9	NYSDEC	decommissioned	na	na	na	na	na	na	2	30.0 - 35.0	35.0 - 48.5	38.5 - 48.5	10	na	na	na	na
MW-10	NYSDEC	decommissioned	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na

See last page for notes and a list of abbreviations.

Table 3
Monitoring Well Construction Summary
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

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Notes

[1] Horizontal survey datum NAD83 (NY State Plane Central Zone U.S. feet). Vertical survey datum NAVD88 (ft).

[2] Construction information documented on well log is provided in ft bgs unless otherwise specified. Elevations provided in ft NAVD88.

[3] Surveys performed by (1) Magde in April 2016 for on-site wells; (2) Clear Creek Land Surveying in May 2020 for on-site and existing off-site wells; and 3) Patriot Surveying for RI wells in March 2021.

[4] Screen elevation calculated from reference elevation (surveyed ground surface elevation from indicated source) and well construction logs.

Abbreviations

bgs =	Below Ground Surface
BOS =	Bottom of Screen
D =	Deep [indicates a deep well in a nested pair]
ft =	Feet
in =	Inches
MW =	Monitoring Well
na =	Not Applicable or Not Available (well construction details and survey information unknown; logs not available for review by Stantec)
NAVD 88 =	North American Vertical Datum of 1988
NAD 83 =	North American Datum of 1983
-R =	Replacement [indicates a replacement well]
RI =	Remedial Investigation
S =	Shallow [indicates a shallow well in a nested pair]
SC =	Site Characterization
TOIC =	Top of Inner [riser] Casing
TOOC =	Top of Outer [protective] Casing
TOS =	Top of Screen

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Table 4
Summary of Well Gauging Data
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

					2020		2021				2022	
Well ID	Northing (ft)	Easting (ft)	Ground Elevation (ft)	TOIC Elevation (ft)	Gauging Date[1]	Groundwater Elevation[2] (ft)	Gauging Date[1]	Groundwater Elevation[2] (ft)	Gauging Date[3]	Groundwater Elevation[2] (ft)	Gauging Date[4]	Groundwater Elevation[2] (ft)
ONSITE WELLS												
MW-15-R	864254.7	527627.5	1207.52	1209.82	01/07/20	1191.22	- -	- -	06/17/21	1190.19	11/28/22	1190.12
MW-16D	864431.1	527440.6	1205.86	1208.65	01/07/20	1174.97	- -	- -	06/17/21	1174.32	11/28/22	1173.75
MW-16S	864432.3	527442.4	1205.90	1208.70	01/07/20	1179.39	- -	- -	06/17/21	1178.90	11/28/22	1178.50
MW-17	864708.6	527359.3	1207.13	1210.05	01/07/20	1185.22	- -	- -	06/17/21	1183.91	11/28/22	1182.90
MW-20	864547.1	527677.5	1220.53	1223.55	03/18/20	1205.29	- -	- -	06/17/21	1205.24	11/28/22	1205.22
MW-101-R	865056.4	527391.2	1232.05	1234.66	01/07/20	1214.89	- -	- -	06/17/21	1216.54	11/28/22	1214.51
MW-102	864772.1	527382.0	1209.80	1209.42	01/07/20	1186.20	- -	- -	06/17/21	1185.67	11/28/22	1184.64
MW-103	864636.4	527566.6	1212.34	1214.61	01/07/20	1197.42	- -	- -	06/17/21	1196.69	11/28/22	1196.66
MW-104D-R	864596.2	527358.6	1207.74	1210.05	01/07/20	1177.64	- -	- -	06/17/21	1176.67	11/28/22	1176.02
MW-104S-R	864596.2	527369.9	1208.03	1210.35	01/07/20	1178.87	- -	- -	06/17/21	1177.77	11/28/22	1177.13
MW-105	864232.7	527552.7	1195.86	1197.74	03/18/20	1184.34	- -	- -	- -	- -	- -	- -
MW-106D-R	864390.4	527610.0	1208.70	1211.03	01/07/20	1194.29	- -	- -	06/17/21	1193.08	11/28/22	1192.68
MW-106S-R	864396.4	527615.1	1208.96	1211.13	01/07/20	1196.48	- -	- -	06/17/21	1195.55	11/28/22	1195.60
MW-201	864345.5	527493.8	1206.01	1206.93	- -	- -	03/01/21	1175.32	06/17/21	1176.06	11/28/22	1175.50
MW-202	864274.5	527574.6	1206.01	1208.82	- -	- -	03/01/21	1184.17	06/17/21	1184.20	11/28/22	1184.19
MW-203	864236.8	527615.4	1206.53	1209.09	- -	- -	03/01/21	1188.18	06/17/21	1187.76	11/28/22	1187.73
MW-204	864216.9	527680.9	1208.50	1211.22	- -	- -	03/01/21	1192.80	06/17/21	1192.42	11/28/22	1192.55
MW-205	864291.0	527664.2	1208.83	1211.63	- -	- -	03/01/21	1198.45	06/17/21	1197.05	11/28/22	1197.13

(see following page for offsite well data, notes, and abbreviations)

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Table 4
Summary of Well Gauging Data
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

					2020		2021				2022	
Well ID	Northing (ft)	Easting (ft)	Ground Elevation (ft)	TOIC Elevation (ft)	Gauging Date[1]	Groundwater Elevation[2] (ft)	Gauging Date[1]	Groundwater Elevation[2] (ft)	Gauging Date[3]	Groundwater Elevation[2] (ft)	Gauging Date[4]	Groundwater Elevation[2] (ft)
OFFSITE WELLS												
MW-1D	860408.7	527546.6	1162.37	1165.02	01/09/20	1160.45	- -	- -	06/17/21	1159.61	11/28/22	1158.58
MW-11	861418.1	527568.4	1163.61	1165.80	01/10/20	1161.04	- -	- -	06/17/21	1160.50	11/28/22	1153.40
MW-12	862975.0	527243.2	1188.41	1191.14	01/10/20	1162.72	- -	- -	06/17/21	1162.27	11/28/22	1161.35
MW-13	863546.7	527159.1	1190.99	1190.61	01/14/20	1164.22	- -	- -	06/17/21	1163.48	11/28/22	1162.81
MW-14	862955.2	526397.8	1177.06	1176.78	01/09/20	1162.94	- -	- -	06/17/21	1162.78	11/28/22	1161.79
MW-3D	861781.1	527714.7	1187.31	1190.02	01/09/20	1159.97	- -	- -	06/17/21	1160.80	11/28/22	1159.39
MW-5	862478.6	527579.6	1192.92	1195.75	01/13/20	1162.33	- -	- -	06/17/21	1161.65	11/28/22	1160.73
MW-6	862970.9	527237.2	1189.10	1191.82	01/10/20	1162.60	- -	- -	06/17/21	1162.20	- -	- -
MW-7	863885.4	527088.5	1191.23	1193.93	01/09/20	1164.54	- -	- -	06/17/21	1163.84	11/28/22	1163.22
MW-18	863656.5	527282.1	1192.44	1192.00	01/10/20	1164.12	- -	- -	06/17/21	1163.58	11/28/22	1162.90
MW-301D	863208.6	526872.7	1185.22	1184.76	- -	- -	03/01/21	1161.94	06/17/21	1162.64	11/28/22	1161.76
MW-301S	863201.6	526880.3	1185.17	1184.71	- -	- -	03/01/21	1162.06	06/17/21	1162.71	11/28/22	1161.79
MW-302	862605.9	527493.1	1192.60	1192.15	- -	- -	03/01/21	1160.64	06/17/21	1161.47	11/28/22	1160.61
MW-303	863325.7	527178.8	1191.04	1190.74	- -	- -	03/01/21	1161.84	06/17/21	1162.64	11/28/22	1161.76
MW-304D	864017.7	527396.5	1195.36	1197.98	- -	- -	03/01/21	1163.17	06/17/21	1163.82	11/28/22	1163.20
MW-304S	864017.6	527390.1	1195.16	1197.85	- -	- -	03/01/21	1163.29	06/17/21	1163.95	11/28/22	1163.34
MW-305	863350.8	527945.8	1256.81	1256.63	- -	- -	03/01/21	1227.05	06/17/21	1228.80	11/28/22	1227.39

Notes

[1] Monitoring well gauging was performed by Stantec prior to groundwater sampling on the indicated date. Monitoring wells MW-20 and MW-105 were not gauged or sampled until March 2020 due to well obstruction and property access issues.

[2] Groundwater elevation calculated using depth to water and reference [top of casing] elevation included on this table. Monitoring wells were surveyed: 1) in May 2020 by Clear Creek Land Surveying and 2) in March 2021 by Patriot Surveying, LLC (newly-installed wells only), using vertical datum NAVD88 and horizontal datum NAD83 State Plane US [Central NY].

[3] A comprehensive round of onsite and offsite monitoring well gauging was performed by Stantec and Watts on the indicated date. Monitoring well MW-105 was not gauged due to property access permission issues.

[4] A comprehensive round of onsite and offsite monitoring well gauging was performed by Watts on the indicated date. Monitoring well MW-105 was not gauged due to propety access permission issues. MW-6 was not gauged due to well damage.

Abbreviations

BTOIC = Below Top of Inner Casing
D = Deep [indicates a deep well in nested pair]
ft = Feet
MW = Monitoring Well
NAVD 88 = North American Vertical Datum of 1988
NAD 83 = North American Datum of 1983
R = Replacement [indicates a replacement well]
S = Shallow [indicates a shallow well in nested pair]

Table 5a
Summary of Site Characterization Samples - Soil
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

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	Location	Sample Information					Analyses								
		Sample ID	Sample Date	Sample Depth (bgs)	Sample Type	QC Type	VOCs[1]	SVOCs[2]	PCBs[3]	Metals[4]	Cyanide[5]	Herbicides[6]	Pesticides[7]	Total Carbon	Waste Characterization[8]
Pre-SCWP Test Pits	TP-A	Test Pit A	7/28/2014	10 ft	TP		x								
	TP-B	Test Pit B	7/28/2014	10 ft	TP		x								
	TP-C	Test Pit C	7/28/2014	10 ft	TP		x								
	TP-D	Test Pit D	7/23/2014	8 ft	TP		x								
		Test Pit D Tar	7/28/2014	--	TP		x								
	TP-E	Test Pit E	7/23/2014	12 ft	TP		x								
	TP-F	Test Pit F	7/23/2014	12 ft	TP		x								
	TP-G	Test Pit G	7/23/2014	12 ft	TP		x								
SCWP Test Pit Program	TP-101	MHSC-TP-101-S	7/28/2015	12 ft	TP		x	x	x	x	x	x	x	x	
	TP-102	MHSC-TP-102-S	7/29/2015	12 ft	TP		x	x	x	x	x	x	x	x	
		MHSC-TP-DUP-S			TP	FD	x	x	x	x	x	x	x	x	
	TP-103	MHSC-TP-103-S	7/29/2015	12 ft	TP	MS/MSD	x	x	x	x	x	x	x	x	
	TP-101 Waste Soil Pile	MHSC-TP-101A-S CLEAN	7/29/2015	--	SP		x	x	x	x	x	x	x	x	
		MHSC-TP-101B-S (MIX)	7/29/2015	--	SP		x	x	x	x	x	x	x	x	
		MHSC-TP-101C (PAINT)	7/29/2015	--	SP										x
	--	MHSC-TP-RINSE BLANK	7/30/2015	--	TP QC	RB	x	x	x	x	x	x	x	x	
	--	MHSC-TB-1	7/30/2015	--	TP QC	TB	x								
SCWP Surface Soil Sampling Program	SS-1	MHSC-SS-1-S	8/4/2015	0 - 2 in	SS			x	x	x	x	x	x	x	
	SS-2	MHSC-SS-2-S	8/4/2015	0 - 2 in	SS			x	x	x	x	x	x	x	
	SS-3	MHSC-SS-3-S	8/4/2015	0 - 2 in	SS			x	x	x	x	x	x	x	
	SS-4	MHSC-SS-4-S	8/4/2015	0 - 2 in	SS			x	x	x	x	x	x	x	
		MHSC-SS-FD-S			SS QC	FD		x	x	x	x	x	x	x	
	SS-5	MHSC-SS-5-S	8/4/2015	0 - 2 in	SS	MS/MSD		x	x	x	x	x	x	x	
	SS-6	MHSC-SS-6-S	8/4/2015	0 - 2 in	SS			x	x	x	x	x	x	x	
SCWP Test Boring Program	B-101	MHSC-B101-S	11/16/2015	22 - 24 ft / 20 - 32 ft	B		x	x	x	x	x	x	x	x	
	B-102	MHSC-B102-S	11/18/2015	30 - 32 ft / 20 - 37 ft	B		x	x	x	x	x	x	x	x	
	B-103	MHSC-B-103-S	8/5/2015	20 - 22 ft / 18 - 35 ft	B		x	x	x	x	x	x	x	x	
	B-104S	MHSC-B104S-S	11/11/2015	18 - 20 ft / 16 - 26 ft	B		x	x	x	x	x	x	x	x	
		MHSC-DUP-S			B QC	FD	x	x	x	x	x	x	x	x	
	B-104	MHSC-B-104D-S	7/30/2015	39 - 41 ft / 10 - 39 ft	B		x	x	x	x	x	x	x	x	
	B-105	MHSC-B105-S	11/17/2015	12 - 14 ft / 10 - 16 ft	B		x	x	x	x	x	x	x	x	
	B-106D	MHSC-B-106D-S	8/4/2015	24 - 25 ft / 15 - 30 ft	B		x	x	x	x	x	x	x	x	
	B-106S	MHSC-B106S-S	11/10/2015	12 - 14 ft / 10 - 25 ft	B	MS/MSD	x	x	x	x	x	x	x	x	
	B-107	MHSC-B-107-S	8/12/2015	22 - 24 ft / 14 - 26 ft	B		x	x	x	x	x	x	x	x	
	B-108	MHSC-B-108-S	8/3/2015	12 - 14 ft / 12 - 28 ft	B		x	x	x	x	x	x	x	x	
	B-109	MHSC-B-109-S	7/31/2015	14 - 16 ft / 12 - 26 ft	B		x	x	x	x	x	x	x	x	
	B-110	MHSC-B110-S	11/11/2015	12 - 14 ft / 10 - 16 ft	B		x	x	x	x	x	x	x	x	
	B-111	MHSC-B111-S	11/12/2015	10 - 12 ft / 6 - 12 ft	B		x	x	x	x	x	x	x	x	
	--	MHSC-SB-RINSE BLANK	8/5/2015	--	B QC	RB	x	x	x	x	x	x	x	x	
	--	MHSC-TB-2	8/5/2015	--	B QC	TB	x								
Supplemental Pre-IRM Test Pits	TP-214	TP-214	4/27/2016	16 - 17 ft	TP		x	x	x	x	x	x	x		
	TP-217	TP-217	4/27/2016	17 - 18 ft	TP		x	x	x	x	x	x	x		
	TP-218	TP-218	4/27/2016	14 - 15 ft	TP		x	x	x	x	x	x	x		
	TP-220	TP-220	4/27/2016	11 - 12 ft	TP		x	x	x	x	x	x	x		
		DUP042716			TP QC	FD	x	x	x	x	x	x	x		
	TP-226	TP-226	4/27/2016	8 - 9 ft	TP		x	x	x	x	x	x	x		

Notes
[1] USEPA TCL and NYSDEC CP-51 VOCs plus TICs by USEPA Method 8260C.
[2] USEPA TCL SVOCs plus TICs by USEPA Method 8270D.
[3] USEPA TCL PCBs by USEPA Method 8082A.
[4] TAL Metals by USEPA Methods 6010/7471.
[5] Total Cyanide by USEPA Method 9012B.
[6] Chlorinated herbicides by USEPA Method 8151A.
[7] USEPA TCL Pesticides by USEPA Method 8081B.
[8] Waste characterization analyses included select VOCs, PCBs, reactivity, ignitability, and TCLP metals and SVOCs. TP-101 sample later analyzed for TCLP lead.

Abbreviations
B = Test Boring Soil
bgs = Below Ground Surface
CP-51 = Commissioner Policy, Soil Cleanup Guidance, October 21, 2010
FD = Field Duplicate
ft = Feet
GW = Groundwater
in = Inches
IRM = Interim Remedial Measure
MS/MSD = Matrix Spike/Matrix Spike Duplicate
NYSDEC = New York State Department of Environmental Conservation
PCBs = Polychlorinated Biphenyls
QC = Quality Control
SCWP = Site Characterization Work Plan
SP = Soil Pile
SS = Surface Soil
SVOCs = Semivolatile Organic Compounds
TCL = Target Compound List
TCLP = Toxicity Characteristic Leachate Procedure
TICs = Tentatively Identified Compounds
TOC = Total Organic Carbon
TP = Test Pit Soil
USEPA = United States Environmental Protection Agency
VOCs = Volatile Organic Compounds

Table 5b
Summary of Site Characterization Samples - Groundwater
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

DRAFT

	Location	Sample Information				Analyses							
		Sample ID	Sample Date	Sample Type	QC Type	VOCs[1]	SVOCs[2]	PCBs[3]	Metals[4]	Cyanide[5]	Herbicides[6]	Pesticides[7]	Chloride, nitrate, sulfate
Pre-SCWP	MW-15	MHS-MW-15	4/24/2014	GW		x							
	MW-16S	MHS-MW-16S	4/24/2014	GW		x							
	MW-16D	MHS-MW-16D	4/24/2014	GW		x							
	MW-17	MHS-MW-17	4/24/2014	GW		x							
	MW-19	MHS-MW-19	4/24/2014	GW		x							
	MW-20	MHS-MW-20	4/24/2014	GW		x							
	--	TRIPBLANK 20140424	4/24/2014	GW QC	TB	x							
	MW-15	MHS-MW-15-R2	9/9/2014	GW		x	x	x	x	x	x	x	
	MW-16S	MHS-MW-16S-R2	9/10/2014	GW		x	x	x	x	x	x	x	
	MW-16D	MHS-MW-16D-R2	9/9/2014	GW		x	x	x	x	x	x	x	
		MHS-MW-16D-S/D	9/9/2014	GW QC	FD	x	x	x	x	x	x	x	
	MW-17	MHS-MW-17-R2	9/9/2014	GW		x	x	x	x	x	x	x	
	MW-19	MHS-MW-19-R2	9/10/2014	GW		x	x	x	x	x	x	x	
	MW-20	MHS-MW-20-R2	9/10/2014	GW	MS/MSD	x	x	x	x	x	x	x	
	--	MHS-TRIPBLANK-090914	9/9/2014	GW QC	TB	x							
	--	MHS-TRIPBLANK-091014	9/10/2014	GW QC	TB	x							
SCWP	MW-15	MHSC-MW15-W	12/9/2015	GW	MS/MSD	x	x	x	x	x	x	x	x
	MW-16S	MHSC-MW16S-W	12/10/2015	GW		x							x
	MW-16D	MHSC-MW16D-W	12/9/2015	GW		x							x
	MW-17	MHSC-MW17-W	12/8/2015	GW		x	x	x	x	x	x	x	x
	MW-19	MHSC-MW19-W	12/8/2015	GW		x	x	x	x	x	x	x	x
		MHSC-DUP-W	12/8/2015	GW QC	FD	x	x	x	x	x	x	x	x
	MW-20	MHSC-MW20-W	12/9/2015	GW		x							x
	MW-101	MHSC-MW101-W	12/8/2015	GW		x	x	x	x	x	x	x	x
	MW-102	MHSC-MW102-W	12/8/2015	GW		x	x	x	x	x	x	x	x
	MW-103	MHSC-MW103-W	12/7/2015	GW		x	x	x	x	x	x	x	x
	MW-104D	MHSC-MW104D-W	12/10/2015	GW		x	x	x	x	x	x	x	x
	MW-105	MHSC-MW105-W	12/9/2015	GW		x	x	x	x	x	x	x	x
	MW-106S	MHSC-MW106S-W	12/8/2015	GW		x	x	x	x	x	x	x	x
	MW-106D	MHSC-MW106D-W	12/8/2015	GW		x	x	x	x	x	x	x	x
	TB	TRIP BLANK	12/7/2015	GW QC	TB	x							
	TB	MHSC-TRIPBLANK2-W	12/8/2015	GW QC	TB	x							
	TB	MHSC-TRIPBLANK3-W	12/8/2015	GW QC	TB	x							
	TB	MHSC-TRIPBLANK4-W	12/10/2015	GW QC	TB	x							

Notes

[1] USEPA TCL VOCs by USEPA Method 8260C. NYSDEC CP-51 VOCs and TICs also included in December 2015 analyses; as well as 1,4-dioxane analysis by SIM.

[2] USEPA TCL SVOCs by USEPA Method 8270D. September 2014 sample analysis by SIM. TICs reported in December 2015.

[3] USEPA TCL PCBs by USEPA Method 8082A.

[4] TAL Metals by USEPA Methods 6010/7470. September 2014 samples analyzed by USEPA Methods 6020/7470. Dissolved metals included in December 2015 analyses.

[5] Total Cyanide by USEPA Method 9012B.

[6] Chlorinated herbicides by USEPA Method 8151A.

[7] USEPA TCL Pesticides by USEPA Method 8081B.

Abbreviations

CP-51 = Commissioner Policy, Soil Cleanup Guidance, October 21, 2010
FD = Field Duplicate
GW = Groundwater
MS/MSD = Matrix Spike/Matrix Spike Duplicate
NYSDEC = New York State Department of Environmental Conservation
PCBs = Polychlorinated Biphenyls
QC = Quality Control
SCWP = Site Characterization Work Plan
SIM = Selective Ion Monitoring
SVOCs = Semivolatile Organic Compounds
TB = Trip Blank
TCL = Target Compound List
TICs = Tentatively Identified Compounds
USEPA = United States Environmental Protection Agency
VOCs = Volatile Organic Compounds

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									B-101	B-102	B-103	B-104D	B-104S		B-105	B-106D		B-107	B-108
Sample Date									16-Nov-15	18-Nov-15	5-Aug-15	30-Jul-15	11-Nov-15	11-Nov-15	17-Nov-15	4-Aug-15	10-Nov-15	12-Aug-15	3-Aug-15
Sample ID									MHSC-B101-S	MHSC-B102-S	MHSC-B-103-S	MHSC-B-104D-S	MHSC-B104S-S	MHSC-DUP-S	MHSC-B105-S	MHSC-B-106D-S	MHSC-B106D-S	MHSC-B-107-S	MHSC-B-108-S
Sample Depth									VOC from 22-24' all others composite from 20-32'	VOC from 30-32' all others composite from 20-37'	VOC from 20-22' all others composite from 18-35'	VOC from 39-41' all others composite from 10-39'	VOC from 18-20' all others composite from 16-16'	VOC from 18-20' all others composite from 16-16'	VOC from 12-14' all others composite from 10-16'	VOC from 24-25' all others composite from 15-30'	VOC from 24-25' all others composite from 15-30'	VOC from 22-24' all others composite from 14-26'	VOC from 12-14' all others composite from 12-28'
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1529996	L1529996	L1518519	L1517923	L1529527	L1529527	L1529996	L1518351	L1529327	L1519286	L1518185
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1529996-01	L1529996-03	L1518519-01	L1517923-01	L1529527-02	L1529527-03	L1529996-02	L1518351-01	L1529327-01	L1519286-01	L1518185-01
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary
General Chemistry																			
Cyanide	mg/kg	27$_i$	40$_i$	27$_i$	n/v	n/v	n/v	n/v	1.0 U	1.0 U	0.98 U	1.1 U	1.0 U	1.0 U	1.1 U	1.0 U	1.1 U	0.96 U	0.39 J
Total Carbon	percent	n/v	n/v	n/v	n/v	n/v	n/v	n/v	1.22	0.670	1.38	1.80	2.15	1.96	0.508	0.530	0.393	2.42	1.38
Solids, Percent	percent	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Hydrogen Cation	su	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Reactive Cyanide	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Sulfide Reactive	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Ignitability																			
Ignitability	none	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Metals																			
Aluminum	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	7,200	6,900	8,600	4,300	5,200	4,900	8,800	9,500	11,000^{ABCEFG}	4,900	5,200
Antimony	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	4.2 U	2.7 J	3.0 J	4.2 U	4.2 U	4.2 U	4.3 U	4.3 U	4.5 U	4.0 U	4.6 U
Arsenic	mg/kg	13$_n$	16$_g$	16$_g$	n/v	n/v	n/v	n/v	7.7	10	14^{A}	2.3	4.2	6.7	9.6	5.9	15^{A}	5.6	10
Barium	mg/kg	350$_n$	820	400	n/v	n/v	n/v	n/v	43	38	43	24	25	26	60	34	32	24	31
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	n/v	0.33 J	0.31 J	0.38 J	0.18 J	0.19 J	0.18 J	0.43	0.44	0.54	0.18 J	0.23 J
Cadmium	mg/kg	2.5$_n$	7.5	9.3	n/v	n/v	n/v	n/v	0.85 U	0.86 U	0.83 U	0.83 U	0.84 U	0.84 U	0.86 U	0.86 U	0.89 U	0.81 U	0.06 J
Calcium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	29,000^{ABCEFG}	20,000^{ABCEFG}	18,000^{ABCEFG}	61,000^{ABCEFG}	47,000^{ABCEFG}	53,000^{ABCEFG}	4,800	10,000	13,000^{ABCEFG}	45,000^{ABCEFG}	62,000^{ABCEFG}
Chromium, Total	mg/kg	30$_{n,l}$	NS$_{,q}$	1,500$_i$	n/v	n/v	n/v	n/v	13	8.7	13	7.4	6.3	6.9	12	13	15	6.6	8.4
Cobalt	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	6.5	6.8	8.0	4.3	4.3	4.6	9.3	9.2	10	4.5	4.9
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	n/v	18	14	15	15	15	16	18	21	18	17	18
Iron	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	16,000^{ABCEFG}	17,000^{ABCEFG}	19,000^{ABCEFG}	12,000^{ABCEFG}	12,000^{ABCEFG}	13,000^{ABCEFG}	19,000^{ABCEFG}	20,000^{ABCEFG}	24,000^{ABCEFG}	12,000^{ABCEFG}	14,000^{ABCEFG}
Lead	mg/kg	63$_n$	450	1,000	n/v	n/v	n/v	n/v	21	4.3 U	4.2 U	6.0	2.4 J	4.2 U	4.9	4.3 U	4.5 U	0.93 J	4.6 U
Magnesium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	9,400	7,300	7,300	12,000^{ABC}	10,000	13,000^{ABC}	4,300	4,300	5,100	11,000^{ABC}	15,000^{ABC}
Manganese	mg/kg	1,600$_n$	2,000$_a$	10,000$_e$	n/v	n/v	n/v	n/v	390	350	340	390	320	330	410	320	400	320	380
Mercury	mg/kg	0.18$_n$	0.73	2.8$_k$	n/v	n/v	n/v	n/v	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.02 J	0.07 U	0.07 U
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	n/v	15	15	18	11	10	11	20	20	22	11	12
Potassium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	480	480	530	300	340	330	530	610	650	280	360
Selenium	mg/kg	3.9$_n$	4$_q$	1,500	n/v	n/v	n/v	n/v	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	0.45 J	1.7 U	1.7 U	0.75 J	0.44 J	1.8 U
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	n/v	0.85 U	0.86 U	0.83 U	0.83 U	0.84 U	0.84 U	0.86 U	0.86 U	0.89 U	0.81 U	0.92 U
Sodium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	79 J	110 J	120 J	70 J	63 J	63 J	140 J	300	230	160	78 J
Thallium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.8 U	1.6 U	1.8 U
Vanadium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	11	8.8	12	7.8	8.0	8.6	11	12	14	7.6	9.5
Zinc	mg/kg	109$_n$	2,480	10,000$_e$	n/v	n/v	n/v	n/v	61	42	60	42	44	44	85	51	55	46	58
Metals (TCLP)																			
Arsenic	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Chromium, Total	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/L	n/v	n/v	n/v	0.015	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/L	n/v	n/v	n/v	0.002	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Silver	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																			
PCB-1016 (Aroclor 1016)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.3 U	35.4 U	33.5 U	35.3 U	33.7 U	33.2 U	37.4 U	34.3 U	36.7 U	33.3 U	32.4 U
PCB-1221 (Aroclor 1221)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.3 U	35.4 U	33.5 U	35.3 U	33.7 U	33.2 U	37.4 U	34.3 U	36.7 U	33.3 U	32.4 U
PCB-1232 (Aroclor 1232)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.3 U	35.4 U	33.5 U	35.3 U	33.7 U	33.2 U	37.4 U	34.3 U	36.7 U	33.3 U	32.4 U
PCB-1242 (Aroclor 1242)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.3 U	35.4 U	33.5 U	35.3 U	33.7 U	33.2 U	37.4 U	34.3 U	36.7 U	33.3 U	32.4 U
PCB-1248 (Aroclor 1248)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.3 U	35.4 U	33.5 U	35.3 U	33.7 U	33.2 U	37.4 U	34.3 U	36.7 U	33.3 U	32.4 U
PCB-1254 (Aroclor 1254)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.3 U	35.4 U	33.5 U	35.3 U	33.7 U	33.2 U	37.4 U	34.3 U	36.7 U	33.3 U	32.4 U
PCB-1260 (Aroclor 1260)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.3 U	35.4 U	33.5 U	35.3 U	33.7 U	33.2 U	37.4 U	34.3 U	36.7 U	33.3 U	32.4 U
PCB-1262 (Aroclor 1262)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.3 U	35.4 U	33.5 U	35.3 U	33.7 U	33.2 U	37.4 U	34.3 U	36.7 U	33.3 U	32.4 U
PCB-1268 (Aroclor 1268)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.3 U	35.4 U	33.5 U	35.3 U	33.7 U	33.2 U	37.4 U	34.3 U	36.7 U	33.3 U	32.4 U
Polychlorinated Biphenyl (PCBs)	µg/kg	100	3,200	1,000	n/v	n/v	n/v	n/v	34.3 U	35.4 U	33.5 U	35.3 U	33.7 U	33.2 U	37.4 U	34.3 U	36.7 U	33.3 U	32.4 U

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									B-101	B-102	B-103	B-104D	B-104S		B-105	B-106D		B-107	B-108
Sample Date									16-Nov-15	18-Nov-15	5-Aug-15	30-Jul-15	11-Nov-15	11-Nov-15	17-Nov-15	4-Aug-15	10-Nov-15	12-Aug-15	3-Aug-15
Sample ID									MHSC-B101-S	MHSC-B102-S	MHSC-B-103-S	MHSC-B-104D-S	MHSC-B104S-S	MHSC-DUP-S	MHSC-B105-S	MHSC-B-106D-S	MHSC-B106D-S	MHSC-B-107-S	MHSC-B-108-S
Sample Depth									VOC from 22-24' all others composite from 20-32'	VOC from 30-32' all others composite from 20-37'	VOC from 20-22' all others composite from 18-35'	VOC from 39-41' all others composite from 10-39'	VOC from 18-20' all others composite from 16-16'	VOC from 18-20' all others composite from 16-16'	VOC from 12-14' all others composite from 10-16'	VOC from 24-25' all others composite from 15-30'	VOC from 24-25' all others composite from 15-30'	VOC from 22-24' all others composite from 14-26'	VOC from 12-14' all others composite from 12-28'
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1529996	L1529996	L1518519	L1517923	L1529527	L1529527	L1529996	L1518351	L1529327	L1519286	L1518185
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1529996-01	L1529996-03	L1518519-01	L1517923-01	L1529527-02	L1529527-03	L1529996-02	L1518351-01	L1529327-01	L1519286-01	L1518185-01
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary
Pesticides																			
2,4 Db	µg/kg	n/v	n/v	680	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	1,900	181 U	182 U	173 U	179 U	176 U	174 U	186 U	177 U	188 U	174 U	168 U
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	500	181 U	182 U	173 U	179 U	176 U	174 U	186 U	177 U	188 U	174 U	168 U
Aldrin	µg/kg	5$_n$	190	680	n/v	n/v	n/v	n/v	1.64 U	1.73 U	1.62 U	1.71 U	1.64 U	1.61 U	1.69 U	1.70 U	1.75 U	1.62 U	1.62 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	n/v	0.685 U	0.721 U	0.676 U	0.713 U	0.685 U	0.669 U	0.703 U	0.710 U	0.730 U	0.674 U	0.676 U
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	n/v	2.05 U	2.16 U	2.03 U	2.14 U	2.05 U	2.01 U	2.11 U	2.13 U	2.19 U	2.02 U	2.03 U
Alpha Endosulfan	µg/kg	2,400$_i$	102,000	200,000$_i$	n/v	n/v	n/v	n/v	1.64 U	1.73 U	1.62 U	1.71 U	1.64 U	1.61 U	1.69 U	1.70 U	1.75 U	1.62 U	1.62 U
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	n/v	1.64 U	1.73 U	1.62 U	1.71 U	1.64 U	1.61 U	1.69 U	1.70 U	1.75 U	1.62 U	1.62 U
Beta Endosulfan	µg/kg	2,400$_i$	102,000	200,000$_i$	n/v	n/v	n/v	n/v	1.64 U	1.73 U	1.62 U	1.71 U	1.64 U	1.61 U	1.69 U	1.70 U	1.75 U	1.62 U	1.62 U
Chlordane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	13.4 U	14.1 U	13.2 U	13.9 U	13.4 U	13.0 U	13.7 U	13.8 U	14.2 U	13.1 U	13.2 U
Dalapon	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40$_n$	250	500,000$_c$	n/v	n/v	n/v	n/v	1.64 U	1.73 U	1.62 U	1.71 U	1.64 U	1.61 U	1.69 U	1.70 U	1.75 U	1.62 U	1.62 U
Dicamba	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Dichloroprop	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	µg/kg	5$_n$	100	1,400	n/v	n/v	n/v	n/v	1.03 U	1.08 U	1.01 U	1.07 U	1.03 U	1.00 U	1.06 U	1.06 U	1.10 U	1.01 U	1.01 U
Dinoseb	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Endosulfan Sulfate	µg/kg	2,400$_i$	1,000,000$_d$	200,000$_i$	n/v	n/v	n/v	n/v	0.685 U	0.721 U	0.676 U	0.713 U	0.685 U	0.669 U	0.703 U	0.710 U	0.730 U	0.674 U	0.676 U
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	n/v	0.685 U	0.721 U	0.676 U	0.713 U	0.685 U	0.669 U	0.703 U	0.710 U	0.730 U	0.674 U	0.676 U
Endrin Aldehyde	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Endrin Ketone	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	1.64 U	1.73 U	1.62 U	1.71 U	1.64 U	1.61 U	1.69 U	1.70 U	1.75 U	1.62 U	1.62 U
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	n/v	0.685 U	0.721 U	0.676 U	0.713 U	0.685 U	0.669 U	0.703 U	0.710 U	0.730 U	0.674 U	0.676 U
Gamma Chlordane (trans-Chlordane)	µg/kg	100,000$_a$	1,000,000$_d$	n/v	n/v	n/v	n/v	n/v	2.05 U	2.16 U	2.03 U	2.14 U	2.05 U	2.01 U	2.11 U	2.13 U	2.19 U	2.02 U	2.03 U
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	n/v	0.822 U	0.866 U	0.811 U	0.856 U	0.822 U	0.803 U	0.844 U	0.852 U	0.876 U	0.808 U	0.812 U
Heptachlor Epoxide	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	20	3.08 U	3.25 U	3.04 U	3.21 U	3.08 U	3.01 U	3.16 U	3.20 U	3.29 U	3.03 U	3.04 U
MCPA	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
MCPP	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	900,000	3.08 U	3.25 U	3.04 U	3.21 U	3.08 U	3.01 U	3.16 U	3.20 U	3.29 U	3.03 U	3.04 U
P,P'-DDD	µg/kg	3.3$_m$	14,000	92,000	n/v	n/v	n/v	n/v	1.64 U	1.73 U	1.62 U	1.71 U	1.64 U	1.61 U	1.69 U	1.70 U	1.75 U	1.62 U	1.62 U
P,P'-DDE	µg/kg	3.3$_m$	17,000	62,000	n/v	n/v	n/v	n/v	1.64 U	1.73 U	1.62 U	1.71 U	1.64 U	1.61 U	1.69 U	1.70 U	1.75 U	1.62 U	1.62 U
P,P'-DDT	µg/kg	3.3$_m$	136,000	47,000	n/v	n/v	n/v	n/v	3.08 U	3.25 U	3.04 U	3.21 U	3.08 U	3.01 U	3.16 U	3.20 U	3.29 U	3.03 U	3.04 U
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000$_c$	n/v	n/v	n/v	n/v	181 U	182 U	173 U	179 U	176 U	174 U	186 U	177 U	188 U	174 U	168 U
Toxaphene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	30.8 U	32.5 U	30.4 U	32.1 U	30.8 U	30.1 U	31.6 U	32.0 U	32.9 U	30.3 U	30.4 U
Semi-Volatile Organics																			
1,2,4,5-Tetrachlorobenzene	µg/kg	100,000$_a$	1,000,000$_d$	n/v	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
2,2-Oxybis(2-Chloropropane)	µg/kg	100,000$_a$	1,000,000$_d$	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
2,4,5-Trichlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	100	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
2,4,6-Trichlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	110 U	110 U	100 U	110 U	100 U	100 U	110 U	110 U	110 U	100 U	100 U
2,4-Dichlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	400	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	150 U
2,4-Dimethylphenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
2,4-Dinitrophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	200	870 U	880 U	830 U	850 U	840 U	830 U	880 U	860 U	880 U	830 U	820 U
2,4-Dinitrotoluene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
2,6-Dinitrotoluene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	1,000/170$_{b,s1}$	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
2-Chloronaphthalene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
2-Chlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
2-Methylnaphthalene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	36,400	220 U	220 U	210 U	210 U	210 U	210 U	220 U	210 U	220 U	210 U	200 U
2-Methylphenol (O-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
2-Nitroaniline	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	400	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
2-Nitrophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	300	390 U	400 U	370 U	380 U	380 U	370 U	400 U	380 U	400 U	370 U	370 U
3- And 4- Methylphenol (Total)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	260 U	260 U	250 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U	250 U
3,3'-Dichlorobenzidine	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
3-Nitroaniline	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	500	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									B-101	B-102	B-103	B-104D	B-104S		B-105	B-106D		B-107	B-108
Sample Date									16-Nov-15	18-Nov-15	5-Aug-15	30-Jul-15	11-Nov-15	11-Nov-15	17-Nov-15	4-Aug-15	10-Nov-15	12-Aug-15	3-Aug-15
Sample ID									MHSC-B101-S	MHSC-B102-S	MHSC-B-103-S	MHSC-B-104D-S	MHSC-B104S-S	MHSC-DUP-S	MHSC-B105-S	MHSC-B-106D-S	MHSC-B106D-S	MHSC-B-107-S	MHSC-B-108-S
Sample Depth									VOC from 22-24' all others composite from 20-32'	VOC from 30-32' all others composite from 20-37'	VOC from 20-22' all others composite from 18-35'	VOC from 39-41' all others composite from 10-39'	VOC from 18-20' all others composite from 16-16'	VOC from 18-20' all others composite from 16-16'	VOC from 12-14' all others composite from 10-16'	VOC from 24-25' all others composite from 15-30'	VOC from 24-25' all others composite from 15-30'	VOC from 22-24' all others composite from 14-26'	VOC from 12-14' all others composite from 12-28'
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1529996	L1529996	L1518519	L1517923	L1529527	L1529527	L1529996	L1518351	L1529327	L1519286	L1518185
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1529996-01	L1529996-03	L1518519-01	L1517923-01	L1529527-02	L1529527-03	L1529996-02	L1518351-01	L1529327-01	L1519286-01	L1518185-01
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary
Semi-Volatile Organics (cont'd)																			
4,6-Dinitro-2-Methylphenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	470 U	480 U	450 U	460 U	460 U	450 U	480 U	460 U	480 U	450 U	440 U
4-Bromophenyl Phenyl Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
4-Chloro-3-Methylphenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
4-Chloroaniline	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	220	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
4-Chlorophenyl Phenyl Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
4-Nitroaniline	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
4-Nitrophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	100	250 U	260 U	240 U	250 U	240 U	240 U	260 U	250 U	260 U	240 U	240 U
Acenaphthene	µg/kg	20,000	98,000	500,000[c]	n/v	n/v	n/v	n/v	140 U	150 U	140 U	140 U	100 J	140 U	150 U	140 U	150 U	140 U	140 U
Acenaphthylene	µg/kg	100,000[a]	107,000	500,000[c]	n/v	n/v	n/v	n/v	140 U	150 U	140 U	140 U	140 U	140 U	150 U	140 U	150 U	140 U	140 U
Acetophenone	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
Anthracene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	110 U	110 U	100 U	110 U	270	100 U	110 U	110 U	110 U	100 U	100 U
Atrazine	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	140 U	150 U	140 U	140 U	140 U	140 U	150 U	140 U	150 U	140 U	140 U
Benzaldehyde	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	240 U	240 U	230 U	230 U	230 U	230 U	340	240 U	240 U	230 U	220 U
Benzo(A)Anthracene	µg/kg	1,000[n]	1,000[g]	5,600	n/v	n/v	n/v	n/v	110 U	110 U	100 U	110 U	510	100 U	110 U	110 U	110 U	100 U	100 U
Benzo(A)Pyrene	µg/kg	1,000[n]	22,000	1,000[g]	n/v	n/v	n/v	n/v	140 U	150 U	140 U	140 U	410	140 U	150 U	140 U	150 U	140 U	140 U
Benzo(B)Fluoranthene	µg/kg	1,000[n]	1,700	5,600	n/v	n/v	n/v	n/v	110 U	110 U	100 U	110 U	550	100 U	110 U	110 U	110 U	100 U	100 U
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	140 U	150 U	140 U	140 U	220	140 U	150 U	140 U	150 U	140 U	140 U
Benzo(K)Fluoranthene	µg/kg	800[n]	1,700	56,000	n/v	n/v	n/v	n/v	110 U	110 U	100 U	110 U	190	100 U	110 U	110 U	110 U	100 U	100 U
Benzyl Butyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	122,000	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
Biphenyl (Diphenyl)	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	500,000[a]	1,000,000[a]	n/v	410 U	420 U	390 U	400 U	400 U	390 U	420 U	410 U	420 U	390 U	390 U
Bis(2-Chloroethoxy) Methane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	200 U	200 U	190 U	190 U	190 U	190 U	200 U	190 U	200 U	190 U	180 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	150 U
Bis(2-Chloroisopropyl) Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	220 U	220 U	210 U	210 U	210 U	210 U	220 U	210 U	220 U	210 U	200 U
Bis(2-Ethylhexyl) Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	435,000	180 U	180 U	530	300	180 U	170 U	180 U	190	180 U	260	250
Caprolactam	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
Carbazole	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	130 J	170 U	180 U	180 U	180 U	170 U	170 U
Chrysene	µg/kg	1,000[n]	1,000[g]	56,000	n/v	n/v	n/v	n/v	110 U	110 U	100 U	110 U	510	100 U	110 U	110 U	110 U	100 U	100 U
Dibenz(A,H)Anthracene	µg/kg	330[m]	1,000,000[d]	560	n/v	n/v	n/v	n/v	110 U	110 U	100 U	110 U	68 J	100 U	110 U	110 U	110 U	100 U	100 U
Dibenzofuran	µg/kg	7,000	210,000	350,000	n/v	500,000[a]	1,000,000[a]	6,200	180 U	180 U	170 U	180 U	61 J	170 U	180 U	180 U	180 U	170 U	170 U
Diethyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	7,100	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
Dimethyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	27,000	180 U	180 U	170 U	180 U	120 J	170 U	180 U	180 U	180 U	170 U	170 U
Di-N-Butyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	8,100	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
Di-N-Octylphthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	120,000	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
Diphenylamine	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	110 U	110 U	100 U	110 U	1,000	100 U	110 U	110 U	110 U	100 U	100 U
Fluorene	µg/kg	30,000	386,000	500,000[c]	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	120 J	170 U	180 U	180 U	180 U	170 U	170 U
Hexachlorobenzene	µg/kg	330[m]	3,200	6,000	n/v	500,000[a]	1,000,000[a]	1,400	110 U	110 U	100 U	110 U	100 U	100 U	110 U	110 U	110 U	100 U	100 U
Hexachlorobutadiene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
Hexachlorocyclopentadiene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	520 U	530 U	490 U	510 U	500 U	490 U	520 U	510 U	530 U	490 U	490 U
Hexachloroethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	140 U	150 U	140 U	140 U	140 U	140 U	150 U	140 U	150 U	140 U	140 U
Indeno(1,2,3-C,D)Pyrene	µg/kg	500[n]	8,200	5,600	n/v	n/v	n/v	n/v	140 U	150 U	140 U	140 U	250	140 U	150 U	140 U	150 U	140 U	140 U
Isophorone	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	4,400	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	150 U
Naphthalene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	61 J	170 U	180 U	180 U	180 U	170 U	170 U
Nitrobenzene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	69,000	140,000	170[b]	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	160 U	150 U
N-Nitrosodi-N-Propylamine	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
N-Nitrosodiphenylamine	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	140 U	150 U	140 U	140 U	140 U	140 U	150 U	140 U	150 U	140 U	140 U
Pentachlorophenol	µg/kg	800[m]	800[f]	6,700	n/v	n/v	n/v	n/v	140 U	150 U	140 U	140 U	140 U	140 U	150 U	140 U	150 U	140 U	140 U
Phenanthrene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	110 U	110 U	100 U	110 U	910	100 U	110 U	110 U	110 U	100 U	100 U
Phenol	µg/kg	330[m]	330[f]	500,000[c]	n/v	n/v	n/v	n/v	180 U	180 U	170 U	180 U	180 U	170 U	180 U	180 U	180 U	170 U	170 U
Pyrene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	110 U	110 U	100 U	110 U	770	100 U	110 U	110 U	110 U	100 U	100 U

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									B-101	B-102	B-103	B-104D	B-104S		B-105	B-106D		B-107	B-108
Sample Date									16-Nov-15	18-Nov-15	5-Aug-15	30-Jul-15	11-Nov-15	11-Nov-15	17-Nov-15	4-Aug-15	10-Nov-15	12-Aug-15	3-Aug-15
Sample ID									MHSC-B101-S	MHSC-B102-S	MHSC-B-103-S	MHSC-B-104D-S	MHSC-B104S-S	MHSC-DUP-S	MHSC-B105-S	MHSC-B-106D-S	MHSC-B106D-S	MHSC-B-107-S	MHSC-B-108-S
Sample Depth									VOC from 22-24' all others composite from 20-32'	VOC from 30-32' all others composite from 20-37'	VOC from 20-22' all others composite from 18-35'	VOC from 39-41' all others composite from 10-39'	VOC from 18-20' all others composite from 16-16'	VOC from 18-20' all others composite from 16-16'	VOC from 12-14' all others composite from 10-16'	VOC from 24-25' all others composite from 15-30'	VOC from 24-25' all others composite from 15-30'	VOC from 22-24' all others composite from 14-26'	VOC from 12-14' all others composite from 12-28'
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1529996	L1529996	L1518519	L1517923	L1529527	L1529527	L1529996	L1518351	L1529327	L1519286	L1518185
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1529996-01	L1529996-03	L1518519-01	L1517923-01	L1529527-02	L1529527-03	L1529996-02	L1518351-01	L1529327-01	L1519286-01	L1518185-01
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary
Semi-Volatile Organics (TCLP)																			
2,4,5-Trichlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol (O-Cresol)	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
3- And 4- Methylphenol (Total)	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Pyridine	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
SVOC - Tentatively Identified Compounds																			
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	170	ND	920	200	4,960	ND	ND	200	ND	ND	ND
Volatile Organic Compounds																			
1,1,1-Trichloroethane	µg/kg	680	680	500,000$_c$	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	0.77 J	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.20 J
1,1,2,2-Tetrachloroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	600	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	6,000	15 U	16 U	410 U	9.0 U	28 U	35 U	24 U	560 U	19 U	13 U	10 U
1,1,2-Trichloroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	1.1 U	1.2 U	31 U	0.68 U	2.1 U	2.6 U	1.8 U	42 U	1.4 U	1.0 U	0.78 U
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	n/v	1.1 U	1.2 U	31 U	0.68 U	2.1 U	2.6 U	1.8 U	42 U	1.4 U	1.0 U	0.78 U
1,1-Dichloroethene	µg/kg	330	330	500,000$_c$	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
1,2,3-Trichlorobenzene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	2.6 U
1,2,4-Trichlorobenzene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	3,400	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	2.6 U
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	0.17 J
1,2-Dibromo-3-Chloropropane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	2.6 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2.9 U	3.2 U	82 U	1.8 U	5.6 U	7.0 U	4.9 U	110 U	3.8 U	2.6 U	2.1 U
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	2.6 U
1,2-Dichloroethane	µg/kg	20$_m$	20$_g$	30,000	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
1,2-Dichloropropane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	2.6 U	2.8 U	72 U	1.6 U	4.9 U	6.1 U	4.3 U	99 U	3.3 U	2.3 U	1.8 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	2.6 U
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	2.6 U
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	2.6 U
1,4-Dioxane (P-Dioxane)	µg/kg	100$_m$	100$_f$	130,000	n/v	n/v	n/v	n/v	73 U	81 U	2,000 U	45 U	140 U	180 U	120 U	2,800 U	95 U	66 U	52 U
2-Hexanone	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	7.3 U	8.1 U	200 U	4.5 U	14 U	18 U	12 U	280 U	9.5 U	6.6 U	5.2 U
Acetone	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	n/v	3.0 J	4.9 J	200 U	31	**54^{AB}**	10 J	12 U	280 U	26	1.3 J	25
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	n/v	0.26 J	0.81 U	20 U	0.12 J	1.4 U	0.58 J	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Bromochloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	2.6 U
Bromodichloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Bromoform	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2.9 U	3.2 U	82 U	1.8 U	5.6 U	7.0 U	4.9 U	110 U	3.8 U	2.6 U	2.1 U
Bromomethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	1.5 U	1.6 U	41 U	0.90 U	2.8 U	3.5 U	2.4 U	56 U	1.9 U	1.3 U	1.0 U
Carbon Disulfide	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	2,700	7.3 U	8.1 U	200 U	4.5 U	14 U	18 U	12 U	280 U	9.5 U	6.6 U	5.2 U
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Chlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Chloroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	1,900	1.5 U	1.6 U	41 U	0.90 U	2.8 U	3.5 U	2.4 U	56 U	1.9 U	1.3 U	1.0 U
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	n/v	1.1 U	1.2 U	31 U	0.68 U	2.1 U	2.6 U	1.8 U	42 U	1.4 U	1.0 U	0.78 U
Chloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	10 J	4.7 U	3.3 U	2.6 U
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000$_c$	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Cis-1,3-Dichloropropene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Cyclohexane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	15 U	16 U	410 U	0.46 J	28 U	35 U	24 U	21 J	19 U	13 U	0.14 J
Cymene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	10,000	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Dibromochloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Dichlorodifluoromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	7.3 U	8.1 U	200 U	4.5 U	14 U	18 U	12 U	280 U	9.5 U	6.6 U	5.2 U
Dichloroethylenes	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Ethyl Acetate	µg/kg	n/v	n/v	n/v	n/v	500,000$_a$	1,000,000$_a$	n/v	-	-	-	-	-	4.4 NJ	-	-	-	-	-

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									B-101	B-102	B-103	B-104D	B-104S		B-105	B-106D		B-107	B-108
Sample Date									16-Nov-15	18-Nov-15	5-Aug-15	30-Jul-15	11-Nov-15	11-Nov-15	17-Nov-15	4-Aug-15	10-Nov-15	12-Aug-15	3-Aug-15
Sample ID									MHSC-B101-S	MHSC-B102-S	MHSC-B-103-S	MHSC-B-104D-S	MHSC-B104S-S	MHSC-DUP-S	MHSC-B105-S	MHSC-B106D-S	MHSC-B106D-S	MHSC-B-107-S	MHSC-B-108-S
Sample Depth									VOC from 22-24' all others composite from 20-32'	VOC from 30-32' all others composite from 20-37'	VOC from 20-22' all others composite from 18-35'	VOC from 39-41' all others composite from 10-39'	VOC from 18-20' all others composite from 16-16'	VOC from 18-20' all others composite from 16-16'	VOC from 12-14' all others composite from 10-16'	VOC from 24-25' all others composite from 15-30'	VOC from 24-25' all others composite from 15-30'	VOC from 22-24' all others composite from 14-26'	VOC from 12-14' all others composite from 12-28'
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1529996	L1529996	L1518519	L1517923	L1529527	L1529527	L1529996	L1518351	L1529327	L1519286	L1518185
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1529996-01	L1529996-03	L1518519-01	L1517923-01	L1529527-02	L1529527-03	L1529996-02	L1518351-01	L1529327-01	L1519286-01	L1518185-01
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds																			
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Isopropylbenzene (Cumene)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	2,300	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Methyl Acetate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	15 U	16 U	410 U	9.0 U	28 U	16 J	24 U	560 U	19 U	13 U	0.82 J
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000[c]	n/v	500,000[a]	1,000,000[a]	300	7.3 U	8.1 U	200 U	1.2 J	14 U	18 U	12 U	280 U	9.5 U	6.6 U	1.0 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	1,000	7.3 U	8.1 U	200 U	4.5 U	14 U	18 U	12 U	280 U	9.5 U	6.6 U	5.2 U
Methylcyclohexane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	0.87 J	0.20 J	82 U	1.0 J	5.6 U	7.0 U	0.41 J	110	3.8 U	2.6 U	0.32 J
Methylene Chloride	µg/kg	50	50	500,000[c]	n/v	n/v	n/v	n/v	7.3 U	8.1 U	200 U	4.5 U	14 U	18 U	12 U	280 U	9.5 U	6.6 U	5.2 U
M-P-Xylene	µg/kg	260[p]	1,600[p]	500,000[c,p]	n/v	n/v	n/v	n/v	0.36 J	1.6 U	41 U	0.90 U	2.8 U	3.5 U	2.4 U	56 U	1.9 U	1.3 U	0.23 J
Naphthalene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	0.31 J	3.3 U	0.31 J
N-Butylbenzene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
N-Propylbenzene	µg/kg	3,900	3,900	500,000[c]	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260[p]	1,600[p]	500,000[c,p]	n/v	n/v	n/v	n/v	1.5 U	1.6 U	41 U	0.90 U	2.8 U	3.5 U	2.4 U	56 U	1.9 U	1.3 U	1.0 U
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000[c]	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Styrene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	1.5 U	1.6 U	41 U	0.90 U	2.8 U	3.5 U	2.4 U	56 U	1.9 U	1.3 U	1.0 U
T-Butylbenzene	µg/kg	5,900	5,900	500,000[c]	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	2.6 U
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000[c]	n/v	n/v	n/v	n/v	1.5 U	1.6 U	41 U	0.90 U	2.8 U	3.5 U	2.4 U	56 U	1.9 U	1.3 U	1.0 U
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	n/v	500,000[a]	1,000,000[a]	n/v	0.73 U	0.81 U	20 U	0.45 U	0.74 J	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.84
Toluene	µg/kg	700	700	500,000[c]	n/v	n/v	n/v	n/v	0.69 J	0.23 J	5.8 J	0.14 J	0.80 J	0.63 J	0.46 J	42 U	1.4 U	0.21 J	0.31 J
Total, 1,3-Dichloropropene (Cis And Trans)	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000[c]	n/v	n/v	n/v	n/v	1.1 U	1.2 U	31 U	0.68 U	2.1 U	2.6 U	1.8 U	42 U	1.4 U	1.0 U	0.78 U
Trans-1,3-Dichloropropene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	1.2 U	28 U	0.95 U	0.66 U	0.52 U
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	n/v	0.73 U	0.81 U	20 U	0.45 U	1.4 U	1.8 U	32	150	0.95 U	0.57 J	0.52 U
Trichlorofluoromethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	3.6 U	4.1 U	100 U	2.2 U	7.0 U	8.8 U	6.1 U	140 U	4.7 U	3.3 U	2.6 U
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	n/v	1.5 U	1.6 U	41 U	0.90 U	2.8 U	3.5 U	2.4 U	56 U	1.9 U	1.3 U	1.0 U
Xylenes	µg/kg	260	1,600	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
VOCs - Tentatively Identified Compounds																			
Total VOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	16 J	2.7 J	ND	8.2 J	4.9 J	15 J	14 J	1,800 J	ND	ND	7.7 J

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									B-109	B-110	B-111	SS-1	SS-2	SS-3	SS-4		SS-5	SS-6
Sample Date									31-Jul-15	11-Nov-15	12-Nov-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15
Sample ID									MHSC-B-109-S	MHSC-B110-S	MHSC-B111-S	MHSC-SS-1-S	MHSC-SS-2-S	MHSC-SS-3-S	MHSC-SS-4-S	MHSC-SS-FD-S	MHSC-SS-5-S	MHSC-SS-6-S
Sample Depth									VOC from 14-16' all others composite from 12-26'	VOC from 12-14' all others composite from 10-16'	VOC from 10-12' all others composite from 6-12'	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1518046	L1529527	L1529527	L1518350	L1518350	L1518350	L1518350	L1518350	L1518350	L1518350
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1518046-01	L1529527-01	L1529527-04	L1518350-07	L1518350-01	L1518350-03	L1518350-02	L1518350-05	L1518350-06	L1518350-04
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary
General Chemistry																		
Cyanide	mg/kg	27$_i$	40$_i$	27$_i$	n/v	n/v	n/v	n/v	0.66 J	0.25 J	1.0 U	0.27 J	1.0 U	0.98 U	0.93 U	0.96 U	1.0 U	0.96 U
Total Carbon	percent	n/v	n/v	n/v	n/v	n/v	n/v	n/v	1.68	0.719	0.241	3.54	4.68	3.77	4.18	4.89	2.59	4.06
Solids, Percent	percent	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Hydrogen Cation	su	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Reactive Cyanide	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Sulfide Reactive	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Ignitability																		
Ignitability	none	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Metals																		
Aluminum	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	5,800	7,300	8,700	4,700	6,100	3,900	6,200	5,800	3,500	4,200
Antimony	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	4.2 U	4.3 U	4.4 U	4.2 U	4.0 U	4.0 U	3.9 U	4.0 U	3.8 U	3.9 U
Arsenic	mg/kg	13$_n$	16$_g$	16$_g$	n/v	n/v	n/v	n/v	10	9.0	11	4.9	6.2	4.6	5.8	5.9	4.4	4.2
Barium	mg/kg	350$_n$	820	400	n/v	n/v	n/v	n/v	32	60	40	27	49	21	40	37	17	23
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	n/v	0.23 J	0.31 J	0.39 J	0.20 J	0.27 J	0.18 J	0.24 J	0.26 J	0.17 J	0.17 J
Cadmium	mg/kg	2.5$_n$	7.5	9.3	n/v	n/v	n/v	n/v	0.84 U	0.86 U	0.88 U	0.84 U	0.81 U	0.80 U	0.78 U	0.80 U	0.76 U	0.79 U
Calcium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	**38,000^{ABCEFG}**	**22,000^{ABCEFG}**	7,200	**31,000^{ABCEFG}**	**28,000^{ABCEFG}**	**62,000^{ABCEFG}**	**27,000^{ABCEFG}**	**23,000^{ABCEFG}**	**27,000^{ABCEFG}**	**42,000^{ABCEFG}**
Chromium, Total	mg/kg	30$_{n,l}$	NS$_{,q}$	1,500$_l$	n/v	n/v	n/v	n/v	10	13	16	10	20	5.9	8.1	7.8	4.6	6.1
Cobalt	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	5.3	6.7	8.6	4.3	5.2	3.7	5.0	4.8	3.2	3.6
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	n/v	20	17	16	16	14	15	18	16	12	14
Iron	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	**14,000^{ABCEFG}**	**17,000^{ABCEFG}**	**21,000^{ABCEFG}**	**12,000^{ABCEFG}**	**15,000^{ABCEFG}**	10,000	**14,000^{ABCEFG}**	**14,000^{ABCEFG}**	9,400	10,000
Lead	mg/kg	63$_n$	450	1,000	n/v	n/v	n/v	n/v	17	21	4.4 U	55	41	23	6.4	7.6	4.2	6.4
Magnesium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	7,300	5,600	4,000	6,300	6,300	9,900	7,000	5,600	6,000	8,400
Manganese	mg/kg	1,600$_n$	2,000$_q$	10,000$_e$	n/v	n/v	n/v	n/v	440	360	220	300	360	320	360	350	220	310
Mercury	mg/kg	0.18$_n$	0.73	2.8$_k$	n/v	n/v	n/v	n/v	0.02 J	0.07 U	0.09 U	0.069 J	0.07 U	0.02 J	0.01 J	0.01 J	0.06 U	0.02 J
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	n/v	13	14	19	10	12	8.8	12	11	8.6	8.9
Potassium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	360	480	500	500	440	450	430	430	310	520
Selenium	mg/kg	3.9$_n$	4$_q$	1,500	n/v	n/v	n/v	n/v	1.7 U	1.7 U	1.8 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	n/v	0.84 U	0.86 U	0.88 U	0.84 U	0.81 U	0.80 U	0.78 U	0.80 U	0.76 U	0.79 U
Sodium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	78 J	67 J	41 J	49 J	49 J	76 J	57 J	50 J	32 J	63 J
Thallium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	1.7 U	1.7 U	1.8 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U
Vanadium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	12	8.8	11	8.0	12	8.0	14	13	6.1	7.6
Zinc	mg/kg	109$_n$	2,480	10,000$_e$	n/v	n/v	n/v	n/v	58	71	58	81	52	**110^{A}**	61	55	37	82
Metals (TCLP)																		
Arsenic	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Barium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Chromium, Total	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Lead	mg/L	n/v	n/v	n/v	0.015	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Mercury	mg/L	n/v	n/v	n/v	0.002	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Selenium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Silver	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																		
PCB-1016 (Aroclor 1016)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.9 U	35.7 U	35.6 U	35.8 U	32.5 U	33.8 U	32.6 U	32.7 U	33.5 U	34.1 U
PCB-1221 (Aroclor 1221)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.9 U	35.7 U	35.6 U	35.8 U	32.5 U	33.8 U	32.6 U	32.7 U	33.5 U	34.1 U
PCB-1232 (Aroclor 1232)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.9 U	35.7 U	35.6 U	35.8 U	32.5 U	33.8 U	32.6 U	32.7 U	33.5 U	34.1 U
PCB-1242 (Aroclor 1242)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.9 U	35.7 U	35.6 U	35.8 U	32.5 U	33.8 U	32.6 U	32.7 U	33.5 U	34.1 U
PCB-1248 (Aroclor 1248)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.9 U	35.7 U	35.6 U	35.8 U	32.5 U	33.8 U	32.6 U	32.7 U	33.5 U	34.1 U
PCB-1254 (Aroclor 1254)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.9 U	35.7 U	35.6 U	35.8 U	32.5 U	33.8 U	32.6 U	32.7 U	33.5 U	34.1 U
PCB-1260 (Aroclor 1260)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	22.8 J	35.7 U	35.6 U	35.8 U	32.5 U	33.8 U	32.6 U	32.7 U	33.5 U	34.1 U
PCB-1262 (Aroclor 1262)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.9 U	35.7 U	35.6 U	35.8 U	32.5 U	33.8 U	32.6 U	32.7 U	33.5 U	34.1 U
PCB-1268 (Aroclor 1268)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	34.9 U	35.7 U	35.6 U	35.8 U	32.5 U	33.8 U	32.6 U	32.7 U	33.5 U	34.1 U
Polychlorinated Biphenyl (PCBs)	µg/kg	100	3,200	1,000	n/v	n/v	n/v	n/v	22.8 J	35.7 U	35.6 U	35.8 U	32.5 U	33.8 U	32.6 U	32.7 U	33.5 U	34.1 U

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									B-109	B-110	B-111	SS-1	SS-2	SS-3	SS-4		SS-5	SS-6
Sample Date									31-Jul-15	11-Nov-15	12-Nov-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15
Sample ID									MHSC-B-109-S	MHSC-B110-S	MHSC-B111-S	MHSC-SS-1-S	MHSC-SS-2-S	MHSC-SS-3-S	MHSC-SS-4-S	MHSC-SS-FD-S	MHSC-SS-5-S	MHSC-SS-6-S
Sample Depth									VOC from 14-16' all others composite from 12-26'	VOC from 12-14' all others composite from 10-16'	VOC from 10-12' all others composite from 6-12'	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1518046	L1529527	L1529527	L1518350	L1518350	L1518350	L1518350	L1518350	L1518350	L1518350
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1518046-01	L1529527-01	L1529527-04	L1518350-07	L1518350-01	L1518350-03	L1518350-02	L1518350-05	L1518350-06	L1518350-04
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary
Pesticides																		
2,4 Db	µg/kg	n/v	n/v	680	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	1,900	176 U	183 U	181 U	178 U	170 U	168 U	169 U	170 U	167 U	169 U
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	500	176 U	183 U	181 U	178 U	170 U	168 U	169 U	170 U	167 U	169 U
Aldrin	µg/kg	5$_n$	190	680	n/v	n/v	n/v	n/v	1.66 U	1.68 U	1.69 U	1.71 U	1.61 U	1.57 U	1.62 U	1.58 U	1.54 U	1.59 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	n/v	0.690 U	0.699 U	0.704 U	0.714 U	0.670 U	0.653 U	0.676 U	0.658 U	0.643 U	0.661 U
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	n/v	2.77	2.10 U	2.11 U	2.14 U	2.01 U	1.96 U	2.03 U	1.97 U	1.93 U	1.98 U
Alpha Endosulfan	µg/kg	2,400$_l$	102,000	200,000$_l$	n/v	n/v	n/v	n/v	1.66 U	1.68 U	1.69 U	1.71 U	1.61 U	1.57 U	1.62 U	1.58 U	1.54 U	1.59 U
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	n/v	1.66 U	1.68 U	1.69 U	1.71 U	1.61 U	1.57 U	1.62 U	1.58 U	1.54 U	1.59 U
Beta Endosulfan	µg/kg	2,400$_l$	102,000	200,000$_l$	n/v	n/v	n/v	n/v	1.66 U	1.68 U	1.69 U	1.71 U	1.61 U	1.57 U	1.62 U	1.58 U	2.92 P I	1.59 U
Chlordane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	10.8 J	13.6 U	13.7 U	13.9 U	13.1 U	12.7 U	13.2 U	12.8 U	12.5 U	12.9 U
Dalapon	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40$_n$	250	500,000$_c$	n/v	n/v	n/v	n/v	1.66 U	1.68 U	1.69 U	1.71 U	1.61 U	1.57 U	1.62 U	1.58 U	1.54 U	1.59 U
Dicamba	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Dichloroprop	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Dieldrin	µg/kg	5$_n$	100	1,400	n/v	n/v	n/v	n/v	1.04 U	1.05 U	1.06 U	1.07 U	1.00 U	0.980 U	1.01 U	0.986 U	0.964 U	0.992 U
Dinoseb	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Endosulfan Sulfate	µg/kg	2,400$_l$	1,000,000$_d$	200,000$_l$	n/v	n/v	n/v	n/v	0.690 U	0.699 U	0.704 U	0.714 U	0.670 U	0.653 U	0.676 U	0.658 U	0.643 U	0.661 U
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	n/v	0.690 U	0.699 U	0.704 U	0.714 U	0.670 U	0.653 U	0.676 U	0.658 U	0.643 U	0.661 U
Endrin Aldehyde	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Endrin Ketone	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	1.66 U	1.68 U	1.69 U	1.71 U	1.61 U	1.57 U	1.62 U	1.58 U	1.54 U	1.59 U
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	n/v	0.690 U	0.699 U	0.704 U	0.714 U	0.670 U	0.653 U	0.676 U	0.658 U	0.643 U	0.661 U
Gamma Chlordane (trans-Chlordane)	µg/kg	100,000$_a$	1,000,000$_d$	n/v	n/v	n/v	n/v	n/v	1.46 J	2.10 U	2.11 U	2.14 U	2.01 U	1.96 U	2.03 U	1.97 U	1.93 U	1.98 U
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	n/v	0.828 U	0.839 U	0.845 U	0.857 U	0.804 U	0.784 U	0.811 U	0.789 U	0.771 U	0.793 U
Heptachlor Epoxide	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	20	3.10 U	3.15 U	3.17 U	3.21 U	3.01 U	2.94 U	3.04 U	2.96 U	2.89 U	2.98 U
MCPA	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
MCPP	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Methoxychlor	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	900,000	3.10 U	3.15 U	3.17 U	3.21 U	3.01 U	2.94 U	3.04 U	2.96 U	2.89 U	2.98 U
P,P'-DDD	µg/kg	3.3$_m$	14,000	92,000	n/v	n/v	n/v	n/v	1.61 J	1.68 U	1.69 U	1.71 U	1.61 U	1.57 U	1.62 U	1.58 U	1.54 U	1.59 U
P,P'-DDE	µg/kg	3.3$_m$	17,000	62,000	n/v	n/v	n/v	n/v	1.56 J	1.68 U	1.69 U	1.25 J	1.61 U	1.57 U	1.62 U	1.58 U	2.34	1.59 U
P,P'-DDT	µg/kg	3.3$_m$	136,000	47,000	n/v	n/v	n/v	n/v	**14.0^A**	3.15 U	3.17 U	3.19 J	3.01 U	2.94 U	3.04 U	2.96 U	2.89 U	2.98 U
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000$_c$	n/v	n/v	n/v	n/v	176 U	183 U	181 U	178 U	170 U	168 U	169 U	170 U	167 U	169 U
Toxaphene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	31.0 U	31.5 U	31.7 U	32.1 U	30.1 U	29.4 U	30.4 U	29.6 U	28.9 U	29.8 U
Semi-Volatile Organics																		
1,2,4,5-Tetrachlorobenzene	µg/kg	100,000$_a$	1,000,000$_d$	n/v	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
2,2-Oxybis(2-Chloropropane)	µg/kg	100,000$_a$	1,000,000$_d$	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
2,4,5-Trichlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	100	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
2,4,6-Trichlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	210 U	110 U	110 U	110 U	2,000 U	200 U	2,000 U	200 U	100 U	210 U
2,4-Dichlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	400	310 U	160 U	160 U	160 U	3,000 U	300 U	3,000 U	300 U	150 U	310 U
2,4-Dimethylphenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
2,4-Dinitrophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	200	1,700 U	880 U	870 U	850 U	16,000 U	1,600 U	16,000 U	1,600 U	800 U	1,600 U
2,4-Dinitrotoluene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
2,6-Dinitrotoluene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	1,000/170$_{b,s1}$	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
2-Chloronaphthalene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
2-Chlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
2-Methylnaphthalene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	36,400	420 U	220 U	220 U	210 U	4,000 U	400 U	4,000 U	400 U	200 U	410 U
2-Methylphenol (O-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
2-Nitroaniline	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	400	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
2-Nitrophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	300	750 U	400 U	390 U	380 U	7,200 U	720 U	7,300 U	720 U	360 U	750 U
3- And 4- Methylphenol (Total)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	500 U	260 U	260 U	260 U	4,800 U	480 U	4,800 U	480 U	240 U	500 U
3,3'-Dichlorobenzidine	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
3-Nitroaniline	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	500	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									B-109	B-110	B-111	SS-1	SS-2	SS-3	SS-4		SS-5	SS-6
Sample Date									31-Jul-15	11-Nov-15	12-Nov-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15
Sample ID									MHSC-B-109-S	MHSC-B110-S	MHSC-B111-S	MHSC-SS-1-S	MHSC-SS-2-S	MHSC-SS-3-S	MHSC-SS-4-S	MHSC-SS-FD-S	MHSC-SS-5-S	MHSC-SS-6-S
Sample Depth									VOC from 14-16' all others composite from 12-26'	VOC from 12-14' all others composite from 10-16'	VOC from 10-12' all others composite from 6-12'	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1518046	L1529527	L1529527	L1518350	L1518350	L1518350	L1518350	L1518350	L1518350	L1518350
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1518046-01	L1529527-01	L1529527-04	L1518350-07	L1518350-01	L1518350-03	L1518350-02	L1518350-05	L1518350-06	L1518350-04
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary
Semi-Volatile Organics (cont'd)																		
4,6-Dinitro-2-Methylphenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	900 U	480 U	470 U	460 U	8,600 U	860 U	8,800 U	870 U	430 U	900 U
4-Bromophenyl Phenyl Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
4-Chloro-3-Methylphenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
4-Chloroaniline	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	220	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
4-Chlorophenyl Phenyl Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
4-Nitroaniline	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
4-Nitrophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	100	490 U	260 U	250 U	250 U	4,600 U	460 U	4,700 U	470 U	230 U	480 U
Acenaphthene	µg/kg	20,000	98,000	500,000[c]	n/v	n/v	n/v	n/v	280 U	150 U	140 U	140 U	2,600 U	260 U	2,700 U	270 U	130 U	280 U
Acenaphthylene	µg/kg	100,000[a]	107,000	500,000[c]	n/v	n/v	n/v	n/v	67 J	150 U	140 U	47 J	2,600 U	260 U	2,700 U	270 U	130 U	280 U
Acetophenone	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Anthracene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	210 U	110 U	110 U	110 U	2,000 U	200 U	2,000 U	200 U	100 U	210 U
Atrazine	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	280 U	150 U	140 U	140 U	2,600 U	260 U	2,700 U	270 U	130 U	280 U
Benzaldehyde	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	460 U	240 U	240 U	92 J	4,400 U	440 U	4,400 U	440 U	220 U	460 U
Benzo(A)Anthracene	µg/kg	1,000[n]	1,000[g]	5,600	n/v	n/v	n/v	n/v	210 U	110 U	110 U	53 J	2,000 U	73 J	2,000 U	200 U	100 U	210 U
Benzo(A)Pyrene	µg/kg	1,000[n]	22,000	1,000[g]	n/v	n/v	n/v	n/v	280 U	150 U	140 U	72 J	2,600 U	260 U	2,700 U	270 U	130 U	280 U
Benzo(B)Fluoranthene	µg/kg	1,000[n]	1,700	5,600	n/v	n/v	n/v	n/v	76 J	110 U	110 U	100 J	2,000 U	140 J	2,000 U	200 U	44 J	110 J
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	95 J	150 U	140 U	65 J	2,600 U	260 U	2,700 U	120 J	130 U	280 U
Benzo(K)Fluoranthene	µg/kg	800[n]	1,700	56,000	n/v	n/v	n/v	n/v	210 U	110 U	110 U	36 J	2,000 U	200 U	2,000 U	200 U	100 U	210 U
Benzyl Butyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	122,000	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Biphenyl (Diphenyl)	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	500,000[a]	1,000,000[a]	n/v	790 U	420 U	410 U	400 U	7,600 U	760 U	7,700 U	760 U	380 U	790 U
Bis(2-Chloroethoxy) Methane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	380 U	200 U	200 U	190 U	3,600 U	360 U	3,600 U	360 U	180 U	370 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	310 U	160 U	160 U	160 U	3,000 U	300 U	3,000 U	300 U	150 U	310 U
Bis(2-Chloroisopropyl) Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	420 U	220 U	220 U	210 U	4,000 U	400 U	4,000 U	400 U	200 U	410 U
Bis(2-Ethylhexyl) Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	435,000	320 J	57 J	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Caprolactam	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Carbazole	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Chrysene	µg/kg	1,000[n]	1,000[g]	56,000	n/v	n/v	n/v	n/v	89 J	110 U	110 U	80 J	2,000 U	110 J	2,000 U	78 J	34 J	180 J
Dibenz(A,H)Anthracene	µg/kg	330[m]	1,000,000[d]	560	n/v	n/v	n/v	n/v	210 U	110 U	110 U	110 U	2,000 U	200 U	2,000 U	200 U	100 U	210 U
Dibenzofuran	µg/kg	7,000	210,000	350,000	n/v	500,000[a]	1,000,000[a]	6,200	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Diethyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	7,100	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Dimethyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	27,000	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Di-N-Butyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	8,100	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Di-N-Octylphthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	120,000	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Diphenylamine	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	88 J	110 U	110 U	93 J	2,000 U	130 J	2,000 U	200 U	49 J	95 J
Fluorene	µg/kg	30,000	386,000	500,000[c]	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Hexachlorobenzene	µg/kg	330[m]	3,200	6,000	n/v	500,000[a]	1,000,000[a]	1,400	210 U	110 U	110 U	110 U	2,000 U	200 U	2,000 U	200 U	100 U	210 U
Hexachlorobutadiene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Hexachlorocyclopentadiene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	1,000 U	520 U	520 U	510 U	9,500 U	950 U	9,600 U	950 U	480 U	990 U
Hexachloroethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	280 U	150 U	140 U	140 U	2,600 U	260 U	2,700 U	270 U	130 U	280 U
Indeno(1,2,3-C,D)Pyrene	µg/kg	500[n]	8,200	5,600	n/v	n/v	n/v	n/v	280 U	150 U	140 U	57 J	2,600 U	260 U	2,700 U	270 U	130 U	280 U
Isophorone	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	4,400	310 U	160 U	160 U	160 U	3,000 U	300 U	3,000 U	300 U	150 U	310 U
Naphthalene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Nitrobenzene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	69,000	140,000	170[b]	310 U	160 U	160 U	160 U	3,000 U	300 U	3,000 U	300 U	150 U	310 U
N-Nitrosodi-N-Propylamine	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
N-Nitrosodiphenylamine	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	280 U	150 U	140 U	140 U	2,600 U	260 U	2,700 U	270 U	130 U	280 U
Pentachlorophenol	µg/kg	800[m]	800[f]	6,700	n/v	n/v	n/v	n/v	280 U	150 U	140 U	140 U	2,600 U	260 U	2,700 U	270 U	130 U	280 U
Phenanthrene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	210 U	110 U	110 U	35 J	2,000 U	200 U	2,000 U	200 U	100 U	210 U
Phenol	µg/kg	330[m]	330[f]	500,000[c]	n/v	n/v	n/v	n/v	350 U	180 U	180 U	180 U	3,300 U	330 U	3,400 U	330 U	170 U	340 U
Pyrene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	130 J	110 U	110 U	94 J	2,000 U	140 J	2,000 U	200 U	39 J	74 J

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									B-109	B-110	B-111	SS-1	SS-2	SS-3	SS-4		SS-5	SS-6
Sample Date									31-Jul-15	11-Nov-15	12-Nov-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15
Sample ID									MHSC-B-109-S	MHSC-B110-S	MHSC-B111-S	MHSC-SS-1-S	MHSC-SS-2-S	MHSC-SS-3-S	MHSC-SS-4-S	MHSC-SS-FD-S	MHSC-SS-5-S	MHSC-SS-6-S
Sample Depth									VOC from 14-16' all others composite from 12-26'	VOC from 12-14' all others composite from 10-16'	VOC from 10-12' all others composite from 6-12'	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1518046	L1529527	L1529527	L1518350	L1518350	L1518350	L1518350	L1518350	L1518350	L1518350
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1518046-01	L1529527-01	L1529527-04	L1518350-07	L1518350-01	L1518350-03	L1518350-02	L1518350-05	L1518350-06	L1518350-04
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary
Semi-Volatile Organics (TCLP)																		
2,4,5-Trichlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
2-Methylphenol (O-Cresol)	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
3- And 4- Methylphenol (Total)	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Pyridine	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SVOC - Tentatively Identified Compounds																		
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	1,440	3,610	ND	14,660	ND	20,800	ND	6,060	5,280	94,620
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/kg	680	680	500,000[c]	n/v	n/v	n/v	n/v	0.18 J	0.93 U	0.93 U	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	600	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	6,000	13 U	18 U	18 U	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	0.96 U	1.4 U	1.4 U	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	n/v	0.96 U	1.4 U	1.4 U	-	-	-	-	-	-	-
1,1-Dichloroethene	µg/kg	330	330	500,000[c]	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	3,400	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
1,2-Dibromo-3-Chloropropane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	2.6 U	3.7 U	3.7 U	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000[c]	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/kg	20[m]	20[g]	30,000	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
1,2-Dichloropropane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	2.2 U	3.2 U	3.2 U	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
1,4-Dioxane (P-Dioxane)	µg/kg	100[m]	100[f]	130,000	n/v	n/v	n/v	n/v	64 U	93 U	93 U	-	-	-	-	-	-	-
2-Hexanone	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	6.4 U	9.3 U	9.3 U	-	-	-	-	-	-	-
Acetone	µg/kg	50	50	500,000[c]	n/v	n/v	n/v	n/v	16	**110[AB]**	9.3 U	-	-	-	-	-	-	-
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	n/v	0.64 U	0.26 J	0.93 U	-	-	-	-	-	-	-
Bromochloromethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
Bromodichloromethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
Bromoform	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	2.6 U	3.7 U	3.7 U	-	-	-	-	-	-	-
Bromomethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	1.3 U	1.8 U	1.8 U	-	-	-	-	-	-	-
Carbon Disulfide	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	2,700	6.4 U	9.3 U	9.3 U	-	-	-	-	-	-	-
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
Chlorobenzene	µg/kg	1,100	1,100	500,000[c]	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
Chloroethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	1,900	1.3 U	1.8 U	1.8 U	-	-	-	-	-	-	-
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	n/v	0.96 U	1.4 U	1.4 U	-	-	-	-	-	-	-
Chloromethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000[c]	n/v	n/v	n/v	n/v	0.64 U	1.2	0.93 U	-	-	-	-	-	-	-
Cis-1,3-Dichloropropene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
Cyclohexane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	0.83 J	18 U	18 U	-	-	-	-	-	-	-
Cymene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	10,000	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
Dibromochloromethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	6.4 U	9.3 U	9.3 U	-	-	-	-	-	-	-
Dichloroethylenes	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Ethyl Acetate	µg/kg	n/v	n/v	n/v	n/v	500,000[a]	1,000,000[a]	n/v	-	-	-	-	-	-	-	-	-	-

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									B-109	B-110	B-111	SS-1	SS-2	SS-3	SS-4		SS-5	SS-6
Sample Date									31-Jul-15	11-Nov-15	12-Nov-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15	4-Aug-15
Sample ID									MHSC-B-109-S	MHSC-B110-S	MHSC-B111-S	MHSC-SS-1-S	MHSC-SS-2-S	MHSC-SS-3-S	MHSC-SS-4-S	MHSC-SS-FD-S	MHSC-SS-5-S	MHSC-SS-6-S
Sample Depth									VOC from 14-16' all others composite from 12-26'	VOC from 12-14' all others composite from 10-16'	VOC from 10-12' all others composite from 6-12'	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in	0 -2 in
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1518046	L1529527	L1529527	L1518350	L1518350	L1518350	L1518350	L1518350	L1518350	L1518350
Laboratory Sample ID									L1518046-01	L1529527-01	L1529527-04	L1518350-07	L1518350-01	L1518350-03	L1518350-02	L1518350-05	L1518350-06	L1518350-04
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary
Volatile Organic Compounds																		
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	2,300	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
Methyl Acetate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	13 U	4.5 J	18 U	-	-	-	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000[c]	n/v	500,000[a]	1,000,000[a]	300	6.4 U	9.3 U	9.3 U	-	-	-	-	-	-	-
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	1,000	6.4 U	9.3 U	9.3 U	-	-	-	-	-	-	-
Methylcyclohexane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	2.6 U	3.7 U	3.7 U	-	-	-	-	-	-	-
Methylene Chloride	µg/kg	50	50	500,000[c]	n/v	n/v	n/v	n/v	6.4 U	9.3 U	9.3 U	-	-	-	-	-	-	-
M-P-Xylene	µg/kg	260[p]	1,600[p]	500,000[c,p]	n/v	n/v	n/v	n/v	0.18 J	1.8 U	1.8 U	-	-	-	-	-	-	-
Naphthalene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
N-Butylbenzene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
N-Propylbenzene	µg/kg	3,900	3,900	500,000[c]	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260[p]	1,600[p]	500,000[c,p]	n/v	n/v	n/v	n/v	1.3 U	1.8 U	1.8 U	-	-	-	-	-	-	-
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000[c]	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
Styrene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	1.3 U	1.8 U	1.8 U	-	-	-	-	-	-	-
T-Butylbenzene	µg/kg	5,900	5,900	500,000[c]	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000[c]	n/v	n/v	n/v	n/v	1.3 U	1.8 U	1.8 U	-	-	-	-	-	-	-
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	n/v	500,000[a]	1,000,000[a]	n/v	1.9	0.93 U	0.93 U	-	-	-	-	-	-	-
Toluene	µg/kg	700	700	500,000[c]	n/v	n/v	n/v	n/v	0.25 J	0.36 J	1.4 U	-	-	-	-	-	-	-
Total, 1,3-Dichloropropene (Cis And Trans)	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000[c]	n/v	n/v	n/v	n/v	0.96 U	1.4 U	1.4 U	-	-	-	-	-	-	-
Trans-1,3-Dichloropropene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	0.64 U	0.93 U	0.93 U	-	-	-	-	-	-	-
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	n/v	2.9	13	0.93 U	-	-	-	-	-	-	-
Trichlorofluoromethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	3.2 U	4.6 U	4.6 U	-	-	-	-	-	-	-
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	n/v	1.3 U	1.8 U	1.8 U	-	-	-	-	-	-	-
Xylenes	µg/kg	260	1,600	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
VOCs - Tentatively Identified Compounds																		
Total VOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	2.7 J	3.5 J	21 J	-	-	-	-	-	-	-

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									SOIL WASTE PILE			TP-102		TP-103	TP-214	TP-217	TP-218	TP-220		TP-226
Sample Date									TP-101	TP-101A CLEAN	TP-101B (MIX)	TP-101C (PAINT)	29-Jul-15	28-Jul-15	29-Jul-15	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16
Sample ID									28-Jul-15	29-Jul-15	29-Jul-15	29-Jul-15	MHSC-TP-102-S	MHSC-TP-DUP-S	MHSC-TP-103-S	TP-214	TP-217	TP-218	TP-220	DUP042716	TP-226
									MHSC-TP-101-S	MHSC-TP-101A-S CLEAN	MHSC-TP-101B-S (MIX)	MHSC-TP-101C (PAINT)									
Sample Depth									12 ft	N/A (pile)	N/A (pile)	N/A (pile)	12 ft	12 ft	12 ft	16 - 17 ft	17 - 18 ft	14 - 15 ft	11 - 12 ft	11 - 12 ft	8 - 9 ft
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1517723	L1517723	L1517723	L1517894	L1517723	L1517723	L1517723	L1612918	L1612918	L1612918	L1612918	L1612918	L1612918
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1517723-01	L1517723-05	L1517723-06	L1517894-01	L1517723-03	L1517723-02	L1517723-04	L1612918-01	L1612918-02	L1612918-03	L1612918-04	L1612918-06	L1612918-05
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary
General Chemistry																					
Cyanide	mg/kg	27$_i$	40$_i$	27$_i$	n/v	n/v	n/v	n/v	1.2 U	1.0 U	1.1 U	-	1.0 U	0.98 U	0.95 U	0.30 J	0.45 J	1.1 U	1.1 U	1.2 U	1.1 U
Total Carbon	percent	n/v	n/v	n/v	n/v	n/v	n/v	n/v	3.76	2.76	2.10	-	1.62	1.83	1.79	-	-	-	-	-	-
Solids, Percent	percent	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	86.8	84.6	89.4	83.3	79.3	87.3
Hydrogen Cation	su	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	5.5	-	-	-	-	-	-	-	-	-
Reactive Cyanide	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	10 U	-	-	-	-	-	-	-	-	-
Sulfide Reactive	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	10 U	-	-	-	-	-	-	-	-	-
Ignitability																					
Ignitability	none	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	NI	-	-	-	-	-	-	-	-	-
Metals																					
Aluminum	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	7,300	5,900	5,000	-	5,700	5,600	5,700	5,600	4,800	5,200	5,600	6,100	5,500
Antimony	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	4.8 U	4.1 U	4.2 U	-	4.1 U	4.0 U	4.0 U	4.6 U	4.6 U	4.4 U	4.7 U	4.8 U	4.5 U
Arsenic	mg/kg	13$_n$	16$_g$	16$_g$	n/v	n/v	n/v	n/v	18^{ABC}	10	8.4	-	9.5	10	11	5.7	6.7	4.8	8	6.3	5
Barium	mg/kg	350$_n$	820	400	n/v	n/v	n/v	n/v	70	37	25	-	33	30	34	29	46	38	44	66	40
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	n/v	0.33 J	0.25 J	0.18 J	-	0.24 J	0.23 J	0.25 J	0.24 J	0.25 J	0.24 J	0.26 J	0.31 J	0.24 J
Cadmium	mg/kg	2.5$_n$	7.5	9.3	n/v	n/v	n/v	n/v	1.1	0.11 J	0.12 J	-	0.81 U	0.81 U	0.80 U	0.91 U	0.91 U	0.87 U	0.94 U	0.96 U	0.89 U
Calcium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	27,000^{ABCEFG}	46,000^{ABCEFG}	57,000^{ABCEFG}	-	40,000^{ABCEFG}	42,000^{ABCEFG}	50,000^{ABCEFG}	35,000^{ABCEFG}	17,000^{ABCEFG}	38,000^{ABCEFG}	17,000^{ABCEFG}	34,000^{ABCEFG}	33,000^{ABCEFG}
Chromium, Total	mg/kg	30$_{n,l}$	NS$_{,q}$	1,500$_i$	n/v	n/v	n/v	n/v	19	10	8.7	-	7.5	7.3	8.5	7.7	12	7.2	21	11	19
Cobalt	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	6.3	5.1	4.1	-	5.0	5.0	5.4	5	4.7	4.8	6	4.8	5.2
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	n/v	39	20	21	-	17	16	20	18	32	13	46	39	30
Iron	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	26,000^{ABCEFG}	15,000^{ABCEFG}	12,000^{ABCEFG}	-	14,000^{ABCEFG}	13,000^{ABCEFG}	14,000^{ABCEFG}	15,000^{ABCEFG}	16,000^{ABCEFG}	13,000^{ABCEFG}	25,000^{ABCEFG}	19,000^{ABCEFG}	15,000^{ABCEFG}
Lead	mg/kg	63$_n$	450	1,000	n/v	n/v	n/v	n/v	120^{A}	58	48	-	4.1 U	4.0 U	8.2	43	61	48	140^{A}	48	120^{A}
Magnesium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	4,800	10,000	9,600	-	8,000	8,300	8,800	9,100	4,800	8,600	5,500	7,700	7,100
Manganese	mg/kg	1,600$_n$	2,000$_q$	10,000$_e$	n/v	n/v	n/v	n/v	1,200	370	420	-	300	300	360	450	380	660	380	530	410
Mercury	mg/kg	0.18$_n$	0.73	2.8$_k$	n/v	n/v	n/v	n/v	0.05 J	0.02 J	0.07 U	-	0.07 U	0.07 U	0.01 J	0.07 U	0.02 J	0.07 U	0.02 J	0.02 J	0.04 J
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	n/v	20	13	11	-	12	12	14	13	13	11	16	15	14
Potassium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	460	380	340	-	310	300	370	290	350	340	270	400	350
Selenium	mg/kg	3.9$_n$	4$_q$	1,500	n/v	n/v	n/v	n/v	1.9 U	1.6 U	1.7 U	-	1.6 U	1.6 U	1.6 U	0.27 J	1.8 U	1.7 U	1.9 U	0.32 J	1.8 U
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	n/v	0.96 U	0.83 U	0.84 U	-	0.81 U	0.81 U	0.80 U	0.91 U	0.91 U	0.87 U	0.94 U	0.96 U	0.89 U
Sodium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	230	77 J	150 J	-	60 J	63 J	78 J	94 J	42 J	130 J	35 J	78 J	95 J
Thallium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	1.9 U	1.6 U	1.7 U	-	1.6 U	1.6 U	1.6 U	0.37 J	1.8 U	1.7 U	0.52 J	1.9 U	1.8 U
Vanadium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	12	10	8.6	-	9.7	9.7	10	8.7	7.6	7.6	7.8	8.6	8.6
Zinc	mg/kg	109$_n$	2,480	10,000$_e$	n/v	n/v	n/v	n/v	180^{A}	78	70	-	47	49	58	67	71	49	170^{A}	100	130^{A}
Metals (TCLP)																					
Arsenic	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	1.0 U	-	-	-	-	-	-	-	-	-
Barium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	0.09 J	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	0.10 U	-	-	-	-	-	-	-	-	-
Chromium, Total	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	0.20 U	-	-	-	-	-	-	-	-	-
Lead	mg/L	n/v	n/v	n/v	0.015	n/v	n/v	n/v	0.50 U	-	-	0.06 J^{D}	-	-	-	-	-	-	-	-	-
Mercury	mg/L	n/v	n/v	n/v	0.002	n/v	n/v	n/v	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-
Selenium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	0.50 U	-	-	-	-	-	-	-	-	-
Silver	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	0.10 U	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																					
PCB-1016 (Aroclor 1016)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	41.0 U	33.6 U	36.1 U	306 U	34.2 U	34.5 U	32.7 U	37.2 U	37.2 U	36.2 U	39.3 U	40.2 U	37.1 U
PCB-1221 (Aroclor 1221)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	41.0 U	33.6 U	36.1 U	306 U	34.2 U	34.5 U	32.7 U	37.2 U	37.2 U	36.2 U	39.3 U	40.2 U	37.1 U
PCB-1232 (Aroclor 1232)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	41.0 U	33.6 U	36.1 U	306 U	34.2 U	34.5 U	32.7 U	37.2 U	37.2 U	36.2 U	39.3 U	40.2 U	37.1 U
PCB-1242 (Aroclor 1242)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	41.0 U	33.6 U	36.1 U	306 U	34.2 U	34.5 U	32.7 U	37.2 U	37.2 U	36.2 U	39.3 U	40.2 U	37.1 U
PCB-1248 (Aroclor 1248)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	41.0 U	33.6 U	36.1 U	306 U	34.2 U	34.5 U	32.7 U	37.2 U	37.2 U	36.2 U	39.3 U	40.2 U	37.1 U
PCB-1254 (Aroclor 1254)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	18.0 J	27.4 J	36.1 U	306 U	34.2 U	34.5 U	32.7 U	37.2 U	37.2 U	36.2 U	16.1 J	20.9 J	55.9
PCB-1260 (Aroclor 1260)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	9.94 J	22.6 J	36.1 U	306 U	34.2 U	34.5 U	32.7 U	37.2 U	37.2 U	36.2 U	10.6 J	9.71 J	29.3 J
PCB-1262 (Aroclor 1262)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	41.0 U	33.6 U	36.1 U	306 U	34.2 U	34.5 U	32.7 U	37.2 U	37.2 U	36.2 U	39.3 U	40.2 U	37.1 U
PCB-1268 (Aroclor 1268)	µg/kg	o	o	o	n/v	n/v	n/v	n/v	41.0 U	33.6 U	36.1 U	306 U	34.2 U	34.5 U	32.7 U	37.2 U	37.2 U	36.2 U	39.3 U	40.2 U	37.1 U
Polychlorinated Biphenyl (PCBs)	µg/kg	100	3,200	1,000	n/v	n/v	n/v	n/v	27.9 J	50.0 J	36.1 U	306 U	34.2 U	34.5 U	32.7 U	ND	ND	ND	26.7 J	30.6 J	85.2 J

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location										SOIL WASTE PILE			TP-102		TP-103	TP-214	TP-217	TP-218	TP-220		TP-226
Sample Date									TP-101	TP-101A CLEAN	TP-101B (MIX)	TP-101C (PAINT)	29-Jul-15	28-Jul-15	29-Jul-15	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16
Sample ID									28-Jul-15 MHSC-TP-101-S	29-Jul-15 MHSC-TP-101A-S CLEAN	29-Jul-15 MHSC-TP-101B-S (MIX)	29-Jul-15 MHSC-TP-101C (PAINT)	MHSC-TP-102-S	MHSC-TP-DUP-S	MHSC-TP-103-S	TP-214	TP-217	TP-218	TP-220	DUP042716	TP-226
Sample Depth									12 ft	N/A (pile)	N/A (pile)	N/A (pile)	12 ft	12 ft	12 ft	16 - 17 ft	17 - 18 ft	14 - 15 ft	11 - 12 ft	11 - 12 ft	8 - 9 ft
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1517723	L1517723	L1517723	L1517894	L1517723	L1517723	L1517723	L1612918	L1612918	L1612918	L1612918	L1612918	L1612918
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1517723-01	L1517723-05	L1517723-06	L1517894-01	L1517723-03	L1517723-02	L1517723-04	L1612918-01	L1612918-02	L1612918-03	L1612918-04	L1612918-06	L1612918-05
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary
Pesticides																					
2,4 Db	µg/kg	n/v	n/v	680	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	191 U	194 U	185 U	198 U	207 U	188 U
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	1,900	2,100 U	176 U	180 U	-	174 U	175 U	18.9 J	191 U	194 U	185 U	198 U	207 U	188 U
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	500	2,100 U	176 U	180 U	-	174 U	175 U	172 U	191 U	194 U	185 U	198 U	207 U	188 U
Aldrin	µg/kg	5$_n$	190	680	n/v	n/v	n/v	n/v	19.7 U	1.66 U	1.74 U	-	1.64 U	1.64 U	1.58 U	1.79 U	1.83 U	1.74 U	1.84 U	1.9 U	1.76 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	n/v	8.22 U	0.693 U	0.723 U	-	0.683 U	0.685 U	0.659 U	0.745 U	0.761 U	0.723 U	0.768 U	0.794 U	0.732 U
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	n/v	24.7 U	2.08 U	2.17 U	-	2.05 U	2.06 U	1.98 U	0.950 J	2.28 U	2.17 U	2.32	2.37 J	8.2
Alpha Endosulfan	µg/kg	2,400$_j$	102,000	200,000$_j$	n/v	n/v	n/v	n/v	19.7 U	1.66 U	1.74 U	-	1.64 U	1.64 U	1.58 U	1.79 U	1.83 U	1.74 U	1.84 U	1.9 U	1.76 U
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	n/v	19.7 U	1.66 U	1.74 U	-	1.64 U	1.64 U	1.58 U	1.79 U	1.83 U	1.74 U	1.84 U	1.9 U	1.76 U
Beta Endosulfan	µg/kg	2,400$_j$	102,000	200,000$_j$	n/v	n/v	n/v	n/v	19.7 U	1.66 U	1.74 U	-	1.64 U	1.64 U	1.58 U	1.79 U	1.83 U	1.74 U	1.84 U	1.9 U	1.76 U
Chlordane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	160 U	13.5 U	14.1 U	-	13.3 U	13.4 U	12.8 U	6.50 J	14.8 U	14.1 U	11.7 J	11.6 J	68.1
Dalapon	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	38.3 U	38.8 U	37 U	39.6 U	41.3 U	37.6 U
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40$_n$	250	500,000$_c$	n/v	n/v	n/v	n/v	19.7 U	1.66 U	1.74 U	-	1.64 U	1.64 U	1.58 U	1.79 U	1.83 U	1.74 U	1.84 U	1.9 U	1.76 U
Dicamba	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	38.3 U	38.8 U	37 U	39.6 U	41.3 U	37.6 U
Dichloroprop	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	38.3 U	38.8 U	37 U	39.6 U	41.3 U	37.6 U
Dieldrin	µg/kg	5$_n$	100	1,400	n/v	n/v	n/v	n/v	12.3 U	1.04 U	1.08 U	-	1.02 U	1.03 U	0.988 U	1.12 U	1.14 U	1.08 U	1.15 U	1.19	1.1 U
Dinoseb	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	38.3 U	38.8 U	37 U	39.6 U	41.3 U	37.6 U
Endosulfan Sulfate	µg/kg	2,400$_j$	1,000,000$_d$	200,000$_j$	n/v	n/v	n/v	n/v	8.22 U	0.693 U	0.723 U	-	0.683 U	0.685 U	0.659 U	0.745 U	0.761 U	0.723 U	0.768 U	0.794 U	0.732 U
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	n/v	8.22 U	0.693 U	0.723 U	-	0.683 U	0.685 U	0.659 U	0.745 U	0.761 U	0.723 U	0.768 U	0.794 U	0.732 U
Endrin Aldehyde	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	2.23 U	2.28 U	2.17 U	2.3 U	2.38 U	2.2 U
Endrin Ketone	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	19.7 U	1.66 U	1.74 U	-	1.64 U	1.64 U	1.58 U	1.79 U	1.83 U	1.74 U	1.84 U	1.9 U	1.76 U
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	n/v	8.22 U	0.693 U	0.723 U	-	0.683 U	0.685 U	0.659 U	0.745 U	0.761 U	0.723 U	0.768 U	0.794 U	0.732 U
Gamma Chlordane (trans-Chlordane)	µg/kg	100,000$_a$	1,000,000$_d$	n/v	n/v	n/v	n/v	n/v	24.7 U	2.08 U	2.17 U	-	2.05 U	2.06 U	1.98 U	0.675 J	2.28 U	2.17 U	1.57 J	1.87 J	10.2
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	n/v	9.87 U	0.832 U	0.868 U	-	0.819 U	0.822 U	0.790 U	0.894 U	0.913 U	0.868 U	0.922 U	0.952 U	0.879 U
Heptachlor Epoxide	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	20	37.0 U	3.12 U	3.25 U	-	3.07 U	3.08 U	2.96 U	3.35 U	3.42 U	3.25 U	3.46 U	3.57 U	3.3 U
MCPA	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	3,830 U	3,880 U	3,700 U	3,960 U	4,130 U	3,760 U
MCPP	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	3,830 U	3,880 U	3,700 U	3,960 U	4,130 U	3,760 U
Methoxychlor	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	900,000	37.0 U	3.12 U	3.25 U	-	3.07 U	3.08 U	2.96 U	3.35 U	3.42 U	3.25 U	3.46 U	3.57 U	3.3 U
P,P'-DDD	µg/kg	3.3$_m$	14,000	92,000	n/v	n/v	n/v	n/v	19.7 U	1.54 J P I	1.74 U	-	1.64 U	1.64 U	1.58 U	2.44	0.699 J	1.74 U	0.678 J	1.13 J	3.26
P,P'-DDE	µg/kg	3.3$_m$	17,000	62,000	n/v	n/v	n/v	n/v	19.7 U	1.66 U	1.74 U	-	1.64 U	1.64 U	1.58 U	1.08 J	1.83 U	1.74 U	0.670 J	0.873 J	1.88
P,P'-DDT	µg/kg	3.3$_m$	136,000	47,000	n/v	n/v	n/v	n/v	37.0 U	**3.31 P I^A**	3.25 U	-	3.07 U	3.08 U	2.96 U	1.47 J	1.68 J	3.25 U	3.13 J	3.57 U	1.92 J
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000$_c$	n/v	n/v	n/v	n/v	2,100 U	176 U	180 U	-	174 U	175 U	172 U	191 U	194 U	185 U	198 U	207 U	188 U
Toxaphene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	370 U	31.2 U	32.5 U	-	30.7 U	30.8 U	29.6 U	33.5 U	34.2 U	32.5 U	34.6 U	35.7 U	33 U
Semi-Volatile Organics																					
1,2,4,5-Tetrachlorobenzene	µg/kg	100,000$_a$	1,000,000$_d$	n/v	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
2,2-Oxybis(2-Chloropropane)	µg/kg	100,000$_a$	1,000,000$_d$	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	230 U	230 U	220 U	240 U	250 U	220 U
2,3,4,6-Tetrachlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
2,4,5-Trichlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	100	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
2,4,6-Trichlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	120 U	110 U	110 U	-	100 U	100 U	100 U	110 U	120 U	110 U	120 U	120 U	110 U
2,4-Dichlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	400	190 U	160 U	160 U	-	160 U	160 U	150 U	170 U	180 U	160 U	180 U	190 U	170 U
2,4-Dimethylphenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
2,4-Dinitrophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	200	1,000 U	850 U	860 U	-	840 U	840 U	810 U	920 U	940 U	880 U	960 U	1,000 U	900 U
2,4-Dinitrotoluene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
2,6-Dinitrotoluene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	1,000/170$_{b,s1}$	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
2-Chloronaphthalene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
2-Chlorophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
2-Methylnaphthalene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	36,400	250 U	210 U	210 U	-	210 U	210 U	200 U	230 U	230 U	90 J	29 J	40 J	220 U
2-Methylphenol (O-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	n/v	210 U	180 U	100 J	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
2-Nitroaniline	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	400	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
2-Nitrophenol	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	300	450 U	380 U	380 U	-	380 U	380 U	360 U	410 U	420 U	390 U	430 U	450 U	400 U
3- And 4- Methylphenol (Total)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	300 U	260 U	76 J	-	250 U	250 U	240 U	280 U	280 U	260 U	290 U	300 U	270 U
3,3'-Dichlorobenzidine	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
3-Nitroaniline	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	500	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location										SOIL WASTE PILE			TP-102		TP-103	TP-214	TP-217	TP-218	TP-220		TP-226
Sample Date								TP-101 28-Jul-15	TP-101A CLEAN 29-Jul-15	TP-101B (MIX) 29-Jul-15	TP-101C (PAINT) 29-Jul-15	29-Jul-15	28-Jul-15	29-Jul-15	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	
Sample ID								MHSC-TP-101-S	MHSC-TP-101A-S CLEAN	MHSC-TP-101B-S (MIX)	MHSC-TP-101C (PAINT)	MHSC-TP-102-S	MHSC-TP-DUP-S	MHSC-TP-103-S	TP-214	TP-217	TP-218	TP-220	DUP042716	TP-226	
Sample Depth								12 ft	N/A (pile)	N/A (pile)	N/A (pile)	12 ft	12 ft	12 ft	16 - 17 ft	17 - 18 ft	14 - 15 ft	11 - 12 ft	11 - 12 ft	8 - 9 ft	
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	
Laboratory								ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	
Laboratory Work Order								L1517723	L1517723	L1517723	L1517894	L1517723	L1517723	L1517723	L1612918	L1612918	L1612918	L1612918	L1612918	L1612918	
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1517723-05	L1517723-06	L1517894-01	L1517723-03	L1517723-02	L1517723-04	L1612918-01	L1612918-02	L1612918-03	L1612918-04	L1612918-06	L1612918-05	
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	
Semi-Volatile Organics (cont'd)																					
4,6-Dinitro-2-Methylphenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	540 U	460 U	460 U	-	460 U	450 U	440 U	500 U	510 U	470 U	520 U	540 U	490 U
4-Bromophenyl Phenyl Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
4-Chloro-3-Methylphenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
4-Chloroaniline	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	220	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
4-Chlorophenyl Phenyl Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
4-Nitroaniline	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
4-Nitrophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	100	290 U	250 U	250 U	-	240 U	240 U	240 U	270 U	270 U	260 U	280 U	290 U	260 U
Acenaphthene	µg/kg	20,000	98,000	500,000[c]	n/v	n/v	n/v	n/v	170 U	44 J	140 U	-	140 U	140 U	140 U	150 U	160 U	150 U	160 U	24 J	150 U
Acenaphthylene	µg/kg	100,000[a]	107,000	500,000[c]	n/v	n/v	n/v	n/v	46 J	48 J	140 U	-	140 U	140 U	140 U	150 U	36 J	150 U	90 J	96 J	150 U
Acetophenone	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
Anthracene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	200	74 J	110 U	-	100 U	100 U	100 U	110 U	120 U	110 U	120 U	46 J	110 U
Atrazine	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	170 U	140 U	140 U	-	140 U	140 U	140 U	150 U	160 U	150 U	160 U	170 U	150 U
Benzaldehyde	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	280 U	230 U	240 U	-	230 U	230 U	220 U	250 U	260 U	240 U	260 U	280 U	250 U
Benzo(A)Anthracene	µg/kg	1,000[n]	1,000[g]	5,600	n/v	n/v	n/v	n/v	370	180	89 J	-	100 U	100 U	96 J	27 J	100 J	72 J	120	130	95 J
Benzo(A)Pyrene	µg/kg	1,000[n]	22,000	1,000[g]	n/v	n/v	n/v	n/v	170 U	170	110 J	-	140 U	140 U	130 J	150 U	100 J	89 J	200	230	110 J
Benzo(B)Fluoranthene	µg/kg	1,000[n]	1,700	5,600	n/v	n/v	n/v	n/v	380	240	140	-	100 U	100 U	77 J	34 J	150	100 J	320	340	150
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	160 J	130 J	93 J	-	140 U	140 U	140	150 U	74 J	63 J	140 J	150 J	83 J
Benzo(K)Fluoranthene	µg/kg	800[n]	1,700	56,000	n/v	n/v	n/v	n/v	120	87 J	50 J	-	100 U	100 U	100 U	110 U	52 J	44 J	110 J	140	49 J
Benzyl Butyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	122,000	210 U	180 U	180 U	-	180 U	170 U	59 J	190 U	200 U	180 U	200 U	210 U	190 U
Biphenyl (Diphenyl)	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	500,000[a]	1,000,000[a]	n/v	480 U	400 U	410 U	-	400 U	400 U	380 U	440 U	440 U	420 U	450 U	480 U	430 U
Bis(2-Chloroethoxy) Methane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	220 U	190 U	190 U	-	190 U	190 U	180 U	210 U	210 U	200 U	210 U	220 U	200 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	190 U	160 U	160 U	-	160 U	160 U	150 U	170 U	180 U	160 U	180 U	190 U	170 U
Bis(2-Chloroisopropyl) Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	250 U	210 U	210 U	-	210 U	210 U	200 U	-	-	-	-	-	-
Bis(2-Ethylhexyl) Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	435,000	560	70 J	140 J	-	180 U	170 U	55 J	190 U	200 U	100 J	79 J	78 J	66 J
Caprolactam	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
Carbazole	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	21 J	180 U	51 J	61 J	190 U
Chrysene	µg/kg	1,000[n]	1,000[g]	56,000	n/v	n/v	n/v	n/v	340	190	100 J	-	100 U	100 U	150	27 J	100 J	71 J	250	290	100 J
Dibenz(A,H)Anthracene	µg/kg	330[m]	1,000,000[d]	560	n/v	n/v	n/v	n/v	120 U	52 J	110 U	-	100 U	100 U	45 J	110 U	120 U	110 U	30 J	36 J	110 U
Dibenzofuran	µg/kg	7,000	210,000	350,000	n/v	500,000[a]	1,000,000[a]	6,200	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	45 J	70 J	190 U
Diethyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	7,100	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
Dimethyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	27,000	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
Di-N-Butyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	8,100	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
Di-N-Octylphthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	120,000	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
Diphenylamine	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	150 U	160 U	150 U	160 U	170 U	150 U
Fluoranthene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	630	360	180	-	100 U	100 U	32 J	60 J	200	140	670	750	200
Fluorene	µg/kg	30,000	386,000	500,000[c]	n/v	n/v	n/v	n/v	91 J	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	56 J	87 J	190 U
Hexachlorobenzene	µg/kg	330[m]	3,200	6,000	n/v	500,000[a]	1,000,000[a]	1,400	120 U	110 U	110 U	-	100 U	100 U	100 U	110 U	120 U	110 U	120 U	120 U	110 U
Hexachlorobutadiene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
Hexachlorocyclopentadiene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	600 U	510 U	510 U	-	500 U	500 U	480 U	550 U	560 U	520 U	570 U	600 U	540 U
Hexachloroethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	170 U	140 U	140 U	-	140 U	140 U	140 U	150 U	160 U	150 U	160 U	170 U	150 U
Indeno(1,2,3-C,D)Pyrene	µg/kg	500[n]	8,200	5,600	n/v	n/v	n/v	n/v	220	150	120 J	-	140 U	140 U	73 J	150 U	59 J	49 J	120 J	130 J	66 J
Isophorone	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	4,400	190 U	160 U	160 U	-	160 U	160 U	150 U	170 U	180 U	160 U	180 U	190 U	170 U
Naphthalene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	n/v	90 J	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
Nitrobenzene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	69,000	140,000	170[b]	190 U	160 U	160 U	-	160 U	160 U	150 U	170 U	180 U	160 U	180 U	190 U	170 U
N-Nitrosodi-N-Propylamine	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
N-Nitrosodiphenylamine	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	170 U	140 U	140 U	-	140 U	140 U	140 U	-	-	-	-	-	-
Pentachlorophenol	µg/kg	800[m]	800[f]	6,700	n/v	n/v	n/v	n/v	170 U	140 U	140 U	-	140 U	140 U	140 U	150 U	160 U	150 U	160 U	170 U	150 U
Phenanthrene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	600	180	89 J	-	100 U	100 U	100 U	30 J	110 J	78 J	790	1,000	110
Phenol	µg/kg	330[m]	330[f]	500,000[c]	n/v	n/v	n/v	n/v	210 U	180 U	180 U	-	180 U	170 U	170 U	190 U	200 U	180 U	200 U	210 U	190 U
Pyrene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	600	300	150	-	100 U	100 U	81 J	47 J	160	120	530	580	170

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location										SOIL WASTE PILE			TP-102		TP-103	TP-214	TP-217	TP-218	TP-220		TP-226
Sample Date									TP-101 28-Jul-15	TP-101A CLEAN 29-Jul-15	TP-101B (MIX) 29-Jul-15	TP-101C (PAINT) 29-Jul-15	29-Jul-15	28-Jul-15	29-Jul-15	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16
Sample ID									MHSC-TP-101-S	MHSC-TP-101A-S CLEAN	MHSC-TP-101B-S (MIX)	MHSC-TP-101C (PAINT)	MHSC-TP-102-S	MHSC-TP-DUP-S	MHSC-TP-103-S	TP-214	TP-217	TP-218	TP-220	DUP042716	TP-226
Sample Depth									12 ft	N/A (pile)	N/A (pile)	N/A (pile)	12 ft	12 ft	12 ft	16 - 17 ft	17 - 18 ft	14 - 15 ft	11 - 12 ft	11 - 12 ft	8 - 9 ft
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1517723	L1517723	L1517723	L1517894	L1517723	L1517723	L1517723	L1612918	L1612918	L1612918	L1612918	L1612918	L1612918
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1517723-01	L1517723-05	L1517723-06	L1517894-01	L1517723-03	L1517723-02	L1517723-04	L1612918-01	L1612918-02	L1612918-03	L1612918-04	L1612918-06	L1612918-05
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary
Semi-Volatile Organics (TCLP)																					
2,4,5-Trichlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	25 U	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	25 U	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	25 U	-	-	-	-	-	-	-	-	-
2-Methylphenol (O-Cresol)	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	13 J	-	-	-	-	-	-	-	-	-
3- And 4- Methylphenol (Total)	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	21 J	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	10 U	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	10 U	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	10 U	-	-	-	-	-	-	-	-	-
Nitrobenzene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	10 U	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	50 U	-	-	-	-	-	-	-	-	-
Pyridine	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	25 U	-	-	-	-	-	-	-	-	-
SVOC - Tentatively Identified Compounds																					
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	165,900	1,710	214,000	-	ND	ND	190	ND	ND	31,090 J	240 J	880 J	ND
Volatile Organic Compounds																					
1,1,1-Trichloroethane	µg/kg	680	680	500,000$_c$	n/v	n/v	n/v	n/v	540 U	40 U	810 U	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
1,1,2,2-Tetrachloroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	600	540 U	40 U	810 U	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	6,000	11,000 U	800 U	16,000 U	-	9.9 U	10 U	11 U	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	810 U	60 U	1,200 U	-	0.74 U	0.77 U	0.83 U	1.6 U	1.7 U	160 U	1.8 U	1.8 U	1.7 U
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	n/v	810 U	60 U	1,200 U	-	0.74 U	0.77 U	0.83 U	1.6 U	1.7 U	160 U	1.8 U	1.8 U	1.7 U
1,1-Dichloroethene	µg/kg	330	330	500,000$_c$	n/v	n/v	n/v	n/v	540 U	40 U	810 U	31,000 U	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
1,2,3-Trichlorobenzene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	2,700 U	200 U	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
1,2,4-Trichlorobenzene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	3,400	2,700 U	200 U	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	n/v	570 J	200 U	310 J	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	99 J	5.9 U	5.8 U	5.6 U
1,2-Dibromo-3-Chloropropane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,700 U	200 U	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,200 U	160 U	3,200 U	-	2.0 U	2.0 U	2.2 U	4.3 U	4.5 U	410 U	4.7 U	4.7 U	4.5 U
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	n/v	2,700 U	200 U	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
1,2-Dichloroethane	µg/kg	20$_m$	20$_g$	30,000	n/v	n/v	n/v	n/v	540 U	40 U	810 U	31,000 U	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
1,2-Dichloropropane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	1,900 U	140 U	2,800 U	-	1.7 U	1.8 U	1.9 U	3.8 U	3.9 U	360 U	4.1 U	4.1 U	3.9 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	n/v	2,700 U	200 U	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	n/v	2,700 U	200 U	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	n/v	2,700 U	200 U	4,000 U	160,000 U	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
1,4-Dioxane (P-Dioxane)	µg/kg	100$_m$	100$_f$	130,000	n/v	n/v	n/v	n/v	54,000 U	4,000 U	81,000 U	-	49 U	51 U	55 U	110 U	110 U	10,000 U	120 U	120 U	110 U
2-Hexanone	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	5,400 U	400 U	8,100 U	-	4.9 U	5.1 U	5.5 U	11 U	11 U	1,000 U	12 U	12 U	11 U
Acetone	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	n/v	5,400 U	400 U	8,100 U	-	1.9 J	25	2.0 J	11 U	11 U	1,000 U	12 U	12 U	11 U
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	n/v	**720^{AB}**	40 U	**300 J^{AB}**	**37,000^{AB}**	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	**84 J^{AB}**	1.2 U	1.2 U	1.1 U
Bromochloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,700 U	200 U	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
Bromodichloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	540 U	40 U	810 U	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Bromoform	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,200 U	160 U	3,200 U	-	2.0 U	2.0 U	2.2 U	4.3 U	4.5 U	410 U	4.7 U	4.7 U	4.5 U
Bromomethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	1,100 U	80 U	1,600 U	-	0.99 U	1.0 U	1.1 U	2.2 U	2.2 U	210 U	2.4 U	2.3 U	2.2 U
Carbon Disulfide	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	2,700	5,400 U	400 U	8,100 U	-	4.9 U	5.1 U	5.5 U	11 U	11 U	1,000 U	12 U	12 U	11 U
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	n/v	540 U	40 U	810 U	31,000 U	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Chlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	n/v	540 U	40 U	810 U	31,000 U	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Chloroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	1,900	1,100 U	80 U	1,600 U	-	0.99 U	1.0 U	1.1 U	2.2 U	2.2 U	210 U	2.4 U	2.3 U	2.2 U
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	n/v	810 U	60 U	1,200 U	46,000 U	0.74 U	0.77 U	0.83 U	1.6 U	1.7 U	160 U	1.8 U	1.8 U	1.7 U
Chloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,700 U	200 U	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000$_c$	n/v	n/v	n/v	n/v	540 U	40 U	810 U	-	0.49 U	0.51 U	1.2	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Cis-1,3-Dichloropropene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	540 U	40 U	810 U	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Cyclohexane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	11,000 U	800 U	840 J	-	9.9 U	10 U	11 U	-	-	-	-	-	-
Cymene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	10,000	540 U	40 U	810 U	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Dibromochloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	540 U	40 U	810 U	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Dichlorodifluoromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	5,400 U	400 U	8,100 U	-	4.9 U	5.1 U	5.5 U	11 U	11 U	1,000 U	12 U	12 U	11 U
Dichloroethylenes	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Ethyl Acetate	µg/kg	n/v	n/v	n/v	n/v	500,000$_a$	1,000,000$_a$	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location										SOIL WASTE PILE			TP-102						TP-220		
Sample Date									TP-101 28-Jul-15	TP-101A CLEAN 29-Jul-15	TP-101B (MIX) 29-Jul-15	TP-101C (PAINT) 29-Jul-15	29-Jul-15	28-Jul-15	TP-103 29-Jul-15	TP-214 27-Apr-16	TP-217 27-Apr-16	TP-218 27-Apr-16	27-Apr-16	27-Apr-16	TP-226 27-Apr-16
Sample ID									MHSC-TP-101-S	MHSC-TP-101A-S CLEAN	MHSC-TP-101B-S (MIX)	MHSC-TP-101C (PAINT)	MHSC-TP-102-S	MHSC-TP-DUP-S	MHSC-TP-103-S	TP-214	TP-217	TP-218	TP-220	DUP042716	TP-226
Sample Depth									12 ft	N/A (pile)	N/A (pile)	N/A (pile)	12 ft	12 ft	12 ft	16 - 17 ft	17 - 18 ft	14 - 15 ft	11 - 12 ft	11 - 12 ft	8 - 9 ft
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1517723	L1517723	L1517723	L1517894	L1517723	L1517723	L1517723	L1612918	L1612918	L1612918	L1612918	L1612918	L1612918
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1517723-01	L1517723-05	L1517723-06	L1517894-01	L1517723-03	L1517723-02	L1517723-04	L1612918-01	L1612918-02	L1612918-03	L1612918-04	L1612918-06	L1612918-05
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary
Volatile Organic Compounds																					
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	n/v	540 U	300	**25,000**^{AB}	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	510	1.2 U	1.2 U	1.1 U
Isopropylbenzene (Cumene)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	2,300	600	40 U	330 J	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Methyl Acetate	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	11,000 U	170 J	16,000 U	-	9.9 U	10 U	11 U	-	-	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	300	5,400 U	400 U	8,100 U	310,000 U	4.9 U	5.1 U	5.5 U	11 U	11 U	1,000 U	12 U	12 U	11 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	1,000	5,400 U	400 U	8,100 U	-	4.9 U	5.1 U	5.5 U	11 U	11 U	1,000 U	12 U	12 U	11 U
Methylcyclohexane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	550 J	160 U	1,200 J	-	2.0 U	2.0 U	2.2 U	-	-	-	-	-	-
Methylene Chloride	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	n/v	5,400 U	400 U	8,100 U	-	4.9 U	5.1 U	5.5 U	11 U	11 U	1,000 U	12 U	12 U	11 U
M-P-Xylene	µg/kg	260$_b$	1,600$_b$	500,000$_{c,b}$	n/v	n/v	n/v	n/v	1,100 U	**1,600**^{A}	**120,000**^{AB}	-	0.99 U	1.0 U	1.1 U	2.2 U	2.2 U	**2,400**^{AB}	2.4 U	2.3 U	2.2 U
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	n/v	160 J	53 J	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
N-Butylbenzene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	n/v	540 U	40 U	810 U	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
N-Propylbenzene	µg/kg	3,900	3,900	500,000$_c$	n/v	n/v	n/v	n/v	340 J	40 U	220 J	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260$_b$	1,600$_b$	500,000$_{c,b}$	n/v	n/v	n/v	n/v	1,100 U	**460**^{A}	**34,000**^{AB}	-	0.99 U	1.0 U	1.1 U	2.2 U	2.2 U	**380**^{A}	2.4 U	2.3 U	2.2 U
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000$_c$	n/v	n/v	n/v	n/v	540 U	40 U	810 U	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Styrene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	1,100 U	80 U	1,600 U	-	0.99 U	1.0 U	1.1 U	2.2 U	2.2 U	210 U	2.4 U	2.3 U	2.2 U
T-Butylbenzene	µg/kg	5,900	5,900	500,000$_c$	n/v	n/v	n/v	n/v	2,700 U	200 U	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000$_c$	n/v	n/v	n/v	n/v	1,100 U	80 U	1,600 U	-	0.99 U	1.0 U	1.1 U	2.2 U	2.2 U	210 U	2.4 U	2.3 U	2.2 U
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	n/v	500,000$_a$	1,000,000$_a$	n/v	540 U	40 U	810 U	31,000 U	0.49 U	0.51 U	0.56	1.1 U	0.96 J	100 U	0.84 J	1.2 U	1.1 U
Toluene	µg/kg	700	700	500,000$_c$	n/v	n/v	n/v	n/v	810 U	**2,400**^{AB}	**110,000**^{AB}	-	0.15 J	0.12 J	0.13 J	1.6 U	1.7 U	240	1.8 U	1.8 U	1.7 U
Total, 1,3-Dichloropropene (Cis And Trans)	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000$_c$	n/v	n/v	n/v	n/v	810 U	60 U	1,200 U	-	0.74 U	0.77 U	0.83 U	1.6 U	1.7 U	160 U	1.8 U	1.8 U	1.7 U
Trans-1,3-Dichloropropene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	540 U	40 U	810 U	-	0.49 U	0.51 U	0.55 U	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	n/v	540 U	55	810 U	**10,000 J**^{AB}	0.49 U	0.51 U	49	1.1 U	1.1 U	100 U	1.2 U	1.2 U	1.1 U
Trichlorofluoromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,700 U	200 U	4,000 U	-	2.5 U	2.6 U	2.8 U	5.4 U	5.6 U	520 U	5.9 U	5.8 U	5.6 U
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	n/v	1,100 U	80 U	1,600 U	62,000 U	0.99 U	1.0 U	1.1 U	2.2 U	2.2 U	210 U	2.4 U	2.3 U	2.2 U
Xylenes	µg/kg	260	1,600	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	2.2 U	2.2 U	**2,800**^{AB}	2.4 U	2.3 U	2.2 U
VOCs - Tentatively Identified Compounds																					
Total VOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	120,000 J	3,500 J	330,000 J	-	3.8 J	5.3 J	ND	17 J	5.0 J	83,000 J	3.0 J	ND	ND

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									TP-A	TP-B	TP-C	TP-D		TP-E	TP-F	TP-G
Sample Date									28-Jul-14	28-Jul-14	28-Jul-14	28-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14
Sample ID									TEST PIT A	TEST PIT B	TEST PIT C	TEST PIT D TAR	TEST PIT D	TEST PIT E	TEST PIT F	TEST PIT G
Sample Depth									10 ft	10 ft	10 ft	N/A (tar sample)	8 ft	12 ft	12 ft	10 ft
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1416945	L1416945	L1416945	L1416945	L1416945	L1416945	L1416945	L1416945
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1416945-01	L1416945-02	L1416945-03	L1416945-08	L1416945-04	L1416945-05	L1416945-06	L1416945-07
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
General Chemistry																
Cyanide	mg/kg	27$_i$	40$_i$	27$_i$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Total Carbon	percent	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Solids, Percent	percent	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Hydrogen Cation	su	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Reactive Cyanide	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Sulfide Reactive	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Ignitability																
Ignitability	none	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Metals																
Aluminum	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	-	-	-	-	-	-	-	-
Antimony	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	-	-	-	-	-	-	-	-
Arsenic	mg/kg	13$_n$	16$_g$	16$_g$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Barium	mg/kg	350$_n$	820	400	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Cadmium	mg/kg	2.5$_n$	7.5	9.3	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Calcium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	-	-	-	-	-	-	-	-
Chromium, Total	mg/kg	30$_{n,l}$	$_{NS,q}$	1,500$_l$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Cobalt	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	-	-	-	-	-	-	-	-
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Iron	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	-	-	-	-	-	-	-	-
Lead	mg/kg	63$_n$	450	1,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Magnesium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Manganese	mg/kg	1,600$_n$	2,000$_q$	10,000$_e$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.18$_n$	0.73	2.8$_k$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Potassium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Selenium	mg/kg	3.9$_n$	4$_q$	1,500	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Sodium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Thallium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	-	-	-	-	-	-	-	-
Vanadium	mg/kg	10,000$_e$	10,000$_e$	10,000$_e$	n/v	10,000$_a$	10,000$_a$	10,000$_a$	-	-	-	-	-	-	-	-
Zinc	mg/kg	109$_n$	2,480	10,000$_e$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Metals (TCLP)																
Arsenic	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Barium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Cadmium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Chromium, Total	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Lead	mg/L	n/v	n/v	n/v	0.015	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Mercury	mg/L	n/v	n/v	n/v	0.002	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Selenium	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Silver	mg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																
PCB-1016 (Aroclor 1016)	µg/kg	$_o$	$_o$	$_o$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
PCB-1221 (Aroclor 1221)	µg/kg	$_o$	$_o$	$_o$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
PCB-1232 (Aroclor 1232)	µg/kg	$_o$	$_o$	$_o$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
PCB-1242 (Aroclor 1242)	µg/kg	$_o$	$_o$	$_o$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
PCB-1248 (Aroclor 1248)	µg/kg	$_o$	$_o$	$_o$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
PCB-1254 (Aroclor 1254)	µg/kg	$_o$	$_o$	$_o$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
PCB-1260 (Aroclor 1260)	µg/kg	$_o$	$_o$	$_o$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
PCB-1262 (Aroclor 1262)	µg/kg	$_o$	$_o$	$_o$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
PCB-1268 (Aroclor 1268)	µg/kg	$_o$	$_o$	$_o$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Polychlorinated Biphenyl (PCBs)	µg/kg	100	3,200	1,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									TP-A	TP-B	TP-C	TP-D		TP-E	TP-F	TP-G
Sample Date									28-Jul-14	28-Jul-14	28-Jul-14	28-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14
Sample ID									TEST PIT A	TEST PIT B	TEST PIT C	TEST PIT D TAR	TEST PIT D	TEST PIT E	TEST PIT F	TEST PIT G
Sample Depth									10 ft	10 ft	10 ft	N/A (tar sample)	8 ft	12 ft	12 ft	10 ft
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1416945	L1416945	L1416945	L1416945	L1416945	L1416945	L1416945	L1416945
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1416945-01	L1416945-02	L1416945-03	L1416945-08	L1416945-04	L1416945-05	L1416945-06	L1416945-07
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Pesticides																
2,4 Db	µg/kg	n/v	n/v	680	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	1,900	-	-	-	-	-	-	-	-
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	500	-	-	-	-	-	-	-	-
Aldrin	µg/kg	5[n]	190	680	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Alpha Endosulfan	µg/kg	2,400[i]	102,000	200,000[i]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Beta Endosulfan	µg/kg	2,400[i]	102,000	200,000[i]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Chlordane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Dalapon	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40[n]	250	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Dicamba	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Dichloroprop	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Dieldrin	µg/kg	5[n]	100	1,400	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Dinoseb	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Endosulfan Sulfate	µg/kg	2,400[i]	1,000,000[d]	200,000[i]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Endrin Aldehyde	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Endrin Ketone	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Gamma Chlordane (trans-Chlordane)	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Heptachlor Epoxide	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	20	-	-	-	-	-	-	-	-
MCPA	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
MCPP	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Methoxychlor	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	900,000	-	-	-	-	-	-	-	-
P,P'-DDD	µg/kg	3.3[m]	14,000	92,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
P,P'-DDE	µg/kg	3.3[m]	17,000	62,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
P,P'-DDT	µg/kg	3.3[m]	136,000	47,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Toxaphene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Semi-Volatile Organics																
1,2,4,5-Tetrachlorobenzene	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2,2-Oxybis(2-Chloropropane)	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	100	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	400	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	200	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	1,000/170[b,s1]	-	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2-Chlorophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	36,400	-	-	-	-	-	-	-	-
2-Methylphenol (O-Cresol)	µg/kg	330[m]	330[f]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	400	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	300	-	-	-	-	-	-	-	-
3- And 4- Methylphenol (Total)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
3-Nitroaniline	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	500	-	-	-	-	-	-	-	-

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									TP-A	TP-B	TP-C	TP-D		TP-E	TP-F	TP-G
Sample Date									28-Jul-14	28-Jul-14	28-Jul-14	28-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14
Sample ID									TEST PIT A	TEST PIT B	TEST PIT C	TEST PIT D TAR	TEST PIT D	TEST PIT E	TEST PIT F	TEST PIT G
Sample Depth									10 ft	10 ft	10 ft	N/A (tar sample)	8 ft	12 ft	12 ft	10 ft
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1416945	L1416945	L1416945	L1416945	L1416945	L1416945	L1416945	L1416945
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1416945-01	L1416945-02	L1416945-03	L1416945-08	L1416945-04	L1416945-05	L1416945-06	L1416945-07
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Semi-Volatile Organics (cont'd)																
4,6-Dinitro-2-Methylphenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
4-Bromophenyl Phenyl Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
4-Chloro-3-Methylphenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	220	-	-	-	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	100	-	-	-	-	-	-	-	-
Acenaphthene	µg/kg	20,000	98,000	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Acenaphthylene	µg/kg	100,000[a]	107,000	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Acetophenone	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Anthracene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Atrazine	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Benzaldehyde	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Benzo(A)Anthracene	µg/kg	1,000[n]	1,000[g]	5,600	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Benzo(A)Pyrene	µg/kg	1,000[n]	22,000	1,000[g]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Benzo(B)Fluoranthene	µg/kg	1,000[n]	1,700	5,600	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Benzo(K)Fluoranthene	µg/kg	800[n]	1,700	56,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Benzyl Butyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	122,000	-	-	-	-	-	-	-	-
Biphenyl (Diphenyl)	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	500,000[a]	1,000,000[a]	n/v	-	-	-	-	-	-	-	-
Bis(2-Chloroethoxy) Methane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Bis(2-Chloroisopropyl) Ether	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Bis(2-Ethylhexyl) Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	435,000	-	-	-	-	-	-	-	-
Caprolactam	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Carbazole	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Chrysene	µg/kg	1,000[n]	1,000[g]	56,000	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Dibenz(A,H)Anthracene	µg/kg	330[m]	1,000,000[d]	560	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Dibenzofuran	µg/kg	7,000	210,000	350,000	n/v	500,000[a]	1,000,000[a]	6,200	-	-	-	-	-	-	-	-
Diethyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	7,100	-	-	-	-	-	-	-	-
Dimethyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	27,000	-	-	-	-	-	-	-	-
Di-N-Butyl Phthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	8,100	-	-	-	-	-	-	-	-
Di-N-Octylphthalate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	120,000	-	-	-	-	-	-	-	-
Diphenylamine	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Fluoranthene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Fluorene	µg/kg	30,000	386,000	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/kg	330[m]	3,200	6,000	n/v	500,000[a]	1,000,000[a]	1,400	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	-	-	-	-	-	-	-	-
Hexachloroethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Indeno(1,2,3-C,D)Pyrene	µg/kg	500[n]	8,200	5,600	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Isophorone	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	4,400	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Nitrobenzene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	69,000	140,000	170[b]	-	-	-	-	-	-	-	-
N-Nitrosodi-N-Propylamine	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	800[m]	800[f]	6,700	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Phenanthrene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Phenol	µg/kg	330[m]	330[f]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Pyrene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									TP-A	TP-B	TP-C	TP-D		TP-E	TP-F	TP-G
Sample Date									28-Jul-14	28-Jul-14	28-Jul-14	28-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14
Sample ID									TEST PIT A	TEST PIT B	TEST PIT C	TEST PIT D TAR	TEST PIT D	TEST PIT E	TEST PIT F	TEST PIT G
Sample Depth									10 ft	10 ft	10 ft	N/A (tar sample)	8 ft	12 ft	12 ft	10 ft
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1416945	L1416945	L1416945	L1416945	L1416945	L1416945	L1416945	L1416945
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1416945-01	L1416945-02	L1416945-03	L1416945-08	L1416945-04	L1416945-05	L1416945-06	L1416945-07
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Semi-Volatile Organics (TCLP)																
2,4,5-Trichlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
2-Methylphenol (O-Cresol)	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
3- And 4- Methylphenol (Total)	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Hexachloroethane	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Nitrobenzene	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Pyridine	µg/L	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
SVOC - Tentatively Identified Compounds																
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Volatile Organic Compounds																
1,1,1-Trichloroethane	µg/kg	680	680	500,000$_c$	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	280 U	1.1 U	61 U	56 U	1.2 U
1,1,2,2-Tetrachloroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	600	550 U	1.0 U	1.0 U	280 U	1.1 U	61 U	56 U	1.2 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	6,000	11,000 U	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	820 U	1.5 U	1.6 U	430 U	1.7 U	91 U	84 U	1.7 U
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	n/v	820 U	1.5 U	1.6 U	430 U	1.7 U	91 U	84 U	1.7 U
1,1-Dichloroethene	µg/kg	330	330	500,000$_c$	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	280 U	1.1 U	61 U	56 U	1.2 U
1,2,3-Trichlorobenzene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	2,700 U	5.1 U	5.3 U	1,400 U	5.7 U	300 U	280 U	5.8 U
1,2,4-Trichlorobenzene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	3,400	2,700 U	5.1 U	5.3 U	1,400 U	5.7 U	300 U	280 U	5.8 U
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	n/v	880 J	5.1 U	5.3 U	**27,000^{AB}**	0.26 J	300 U	280 U	5.8 U
1,2-Dibromo-3-Chloropropane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,700 U	5.1 U	5.3 U	1,400 U	5.7 U	300 U	280 U	5.8 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,200 U	4.1 U	4.2 U	1,100 U	4.5 U	240 U	220 U	4.6 U
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	n/v	2,700 U	5.1 U	5.3 U	1,400 U	5.7 U	300 U	280 U	5.8 U
1,2-Dichloroethane	µg/kg	20$_m$	20$_g$	30,000	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	280 U	1.1 U	**280^{AB}**	56 U	1.2 U
1,2-Dichloropropane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	1,900 U	3.6 U	3.7 U	1,000 U	4.0 U	210 U	200 U	4.1 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	n/v	2,700 U	5.1 U	5.3 U	**9,600^{AB}**	5.7 U	300 U	280 U	5.8 U
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	n/v	2,700 U	5.1 U	5.3 U	1,400 U	5.7 U	300 U	280 U	0.64 J
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	n/v	2,700 U	5.1 U	5.3 U	1,400 U	5.7 U	300 U	280 U	6.5
1,4-Dioxane (P-Dioxane)	µg/kg	100$_m$	100$_f$	130,000	n/v	n/v	n/v	n/v	55,000 U	100 U	100 U	28,000 U	110 U	6,100 U	5,600 U	120 U
2-Hexanone	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	5,500 U	10 U	10 U	2,800 U	11 U	610 U	560 U	12 U
Acetone	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	n/v	5,500 U	10 U	10 U	2,800 U	11 U	610 U	560 U	12 U
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	**1,300^{AB}**	1.1 U	61 U	56 U	1.2 U
Bromochloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,700 U	5.1 U	5.3 U	1,400 U	5.7 U	300 U	280 U	5.8 U
Bromodichloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	280 U	1.1 U	61 U	56 U	1.2 U
Bromoform	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,200 U	4.1 U	4.2 U	1,100 U	4.5 U	240 U	220 U	4.6 U
Bromomethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	1,100 U	2.0 U	2.1 U	570 U	2.3 U	120 U	110 U	2.3 U
Carbon Disulfide	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	2,700	5,500 U	10 U	10 U	2,800 U	11 U	610 U	560 U	12 U
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	280 U	1.1 U	61 U	56 U	1.2 U
Chlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	280 U	1.1 U	61 U	56 U	1.2
Chloroethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	1,900	1,100 U	2.0 U	2.1 U	570 U	2.3 U	120 U	110 U	2.3 U
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	n/v	820 U	1.5 U	1.6 U	430 U	1.7 U	91 U	84 U	1.7 U
Chloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	2,700 U	5.1 U	5.3 U	1,400 U	5.7 U	300 U	280 U	5.8 U
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000$_c$	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	**470^{AB}**	1.1 U	**690^{AB}**	50 J	1.2 U
Cis-1,3-Dichloropropene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	280 U	1.1 U	61 U	56 U	1.2 U
Cyclohexane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	11,000 U	-	-	-	-	-	-	-
Cymene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	10,000	550 U	1.0 U	1.0 U	1,300	1.1 U	61 U	34 J	0.78 J
Dibromochloromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	500,000$_a$	1,000,000$_a$	n/v	550 U	1.0 U	1.0 U	280 U	1.1 U	61 U	56 U	1.2 U
Dichlorodifluoromethane	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	n/v	5,500 U	10 U	10 U	2,800 U	11 U	610 U	560 U	12 U
Dichloroethylenes	µg/kg	n/v	n/v	500,000$_c$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Ethyl Acetate	µg/kg	n/v	n/v	n/v	n/v	500,000$_a$	1,000,000$_a$	n/v	-	-	-	-	-	-	-	-

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location									TP-A	TP-B	TP-C	TP-D		TP-E	TP-F	TP-G
Sample Date									28-Jul-14	28-Jul-14	28-Jul-14	28-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14
Sample ID									TEST PIT A	TEST PIT B	TEST PIT C	TEST PIT D TAR	TEST PIT D	TEST PIT E	TEST PIT F	TEST PIT G
Sample Depth									10 ft	10 ft	10 ft	N/A (tar sample)	8 ft	12 ft	12 ft	10 ft
Sampling Company									Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory									ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order									L1416945	L1416945	L1416945	L1416945	L1416945	L1416945	L1416945	L1416945
Laboratory Sample ID		NYSDEC-Part 375 (2006)			NYDEC Leachate	NYSDEC CP-51			L1416945-01	L1416945-02	L1416945-03	L1416945-08	L1416945-04	L1416945-05	L1416945-06	L1416945-07
Sample Type	Units	A	B	C	D	E	F	G	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds																
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	**12,000[AB]**	1.1 U	61 U	56 U	1.2 U
Isopropylbenzene (Cumene)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	2,300	550 U	1.0 U	1.0 U	**4,600[G]**	1.1 U	61 U	56 U	1.2 U
Methyl Acetate	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	11,000 U	-	-	-	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000[c]	n/v	500,000[a]	1,000,000[a]	300	**1,400 J[ABG]**	2.3 J	10 U	2,800 U	2.4 J	**170 J[AB]**	**150 J[AB]**	2.7 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	1,000	5,500 U	10 U	10 U	2,800 U	11 U	610 U	560 U	12 U
Methylcyclohexane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	2,200 U	-	-	-	-	-	-	-
Methylene Chloride	µg/kg	50	50	500,000[c]	n/v	n/v	n/v	n/v	5,500 U	10 U	2.1 J	2,800 U	11 U	610 U	560 U	12 U
M-P-Xylene	µg/kg	260[p]	1,600[p]	500,000[c,p]	n/v	n/v	n/v	n/v	1,100 U	2.0 U	2.1 U	**38,000[AB]**	2.3 U	120 U	110 U	0.27 J
Naphthalene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	n/v	2,700 U	5.1 U	5.3 U	3,100	5.7 U	300 U	280 U	5.8 U
N-Butylbenzene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	n/v	340 J	1.0 U	1.0 U	950	1.1 U	61 U	56 U	1.2 U
N-Propylbenzene	µg/kg	3,900	3,900	500,000[c]	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	**5,600[AB]**	1.1 U	61 U	56 U	1.2 U
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260[p]	1,600[p]	500,000[c,p]	n/v	n/v	n/v	n/v	1,100 U	2.0 U	2.1 U	**20,000[AB]**	2.3 U	120 U	110 U	2.3 U
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000[c]	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	1,700	1.1 U	61 U	56 U	1.2 U
Styrene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	500,000[a]	1,000,000[a]	n/v	1,100 U	2.0 U	2.1 U	570 U	2.3 U	120 U	110 U	2.3 U
T-Butylbenzene	µg/kg	5,900	5,900	500,000[c]	n/v	n/v	n/v	n/v	2,700 U	5.1 U	5.3 U	1,400 U	5.7 U	300 U	280 U	5.8 U
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000[c]	n/v	n/v	n/v	n/v	1,100 U	2.0 U	2.1 U	570 U	2.3 U	120 U	110 U	2.3 U
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	n/v	500,000[a]	1,000,000[a]	n/v	550 U	1.0 U	1.0 U	280 U	1.1 U	61 U	56 U	1.2 U
Toluene	µg/kg	700	700	500,000[c]	n/v	n/v	n/v	n/v	820 U	0.36 J	1.6 U	**10,000[AB]**	0.52 J	91 U	84 U	0.74 J
Total, 1,3-Dichloropropene (Cis And Trans)	µg/kg	n/v	n/v	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000[c]	n/v	n/v	n/v	n/v	820 U	1.5 U	1.6 U	430 U	1.7 U	91 U	84 U	1.7 U
Trans-1,3-Dichloropropene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	280 U	1.1 U	61 U	56 U	1.2 U
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	n/v	550 U	1.0 U	1.0 U	280 U	0.55 J	**1,500[AB]**	**740[AB]**	1.2 U
Trichlorofluoromethane	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	n/v	2,700 U	5.1 U	5.3 U	1,400 U	5.7 U	300 U	280 U	5.8 U
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	n/v	1,100 U	2.0 U	2.1 U	570 U	2.3 U	120 U	110 U	2.3 U
Xylenes	µg/kg	260	1,600	500,000[c]	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-
VOCs - Tentatively Identified Compounds																
Total VOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	n/v	616,000	-	-	-	-	-	1,320	603

See notes on last page.

Table 6
Summary of Analytical Results for Site Characterization Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Notes:

NYSDEC-Part 375	NYSDEC 6 NYCRR Part 375 Soil Clean-up Objectives (SCOs) (December 14, 2006). Data were subsequently evaluated against the revised SCOs effective December 31, 2025; additional exceedances for applicable restricted use SCOs are described in the Remedial Action Work Plan text.
A	NYSDEC 6 NYCRR Part 375 - Unrestricted Use Soil Cleanup Objectives
B	NYSDEC 6 NYCRR Part 375 - Restricted Use SCO - Protection of Groundwater
C	NYSDEC 6 NYCRR Part 375 - Restricted Use SCO - Protection of Human Health - Commercial
NYSDEC	New York State Department of Environmental Conservation, Division of Hazardous Substances Regulation, November 30, 1992 (updated August 4, 1997)
D	NYDEC - Contained-in Action Levels (For Leachate)
NYSDEC CP-51	New York State Department of Environmental Conservation, DEC Policy CP-51, October 21, 2010
E	Table 1 Supplemental Soil Cleanup Objectives - Commercial
F	Table 1 Supplemental Soil Cleanup Objectives - Industrial
G	Table 1 Supplemental Soil Cleanup Objectives - Protection of Groundwater
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
0.03 U	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.

NYSDEC Part 375 and CP-51 Criteria footnotes:

A a EFG	The SCOs for unrestricted use were capped at a maximum value of 100 mg/kg. See 6 NYCRR Part 375 TSD Section 9.3 SCOs for organic contaminants (volatile organic compounds, semivolatile organic compounds, and pesticides) are capped at 100 ppm for residential use, 500 ppm for commercial use, 1000 ppm for industrial use. SCOs for metals are capped at 10,000 ppm.
b	Based on rural background study
b,s1	Based on rural background study. The value of 1.0 refers to SVOC analses while the 0.17b refers to VOC analyses.
c	The SCOs for commercial use were capped at a maximum value of 500 mg/kg. See TSD Section 9.3.
c,p	The SCOs for commercial use were capped at a maximum value of 500 mg/kg. See TSD Section 9.3. The criterion is applicable to total xylenes, and the individual isomers should be added for comparison.
d	The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 mg/kg (Organics) and 10000 mg/kg (Inorganics). See 6 NYCRR Part 375 TSD Section 9.3.
e	The SCOS for metals were capped at a maximum value of 10,000 mg/kg. See 6 NYCRR Part 375 TSD Section 9.3.
f	For constituents where the calculated SCO was lower than the CRQL, the CRQL is used as the SCO value.
g	For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.
i	The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
j	This SCO is the sum of endosulfan I, endosulfan II, and endosulfan sulfate.
k	This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See 6 NYCRR Part 375 TSD Table 5.6-1.
m	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.
n	For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site.
n1	Total concentration of iron and manganese should not exceed 500 ug/L.
n,i	For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site. The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
NS,q	No SCO has been established for this compound. No SCO has been established for total chromium; however, see standards for trivalent and hexavalent chromium.
o	Standard is applicable to total PCBs, and the individual Aroclors should be added for comparison.
p	The criterion is applicable to total xylenes, and the individual isomers should be added for comparison.

Laboratory Qualifiers:

I	The lower value for the two columns has been reported due to obvious interference.
J	Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
P	The RPD between the results for the two columns exceeds the method-specified criteria.
NI	Not Ignitable
U	Not Detected

Table 7
Summary of Analytical Results for Onsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location						MW-15						MW-15-R			MW-16S	
Sample Date						30-Jul-13	16-Sep-13	16-Sep-13	24-Apr-14	9-Sep-14	8-Dec-15	7-Jan-20	5-Dec-22	16-Sep-13	24-Apr-14	10-Sep-14
Sample ID						851043-MW-15 (24-34)	851043-MW-15 (22-24)	851043-MW-15 (28-30)	MHS-MW-15	MHS-MW-15-R2	MHSC-MW15-W	MH-MW15-W	MH-MW-15R-W	851043-MW-16S (30 - 32)	MHS-MW-16S	MHS-MW-16S-R2
Sampling Company						EAENG	EAENG	EAENG	Stantec	Stantec	Stantec	Stantec	Stantec	EAENG	Stantec	Stantec
Laboratory						SPEC	MITKEM	SPEC	ALPHA	ALPHA	ALPHA	TALBUFF	ERF	MITKEM	ALPHA	ALPHA
Laboratory Work Order						M1311	SM1762	M1763	L1408764	L1420800	L1532151	480-164901-1	480-204418-1	SM1762	L1408764	L1420800
Laboratory Sample ID		TOGS Standards A	TOGS Guidance B	USEPA HAL C	NYSDEC PFAS Criteria D	M1311-06	M1762-20A	M1763-01A	L1408764-01	L1420800-05	L1532151-12	480-164901-1	480-204418-3	M1762-19A	L1408764-02	L1420800-07
Sample Type	Units					Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds																
1,1,1,2-Tetrachloroethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	4.0 U	1.0 U	1.4	0.98 J	0.83 J
1,1,2,2-Tetrachloroethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	0.50 U	1.2 U	1.2 U	-	-	1.0 U	0.50 U	0.50 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	2.5 U	***6.2 U***	***6.2 U***	-	-	-	2.5 U	2.5 U
1,1,2-Trichloroethane	µg/L	1	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	***1.5 U***	***3.8 U***	***3.8 U***	-	-	1.0 U	***1.5 U***	***1.5 U***
1,1-Dichloroethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	4.0 U	1.0 U	1.6	1.2 J	0.95 J
1,1-Dichloroethene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	0.50 U	1.2 U	1.2 U	4.0 U	1.0 U	1.0 U	0.50 U	0.50 U
1,1-Dichloropropene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	-	-	1.0 U	2.5 U	2.5 U
1,2,3-Trichloropropane	µg/L	0.04	n/v	n/v	n/v	***1.0 U***	-	***1.0 U***	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	-	-	1.0 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	***6.2 U***	4.0 U	1.0 U	-	-	-
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	n/v	n/v	***1.0 U***	***1.0 UJ***	***1.0 UJ***	***2.5 U***	***6.2 U***	***6.2 U***	-	-	***1.0 UJ***	***2.5 U***	***2.5 U***
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	n/v	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***2.0 U***	***5.0 U***	***5.0 U***	-	-	***1.0 U***	***2.0 U***	***2.0 U***
1,2-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	***4.0 U***	1.0 U	1.0 U	2.5 U	2.5 U
1,2-Dichloroethane	µg/L	0.6	n/v	n/v	n/v	***1.0 U***	***1.0 U***	***1.0 U***	0.50 U	***1.2 U***	***1.2 U***	***4.0 U***	***1.0 U***	***1.0 U***	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	1	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	1.0 U	***2.5 U***	***2.5 U***	-	-	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	***6.2 U***	4.0 U	1.0 U	-	-	-
1,3-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	***4.0 U***	1.0 U	1.0 U	2.5 U	2.5 U
1,3-Dichloropropane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	***4.0 U***	1.0 U	1.0 U	2.5 U	2.5 U
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	n/v	n/v	-	-	-	250 U	620 UR	-	160 U	40 UR	-	250 U	250 UR
2,2-Dichloropropane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
2-Hexanone	µg/L	n/v	50	n/v	n/v	5.0 U	5.0 U	5.0 U	5.0 U	12 U	12 U	-	-	5.0 U	5.0 U	5.0 U
4-Chlorotoluene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Acetone	µg/L	n/v	50	n/v	n/v	5.0 U	**330 J[B]**	**320 J[B]**	5.0 U	12 U	12 U	40 U	3.5 J	**320 J[B]**	5.0 U	5.8
Benzene	µg/L	1	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	0.50 U	***1.2 U***	***1.2 U***	***4.0 U***	1.0 U	1.0 U	0.50 U	0.50 U
Bromobenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Bromochloromethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	-	-	1.0 U	2.5 U	2.5 U
Bromodichloromethane	µg/L	n/v	50	n/v	n/v	1.0 U	1.0 U	1.0 U	0.50 U	1.2 U	1.2 U	-	-	1.0 U	0.50 U	0.50 U
Bromoform	µg/L	n/v	50	n/v	n/v	1.0 U	1.0 UJ	1.0 UJ	2.0 U	5.0 U	5.0 U	-	-	1.0 UJ	2.0 U	2.0 U
Bromomethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	-	-	1.0 U	2.5 U	2.5 U
Carbon Disulfide	µg/L	n/v	60	n/v	n/v	1.0 U	1.0 U	1.0 U	5.0 U	12 UJ	12 U	-	-	1.0 U	5.0 U	5.0 UJ
Carbon Tetrachloride	µg/L	5	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	0.50 U	1.2 U	1.2 U	4.0 U	1.0 U	1.0 U	0.50 U	0.50 U
Chlorobenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	4.0 U	1.0 U	1.0 U	2.5 U	2.5 U
Chloroethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	-	-	1.0 U	2.5 U	2.5 U
Chloroform	µg/L	7	n/v	n/v	n/v	1.0 U	0.58 J	1.0 U	2.5 U	6.2 U	6.2 U	4.0 U	1.0 U	0.61 J	2.5 U	2.5 U
Chloromethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	-	-	1.0 U	2.5 U	2.5 U
Cis-1,2-Dichloroethylene	µg/L	5[c]	n/v	n/v	n/v	3.9	**23[A]**	**20[A]**	**15[A]**	**12[A]**	**20[A]**	**32[A]**	**27[A]**	1.0 U	2.5 U	1.2 J
Cis-1,3-Dichloropropene	µg/L	0.4[p]	n/v	n/v	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***0.50 U***	***1.2 U***	***1.2 U***	-	-	***1.0 U***	***0.50 U***	***0.50 U***
Cyclohexane	µg/L	n/v	n/v	n/v	n/v	-	-	-	10 U	25 U	25 U	-	-	-	10 U	10 U
Cymene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	***6.2 U***	4.0 U	1.0 U	-	-	-
Dibromochloromethane	µg/L	n/v	50	n/v	n/v	1.0 U	1.0 UJ	1.0 UJ	0.50 U	1.2 U	1.2 U	-	-	1.0 UJ	0.50 U	0.50 U
Dibromomethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	5.0 U	***12 UJ***	***12 U***	-	-	1.0 U	5.0 U	5.0 UJ
Ethylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	4.0 U	1.0 U	1.0 U	2.5 U	2.5 U
Hexachlorobutadiene	µg/L	0.5	n/v	n/v	n/v	***1.0 U***	-	***1.0 U***	-	-	-	-	-	-	-	-
Iodomethane (Methyl Iodide)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	4.0 U	1.0 U	1.0 U	2.5 U	2.5 U
Methyl Acetate	µg/L	n/v	n/v	n/v	n/v	-	-	-	2.0 U	5.0 U	5.0 U	-	-	-	2.0 U	2.0 U
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	n/v	n/v	5.0 U	5.0 R	5.0 R	5.0 U	12 U	12 U	40 U	10 U	5.0 R	5.0 U	5.0 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	n/v	n/v	5.0 U	5.0 U	5.0 U	5.0 U	12 UJ	12 U	-	-	5.0 U	5.0 U	5.0 UJ
Methylcyclohexane	µg/L	n/v	n/v	n/v	n/v	-	-	-	10 U	25 U	25 U	-	-	-	10 U	10 U
Methylene Chloride	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	4.0 U	1.0 U	1.0 U	2.5 U	2.5 U
M-P-Xylene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	***8.0 U***	2.0 U	1.0 U	2.5 U	2.5 U
Naphthalene	µg/L	10	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	6.2 U	4.0 U	1.0 U	-	-	-
N-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	***6.2 U***	4.0 U	1.0 U	-	-	-
N-Propylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	***6.2 U***	4.0 U	1.0 U	-	-	-
O-Xylene (1,2-Dimethylbenzene)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	4.0 U	1.0 U	1.0 U	2.5 U	2.5 U
Sec-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	***6.2 U***	4.0 U	1.0 U	-	-	-
Styrene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	-	-	1.0 U	2.5 U	2.5 U
T-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	***6.2 U***	4.0 U	1.0 U	-	-	-
Tert-Butyl Methyl Ether	µg/L	n/v	10	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	6.2 U	6.2 U	4.0 U	1.0 U	1.0 U	2.5 U	2.5 U
Tetrachloroethylene (PCE)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	0.66	1.2 U	1.2 U	4.0 U	0.46 J	1.4	1.8	1.2
Toluene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	4.0 U	1.0 U	1.0 U	2.5 U	2.5 U
Trans-1,2-Dichloroethene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	4.0 U	1.0 U	1.0 U	2.5 U	2.5 U
Trans-1,3-Dichloropropene	µg/L	0.4[p]	n/v	n/v	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***0.50 U***	***1.2 U***	***1.2 U***	-	-	***1.0 U***	***0.50 U***	***0.50 U***
Trichloroethylene (TCE)	µg/L	5[c]	n/v	n/v	n/v	**12[A]**	**180 J[A]**	**170[A]**	**150[A]**	**140[A]**	**190[A]**	**210[A]**	**270[A]**	**5.9[A]**	**6.2[A]**	**5.5[A]**
Trichlorofluoromethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	2.5 U	***6.2 U***	***6.2 U***	-	-	1.0 U	2.5 U	2.5 U
Vinyl Acetate	µg/L	n/v	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Vinyl Chloride	µg/L	2	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	1.0 U	***2.5 U***	***2.5 U***	***4.0 U***	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	***8.0 U***	2.0 U	-	-	-
VOCs - Tentatively Identified Compounds																
Total VOC TICs	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	-	ND	-	ND	-	-	-

See notes on last page.

Table 7
Summary of Analytical Results for Onsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location						MW-16S			MW-16D								
Sample Date						10-Dec-15	8-Jan-20	2-Dec-22	30-Jul-13	30-Jul-13	16-Sep-13	16-Sep-13	24-Apr-14	9-Sep-14	9-Sep-14	8-Dec-15
Sample ID						MHSC-MW16S-W	MH-MW16S-W	MH-MW-16S-W	851043-MW-16 (48)	851043-MW-16 (55-56)	851043-MW-16D (42 - 44)	851043-MW-16D (48 - 50)	MHS-MW-16D	MHS-MW-16D-R2	MHS-MW-16D-S/D	MHSC-MW16D
Sampling Company						Stantec	Stantec	Stantec	EAENG	EAENG	EAENG	EAENG	Stantec	Stantec	Stantec	Stantec
Laboratory						ALPHA	TALBUFF	ERF	SPEC	SPEC	MITKEM	MITKEM	ALPHA	ALPHA	ALPHA	ALPHA
Laboratory Work Order		TOGS		USEPA	NYSDEC	L1532611	480-164901-1	480-204398-1	M1311	M1311	SM1762	SM1762	L1408764	L1420800	L1420800	L1532151
Laboratory Sample ID		Standards	Guidance	HAL	PFAS	L1532611-01	480-165082-4	480-204398-18	M1311-04	M1311-05	M1762-17A	M1762-18A	L1408764-03	L1420800-01	L1420800-02	L1532151-14
Sample Type	Units	A	B	C	D	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary
Volatile Organic Compounds																
1,1,1,2-Tetrachloroethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	5[c]	n/v	n/v	n/v	0.89 J	0.94 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	µg/L	5[c]	n/v	n/v	n/v	0.50 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	-	-	-	-	-	2.5 U	2.5 U	2.5 U	2.5 U
1,1,2-Trichloroethane	µg/L	1	n/v	n/v	n/v	***1.5 U***	-	-	1.0 U	1.0 U	1.0 U	1.0 U	***1.5 U***	***1.5 U***	***1.5 U***	***1.5 U***
1,1-Dichloroethane	µg/L	5[c]	n/v	n/v	n/v	0.92 J	1.1	0.39 J	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	µg/L	5[c]	n/v	n/v	n/v	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloropropene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichloropropane	µg/L	0.04	n/v	n/v	n/v	-	-	-	***1.0 U***	***1.0 U***	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	-	-	2.5 U
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	n/v	n/v	***2.5 U***	-	-	***1.0 U***	***1.0 U***	***1.0 UJ***	***1.0 UJ***	***2.5 U***	***2.5 U***	***2.5 U***	***2.5 U***
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	n/v	n/v	***2.0 U***	-	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***2.0 U***	***2.0 U***	***2.0 U***	***2.0 U***
1,2-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	µg/L	0.6	n/v	n/v	n/v	0.50 U	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	1	n/v	n/v	n/v	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	-	-	2.5 U
1,3-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	n/v	n/v	-	40 U	40 UR	-	-	-	-	250 U	250 UR	250 UR	-
2,2-Dichloropropane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
2-Chlorotoluene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
2-Hexanone	µg/L	n/v	50	n/v	n/v	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Chlorotoluene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
Acetone	µg/L	n/v	50	n/v	n/v	2.0 J	10 U	10 U	5.0 U	5.0 U	360[B]	350 J[B]	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	µg/L	1	n/v	n/v	n/v	0.50 U	1.0 U	1.0 U	1.1[A]	1.0 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromobenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
Bromochloromethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Bromodichloromethane	µg/L	n/v	50	n/v	n/v	0.50 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	µg/L	n/v	50	n/v	n/v	2.0 U	-	-	1.0 U	1.0 U	1.0 UJ	1.0 UJ	2.0 U	2.0 U	2.0 U	2.0 U
Bromomethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Carbon Disulfide	µg/L	n/v	60	n/v	n/v	5.0 U	-	-	1.0 U	1.0 U	0.77 J	1.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 U
Carbon Tetrachloride	µg/L	5	n/v	n/v	n/v	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloroethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloroform	µg/L	7	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloromethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Cis-1,2-Dichloroethylene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	11[A]	4.6	4.5	6.9[A]	7.6[A]	7.8 J[A]	26 J[A]	19[A]
Cis-1,3-Dichloropropene	µg/L	0.4[p]	n/v	n/v	n/v	***0.50 U***	-	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***0.50 U***	***0.50 U***	***0.50 U***	***0.50 U***
Cyclohexane	µg/L	n/v	n/v	n/v	n/v	10 U	-	-	-	-	-	-	10 U	10 U	10 U	10 U
Cymene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	-	-	2.5 U
Dibromochloromethane	µg/L	n/v	50	n/v	n/v	0.50 U	-	-	1.0 U	1.0 U	1.0 UJ	1.0 UJ	0.50 U	0.50 U	0.50 U	0.50 U
Dibromomethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	5[c]	n/v	n/v	n/v	5.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 U
Ethylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	µg/L	0.5	n/v	n/v	n/v	-	-	-	***1.0 U***	***1.0 U***	-	-	-	-	-	-
Iodomethane (Methyl Iodide)	µg/L	5[c]	n/v	n/v	n/v	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
Isopropylbenzene (Cumene)	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Methyl Acetate	µg/L	n/v	n/v	n/v	n/v	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	n/v	n/v	5.0 U	10 U	10 U	5.0 U	5.0 U	5.0 R	5.0 R	5.0 U	5.0 U	5.0 U	5.0 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	n/v	n/v	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 U
Methylcyclohexane	µg/L	n/v	n/v	n/v	n/v	10 U	-	-	-	-	-	-	10 U	10 U	10 U	10 U
Methylene Chloride	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
M-P-Xylene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Naphthalene	µg/L	10	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	-	-	2.5 U
N-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	-	-	2.5 U
N-Propylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	-	-	2.5 U
O-Xylene (1,2-Dimethylbenzene)	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Sec-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	-	-	2.5 U
Styrene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
T-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	-	-	2.5 U
Tert-Butyl Methyl Ether	µg/L	n/v	10	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Tetrachloroethylene (PCE)	µg/L	5[c]	n/v	n/v	n/v	1.3	1.5	1.5	1.0 U	1.0 U	1.0 U	1.0 U	0.25 J	0.50 UJ	0.50 UJ	0.50 U
Toluene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.8	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Trans-1,2-Dichloroethene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Trans-1,3-Dichloropropene	µg/L	0.4[p]	n/v	n/v	n/v	***0.50 U***	-	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***0.50 U***	***0.50 U***	***0.50 U***	***0.50 U***
Trichloroethylene (TCE)	µg/L	5[c]	n/v	n/v	n/v	6.0[A]	3.8	3.6	83[A]	8.0[A]	13[A]	65[A]	50[A]	46[A]	76[A]	64[A]
Trichlorofluoromethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Vinyl Acetate	µg/L	n/v	n/v	n/v	n/v	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
Vinyl Chloride	µg/L	2	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	µg/L	5[c]	n/v	n/v	n/v	-	2.0 U	2.0 U	1.0 U	1.0 U	-	-	-	-	-	-
VOCs - Tentatively Identified Compounds																
Total VOC TICs	µg/L	n/v	n/v	n/v	n/v	ND	-	ND	-	-	-	-	-	-	-	ND

See notes on last page.

Table 7
Summary of Analytical Results for Onsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location						MW-16D					MW-17								
Sample Date						6-Jan-20	6-Jan-20	6-Jan-20	6-Jan-20	1-Dec-22	16-Sep-13	16-Sep-13	24-Apr-14	9-Sep-14	8-Dec-15	8-Jan-20	1-Dec-22	1-Dec-22	
Sample ID						MH-MW16D-W	MH-MW16D-W	MH-MWDUP1-W	MH-MWDUP1-W	MH-MW-16D-W	851043-MW-17 (33 - 35)	851043-MW-17 (37 - 39)	MHS-MW-17	MHS-MW-17-R2	MHSC-MW17-W	MH-MW17-W	MH-MW-17-W	MH-FD-W	
Sampling Company						Stantec	Stantec	Stantec	Stantec	Stantec	EAENG	EAENG	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	
Laboratory						TALBUFF	TALBURL	TALBUFF	TALBURL	ERF	MITKEM	MITKEM	ALPHA	ALPHA	ALPHA	TALBUFF	ERF	ERF	
Laboratory Work Order						480-164901-1	480-164901-1	480-164901-1	480-164901-1	480-204398-1	SM1762	SM1762	L1408764	L1420800	L1532151	480-164901-1	480-204398-1	480-204398-1	
Laboratory Sample ID		TOGS		USEPA	NYSDEC	480-164901-2	480-164901-2	480-164901-12	480-164901-12	480-204398-15	M1762-15A	M1762-16A	L1408764-04	L1420800-03	L1532151-06	480-165082-5	480-204398-12	480-204398-16	
Sample Type	Units	Standards A	Guidance B	HAL C	PFAS Criteria D	Primary	Primary	Field Duplicate	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	
Volatile Organic Compounds																			
1,1,1,2-Tetrachloroethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,1,1-Trichloroethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
1,1,2,2-Tetrachloroethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	-	-	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	2.5 U	2.5 U	2.5 U	-	-	-	
1,1,2-Trichloroethane	µg/L	1	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	***1.5 U***	***1.5 U***	***1.5 U***	-	-	-	
1,1-Dichloroethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	0.70 J	0.76 J	
1,1-Dichloroethene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	1.0 U	
1,1-Dichloropropene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,2,3-Trichlorobenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	-	-	
1,2,3-Trichloropropane	µg/L	0.04	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,2,4-Trichlorobenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	-	-	
1,2,4-Trimethylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	-	-	-	-	2.5 U	1.0 U	1.0 U	1.0 U	
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	n/v	n/v	-	-	-	-	-	***1.0 UJ***	***1.0 UJ***	***2.5 U***	***2.5 U***	***2.5 U***	-	-	-	
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	n/v	n/v	-	-	-	-	-	***1.0 U***	***1.0 U***	***2.0 U***	***2.0 U***	***2.0 U***	-	-	-	
1,2-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
1,2-Dichloroethane	µg/L	0.6	n/v	n/v	n/v	***1.0 U***	-	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***	**0.98[A]**	**0.92[A]**	0.50 U	0.24 J	**1.1[A]**	**1.1[A]**	
1,2-Dichloropropane	µg/L	1	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	-	-	-	-	2.5 U	1.0 U	1.0 U	1.0 U	
1,3-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
1,3-Dichloropropane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,4-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	n/v	n/v	40 U	-	40 U	-	40 UR	-	-	250 U	250 UR	-	40 U	40 UR	40 UR	
2,2-Dichloropropane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
2-Chlorotoluene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
2-Hexanone	µg/L	n/v	50	n/v	n/v	-	-	-	-	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-	-	
4-Chlorotoluene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Acetone	µg/L	n/v	50	n/v	n/v	3.1 J	-	10 U	-	10 U	**400[B]**	**370[B]**	5.0 U	5.0 U	5.0 U	10 U	10 U	10 U	
Benzene	µg/L	1	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	1.0 U	
Bromobenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bromochloromethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	-	-	
Bromodichloromethane	µg/L	n/v	50	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	-	-	-	
Bromoform	µg/L	n/v	50	n/v	n/v	-	-	-	-	-	1.0 UJ	1.0 UJ	2.0 U	2.0 U	2.0 U	-	-	-	
Bromomethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	-	-	
Carbon Disulfide	µg/L	n/v	60	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	5.0 U	5.0 UJ	5.0 U	-	-	-	
Carbon Tetrachloride	µg/L	5	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	1.0 U	
Chlorobenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
Chloroethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	-	-	
Chloroform	µg/L	7	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
Chloromethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	-	-	
Cis-1,2-Dichloroethylene	µg/L	5[c]	n/v	n/v	n/v	4.6	-	4.6	-	4.9	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
Cis-1,3-Dichloropropene	µg/L	0.4[p]	n/v	n/v	n/v	-	-	-	-	-	***1.0 U***	***1.0 U***	***0.50 U***	***0.50 U***	***0.50 U***	-	-	-	
Cyclohexane	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	10 U	10 U	10 U	-	-	-	
Cymene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	-	-	-	-	2.5 U	1.0 U	1.0 U	1.0 U	
Dibromochloromethane	µg/L	n/v	50	n/v	n/v	-	-	-	-	-	1.0 UJ	1.0 UJ	0.50 U	0.50 U	0.50 U	-	-	-	
Dibromomethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dichlorodifluoromethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	5.0 U	5.0 UJ	5.0 U	-	-	-	
Ethylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
Hexachlorobutadiene	µg/L	0.5	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Iodomethane (Methyl Iodide)	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Isopropylbenzene (Cumene)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
Methyl Acetate	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	n/v	n/v	10 U	-	10 U	-	10 U	5.0 R	5.0 R	5.0 U	5.0 U	5.0 U	10 U	10 U	10 U	
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	-	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	-	-	-	
Methylcyclohexane	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	10 U	10 U	10 U	-	-	-	
Methylene Chloride	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	**6.0[A]**	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
M-P-Xylene	µg/L	5[c]	n/v	n/v	n/v	2.0 U	-	2.0 U	-	2.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.0 U	2.0 U	2.0 U	
Naphthalene	µg/L	10	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	-	-	-	-	2.5 U	1.0 U	1.0 U	1.0 U	
N-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	-	-	-	-	2.5 U	1.0 U	1.0 U	1.0 U	
N-Propylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	-	-	-	-	2.5 U	1.0 U	1.0 U	1.0 U	
O-Xylene (1,2-Dimethylbenzene)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
Sec-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	-	-	-	-	2.5 U	1.0 U	1.0 U	1.0 U	
Styrene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	-	-	
T-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	-	-	-	-	2.5 U	1.0 U	1.0 U	1.0 U	
Tert-Butyl Methyl Ether	µg/L	n/v	10	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
Tetrachloroethylene (PCE)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	1.0 U	
Toluene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
Trans-1,2-Dichloroethene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	
Trans-1,3-Dichloropropene	µg/L	0.4[p]	n/v	n/v	n/v	-	-	-	-	-	***1.0 U***	***1.0 U***	***0.50 U***	***0.50 U***	***0.50 U***	-	-	-	
Trichloroethylene (TCE)	µg/L	5[c]	n/v	n/v	n/v	**44[A]**	-	**44[A]**	-	**42[A]**	1.7	2.1	2.1	1.2	**6.9[A]**	4.6	1.0 U	1.0 U	
Trichlorofluoromethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	-	-	
Vinyl Acetate	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Vinyl Chloride	µg/L	2	n/v	n/v	n/v	1.0 U	-	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
Xylenes	µg/L	5[c]	n/v	n/v	n/v	2.0 U	-	2.0 U	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	
VOCs - Tentatively Identified Compounds																			
Total VOC TICs	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	ND	-	-	-	-	ND	-	-	ND	

See notes on last page.

Table 7
Summary of Analytical Results for Onsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location						MW-19						MW-20						MW-101	MW-101-R
Sample Date						16-Sep-13	16-Sep-13	24-Apr-14	10-Sep-14	8-Dec-15	8-Dec-15	16-Sep-13	16-Sep-13	24-Apr-14	10-Sep-14	8-Dec-15	18-Mar-20	8-Dec-15	8-Jan-20
Sample ID						851043-MW-19 (24 - 26)	851043-MW-19 (28 - 30)	MHS-MW-19	MHS-MW-19-R2	MHSC-MW19-W	MHSC-DUP-W	851043-MW-20 (19-21)	851043-MW-20 (24-26)	MHS-MW-20	MHS-MW-20-R2	MHSC-MW20	MH-MW20-W	MHSC-MW101-W	MH-MW101-W
Sampling Company						EAENG	EAENG	Stantec	Stantec	Stantec	Stantec	EAENG	EAENG	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory						MITKEM	MITKEM	ALPHA	ALPHA	ALPHA	ALPHA	SPEC	SPEC	ALPHA	ALPHA	ALPHA	TALBUFF	ALPHA	TALBUFF
Laboratory Work Order						SM1762	SM1762	L1408764	L1420800	L1532151	L1532151	M1763	M1763	L1408764	L1420800	L1532151	480-167625-1	L1532151	480-164901-1
Laboratory Sample ID		TOGS Standards	TOGS Guidance	USEPA HAL	NYSDEC PFAS Criteria	M1762-12A	M1762-13A	L1408764-05	L1420800-09	L1532151-05	L1532151-08	M1763-15A	M1763-15A	L1408764-06	L1420800-08	L1532151-13	480-167625-2	L1532151-03	480-165082-1
Sample Type	Units	A	B	C	D	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds																			
1,1,1,2-Tetrachloroethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	5[c]	n/v	n/v	n/v	2.5	2.4	4.0	1.9 J	0.73 J	0.83 J	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	1.0 UJ	1.0 UJ	0.50 U	0.50 U	0.50 U	-	0.50 U	-
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	5[c]	n/v	n/v	n/v	-	-	2.5 U	2.5 U	2.5 U	2.5 U	-	-	2.5 U	2.5 U	2.5 U	-	2.5 U	-
1,1,2-Trichloroethane	µg/L	1	n/v	n/v	n/v	1.0 U	1.0 U	***1.5 U***	***1.5 U***	***1.5 U***	***1.5 U***	1.0 U	1.0 U	***1.5 U***	***1.5 U***	***1.5 U***	-	***1.5 U***	-
1,1-Dichloroethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	3.1	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
1,1-Dichloroethene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	1.0 U
1,1-Dichloropropene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 UJ	1.0 UJ	2.5 U	2.5 U	2.5 U	-	2.5 U	-
1,2,3-Trichloropropane	µg/L	0.04	n/v	n/v	n/v	-	-	-	-	-	-	***1.0 U***	***1.0 U***	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 UJ	1.0 UJ	2.5 U	2.5 U	2.5 U	-	2.5 U	-
1,2,4-Trimethylbenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	2.5 U	2.5 U	1.0 U	1.0 U	-	-	2.5 U	1.0 U	2.5 U	1.0 U
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	n/v	n/v	***1.0 UJ***	***1.0 UJ***	***2.5 U***	***2.5 U***	***2.5 U***	***2.5 U***	***1.0 UJ***	***1.0 UJ***	***2.5 U***	***2.5 U***	***2.5 U***	-	***2.5 U***	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	n/v	n/v	***1.0 U***	***1.0 U***	***2.0 U***	***2.0 U***	***2.0 U***	***2.0 U***	***1.0 U***	***1.0 U***	***2.0 U***	***2.0 U***	***2.0 U***	-	***2.0 U***	-
1,2-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
1,2-Dichloroethane	µg/L	0.6	n/v	n/v	n/v	***1.0 U***	***1.0 U***	0.50 U	0.50 U	0.50 U	0.50 U	***1.0 UJ***	***1.0 UJ***	0.50 U	0.50 U	0.50 U	***1.0 U***	0.50 U	***1.0 U***
1,2-Dichloropropane	µg/L	1	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	2.5 U	2.5 U	1.0 U	1.0 U	-	-	2.5 U	1.0 U	2.5 U	1.0 U
1,3-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
1,3-Dichloropropane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	n/v	n/v	-	-	250 U	250 UR	-	-	-	-	250 U	250 UR	-	40 U	-	40 U
2,2-Dichloropropane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
2-Chlorotoluene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
2-Hexanone	µg/L	n/v	50	n/v	n/v	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	-
4-Chlorotoluene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
Acetone	µg/L	n/v	50	n/v	n/v	**400 J[B]**	**400 J[B]**	5.0 U	5.0 U	5.0 U	3.1 J	5.0 R	5.0 R	5.0 U	5.0 U	5.0 U	10 U	1.8 J	10 U
Benzene	µg/L	1	n/v	n/v	n/v	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	1.0 U
Bromobenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
Bromochloromethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	2.5 U	-
Bromodichloromethane	µg/L	n/v	50	n/v	n/v	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	12 J	13 J	0.50 U	0.50 U	0.50 U	-	0.50 U	-
Bromoform	µg/L	n/v	50	n/v	n/v	1.0 UJ	1.0 UJ	2.0 U	2.0 U	2.0 U	2.0 U	1.0 UJ	1.0 UJ	2.0 U	2.0 U	2.0 U	-	2.0 U	-
Bromomethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	2.5 U	-
Carbon Disulfide	µg/L	n/v	60	n/v	n/v	1.0 U	1.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	1.0 U	1.0 U	5.0 U	5.0 UJ	5.0 U	-	5.0 U	-
Carbon Tetrachloride	µg/L	5	n/v	n/v	n/v	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	1.0 UJ	1.0 UJ	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	1.0 U
Chlorobenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
Chloroethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	2.5 U	-
Chloroform	µg/L	7	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	**50 J[A]**	**50 J[A]**	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
Chloromethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	2.5 U	-
Cis-1,2-Dichloroethylene	µg/L	5[c]	n/v	n/v	n/v	**22[A]**	**22[A]**	**11[A]**	**50[A]**	4.2	4.7	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
Cis-1,3-Dichloropropene	µg/L	0.4[p]	n/v	n/v	n/v	***1.0 U***	***1.0 U***	***0.50 U***	***0.50 U***	***0.50 U***	***0.50 U***	***1.0 U***	***1.0 U***	***0.50 U***	***0.50 U***	***0.50 U***	-	***0.50 U***	-
Cyclohexane	µg/L	n/v	n/v	n/v	n/v	-	-	10 U	10 U	10 U	10 U	-	-	10 U	10 U	10 U	-	10 U	-
Cymene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	2.5 U	2.5 U	1.0 U	1.0 U	-	-	2.5 U	1.0 U	2.5 U	1.0 U
Dibromochloromethane	µg/L	n/v	50	n/v	n/v	1.0 UJ	1.0 UJ	0.50 U	0.50 U	0.50 U	0.50 U	1.0 UJ	1.0 UJ	0.50 U	0.50 U	0.50 U	-	0.50 U	-
Dibromomethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	1.0 U	1.0 U	5.0 U	5.0 UJ	5.0 U	-	5.0 U	-
Ethylbenzene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
Hexachlorobutadiene	µg/L	0.5	n/v	n/v	n/v	-	-	-	-	-	-	***1.0 U***	***1.0 U***	-	-	-	-	-	-
Iodomethane (Methyl Iodide)	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
Isopropylbenzene (Cumene)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
Methyl Acetate	µg/L	n/v	n/v	n/v	n/v	-	-	2.0 U	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	n/v	n/v	5.0 R	5.0 R	5.0 U	5.0 U	5.0 U	5.0 U	5.0 R	5.0 R	5.0 U	5.0 U	5.0 U	10 U	5.0 U	10 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	n/v	n/v	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	-	5.0 U	-
Methylcyclohexane	µg/L	n/v	n/v	n/v	n/v	-	-	10 U	10 U	10 U	10 U	-	-	10 U	10 U	10 U	-	10 U	-
Methylene Chloride	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
M-P-Xylene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.0 U	2.5 U	2.0 U
Naphthalene	µg/L	10	n/v	n/v	n/v	-	-	-	-	2.5 U	2.5 U	1.0 U	1.0 U	-	-	2.5 U	1.0 U	2.5 U	1.0 U
N-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	2.5 U	2.5 U	1.0 U	1.0 U	-	-	2.5 U	1.0 U	2.5 U	1.0 U
N-Propylbenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	2.5 U	2.5 U	1.0 U	1.0 U	-	-	2.5 U	1.0 U	2.5 U	1.0 U
O-Xylene (1,2-Dimethylbenzene)	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
Sec-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	2.5 U	2.5 U	1.0 U	1.0 U	-	-	2.5 U	1.0 U	2.5 U	1.0 U
Styrene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 UJ	2.5 U	2.5 U	2.5 U	-	2.5 U	-
T-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	2.5 U	2.5 U	1.0 U	1.0 U	-	-	2.5 U	1.0 U	2.5 U	1.0 U
Tert-Butyl Methyl Ether	µg/L	n/v	10	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5[c]	n/v	n/v	n/v	2.4	2.3	2.1	1.8	0.41 J	0.50	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	1.0 U
Toluene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
Trans-1,2-Dichloroethene	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U
Trans-1,3-Dichloropropene	µg/L	0.4[p]	n/v	n/v	n/v	***1.0 U***	***1.0 U***	***0.50 U***	***0.50 U***	***0.50 U***	***0.50 U***	***1.0 U***	***1.0 U***	***0.50 U***	***0.50 U***	***0.50 U***	-	***0.50 U***	-
Trichloroethylene (TCE)	µg/L	5[c]	n/v	n/v	n/v	**77[A]**	**76[A]**	**34[A]**	**76[A]**	**9.6[A]**	**11[A]**	1.0 U	1.0 U	0.27 J	0.23 J	0.50 U	1.0 U	0.50 U	1.0 U
Trichlorofluoromethane	µg/L	5[c]	n/v	n/v	n/v	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	1.0 U	2.5 U	2.5 U	2.5 U	-	2.5 U	-
Vinyl Acetate	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-	-	-
Vinyl Chloride	µg/L	2	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	1.0 U	1.0 U	-	-	-	2.0 U	-	2.0 U
VOCs - Tentatively Identified Compounds																			
Total VOC TICs	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	ND	ND	-	-	-	-	ND	-	ND	-

See notes on last page.

Table 7
Summary of Analytical Results for Onsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location						MW-102			MW-103			MW-104D	MW-104D-R		MW-104S-R		MW-105		
Sample Date						8-Dec-15	6-Jan-20	6-Jan-20	7-Dec-15	7-Jan-20	7-Jan-20	10-Dec-15	8-Jan-20	1-Dec-22	8-Jan-20	1-Dec-22	9-Dec-15	18-Mar-20	18-Mar-20
Sample ID						MHSC-MW102-W	MH-MW102-W	MH-MW102-W	MHSC-MW103-W	MH-MW103-W	MH-MW103-W	MHSC-MW104D-W	MH-MW104D-W	MH-MW-104D-W	MH-MW104S-W	MH-MW-104S-W	MHSC-MW105-W	MH-MW105-W	MH-MWDUP2-W
Sampling Company						Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory						ALPHA	TALBUFF	TALBURL	ALPHA	TALBUFF	TALBURL	ALPHA	TALBUFF	ERF	TALBUFF	ERF	ALPHA	TALBUFF	TALBUFF
Laboratory Work Order						L1532151	480-164901-1	480-164901-1	L1532151	480-164901-1	480-164901-1	L1532611	480-164901-1	480-204398-1	480-164901-1	480-204398-1	L1532151	480-167625-1	480-167625-1
Laboratory Sample ID		TOGS Standards A	TOGS Guidance B	USEPA HAL C	NYSDEC PFAS Criteria D	L1532151-04	480-164901-5	480-164901-5	L1532151-01	480-164901-6	480-164901-6	L1532611-02	480-165082-2	480-204398-14	480-165082-3	480-204398-13	L1532151-11	480-167625-1	480-167625-4
Sample Type	Units					Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate
Volatile Organic Compounds																			
1,1,1,2-Tetrachloroethane	µg/L	5$_C$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5$_C$	n/v	n/v	n/v	0.50 U	-	-	0.50 U	-	-	0.50 U	-	-	-	-	0.50 U	-	-
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	-	-	2.5 U	-	-	2.5 U	-	-	-	-	2.5 U	-	-
1,1,2-Trichloroethane	µg/L	1	n/v	n/v	n/v	***1.5 U***	-	-	***1.5 U***	-	-	***1.5 U***	-	-	-	-	***1.5 U***	-	-
1,1-Dichloroethane	µg/L	5$_C$	n/v	n/v	n/v	2.1 J	4.2	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	5$_C$	n/v	n/v	n/v	0.50 U	1.0 U	-	0.50 U	1.0 U	-	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	0.50 U	1.0 U	1.0 U
1,1-Dichloropropene	µg/L	5$_C$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	-	-	2.5 U	-	-	2.5 U	-	-	-	-	2.5 U	-	-
1,2,3-Trichloropropane	µg/L	0.04	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	-	-	2.5 U	-	-	2.5 U	-	-	-	-	2.5 U	-	-
1,2,4-Trimethylbenzene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	n/v	n/v	***2.5 U***	-	-	***2.5 U***	-	-	***2.5 U***	-	-	-	-	***2.5 U***	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	n/v	n/v	***2.0 U***	-	-	***2.0 U***	-	-	***2.0 U***	-	-	-	-	***2.0 U***	-	-
1,2-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.6	n/v	n/v	n/v	0.50 U	***1.0 U***	-	0.50 U	***1.0 U***	-	0.50 U	**2.3^A**	**0.88 J^A**	***1.0 U***	***1.0 U***	0.50 U	***1.0 U***	***1.0 U***
1,2-Dichloropropane	µg/L	1	n/v	n/v	n/v	1.0 U	-	-	1.0 U	-	-	1.0 U	-	-	-	-	1.0 U	-	-
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
1,3-Dichloropropane	µg/L	5$_C$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	n/v	n/v	-	40 U	-	-	40 U	-	-	40 U	40 UR	40 U	40 UR	-	40 U	40 U
2,2-Dichloropropane	µg/L	5$_C$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/L	5$_C$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	µg/L	n/v	50	n/v	n/v	5.0 U	-	-	5.0 U	-	-	5.0 U	-	-	-	-	5.0 U	-	-
4-Chlorotoluene	µg/L	5$_C$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	µg/L	n/v	50	n/v	n/v	5.0 U	10 U	-	5.0 U	3.7 J+	-	3.2 J	10 U	10 U	10 U	10 U	**91^B**	10 U	10 U
Benzene	µg/L	1	n/v	n/v	n/v	0.50 U	1.0 U	-	0.50 U	1.0 U	-	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	0.47 J	1.0 U	1.0 U
Bromobenzene	µg/L	5$_C$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	-	-	2.5 U	-	-	2.5 U	-	-	-	-	2.5 U	-	-
Bromodichloromethane	µg/L	n/v	50	n/v	n/v	0.50 U	-	-	0.50 U	-	-	0.50 U	-	-	-	-	0.50 U	-	-
Bromoform	µg/L	n/v	50	n/v	n/v	2.0 U	-	-	2.0 U	-	-	2.0 U	-	-	-	-	2.0 U	-	-
Bromomethane	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	-	-	2.5 U	-	-	2.5 U	-	-	-	-	2.5 U	-	-
Carbon Disulfide	µg/L	n/v	60	n/v	n/v	5.0 U	-	-	5.0 U	-	-	5.0 U	-	-	-	-	5.0 U	-	-
Carbon Tetrachloride	µg/L	5	n/v	n/v	n/v	0.50 U	1.0 U	-	0.50 U	1.0 U	-	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	0.50 U	1.0 U	1.0 U
Chlorobenzene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Chloroethane	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	-	-	2.5 U	-	-	2.5 U	-	-	-	-	2.5 U	-	-
Chloroform	µg/L	7	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0	1.0 U	1.0 U
Chloromethane	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	-	-	2.5 U	-	-	2.5 U	-	-	-	-	2.5 U	-	-
Cis-1,2-Dichloroethylene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	**8.4^A**	**6.1^A**	**6.8^A**
Cis-1,3-Dichloropropene	µg/L	0.4$_P$	n/v	n/v	n/v	***0.50 U***	-	-	***0.50 U***	-	-	***0.50 U***	-	-	-	-	***0.50 U***	-	-
Cyclohexane	µg/L	n/v	n/v	n/v	n/v	10 U	-	-	10 U	-	-	10 U	-	-	-	-	0.43 J	-	-
Cymene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	n/v	50	n/v	n/v	0.50 U	-	-	0.50 U	-	-	0.50 U	-	-	-	-	0.50 U	-	-
Dibromomethane	µg/L	5$_C$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	5$_C$	n/v	n/v	n/v	5.0 U	-	-	5.0 U	-	-	5.0 U	-	-	-	-	5.0 U	-	-
Ethylbenzene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Hexachlorobutadiene	µg/L	0.5	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iodomethane (Methyl Iodide)	µg/L	5$_C$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Methyl Acetate	µg/L	n/v	n/v	n/v	n/v	2.0 U	-	-	2.0 U	-	-	2.0 U	-	-	-	-	2.0 U	-	-
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	n/v	n/v	5.0 U	10 U	-	5.0 U	10 U	-	5.0 U	10 U	10 U	10 U	10 U	2.8 J	10 U	10 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	n/v	n/v	5.0 U	-	-	5.0 U	-	-	5.0 U	-	-	-	-	5.0 U	-	-
Methylcyclohexane	µg/L	n/v	n/v	n/v	n/v	10 U	-	-	10 U	-	-	10 U	-	-	-	-	0.53 J	-	-
Methylene Chloride	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	4.2	1.0 U	1.0 U
M-P-Xylene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	2.0 U	-	2.5 U	2.0 U	-	2.5 U	2.0 U	2.0 U	2.0 U	2.0 U	2.5 U	2.0 U	2.0 U
Naphthalene	µg/L	10	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
N-Butylbenzene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
N-Propylbenzene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
O-Xylene (1,2-Dimethylbenzene)	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Sec-Butylbenzene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Styrene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	-	-	2.5 U	-	-	2.5 U	-	-	-	-	2.5 U	-	-
T-Butylbenzene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Tert-Butyl Methyl Ether	µg/L	n/v	10	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5$_C$	n/v	n/v	n/v	0.50 U	1.0 U	-	0.50 U	1.0 U	-	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	0.50 U	1.0 U	1.0 U
Toluene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	0.71 J	1.0 U	1.0 U
Trans-1,2-Dichloroethene	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	1.0 U	-	2.5 U	1.0 U	-	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U
Trans-1,3-Dichloropropene	µg/L	0.4$_P$	n/v	n/v	n/v	***0.50 U***	-	-	***0.50 U***	-	-	***0.50 U***	-	-	-	-	***0.50 U***	-	-
Trichloroethylene (TCE)	µg/L	5$_C$	n/v	n/v	n/v	0.50 U	1.0 U	-	0.50 U	1.0 U	-	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	**20^A**	**48^A**	**54^A**
Trichlorofluoromethane	µg/L	5$_C$	n/v	n/v	n/v	2.5 U	-	-	2.5 U	-	-	2.5 U	-	-	-	-	2.5 U	-	-
Vinyl Acetate	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	µg/L	2	n/v	n/v	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	µg/L	5$_C$	n/v	n/v	n/v	-	2.0 U	-	-	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	2.0 U
VOCs - Tentatively Identified Compounds																			
Total VOC TICs	µg/L	n/v	n/v	n/v	n/v	ND	-	-	ND	-	-	ND	-	ND	-	ND	ND	-	-

See notes on last page.

Table 7
Summary of Analytical Results for Onsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location						MW-106D	MW-106D-R	MW-106S	MW-106S-R	MW-201		MW-202		MW-203		MW-204		MW-205	
Sample Date						8-Dec-15	7-Jan-20	8-Dec-15	7-Jan-20	3-Mar-21	2-Dec-22	3-Mar-21	2-Dec-22	3-Mar-21	5-Dec-22	3-Mar-21	5-Dec-22	3-Mar-21	2-Dec-22
Sample ID						MHSC-MW106D-W	MH-MW106D-W	MHSC-MW106S-W	MH-MW106S-W	MH-MW201W	MH-MW-201-W	MH-MW202-W	MH-MW-202-W	MH-MW203-W	MH-MW-203-W	MH-MW204-W	MH-MW-204-W	MH-MW205-W	MH-MW-205-W
Sampling Company						Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory						ALPHA	TALBUFF	ALPHA	TALBUFF	TALBUFF	ERF	TALBUFF	ERF	TALBUFF	ERF	TALBUFF	ERF	TALBUFF	ERF
Laboratory Work Order						L1532151	480-164901-1	L1532151	480-164901-1	480-181651-1	480-204398-1	480-181651-1	480-204398-1	480-181651-1	480-204418-1	480-181651-1	480-204418-1	480-181651-1	480-204398-1
Laboratory Sample ID		TOGS Standards A	TOGS Guidance B	USEPA HAL C	NYSDEC PFAS Criteria D	L1532151-10	480-164901-3	L1532151-09	480-164901-4	480-181651-1	480-204398-19	480-181651-2	480-204398-20	480-181651-3	480-204418-1	480-181651-4	480-204418-2	480-181651-5	480-204398-21
Sample Type	Units					Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds																			
1,1,1,2-Tetrachloroethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5[c]	n/v	n/v	n/v	0.50 U	-	0.50 U	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	2.5 U	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	1	n/v	n/v	n/v	***1.5 U***	-	***1.5 U***	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	0.46 J	0.43 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	5[c]	n/v	n/v	n/v	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloropropene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	2.5 U	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/L	0.04	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	2.5 U	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	n/v	n/v	***2.5 U***	-	***2.5 U***	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	n/v	n/v	***2.0 U***	-	***2.0 U***	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.6	n/v	n/v	n/v	0.50 U	***1.0 U***	0.50 U	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
1,2-Dichloropropane	µg/L	1	n/v	n/v	n/v	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	3	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	n/v	n/v	-	40 U	-	40 U	40 U	40 UR	40 U	40 UR	40 U	40 UR	40 U	40 UR	40 U	40 UR
2,2-Dichloropropane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	µg/L	n/v	50	n/v	n/v	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	µg/L	n/v	50	n/v	n/v	16	25	5.0 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	µg/L	1	n/v	n/v	n/v	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	1.0 U	0.42 J	0.46 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromobenzene	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	2.5 U	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/L	n/v	50	n/v	n/v	0.50 U	-	0.50 U	-	-	-	-	-	-	-	-	-	-	-
Bromoform	µg/L	n/v	50	n/v	n/v	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	2.5 U	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulfide	µg/L	n/v	60	n/v	n/v	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	µg/L	5	n/v	n/v	n/v	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Chlorobenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	2.5 U	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/L	7	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.49 J	1.0 U	1.0 U	1.0 U
Chloromethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	2.5 U	-	-	-	-	-	-	-	-	-	-	-
Cis-1,2-Dichloroethylene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	2.1	1.8	39[A]	40[A]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cis-1,3-Dichloropropene	µg/L	0.4[p]	n/v	n/v	n/v	***0.50 U***	-	***0.50 U***	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/L	n/v	n/v	n/v	n/v	10 U	-	0.52 J	-	-	-	-	-	-	-	-	-	-	-
Cymene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	n/v	50	n/v	n/v	0.50 U	-	0.50 U	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	5[c]	n/v	n/v	n/v	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorobutadiene	µg/L	0.5	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iodomethane (Methyl Iodide)	µg/L	5[c]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	µg/L	n/v	n/v	n/v	n/v	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	n/v	n/v	5.0 U	2.2 J	5.0 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	n/v	n/v	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-	-	-	-
Methylcyclohexane	µg/L	n/v	n/v	n/v	n/v	10 U	-	0.51 J	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
M-P-Xylene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	2.0 U	2.5 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	µg/L	10	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Propylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
O-Xylene (1,2-Dimethylbenzene)	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Sec-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	2.5 U	-	-	-	-	-	-	-	-	-	-	-
T-Butylbenzene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tert-Butyl Methyl Ether	µg/L	n/v	10	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5[c]	n/v	n/v	n/v	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,2-Dichloroethene	µg/L	5[c]	n/v	n/v	n/v	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	1.1	1.1	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,3-Dichloropropene	µg/L	0.4[p]	n/v	n/v	n/v	***0.50 U***	-	***0.50 U***	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	µg/L	5[c]	n/v	n/v	n/v	0.50 U	1.0 U	0.50 U	1.0 U	34[A]	27[A]	73[A]	75[A]	1.4	1.3	0.55 J	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	µg/L	5[c]	n/v	n/v	n/v	2.5 U	-	2.5 U	-	-	-	-	-	-	-	-	-	-	-
Vinyl Acetate	µg/L	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	µg/L	2	n/v	n/v	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	µg/L	5[c]	n/v	n/v	n/v	-	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
VOCs - Tentatively Identified Compounds																			
Total VOC TICs	µg/L	n/v	n/v	n/v	n/v	ND	3.7 J	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

See notes on last page.

Table 7
Summary of Analytical Results for Onsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Notes:

TOGS	NYSDEC TOGS 1.1.1 (Reissued June 1998 with errata in January 1999 and addenda in April 2000 and June 2004)
A	TOGS 1.1.1 - Table 1 - Ambient Water Quality Standards and Guidance Values, Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1); Standards
B	TOGS 1.1.1 - Table 1 - Ambient Water Quality Standards and Guidance Values, Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1); Guidance
C	2016 USEPA PFAS/PFOA Health Advisory Level (HAL)
NYSDEC PFAS	NYSDEC's Part 385 Remedial Programs
D	Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS), January 2021
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
0.50 U	Laboratory reporting limit was greater than the applicable standard.
0.03 U	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
ND	None detected.
SIM	Selected Ion Monitoring

a	The standard for Iron and Manganese is 500 ug/L, which applies to the sum of these substances. As individual standards, the standard is 300 ug/L.
b	Standard applies to the sum of all polychlorinated biphenyls.
c	The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in the TOGS table) applies to this substance.
p	Applies to the sum of cis- and trans-1,3-dichloropropene.

Data Validation Qualifiers:

J	The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control limits. The analyte may or may not be present.
U	The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
UJ	The analyte was analyzed for, but was not detected. The associated reported quantitation limit is approximate and may be inaccurate or imprecise.

Table 8a
Summary of Remedial Investigation Samples - Soil
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

DRAFT

	Sample Information				Analyses								
Location	Sample ID	Sample Date	Sample Depth (ft bgs)	Associated QC Samples	VOCs[1]	SVOCs[2]	PCBs[3]	Metals[4]	Cyanide[5]	Hexavalent Chromium[6]	Pesticides[7]	Org. Herbicides[8]	Chlor. Herbicides[9]
Surface Soil Grab Samples													
Area 101	MH-SS101_gA-SH-s	11/27/2018	0.0 - 0.5		x								
Area 101	MH-SS101_gA-DE-s	11/27/2018	0.5 - 1.0	FD: MH-SSDUP1_g-s	x								
Area 101	MH-SS101_gB-SH-s	11/27/2018	0.0 - 0.5		x								
Area 101	MH-SS101_gB-DE-s	11/27/2018	0.5 - 1.0		x								
Area 102	MH-SS102_gA-SH-s	11/27/2018	0.0 - 0.5		x								
Area 102	MH-SS102_gA-DE-s	11/27/2018	0.5 - 1.0		x								
Area 102	MH-SS102_gB-SH-s	11/27/2018	0.0 - 0.5		x								
Area 102	MH-SS102_gB-DE-s	11/27/2018	0.5 - 1.0	FD: MH-SSDUP2_g-s	x								
Area 103	MH-SS103_gA-SH-s	11/28/2018	0.0 - 0.5		x								
Area 103	MH-SS103_gA-DE-s	11/28/2018	0.5 - 1.0		x								
Area 103	MH-SS103_gB-SH-s	11/28/2018	0.0 - 0.5		x								
Area 103	MH-SS103_gB-DE-s	11/28/2018	0.5 - 1.0		x								
Area 104	MH-SS104_gA-SH-s	11/28/2018	0.0 - 0.5		x								
Area 104	MH-SS104_gA-DE-s	11/28/2018	0.5 - 1.0		x								
Area 104	MH-SS104_gB-SH-s	11/28/2018	0.0 - 0.5		x								
Area 104	MH-SS104_gB-DE-s	11/28/2018	0.5 - 1.0		x								
Area 105	MH-SS105_gA-SH-s	11/27/2018	0.0 - 0.5		x								
Area 105	MH-SS105_gA-DE-s	11/27/2018	0.5 - 1.0	MS/MSD	x								
Area 105	MH-SS105_gB-SH-s	11/27/2018	0.0 - 0.5		x								
Area 105	MH-SS105_gB-DE-s	11/27/2018	0.5 - 1.0	MS/MSD	x								
Area 106	MH-SS106_gA-SH-s	11/28/2018	0.0 - 0.5		x								
Area 106	MH-SS106_gA-DE-s	11/28/2018	0.5 - 1.0		x								
Area 106	MH-SS106_gB-SH-s	11/28/2018	0.0 - 0.5		x								
Area 106	MH-SS106_gB-DE-s	11/28/2018	0.5 - 1.0		x								
Area 107	MH-SS107_gA-SH-s	11/28/2018	0.0 - 0.5		x								
Area 107	MH-SS107_gA-DE-s	11/28/2018	0.5 - 1.0		x								
Area 107	MH-SS107_gB-SH-s	11/28/2018	0.0 - 0.5		x								
Area 107	MH-SS107_gB-DE-s	11/28/2018	0.5 - 1.0		x								
Surface Soil Composite Samples													
Area 101	MH-101_cSH-s	11/27/2018	0.0 - 0.2	FD: MH-SSDUP1_C-s		x	x				x	x	x
Area 101	MH-101_cDE-s	11/27/2018	0.2 - 1.0	MS/MSD		x	x				x	x	x
Area 102	MH-102_cSH-s	11/27/2018	0.0 - 0.2	FD: MH-SSDUP2_C-s				x	x	x	x	x	x
Area 102	MH-102_cDE-s	11/27/2018	0.2 - 1.0					x	x	x	x	x	x
Area 103	MH-103_cSH-s	11/28/2018	0.0 - 0.2								x	x	x
Area 103	MH-103_cDE-s	11/28/2018	0.2 - 1.0								x	x	x
Area 104	MH-104_cSH-s	11/28/2018	0.0 - 0.2			x	x				x	x	x
Area 104	MH-104_cDE-s	11/28/2018	0.2 - 1.0			x	x				x	x	x
Area 105	MH-105_cSH-s	11/27/2018	0.0 - 0.2								x	x	x
Area 105	MH-105_cDE-s	11/27/2018	0.2 - 1.0								x	x	x
Area 106	MH-106_cSH-s	11/28/2018	0.0 - 0.2	MS/MSD				x	x	x	x	x	x
Area 106	MH-106_cDE-s	11/28/2018	0.2 - 1.0					x	x	x	x	x	x
Area 107	MH-107_cSH-s	11/28/2018	0.0 - 0.2								x	x	x
Area 107	MH-107_cDE-s	11/28/2018	0.2 - 1.0								x	x	x

Notes
[1] USEPA TCL and NYSDEC CP-51 VOCs (plus up to 10 TICs) by USEPA Method 8260C.
[2] USEPA TCL SVOCs (plus up to 20 TICs) by USEPA Method 8270D.
[3] USEPA TCL PCBs by USEPA Method 8082A.
[4] TAL Metals by USEPA Methods 6010C/7471B.
[5] Total Cyanide by USEPA Method 9012B.
[6] Hexavalent chromium by USEPA Method 7196A.
[7] USEPA TCL Pesticides by USEPA Method 8081B.
[8] Organophosphorus herbicides by USEPA Method 8141B.
[9] Chlorinated herbicides by USEPA Method 8151A.

Abbreviations
CP-51 = Commissioner Policy, Soil Cleanup Guidance, October 21, 2010
FD = Field Duplicate
ft bgs = Feet Below Ground Surface
MS/MSD = Matrix Spike/Matrix Spike Duplicate
NYSDEC = New York State Department of Environmental Conservation
PCBs = Polychlorinated Biphenyls
QC = Quality Control
SVOCs = Semivolatile Organic Compounds
TAL = Target Analyte List
TCL = Target Compound List
TICs = Tentatively Identified Compounds
USEPA = United States Environmental Protection Agency
VOCs = Volatile Organic Compounds

Table 8b
Summary of Remedial Investigation Samples - Groundwater
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

DRAFT

	Sample Information			Analyses		
Well/ Location ID	Sample ID	Sample Date	Associated QC Samples	VOCs[1]	PFAS[2]	1,4-Dioxane[3]
2020 Sampling						
Onsite						
MW-101	MH-MW101-W	1/8/2020		x		
MW-102	MH-MW102-W	1/6/2020	MS/MSD	x	x	x
MW-103	MH-MW103-W	1/7/2020		x	x	x
MW-104D	MH-MW104D-W	1/8/2020		x		
MW-104S	MH-MW104S-W	1/8/2020		x		
MW-105	MH-MW105-W	3/18/2020	FD: MH-MWDUP2-W	x		
MW-106D	MH-MW106D-W	1/7/2020		x		
MW-106S	MH-MW106S-W	1/7/2020		x		
MW-15	MH-MW15-W	1/7/2020		x		
MW-16D	MH-MW16D-W	1/6/2020	FD: MH-MWDUP1-W	x	x	x
MW-16S	MH-MW16S-W	1/8/2020		x		
MW-17	MH-MW17-W	1/8/2020		x		
MW-20	MH-MW20-W	3/18/2020		x		
Offsite						
MW-1	MH-MW1-W	1/14/2020		x		
MW-11	MH-MW11-W	1/10/2020		x		
MW-12	MH-MW12-W	1/10/2020		x		
MW-13	MH-MW13-W	1/14/2020		x		
MW-14	MH-MW14-W	1/9/2020		x		
MW-18	MH-MW18-W	1/10/2020		x		
MW-3D	MH-MW3D-W	1/9/2020		x		
MW-5	MH-MW5-W	1/13/2020	MS/MSD	x		
MW-6	MH-MW6-W	1/10/2020		x		
MW-7	MH-MW7-W	1/9/2020		x		
2021 Sampling						
Onsite						
MW-201	MH-MW201W	3/3/2021		x		
MW-202	MH-MW202-W	3/3/2021		x		
MW-203	MH-MW203-W	3/3/2021		x		
MW-204	MH-MW204-W	3/3/2021		x		
MW-205	MH-MW205-W	3/3/2021		x		
Offsite						
MW-301S	MH-MW301-S-W	3/1/2021		x		
MW-301D	MH-MW301-D-W	3/1/2021	MS/MSD	x		
MW-302	MH-MW302-W	3/2/2021		x		
MW-303	MH-MW303-W	3/2/2021	FD: MH-MWDUP-W	x		
MW-304S	MH-MW304-S-W	3/2/2021		x		
MW-304D	MH-MW304-D-W	3/2/2021		x		
MW-305	MH-MW305-W	3/2/2021		x		

Notes
[1] USEPA TCL and NYSDEC CP-51 VOCs (plus up to 10 TICs) by USEPA Method 8260C.
[2] NYSDEC's 21-compound PFAS list by modified USEPA Method 537.
[3] 1,4-dioxane by USEPA Method 8270 SIM.

Abbreviations
FD = Field Duplicate
MS/MSD = Matrix Spike/Matrix Spike Duplicate
MW = Monitoring Well
NYSDEC = New York State Department of Environmental Conservation
PFAS = Per- and Poly-fluoroalkyl Substance
QC = Quality Control
SIM = Selective Ion Monitoring
TCL = Target Compound Llist
TICs = Tentatively Identified Compounds
USEPA = United States Environmental Protection Agency
VOCs = Volatile Organic Compounds

Table 9
Summary of Analytical Results for Offsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location		TOGS		MW-1D			MW-1S	MW-2D	MW-2S		MW-3D		MW-3S	MW-4D	MW-4S
Sample Date				21-Apr-11	16-Sep-13	14-Jan-20	21-Apr-11	20-Apr-11	20-Apr-11	20-Apr-11	16-Sep-13	9-Jan-20	20-Apr-11	19-Apr-11	19-Apr-11
Sample ID				MW-1D	851043-MW-1D (60-62)	MH-MW1-W	MW-1S	MW-2D	MW-2S	MW-3D	851043-MW-3D (70-72)	MH-MW3D-W	MW-3S	MW-4D	MW-4S
Sampling Company				HRP	EAENG	Stantec	HRP	HRP	HRP	HRP	EAENG	Stantec	HRP	HRP	HRP
Laboratory				MITKEM	SPEC	TALBUFF	MITKEM	MITKEM	MITKEM	MITKEM	SPEC	TALBUFF	MITKEM	MITKEM	MITKEM
Laboratory Work Order				K0699	M1762	480-165177-1	K0699	K0699	K0699	K0699	M1762	480-164901-1	K0699	K0699	K0699
Laboratory Sample ID				K0699-02	M1762-01	480-165177-2	K0699-01	K0699-04	K0699-03	K0699-06	M1762-03	480-165082-9	K0699-05	K0699-08	K0699-07
Sample Type	Units	Standards A	Guidance B	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds															
1,1,1,2-Tetrachloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloropropene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
1,2,3-Trichlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
1,2,3-Trichloropropane	µg/L	0.04	n/v	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***
1,2,4-Trichlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
1,2,4-Trimethylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	***1.0 U***	***1.0 UJ***	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 UJ***	-	***1.0 U***	***1.0 U***	***1.0 U***
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***
1,2-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.6	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
1,2-Dichloropropane	µg/L	1	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	-	-	40 U	-	-	-	-	-	40 U	-	-	-
2,2-Dichloropropane	µg/L	5[c]	n/v	1.0 U	1.0 UJ	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	-	1.0 U	1.0 U	1.0 U
2-Chlorotoluene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
2-Hexanone	µg/L	n/v	50	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
4-Chlorotoluene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Acetone	µg/L	n/v	50	5.0 U	**360[B]**	10 U	5.0 U	5.0 U	5.0 U	5.0 U	**390[B]**	10 U	5.0 U	5.0 U	5.0 U
Benzene	µg/L	1	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Bromochloromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	n/v	50	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	n/v	50	1.0 U	1.0 UJ	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	-	1.0 U	1.0 U	1.0 U
Bromomethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Carbon Disulfide	µg/L	n/v	60	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	µg/L	5	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Chloroform	µg/L	7	n/v	4.9	1.3	0.50 J+	1.0 U	1.0 U	1.0 U	3.2	0.89 J	3.5	1.4	0.57 J	1.5
Chloromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Cis-1,2-Dichloroethylene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cis-1,3-Dichloropropene	µg/L	0.4[p]	n/v	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***
Cymene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	n/v	50	1.0 U	1.0 UJ	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	-	1.0 U	1.0 U	1.0 U
Dibromomethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorobutadiene	µg/L	0.5	n/v	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***
Iodomethane (Methyl Iodide)	µg/L	5[c]	n/v	1.0 U	1.0 UJ	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	-	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	5.0 U	5.0 R	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 R	10 U	5.0 U	5.0 U	5.0 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Methylene Chloride	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
M-P-Xylene	µg/L	5[c]	n/v	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	µg/L	10	n/v	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
N-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Propylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
O-Xylene (1,2-Dimethylbenzene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Sec-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
T-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tert-Butyl Methyl Ether	µg/L	n/v	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,2-Dichloroethene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,3-Dichloropropene	µg/L	0.4[p]	n/v	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***
Trichloroethylene (TCE)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Vinyl Acetate	µg/L	n/v	n/v	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U
Vinyl Chloride	µg/L	2	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	µg/L	5[c]	n/v	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U
VOCs - Tentatively Identified Compounds															
Total VOC TICs	µg/L	n/v	n/v	-	-	4.2 J N	-	-	-	-	-	-	-	-	-

See notes on last page.

Table 9
Summary of Analytical Results for Offsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location		TOGS		MW-5				MW-6*			MW-7				MW-8	MW-9	MW-11	
Sample Date				19-Apr-11	16-Sep-13	13-Jan-20	30-Nov-22	20-Apr-11	16-Sep-13	10-Jan-20	21-Apr-11	16-Sep-13	9-Jan-20	29-Nov-22	20-Apr-11	20-Apr-11	16-Sep-13	10-Jan-20
Sample ID				MW-5	851043-MW-5 (76-78)	MH-MW5-W	MH-MW-5-W	MW-6	851043-MW-12 (40-42)	MH-MW6-W	MW-7	851043-MW-7 (58-60)	MH-MW7-W	MH-MW-7-W	MW-8	MW-9	851043-MW-11 (55-57)	MH-MW11-W
Sampling Company				HRP	EAENG	Stantec	Stantec	HRP	EAENG	Stantec	HRP	EAENG	Stantec	Stantec	HRP	HRP	EAENG	Stantec
Laboratory				MITKEM	SPEC	TALBUFF	ERF	MITKEM	SPEC	TALBUFF	MITKEM	SPEC	TALBUFF	ERF	MITKEM	MITKEM	SPEC	TALBUFF
Laboratory Work Order				K0699	M1762	480-165177-1	480-204398-1	K0699	M1762	480-164901-1	K0699	M1762	480-164901-1	480-204398-1	K0699	K0699	M1762	480-164901-1
Laboratory Sample ID				K0699-09	M1762-04	480-165177-1	480-204398-6	K0699-10	M1762-06	480-165082-11	K0699-11	M1762-08	480-165082-8	480-204398-4	K0699-12	K0699-13	M1762-02	480-165082-12
Sample Type	Units	Standards A	Guidance B	Primary	Primary	Primary	Primary	Primary	Primary *see Note 1 on last page	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds																		
1,1,1,2-Tetrachloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
1,1,1-Trichloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
1,1,2-Trichloroethane	µg/L	1	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
1,1-Dichloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloropropene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
1,2,3-Trichlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
1,2,3-Trichloropropane	µg/L	0.04	n/v	***1.0 U***	***1.0 U***	-	-	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	-	-	***1.0 U***	***1.0 U***	***1.0 U***	-
1,2,4-Trichlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
1,2,4-Trimethylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	***1.0 U***	***1.0 UJ***	-	-	***1.0 U***	***1.0 UJ***	-	***1.0 U***	***1.0 UJ***	-	-	***1.0 U***	***1.0 U***	***1.0 UJ***	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	***1.0 U***	***1.0 U***	-	-	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	-	-	***1.0 U***	***1.0 U***	***1.0 U***	-
1,2-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.6	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
1,2-Dichloropropane	µg/L	1	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
1,4-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	-	-	40 U	40 UR	-	-	40 U	-	-	40 U	40 UR	-	-	-	40 U
2,2-Dichloropropane	µg/L	5[c]	n/v	1.0 U	1.0 UJ	-	-	1.0 U	1.0 UJ	-	1.0 U	1.0 UJ	-	-	1.0 U	1.0 U	1.0 UJ	-
2-Chlorotoluene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
2-Hexanone	µg/L	n/v	50	5.0 U	5.0 U	-	-	5.0 U	5.0 U	-	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	-
4-Chlorotoluene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Acetone	µg/L	n/v	50	5.0 U	**380[B]**	10 U	10 U	5.0 U	**360[B]**	10 U	5.0 U	**360[B]**	10 U	10 U	5.0 U	5.0 U	3.1 J	10 U
Benzene	µg/L	1	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Bromochloromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Bromodichloromethane	µg/L	n/v	50	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Bromoform	µg/L	n/v	50	1.0 U	1.0 UJ	-	-	1.0 U	1.0 UJ	-	1.0 U	1.0 UJ	-	-	1.0 U	1.0 U	1.0 UJ	-
Bromomethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Carbon Disulfide	µg/L	n/v	60	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Carbon Tetrachloride	µg/L	5	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Chloroform	µg/L	7	n/v	0.96 J	1.0 U	0.80 J	2.4	3.3	0.99 J	**12[A]**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.7	0.94 J
Chloromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Cis-1,2-Dichloroethylene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cis-1,3-Dichloropropene	µg/L	0.4[p]	n/v	***1.0 U***	***1.0 U***	-	-	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	-	-	***1.0 U***	***1.0 U***	***1.0 U***	-
Cymene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	n/v	50	1.0 U	1.0 UJ	-	-	1.0 U	1.0 UJ	-	1.0 U	1.0 UJ	-	-	1.0 U	1.0 U	1.0 UJ	-
Dibromomethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Dichlorodifluoromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Ethylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorobutadiene	µg/L	0.5	n/v	***1.0 U***	***1.0 U***	-	-	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	-	-	***1.0 U***	***1.0 U***	***1.0 U***	-
Iodomethane (Methyl Iodide)	µg/L	5[c]	n/v	1.0 U	1.0 UJ	-	-	1.0 U	1.0 UJ	-	1.0 U	1.0 UJ	-	-	1.0 U	1.0 U	1.0 UJ	-
Isopropylbenzene (Cumene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	5.0 U	5.0 R	10 U	10 U	5.0 U	5.0 R	10 U	5.0 U	5.0 R	10 U	10 U	5.0 U	5.0 U	5.0 R	10 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	5.0 U	5.0 U	-	-	5.0 U	5.0 U	-	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	-
Methylene Chloride	µg/L	5[c]	n/v	1.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
M-P-Xylene	µg/L	5[c]	n/v	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U
Naphthalene	µg/L	10	n/v	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
N-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Propylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
O-Xylene (1,2-Dimethylbenzene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Sec-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
T-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tert-Butyl Methyl Ether	µg/L	n/v	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	5[c]	n/v	**8.4[A]**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,2-Dichloroethene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,3-Dichloropropene	µg/L	0.4[p]	n/v	***1.0 U***	***1.0 U***	-	-	***1.0 U***	***1.0 U***	-	***1.0 U***	***1.0 U***	-	-	***1.0 U***	***1.0 U***	***1.0 U***	-
Trichloroethylene (TCE)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	0.80 J	0.87 J	0.50 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.3	1.8
Trichlorofluoromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Vinyl Acetate	µg/L	n/v	n/v	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	-
Vinyl Chloride	µg/L	2	n/v	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	µg/L	5[c]	n/v	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	2.0 U
VOCs - Tentatively Identified Compounds																		
Total VOC TICs	µg/L	n/v	n/v	-	-	-	ND	-	-	-	-	-	-	ND	-	-	-	-

See notes on last page.

Table 9
Summary of Analytical Results for Offsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location				MW-12*								MW-13			
Sample Date				2-Aug-12	2-Aug-12	2-Aug-12	2-Aug-12	2-Aug-12	16-Sep-13	10-Jan-20	29-Nov-22	16-Sep-13	14-Jan-20	29-Nov-22	29-Nov-22
Sample ID				MW-12 (35FT)	MW-12 (40FT)	MW-12 (45FT)	MW-12 (50FT)	MW-12 (55FT)	851043-MW-6 (91-93)	MH-MW12-W	MH-MW-6-W	851043-MW-13 (85-87)	MH-MW13-W	MH-MW-13-W	MH-FD-W
Sampling Company				HRP	HRP	HRP	HRP	HRP	EAENG	Stantec	Stantec	EAENG	Stantec	Stantec	Stantec
Laboratory				SPEC	SPEC	SPEC	SPEC	SPEC	SPEC	TALBUFF	ERF	SPEC	TALBUFF	ERF	ERF
Laboratory Work Order		TOGS		L1687	L1687	L1687	L1687	L1687	M1762	480-164901-1	480-204398-1	M1762	480-165177-1	480-204398-1	480-204398-1
Laboratory Sample ID		Standards	Guidance	L1687-03A	L1687-04A	L1687-05A	L1687-06A	L1687-08A	M1762-05	480-165082-13	480-204398-1	M1762-09	480-165177-3	480-204398-3	480-204398-5
Sample Type	Units	A	B	Primary	Primary	Primary	Primary	Primary	Primary *see Note 1 on last page	Primary	Primary *see Note 1 on last page	Primary	Primary	Primary	Field Duplicate
Volatile Organic Compounds															
1,1,1,2-Tetrachloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
1,1,1-Trichloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
1,1,2-Trichloroethane	µg/L	1	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
1,1-Dichloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloropropene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
1,2,3-Trichlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
1,2,3-Trichloropropane	µg/L	0.04	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	-	***1.0 U***	-	-	-
1,2,4-Trichlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
1,2,4-Trimethylbenzene	µg/L	5[c]	n/v	0.70 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 UJ***	-	-	***1.0 UJ***	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	-	***1.0 U***	-	-	-
1,2-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.6	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
1,2-Dichloropropane	µg/L	1	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
1,4-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	-	-	-	-	-	-	40 U	40 UR	-	40 U	40 UR	40 UR
2,2-Dichloropropane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	-	-	1.0 UJ	-	-	-
2-Chlorotoluene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
2-Hexanone	µg/L	n/v	50	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-	5.0 U	-	-	-
4-Chlorotoluene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Acetone	µg/L	n/v	50	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**430[B]**	10 U	10 U	**370[B]**	10 U	10 U	10 U
Benzene	µg/L	1	n/v	0.53 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Bromochloromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Bromodichloromethane	µg/L	n/v	50	1.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Bromoform	µg/L	n/v	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	-	-	1.0 UJ	-	-	-
Bromomethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Carbon Disulfide	µg/L	n/v	60	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Carbon Tetrachloride	µg/L	5	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Chloroform	µg/L	7	n/v	**13[A]**	1.6	1.2	1.6	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Cis-1,2-Dichloroethylene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cis-1,3-Dichloropropene	µg/L	0.4[p]	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	-	***1.0 U***	-	-	-
Cymene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	n/v	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	-	-	1.0 UJ	-	-	-
Dibromomethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Dichlorodifluoromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Ethylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorobutadiene	µg/L	0.5	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	-	***1.0 U***	-	-	-
Iodomethane (Methyl Iodide)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	-	-	1.0 UJ	-	-	-
Isopropylbenzene (Cumene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 R	10 U	10 U	5.0 R	10 U	10 U	10 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	-	-	5.0 U	-	-	-
Methylene Chloride	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
M-P-Xylene	µg/L	5[c]	n/v	1.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	µg/L	10	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U
N-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Propylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
O-Xylene (1,2-Dimethylbenzene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Sec-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
T-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tert-Butyl Methyl Ether	µg/L	n/v	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	5[c]	n/v	1.9	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,2-Dichloroethene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,3-Dichloropropene	µg/L	0.4[p]	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	-	***1.0 U***	-	-	-
Trichloroethylene (TCE)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.2	1.2	1.5	**9.1[A]**	3.2	3.5	1.4	0.69 J+	0.50 J	0.47 J
Trichlorofluoromethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Vinyl Acetate	µg/L	n/v	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	1.0 U	-	-	-
Vinyl Chloride	µg/L	2	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	µg/L	5[c]	n/v	1.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	2.0 U	2.0 U	2.0 U
VOCs - Tentatively Identified Compounds															
Total VOC TICs	µg/L	n/v	n/v	-	-	-	-	-	-	-	ND	-	-	-	ND

See notes on last page.

Table 9
Summary of Analytical Results for Offsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location		TOGS		MW-14		MW-18				MW-301D		MW-301S		MW-302	
Sample Date				16-Sep-13	9-Jan-20	16-Sep-13	16-Sep-13	10-Jan-20	29-Nov-22	1-Mar-21	30-Nov-22	1-Mar-21	30-Nov-22	2-Mar-21	30-Nov-22
Sample ID				851043-MW-14 (78-80)	MH-MW14-W	851043-MW-18 (65-67)	851043-MW-18 (70-72)	MH-MW18-W	MH-MW-18-W	MH-MW301-D-W	MH-MW-301D-W	MH-MW301-S-W	MH-MW-301S-W	MH-MW302-W	MH-MW-302-W
Sampling Company				EAENG	Stantec	EAENG	EAENG	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory				SPEC	TALBUFF	SPEC	SPEC	TALBUFF	ERF	TALBUFF	ERF	TALBUFF	ERF	TALBUFF	ERF
Laboratory Work Order				M1762	480-164901-1	M1762	M1762	480-164901-1	480-204398-1	480-181651-1	480-204398-1	480-181651-1	480-204398-1	480-181651-1	480-204398-1
Laboratory Sample ID				M1762-07	480-165082-7	M1762-10	M1762-11	480-165082-10	480-204398-2	480-181651-8	480-204398-8	480-181651-7	480-204398-9	480-181651-9	480-204398-7
Sample Type	Units	Standards A	Guidance B	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds															
1,1,1,2-Tetrachloroethane	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	1	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloropropene	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/L	0.04	n/v	***1.0 U***	-	***1.0 U***	***1.0 U***	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	***1.0 UJ***	-	***1.0 UJ***	***1.0 UJ***	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	***1.0 U***	-	***1.0 U***	***1.0 U***	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	***4.0 U***	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.6	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***4.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
1,2-Dichloropropane	µg/L	1	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	***4.0 U***	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropane	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	***4.0 U***	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	-	40 U	-	-	40 U	40 UR	40 U	160 UR	40 U	40 R	40 U	40 UR
2,2-Dichloropropane	µg/L	5[c]	n/v	1.0 UJ	-	1.0 UJ	1.0 UJ	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
2-Hexanone	µg/L	n/v	50	5.0 U	-	5.0 U	5.0 U	-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Acetone	µg/L	n/v	50	**380[B]**	10 U	**380[B]**	**400 J[B]**	10 U	10 U	10 U	40 U	10 U	10 U	10 U	10 U
Benzene	µg/L	1	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	***4.0 U***	1.0 U	1.0 U	1.0 U	1.0 U
Bromobenzene	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Bromochloromethane	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/L	n/v	50	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Bromoform	µg/L	n/v	50	1.0 UJ	-	1.0 UJ	1.0 UJ	-	-	-	-	-	-	-	-
Bromomethane	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Carbon Disulfide	µg/L	n/v	60	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Carbon Tetrachloride	µg/L	5	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Chlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Chloroform	µg/L	7	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.3	4.0 U	1.0 U	0.91 J	6.4	**7.8[A]**
Chloromethane	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Cis-1,2-Dichloroethylene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cis-1,3-Dichloropropene	µg/L	0.4[p]	n/v	***1.0 U***	-	***1.0 U***	***1.0 U***	-	-	-	-	-	-	-	-
Cymene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	n/v	50	1.0 UJ	-	1.0 UJ	1.0 UJ	-	-	-	-	-	-	-	-
Dibromomethane	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorobutadiene	µg/L	0.5	n/v	***1.0 U***	-	***1.0 U***	***1.0 U***	-	-	-	-	-	-	-	-
Iodomethane (Methyl Iodide)	µg/L	5[c]	n/v	1.0 UJ	-	1.0 UJ	1.0 UJ	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	5.0 R	10 U	5.0 R	5.0 R	10 U	10 U	10 U	40 U	10 U	10 U	10 U	10 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	5.0 U	-	5.0 U	5.0 U	-	-	-	-	-	-	-	-
Methylene Chloride	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
M-P-Xylene	µg/L	5[c]	n/v	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	2.0 U	2.0 U	***8.0 U***	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	µg/L	10	n/v	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Propylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
O-Xylene (1,2-Dimethylbenzene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Sec-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
T-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tert-Butyl Methyl Ether	µg/L	n/v	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.51 J	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,2-Dichloroethene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,3-Dichloropropene	µg/L	0.4[p]	n/v	***1.0 U***	-	***1.0 U***	***1.0 U***	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	µg/L	5[c]	n/v	1.0 U	1.0 U	**5.3[A]**	**5.9[A]**	3.5	2.3	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	µg/L	5[c]	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Vinyl Acetate	µg/L	n/v	n/v	1.0 U	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-
Vinyl Chloride	µg/L	2	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	***4.0 U***	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	µg/L	5[c]	n/v	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	2.0 U	2.0 U	***8.0 U***	2.0 U	2.0 U	2.0 U	2.0 U
VOCs - Tentatively Identified Compounds															
Total VOC TICs	µg/L	n/v	n/v	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND

See notes on last page.

Table 9
Summary of Analytical Results for Offsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location				MW-303			MW-304D		MW-304S		MW-305	
Sample Date				2-Mar-21	2-Mar-21	5-Dec-22	2-Mar-21	30-Nov-22	2-Mar-21	30-Nov-22	2-Mar-21	2-Dec-22
Sample ID				MH-MW303-W	MH-MWDUP-W	MH-303-W	MH-MW304-D-W	MH-MW-304D-W	MH-MW304-S-W	MH-MW-304S-W	MH-MW305-W	MH-MW-305-W
Sampling Company				Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory				TALBUFF	TALBUFF	ERF	TALBUFF	ERF	TALBUFF	ERF	TALBUFF	ERF
Laboratory Work Order		TOGS		480-181651-1	480-181651-1	480-204418-1	480-181651-1	480-204398-1	480-181651-1	480-204398-1	480-181651-1	480-204398-1
Laboratory Sample ID		Standards	Guidance	480-181651-10	480-181651-14	480-204418-5	480-181651-12	480-204398-10	480-181651-11	480-204398-11	480-181651-13	480-204398-17
Sample Type	Units	A	B	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds												
1,1,1,2-Tetrachloroethane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	5[c]	n/v	1.1	0.97 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	1	n/v	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloropropene	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/L	0.04	n/v	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	µg/L	0.04	n/v	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	n/v	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.6	n/v	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
1,2-Dichloropropane	µg/L	1	n/v	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	3	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dioxane (P-Dioxane)	µg/L	n/v	n/v	40 U	40 U	40 UR	40 U	40 UR	40 U	40 UR	40 U	40 UR
2,2-Dichloropropane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
2-Hexanone	µg/L	n/v	50	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
Acetone	µg/L	n/v	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.8 J
Benzene	µg/L	1	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromobenzene	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
Bromochloromethane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/L	n/v	50	-	-	-	-	-	-	-	-	-
Bromoform	µg/L	n/v	50	-	-	-	-	-	-	-	-	-
Bromomethane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
Carbon Disulfide	µg/L	n/v	60	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	µg/L	5	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
Chloroform	µg/L	7	n/v	1.0 U	1.0 U	1.0 U	0.72 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
Cis-1,2-Dichloroethylene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cis-1,3-Dichloropropene	µg/L	0.4[p]	n/v	-	-	-	-	-	-	-	-	-
Cymene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	n/v	50	-	-	-	-	-	-	-	-	-
Dibromomethane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorobutadiene	µg/L	0.5	n/v	-	-	-	-	-	-	-	-	-
Iodomethane (Methyl Iodide)	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Ethyl Ketone (2-Butanone)	µg/L	n/v	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-
Methylene Chloride	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
M-P-Xylene	µg/L	5[c]	n/v	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	µg/L	10	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Propylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
O-Xylene (1,2-Dimethylbenzene)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Sec-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
T-Butylbenzene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tert-Butyl Methyl Ether	µg/L	n/v	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,2-Dichloroethene	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,3-Dichloropropene	µg/L	0.4[p]	n/v	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	µg/L	5[c]	n/v	1.0 U	1.0 U	1.0 U	2.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	µg/L	5[c]	n/v	-	-	-	-	-	-	-	-	-
Vinyl Acetate	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-
Vinyl Chloride	µg/L	2	n/v	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	µg/L	5[c]	n/v	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
VOCs - Tentatively Identified Compounds												
Total VOC TICs	µg/L	n/v	n/v	ND	ND	ND	110 J	ND	ND	ND	39 J	ND

See notes on last page.

Table 9
Summary of Analytical Results for Offsite Groundwater Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Notes:

1. Based on a review of constructed screen depths of well pair MW-6 and MW-12, it was interpreted that there were two sampling events during which the labels appear swapped:
- September 2013: although this event was conducted on behalf of NYSDEC, the sample identification listed depths suggest this is the deeper screened well in the pair which is understood to be MW-12, located further from the road.
- November 2022: during this sampling event, one of the wells in the pair was observed to be damaged (the well closer to the road). Depth to bottom in the undamaged well was measured to be deeper than the well construction log for MW-6 indicates. Therefore, it is assumed that the undamaged well is MW-12 (deeper screen, located further from the road) and that the sample collected during this round is associated with MW-12.

List of Abbreviations:

TOGS	NYSDEC TOGS 1.1.1 (Reissued June 1998 with errata in January 1999 and addenda in April 2000 and June 2004)
A	TOGS 1.1.1 - Table 1 - Ambient Water Quality Standards and Guidance Values, Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1); Standards
B	TOGS 1.1.1 - Table 1 - Ambient Water Quality Standards and Guidance Values, Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1); Guidance
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
0.50 U	Laboratory reporting limit was greater than the applicable standard.
0.03 U	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
c	The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in the TOGS table) applies to this substance.
p	Applies to the sum of cis- and trans-1,3-dichloropropene.

Data Validation Qualifiers:

J	The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high.
N	Indicates presumptive evidence of a compound. this flag is usually used for a tentatively identified compound, where the identification is based on a mass spectral library search.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control limits. The analyte may or may not be present.
U	The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
UJ	The analyte was analyzed for, but was not detected. The associated reported quantitation limit is approximate and may be inaccurate or imprecise.
ND	None detected (TIC results only)

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS101_cSH-s				MH-SS101_gA-DE-s		MH-SS101_gA-SH-s	MH-SS101_gB-DE-s	MH-SS101_gB-SH-s
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18
Sample ID								MH-101_cSH-s	MH-101_cSH-s (480-145878-4)	MH-SSDUP1-C-s	MH-SSDUP1-C-s (480-145878-10)	MH-SS101_gA-DE-s	MH-SSDUP1-g-s	MH-SS101_gA-SH-s	MH-SS101_gB-DE-s	MH-SS101_gB-SH-s
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-145858-1	P183490	480-145858-1	P183490	480-145858-1	480-145858-1	480-145858-1	480-145858-1	480-145858-1
Laboratory Sample ID								480-145878-4	P183490-01	480-145878-10	P183490-07	480-145878-14	480-145878-16	480-145878-12	480-145878-15	480-145878-13
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Field Duplicate	Field Duplicate	Primary	Field Duplicate	Primary	Primary	Primary
General Chemistry																
Cyanide	mg/kg	27$_{i}$	40$_{i}$	27$_{i}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Metals																
Aluminum	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	-
Antimony	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	13$_{n}$	16$_{q}$	16$_{q}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Barium	mg/kg	350$_{n}$	820	400	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	2.5$_{n}$	7.5	9.3	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Calcium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	-
Chromium, Hexavalent	mg/kg	1$_{m,i}$	19$_{i}$	400$_{i}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Chromium, Total	mg/kg	30$_{n,i}$	NS$_{q}$	1,500$_{i}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Cobalt	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	-
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Iron	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	-
Lead	mg/kg	63$_{n}$	450	1,000	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Magnesium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Manganese	mg/kg	1,600$_{n}$	2,000$_{g}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.18$_{n}$	0.73	2.8$_{k}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Potassium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	3.9$_{n}$	4$_{q}$	1,500	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Sodium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Thallium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	109$_{n}$	2,480	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																
PCB-1016 (Aroclor 1016)	mg/kg	o	o	o	n/v	n/v	n/v	0.20 U	-	0.24 U	-	-	-	-	-	-
PCB-1221 (Aroclor 1221)	mg/kg	o	o	o	n/v	n/v	n/v	0.20 U	-	0.24 U	-	-	-	-	-	-
PCB-1232 (Aroclor 1232)	mg/kg	o	o	o	n/v	n/v	n/v	0.20 U	-	0.24 U	-	-	-	-	-	-
PCB-1242 (Aroclor 1242)	mg/kg	o	o	o	n/v	n/v	n/v	0.20 U	-	0.24 U	-	-	-	-	-	-
PCB-1248 (Aroclor 1248)	mg/kg	o	o	o	n/v	n/v	n/v	0.20 U	-	0.24 U	-	-	-	-	-	-
PCB-1254 (Aroclor 1254)	mg/kg	o	o	o	n/v	n/v	n/v	0.20 U	-	0.24 U	-	-	-	-	-	-
PCB-1260 (Aroclor 1260)	mg/kg	o	o	o	n/v	n/v	n/v	0.20 U	-	0.24 U	-	-	-	-	-	-
Polychlorinated Biphenyl (PCBs)	mg/kg	0.1	3.2	1	n/v	n/v	n/v	ND	-	ND	-	-	-	-	-	-
Pesticides																
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	1,900	18 UJ	-	19 U	-	-	-	-	-	-
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	500	18 UJ	-	19 U	-	-	-	-	-	-
Aldrin	µg/kg	5$_{n}$	190	680	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Alpha Endosulfan	µg/kg	2,400$_{l}$	102,000	200,000$_{l}$	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Beta Endosulfan	µg/kg	2,400$_{l}$	102,000	200,000$_{l}$	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40$_{n}$	250	500,000$_{c}$	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Dieldrin	µg/kg	5$_{n}$	100	1,400	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Endosulfan Sulfate	µg/kg	2,400$_{l}$	1,000,000$_{d}$	200,000$_{l}$	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Endrin Aldehyde	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Endrin Ketone	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Gamma Chlordane (trans-Chlordane)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	n/v	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Heptachlor Epoxide	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	20	37 U	-	19 U	-	-	-	-	-	-
Methoxychlor	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	900,000	37 U	-	19 U	-	-	-	-	-	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS101_cSH-s				MH-SS101_gA-DE-s		MH-SS101_gA-SH-s	MH-SS101_gB-DE-s	MH-SS101_gB-SH-s
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18
Sample ID								MH-101_cSH-s	MH-101_cSH-s (480-145878-4)	MH-SSDUP1-C-s	MH-SSDUP1-C-s (480-145878-10)	MH-SS101_gA-DE-s	MH-SSDUP1-g-s	MH-SS101_gA-SH-s	MH-SS101_gB-DE-s	MH-SS101_gB-SH-s
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-145858-1	P183490	480-145858-1	P183490	480-145858-1	480-145858-1	480-145858-1	480-145858-1	480-145858-1
Laboratory Sample ID								480-145878-4	P183490-01	480-145878-10	P183490-07	480-145878-14	480-145878-16	480-145878-12	480-145878-15	480-145878-13
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Field Duplicate	Field Duplicate	Primary	Field Duplicate	Primary	Primary	Primary
Pesticides (cont'd)																
P,P'-DDD	µg/kg	3.3$_m$	14,000	92,000	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
P,P'-DDE	µg/kg	3.3$_m$	17,000	62,000	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
P,P'-DDT	µg/kg	3.3$_m$	136,000	47,000	n/v	n/v	n/v	37 U	-	19 U	-	-	-	-	-	-
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000$_c$	n/v	n/v	n/v	18 UJ	-	19 U	-	-	-	-	-	-
Toxaphene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	370 U	-	190 U	-	-	-	-	-	-
Organophosphorus Compounds																
Aspon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-
Chlorofenvinphos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-
Chlorpyrifos-methyl	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-
Dichlorofenthion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-
Dicrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-
Ethion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-
Fenitrothion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-
Fonofos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-
Monochrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-
Phosphamidon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-
Semi-Volatile Organics																
2-Methylphenol (O-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
3-Methylphenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	1,800 U	-	1,800 U	-	-	-	-	-	-
4-Methylphenol (P-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	1,800 U	-	1,800 U	-	-	-	-	-	-
Acenaphthene	µg/kg	20,000	98,000	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Acenaphthylene	µg/kg	100,000$_a$	107,000	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Anthracene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Benzo(A)Anthracene	µg/kg	1,000$_n$	1,000$_g$	5,600	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Benzo(A)Pyrene	µg/kg	1,000$_n$	22,000	1,000$_q$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Benzo(B)Fluoranthene	µg/kg	1,000$_n$	1,700	5,600	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Benzo(K)Fluoranthene	µg/kg	800$_n$	1,700	56,000	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Chrysene	µg/kg	1,000$_n$	1,000$_g$	56,000	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Dibenz(A,H)Anthracene	µg/kg	330$_m$	1,000,000$_d$	560	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Dibenzofuran	µg/kg	7,000	210,000	350,000	500,000$_a$	1,000,000$_a$	6,200	930 U	-	950 U	-	-	-	-	-	-
Fluoranthene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Fluorene	µg/kg	30,000	386,000	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Hexachlorobenzene	µg/kg	330$_m$	3,200	6,000	500,000$_a$	1,000,000$_a$	1,400	930 U	-	950 U	-	-	-	-	-	-
Indeno(1,2,3-C,D)Pyrene	µg/kg	500$_n$	8,200	5,600	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Pentachlorophenol	µg/kg	800$_m$	800$_f$	6,700	n/v	n/v	n/v	1,800 U	-	1,800 U	-	-	-	-	-	-
Phenanthrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Phenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
Pyrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	930 U	-	950 U	-	-	-	-	-	-
SVOCs - Tentatively Identified Compounds																
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	ND	-	-	-	-	-	-	-	-
Volatile Organic Compounds																
1,1,1-Trichloroethane	µg/kg	680	680	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
1,1-Dichloroethene	µg/kg	330	330	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
1,2-Dichloroethane	µg/kg	20$_m$	20$_g$	30,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
1,4-Dioxane (P-Dioxane)	µg/kg	100$_m$	100$_f$	130,000	n/v	n/v	n/v	-	-	-	-	100 R	**110 R^{AB}**	**110 R^{AB}**	**110 R^{AB}**	**110 R^{AB}**
Acetone	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	-	-	-	-	26 U	26 U	27 U	28 UJ	27 U
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS101_cSH-s				MH-SS101_gA-DE-s		MH-SS101_gA-SH-s	MH-SS101_gB-DE-s	MH-SS101_gB-SH-s
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18
Sample ID								MH-101_cSH-s	MH-101_cSH-s (480-145878-4)	MH-SSDUP1-C-s	MH-SSDUP1-C-s (480-145878-10)	MH-SS101_gA-DE-s	MH-SSDUP1-g-s	MH-SS101_gA-SH-s	MH-SS101_gB-DE-s	MH-SS101_gB-SH-s
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-145858-1	P183490	480-145858-1	P183490	480-145858-1	480-145858-1	480-145858-1	480-145858-1	480-145858-1
Laboratory Sample ID								480-145878-4	P183490-01	480-145878-10	P183490-07	480-145878-14	480-145878-16	480-145878-12	480-145878-15	480-145878-13
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Field Duplicate	Field Duplicate	Primary	Field Duplicate	Primary	Primary	Primary
Volatile Organic Compounds (cont'd)																
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Chlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	-	-	-	-	0.45 J	0.48 J	0.46 J	5.6 UJ	0.49 J
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Cymene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	10,000	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Isopropylbenzene (Cumene)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	2,300	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000$_c$	500,000$_a$	1,000,000$_a$	300	-	-	-	-	26 U	26 U	27 U	28 UJ	27 U
Methylene Chloride	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
M-P-Xylene	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	-	-	-	-	10 U	11 U	11 U	11 UJ	11 U
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
N-Butylbenzene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
N-Propylbenzene	µg/kg	3,900	3,900	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
T-Butylbenzene	µg/kg	5,900	5,900	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	500,000$_a$	1,000,000$_a$	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Toluene	µg/kg	700	700	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.3 U	5.4 U	5.6 UJ	5.4 U
Xylenes	µg/kg	260	1,600	500,000$_c$	n/v	n/v	n/v	-	-	-	-	10 U	11 U	11 U	11 UJ	11 U

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS101-cDE-s		MH-SS102_cDE-s			MH-SS102_cSH-s		MH-SS102_gA-DE-s	MH-SS102_gA-SH-s
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18
Sample ID								MH-101_cDE-s (480-145878-5)	MH-101-cDE-s	MH-102_cDE-s	MH-102_cDE-s (480-145878-7)	MH-102_cSH-s	MH-102_cSH-s (480-145878-6)	MH-SSDUP2-C-s	MH-SS102_gA-DE-s	MH-SS102_gA-SH-s
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory		NYSDEC-Part 375 (2006)			NYSDEC CP-51			PAL	TALBUFF	TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order								P183490	480-145858-1	480-145858-1	P183490	480-145858-1	P183490	480-145858-1	480-145858-1	480-145858-1
Laboratory Sample ID								P183490-02	480-145878-5	480-145878-7	P183490-04	480-145878-6	P183490-03	480-145878-11	480-145878-18	480-145878-17
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary
General Chemistry																
Cyanide	mg/kg	27_{i}	40_{i}	27_{i}	n/v	n/v	n/v	-	-	1.0 U	-	1.0 U	-	1.1 U	-	-
Metals																
Aluminum	mg/kg	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{a}$	$10{,}000_{a}$	$10{,}000_{a}$	-	-	7,340	-	7,260	-	7,050	-	-
Antimony	mg/kg	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{a}$	$10{,}000_{a}$	$10{,}000_{a}$	-	-	16.7 U	-	16.2 U	-	15.7 U	-	-
Arsenic	mg/kg	13_{n}	16_{q}	16_{q}	n/v	n/v	n/v	-	-	5.6	-	6.4	-	5.7	-	-
Barium	mg/kg	350_{n}	820	400	n/v	n/v	n/v	-	-	42.8	-	50.6	-	56.4	-	-
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	-	-	0.35	-	0.39	-	0.34	-	-
Cadmium	mg/kg	2.5_{n}	7.5	9.3	n/v	n/v	n/v	-	-	0.17 J	-	0.19 J	-	0.23	-	-
Calcium	mg/kg	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{a}$	$10{,}000_{a}$	$10{,}000_{a}$	-	-	**57,500^{ABCDEF}**	-	**18,300 J^{ABCDEF}**	-	**31,700 J^{ABCDEF}**	-	-
Chromium, Hexavalent	mg/kg	$1_{m,i}$	19_{i}	400_{i}	n/v	n/v	n/v	-	-	**1.7 J^{A}**	-	2.2 UJ	-	2.2 UJ	-	-
Chromium, Total	mg/kg	$30_{n,i}$	$_{NS,q}$	$1{,}500_{i}$	n/v	n/v	n/v	-	-	28.3	-	9.6	-	10.2	-	-
Cobalt	mg/kg	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{a}$	$10{,}000_{a}$	$10{,}000_{a}$	-	-	5.9	-	6.6	-	6.2	-	-
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	-	-	14.6	-	11.9	-	13.5	-	-
Iron	mg/kg	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{a}$	$10{,}000_{a}$	$10{,}000_{a}$	-	-	**14,800^{ABCDEF}**	-	**16,500^{ABCDEF}**	-	**15,000^{ABCDEF}**	-	-
Lead	mg/kg	63_{n}	450	1,000	n/v	n/v	n/v	-	-	**98.3^{A}**	-	18.3	-	22.9	-	-
Magnesium	mg/kg	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{e}$	n/v	n/v	n/v	-	-	5,430	-	6,920	-	5,170	-	-
Manganese	mg/kg	$1{,}600_{n}$	$2{,}000_{g}$	$10{,}000_{e}$	n/v	n/v	n/v	-	-	264	-	323 J	-	557 J	-	-
Mercury	mg/kg	0.18_{n}	0.73	2.8_{k}	n/v	n/v	n/v	-	-	0.023 U	-	0.023 U	-	0.022 U	-	-
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	-	-	16.0	-	16.4	-	15.2	-	-
Potassium	mg/kg	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{e}$	n/v	n/v	n/v	-	-	1,220	-	1,220	-	1,190	-	-
Selenium	mg/kg	3.9_{n}	4_{q}	1,500	n/v	n/v	n/v	-	-	4.5 U	-	4.3 U	-	4.2 U	-	-
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	-	-	0.67 U	-	0.65 U	-	0.63 U	-	-
Sodium	mg/kg	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{e}$	n/v	n/v	n/v	-	-	90.8 J	-	72.4 J	-	69.3 J	-	-
Thallium	mg/kg	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{a}$	$10{,}000_{a}$	$10{,}000_{a}$	-	-	6.7 U	-	6.5 U	-	6.3 U	-	-
Vanadium	mg/kg	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{e}$	$10{,}000_{a}$	$10{,}000_{a}$	$10{,}000_{a}$	-	-	14.7	-	13.7	-	13.5	-	-
Zinc	mg/kg	109_{n}	2,480	$10{,}000_{e}$	n/v	n/v	n/v	-	-	48.2	-	55.6	-	70.5	-	-
Polychlorinated Biphenyls																
PCB-1016 (Aroclor 1016)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	0.19 U	-	-	-	-	-	-	-
PCB-1221 (Aroclor 1221)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	0.19 U	-	-	-	-	-	-	-
PCB-1232 (Aroclor 1232)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	0.19 U	-	-	-	-	-	-	-
PCB-1242 (Aroclor 1242)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	0.19 U	-	-	-	-	-	-	-
PCB-1248 (Aroclor 1248)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	0.19 U	-	-	-	-	-	-	-
PCB-1254 (Aroclor 1254)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	0.19 U	-	-	-	-	-	-	-
PCB-1260 (Aroclor 1260)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	0.19 U	-	-	-	-	-	-	-
Polychlorinated Biphenyl (PCBs)	mg/kg	0.1	3.2	1	n/v	n/v	n/v	-	ND	-	-	-	-	-	-	-
Pesticides																
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	$100{,}000_{a}$	$1{,}000{,}000_{d}$	$500{,}000_{c}$	$500{,}000_{a}$	$1{,}000{,}000_{a}$	1,900	-	18 U	18 U	-	18 UJ	-	-	-	-
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	$100{,}000_{a}$	$1{,}000{,}000_{d}$	$500{,}000_{c}$	$500{,}000_{a}$	$1{,}000{,}000_{a}$	500	-	18 U	18 U	-	18 UJ	-	-	-	-
Aldrin	µg/kg	5_{n}	190	680	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Alpha Endosulfan	µg/kg	$2{,}400_{l}$	102,000	$200{,}000_{l}$	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Beta Endosulfan	µg/kg	$2{,}400_{l}$	102,000	$200{,}000_{l}$	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40_{n}	250	$500{,}000_{c}$	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Dieldrin	µg/kg	5_{n}	100	1,400	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Endosulfan Sulfate	µg/kg	$2{,}400_{l}$	$1{,}000{,}000_{d}$	$200{,}000_{l}$	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Endrin Aldehyde	µg/kg	$100{,}000_{a}$	$1{,}000{,}000_{d}$	$500{,}000_{c}$	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Endrin Ketone	µg/kg	$100{,}000_{a}$	$1{,}000{,}000_{d}$	$500{,}000_{c}$	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Gamma Chlordane (trans-Chlordane)	µg/kg	$100{,}000_{a}$	$1{,}000{,}000_{d}$	n/v	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Heptachlor Epoxide	µg/kg	$100{,}000_{a}$	$1{,}000{,}000_{d}$	$500{,}000_{c}$	$500{,}000_{a}$	$1{,}000{,}000_{a}$	20	-	18 U	-	-	-	-	-	-	-
Methoxychlor	µg/kg	$100{,}000_{a}$	$1{,}000{,}000_{d}$	$500{,}000_{c}$	$500{,}000_{a}$	$1{,}000{,}000_{a}$	900,000	-	18 U	-	-	-	-	-	-	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS101-cDE-s		MH-SS102_cDE-s			MH-SS102_cSH-s		MH-SS102_gA-DE-s	MH-SS102_gA-SH-s
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18
Sample ID								MH-101_cDE-s (480-145878-5)	MH-101-cDE-s	MH-102_cDE-s	MH-102_cDE-s (480-145878-7)	MH-102_cSH-s	MH-102_cSH-s (480-145878-6)	MH-SSDUP2-C-s	MH-SS102_gA-DE-s	MH-SS102_gA-SH-s
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								PAL	TALBUFF	TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			P183490	480-145858-1	480-145858-1	P183490	480-145858-1	P183490	480-145858-1	480-145858-1	480-145858-1
Laboratory Sample ID								P183490-02	480-145878-5	480-145878-7	P183490-04	480-145878-6	P183490-03	480-145878-11	480-145878-18	480-145878-17
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary
Pesticides (cont'd)																
P,P'-DDD	µg/kg	3.3$_m$	14,000	92,000	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
P,P'-DDE	µg/kg	3.3$_m$	17,000	62,000	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
P,P'-DDT	µg/kg	3.3$_m$	136,000	47,000	n/v	n/v	n/v	-	18 U	-	-	-	-	-	-	-
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000$_c$	n/v	n/v	n/v	-	18 U	18 U	-	18 UJ	-	-	-	-
Toxaphene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	180 U	-	-	-	-	-	-	-
Organophosphorus Compounds																
Aspon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	0.017 U	-	-	0.017 U	-	0.017 U	-	-	-
Chlorofenvinphos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	0.017 U	-	-	0.017 U	-	0.017 U	-	-	-
Chlorpyrifos-methyl	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	0.017 U	-	-	0.017 U	-	0.017 U	-	-	-
Dichlorofenthion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	0.017 U	-	-	0.017 U	-	0.017 U	-	-	-
Dicrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	0.017 U	-	-	0.017 U	-	0.017 U	-	-	-
Ethion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	0.017 U	-	-	0.017 U	-	0.017 U	-	-	-
Fenitrothion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	0.017 U	-	-	0.017 U	-	0.017 U	-	-	-
Fonofos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	0.017 U	-	-	0.017 U	-	0.017 U	-	-	-
Monochrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	0.017 U	-	-	0.017 U	-	0.017 U	-	-	-
Phosphamidon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	0.017 U	-	-	0.017 U	-	0.017 U	-	-	-
Semi-Volatile Organics																
2-Methylphenol (O-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
3-Methylphenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	1,700 U	-	-	-	-	-	-	-
4-Methylphenol (P-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	1,700 U	-	-	-	-	-	-	-
Acenaphthene	µg/kg	20,000	98,000	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Acenaphthylene	µg/kg	100,000$_a$	107,000	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Anthracene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Benzo(A)Anthracene	µg/kg	1,000$_n$	1,000$_g$	5,600	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Benzo(A)Pyrene	µg/kg	1,000$_n$	22,000	1,000$_q$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Benzo(B)Fluoranthene	µg/kg	1,000$_n$	1,700	5,600	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Benzo(K)Fluoranthene	µg/kg	800$_n$	1,700	56,000	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Chrysene	µg/kg	1,000$_n$	1,000$_g$	56,000	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Dibenz(A,H)Anthracene	µg/kg	330$_m$	1,000,000$_d$	560	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Dibenzofuran	µg/kg	7,000	210,000	350,000	500,000$_a$	1,000,000$_a$	6,200	-	900 U	-	-	-	-	-	-	-
Fluoranthene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Fluorene	µg/kg	30,000	386,000	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Hexachlorobenzene	µg/kg	330$_m$	3,200	6,000	500,000$_a$	1,000,000$_a$	1,400	-	900 U	-	-	-	-	-	-	-
Indeno(1,2,3-C,D)Pyrene	µg/kg	500$_n$	8,200	5,600	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	800$_m$	800$_f$	6,700	n/v	n/v	n/v	-	1,700 U	-	-	-	-	-	-	-
Phenanthrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Phenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
Pyrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	900 U	-	-	-	-	-	-	-
SVOCs - Tentatively Identified Compounds																
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	ND	-	-	-	-	-	-	-
Volatile Organic Compounds																
1,1,1-Trichloroethane	µg/kg	680	680	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
1,1-Dichloroethene	µg/kg	330	330	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
1,2-Dichloroethane	µg/kg	20$_m$	20$_g$	30,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
1,4-Dioxane (P-Dioxane)	µg/kg	100$_m$	100$_f$	130,000	n/v	n/v	n/v	-	-	-	-	-	-	-	100 R	100 R
Acetone	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	26 U	26 U
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS101-cDE-s		MH-SS102_cDE-s			MH-SS102_cSH-s		MH-SS102_gA-DE-s	MH-SS102_gA-SH-s
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18
Sample ID								MH-101_cDE-s (480-145878-5)	MH-101-cDE-s	MH-102_cDE-s	MH-102_cDE-s (480-145878-7)	MH-102_cSH-s	MH-102_cSH-s (480-145878-6)	MH-SSDUP2-C-s	MH-SS102_gA-DE-s	MH-SS102_gA-SH-s
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								PAL	TALBUFF	TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			P183490	480-145858-1	480-145858-1	P183490	480-145858-1	P183490	480-145858-1	480-145858-1	480-145858-1
Laboratory Sample ID								P183490-02	480-145878-5	480-145878-7	P183490-04	480-145878-6	P183490-03	480-145878-11	480-145878-18	480-145878-17
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary
Volatile Organic Compounds (cont'd)																
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Chlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	-	-	-	-	-	-	-	0.42 J	0.40 J
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Cymene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	10,000	-	-	-	-	-	-	-	5.2 U	5.2 U
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Isopropylbenzene (Cumene)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	2,300	-	-	-	-	-	-	-	5.2 U	5.2 U
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000$_c$	500,000$_a$	1,000,000$_a$	300	-	-	-	-	-	-	-	26 U	26 U
Methylene Chloride	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
M-P-Xylene	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	-	-	-	-	-	-	-	10 U	10 U
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
N-Butylbenzene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
N-Propylbenzene	µg/kg	3,900	3,900	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
T-Butylbenzene	µg/kg	5,900	5,900	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	500,000$_a$	1,000,000$_a$	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Toluene	µg/kg	700	700	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	-	-	-	-	-	-	-	5.2 U	5.2 U
Xylenes	µg/kg	260	1,600	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	10 U	10 U

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS102_gB-DE-s		MH-SS102_gB-SG-s	MH-SS103_CDE-S		MH-SS103_CSH-S		MH-SS103_GA-DE-S	MH-SS103_GA-SH-S	MH-SS103_GB-DE-S	MH-SS103_GB-SH-S
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-SS102_gB-DE-s	MH-SSDUP-2-g-s	MH-SS102_gB-SG-s	MH-103_CDE-S	MH-103_CDE-S (480-146045-18)	MH-103_CSH-S	MH-103_CSH-S (480-146045-17)	MH-SS103_GA-DE-S	MH-SS103_GA-SH-S	MH-SS103_GB-DE-S	MH-SS103_GB-SH-S
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory		NYSDEC-Part 375 (2006)			NYSDEC CP-51			TALBUFF	TALBUFF	TALBUFF	TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order								480-145858-1	480-145858-1	480-145858-1	480-146045-1	P183518	480-146045-1	P183518	480-146045-1	480-146045-1	480-146045-1	480-146045-1
Laboratory Sample ID								480-145878-20	480-145878-21	480-145878-19	480-146045-18	P183518-02	480-146045-17	P183518-01	480-146045-2	480-146045-1	480-146045-4	480-146045-3
Sample Type	Units	A	B	C	D	E	F	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
General Chemistry																		
Cyanide	mg/kg	27[j]	40[j]	27[j]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Metals																		
Aluminum	mg/kg	10,000[e]	10,000[e]	10,000[e]	10,000[a]	10,000[a]	10,000[a]	-	-	-	-	-	-	-	-	-	-	-
Antimony	mg/kg	10,000[e]	10,000[e]	10,000[e]	10,000[a]	10,000[a]	10,000[a]	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	13[n]	16[q]	16[q]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/kg	350[n]	820	400	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	2.5[n]	7.5	9.3	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Calcium	mg/kg	10,000[e]	10,000[e]	10,000[e]	10,000[a]	10,000[a]	10,000[a]	-	-	-	-	-	-	-	-	-	-	-
Chromium, Hexavalent	mg/kg	1[m,i]	19[i]	400[i]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Chromium, Total	mg/kg	30[n,i]	[NS,q]	1,500[i]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Cobalt	mg/kg	10,000[e]	10,000[e]	10,000[e]	10,000[a]	10,000[a]	10,000[a]	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Iron	mg/kg	10,000[e]	10,000[e]	10,000[e]	10,000[a]	10,000[a]	10,000[a]	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	63[n]	450	1,000	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/kg	10,000[e]	10,000[e]	10,000[e]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/kg	1,600[n]	2,000[g]	10,000[e]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.18[n]	0.73	2.8[k]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Potassium	mg/kg	10,000[e]	10,000[e]	10,000[e]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	3.9[n]	4[q]	1,500	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Sodium	mg/kg	10,000[e]	10,000[e]	10,000[e]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Thallium	mg/kg	10,000[e]	10,000[e]	10,000[e]	10,000[a]	10,000[a]	10,000[a]	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	10,000[e]	10,000[e]	10,000[e]	10,000[a]	10,000[a]	10,000[a]	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	109[n]	2,480	10,000[e]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																		
PCB-1016 (Aroclor 1016)	mg/kg	[o]	[o]	[o]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
PCB-1221 (Aroclor 1221)	mg/kg	[o]	[o]	[o]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
PCB-1232 (Aroclor 1232)	mg/kg	[o]	[o]	[o]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
PCB-1242 (Aroclor 1242)	mg/kg	[o]	[o]	[o]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
PCB-1248 (Aroclor 1248)	mg/kg	[o]	[o]	[o]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
PCB-1254 (Aroclor 1254)	mg/kg	[o]	[o]	[o]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
PCB-1260 (Aroclor 1260)	mg/kg	[o]	[o]	[o]	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyl (PCBs)	mg/kg	0.1	3.2	1	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Pesticides																		
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	500,000[a]	1,000,000[a]	1,900	-	-	-	19 U	-	19 U	-	-	-	-	-
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	500,000[a]	1,000,000[a]	500	-	-	-	19 U	-	19 U	-	-	-	-	-
Aldrin	µg/kg	5[n]	190	680	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Alpha Endosulfan	µg/kg	2,400[l]	102,000	200,000[l]	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Beta Endosulfan	µg/kg	2,400[l]	102,000	200,000[l]	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40[n]	250	500,000[c]	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Dieldrin	µg/kg	5[n]	100	1,400	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Endosulfan Sulfate	µg/kg	2,400[l]	1,000,000[d]	200,000[l]	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Endrin Aldehyde	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Endrin Ketone	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Gamma Chlordane (trans-Chlordane)	µg/kg	100,000[a]	1,000,000[d]	n/v	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Heptachlor Epoxide	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	500,000[a]	1,000,000[a]	20	-	-	-	38 U	-	38 U	-	-	-	-	-
Methoxychlor	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	500,000[a]	1,000,000[a]	900,000	-	-	-	38 U	-	38 U	-	-	-	-	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS102_gB-DE-s		MH-SS102_gB-SG-s	MH-SS103_CDE-S		MH-SS103_CSH-S		MH-SS103_GA-DE-S	MH-SS103_GA-SH-S	MH-SS103_GB-DE-S	MH-SS103_GB-SH-S
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-SS102_gB-DE-s	MH-SSDUP-2-g-s	MH-SS102_gB-SG-s	MH-103_CDE-S	MH-103_CDE-S (480-146045-18)	MH-103_CSH-S	MH-103_CSH-S (480-146045-17)	MH-SS103_GA-DE-S	MH-SS103_GA-SH-S	MH-SS103_GB-DE-S	MH-SS103_GB-SH-S
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory		NYSDEC-Part 375 (2006)			NYSDEC CP-51			TALBUFF	TALBUFF	TALBUFF	TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order								480-145858-1	480-145858-1	480-145858-1	480-146045-1	P183518	480-146045-1	P183518	480-146045-1	480-146045-1	480-146045-1	480-146045-1
Laboratory Sample ID								480-145878-20	480-145878-21	480-145878-19	480-146045-18	P183518-02	480-146045-17	P183518-01	480-146045-2	480-146045-1	480-146045-4	480-146045-3
Sample Type	Units	A	B	C	D	E	F	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Pesticides (cont'd)																		
P,P'-DDD	µg/kg	3.3$_m$	14,000	92,000	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
P,P'-DDE	µg/kg	3.3$_m$	17,000	62,000	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
P,P'-DDT	µg/kg	3.3$_m$	136,000	47,000	n/v	n/v	n/v	-	-	-	38 U	-	38 U	-	-	-	-	-
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000$_c$	n/v	n/v	n/v	-	-	-	19 U	-	19 U	-	-	-	-	-
Toxaphene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	380 U	-	380 U	-	-	-	-	-
Organophosphorus Compounds																		
Aspon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	0.017 U	-	0.017 U	-	-	-	-
Chlorofenvinphos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	0.017 U	-	0.017 U	-	-	-	-
Chlorpyrifos-methyl	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	0.017 U	-	0.017 U	-	-	-	-
Dichlorofenthion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	0.017 U	-	0.017 U	-	-	-	-
Dicrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	0.017 U	-	0.017 U	-	-	-	-
Ethion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	0.017 U	-	0.017 U	-	-	-	-
Fenitrothion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	0.017 U	-	0.017 U	-	-	-	-
Fonofos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	0.017 U	-	0.017 U	-	-	-	-
Monochrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	0.017 U	-	0.017 U	-	-	-	-
Phosphamidon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	0.017 U	-	0.017 U	-	-	-	-
Semi-Volatile Organics																		
2-Methylphenol (O-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
3-Methylphenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol (P-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/kg	20,000	98,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/kg	100,000$_a$	107,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Benzo(A)Anthracene	µg/kg	1,000$_n$	1,000$_g$	5,600	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Benzo(A)Pyrene	µg/kg	1,000$_n$	22,000	1,000$_q$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Benzo(B)Fluoranthene	µg/kg	1,000$_n$	1,700	5,600	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Benzo(K)Fluoranthene	µg/kg	800$_n$	1,700	56,000	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/kg	1,000$_n$	1,000$_g$	56,000	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Dibenz(A,H)Anthracene	µg/kg	330$_m$	1,000,000$_d$	560	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/kg	7,000	210,000	350,000	500,000$_a$	1,000,000$_a$	6,200	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/kg	30,000	386,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/kg	330$_m$	3,200	6,000	500,000$_a$	1,000,000$_a$	1,400	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-C,D)Pyrene	µg/kg	500$_n$	8,200	5,600	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	800$_m$	800$_f$	6,700	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Phenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
SVOCs - Tentatively Identified Compounds																		
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/kg	680	680	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
1,1-Dichloroethene	µg/kg	330	330	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
1,2-Dichloroethane	µg/kg	20$_m$	20$_g$	30,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
1,4-Dioxane (P-Dioxane)	µg/kg	100$_m$	100$_f$	130,000	n/v	n/v	n/v	**110 R^{AB}**	**110 R^{AB}**	**110 R^{AB}**	-	-	-	-	**110 R^{AB}**	100 R	**110 R^{AB}**	**120 R^{AB}**
Acetone	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	15 J	25 J	8.3 J	-	-	-	-	26 U	26 U	27 U	29 U
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS102_gB-DE-s		MH-SS102_gB-SG-s	MH-SS103_CDE-S		MH-SS103_CSH-S		MH-SS103_GA-DE-S	MH-SS103_GA-SH-S	MH-SS103_GB-DE-S	MH-SS103_GB-SH-S
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-SS102_gB-DE-s	MH-SSDUP-2-g-s	MH-SS102_gB-SG-s	MH-103_CDE-S	MH-103_CDE-S (480-146045-18)	MH-103_CSH-S	MH-103_CSH-S (480-146045-17)	MH-SS103_GA-DE-S	MH-SS103_GA-SH-S	MH-SS103_GB-DE-S	MH-SS103_GB-SH-S
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory		NYSDEC-Part 375 (2006)			NYSDEC CP-51			TALBUFF	TALBUFF	TALBUFF	TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order								480-145858-1	480-145858-1	480-145858-1	480-146045-1	P183518	480-146045-1	P183518	480-146045-1	480-146045-1	480-146045-1	480-146045-1
Laboratory Sample ID								480-145878-20	480-145878-21	480-145878-19	480-146045-18	P183518-02	480-146045-17	P183518-01	480-146045-2	480-146045-1	480-146045-4	480-146045-3
Sample Type	Units	A	B	C	D	E	F	Primary	Field Duplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds (cont'd)																		
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Chlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	5.6 U	0.40 J	0.40 J	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Cymene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	10,000	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Isopropylbenzene (Cumene)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	2,300	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000$_c$	500,000$_a$	1,000,000$_a$	300	28 U	28 U	28 U	-	-	-	-	26 U	26 U	27 U	29 U
Methylene Chloride	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
M-P-Xylene	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	11 U	11 U	11 U	-	-	-	-	11 U	10 U	11 U	12 U
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
N-Butylbenzene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
N-Propylbenzene	µg/kg	3,900	3,900	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
T-Butylbenzene	µg/kg	5,900	5,900	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	500,000$_a$	1,000,000$_a$	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Toluene	µg/kg	700	700	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000$_c$	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	5.6 U	5.7 U	5.6 U	-	-	-	-	5.3 U	5.1 U	5.4 U	5.8 U
Xylenes	µg/kg	260	1,600	500,000$_c$	n/v	n/v	n/v	11 U	11 U	11 U	-	-	-	-	11 U	10 U	11 U	12 U

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS104_CDE-S		MH-SS104_CSH-S		MH-SS104_GA-DE-S	MH-SS104_GA-SH-S	MH-SS104_GB-DE-S	MH-SS104_GB-SH-S
Sample Date								28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-104_CDE-S	MH-104_CDE-S (480-146045-24)	MH-104_CSH-S	MH-104_CSH-S (480-146045-23)	MH-SS104_GA-DE-S	MH-SS104_GA-SH-S	MH-SS104_GB-DE-S	MH-SS104_GB-SH-S
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-146045-1	P183518	480-146045-1	P183518	480-146045-1	480-146045-1	480-146045-1	480-146045-1
Laboratory Sample ID								480-146045-24	P183518-08	480-146045-23	P183518-07	480-146045-14	480-146045-13	480-146045-16	480-146045-15
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
General Chemistry															
Cyanide	mg/kg	27$_{i}$	40$_{i}$	27$_{i}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Metals															
Aluminum	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-
Antimony	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-
Arsenic	mg/kg	13$_{n}$	16$_{q}$	16$_{q}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Barium	mg/kg	350$_{n}$	820	400	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Cadmium	mg/kg	2.5$_{n}$	7.5	9.3	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Calcium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-
Chromium, Hexavalent	mg/kg	1$_{m,i}$	19$_{i}$	400$_{i}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Chromium, Total	mg/kg	30$_{n,i}$	$_{NS,q}$	1,500$_{i}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Cobalt	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Iron	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-
Lead	mg/kg	63$_{n}$	450	1,000	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Magnesium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Manganese	mg/kg	1,600$_{n}$	2,000$_{g}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.18$_{n}$	0.73	2.8$_{k}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Potassium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Selenium	mg/kg	3.9$_{n}$	4$_{q}$	1,500	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Sodium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Thallium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-
Vanadium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-
Zinc	mg/kg	109$_{n}$	2,480	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls															
PCB-1016 (Aroclor 1016)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	0.27 U	-	0.21 U	-	-	-	-	-
PCB-1221 (Aroclor 1221)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	0.27 U	-	0.21 U	-	-	-	-	-
PCB-1232 (Aroclor 1232)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	0.27 U	-	0.21 U	-	-	-	-	-
PCB-1242 (Aroclor 1242)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	0.27 U	-	0.21 U	-	-	-	-	-
PCB-1248 (Aroclor 1248)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	0.27 U	-	0.21 U	-	-	-	-	-
PCB-1254 (Aroclor 1254)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	0.27 U	-	0.21 U	-	-	-	-	-
PCB-1260 (Aroclor 1260)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	0.27 U	-	0.21 U	-	-	-	-	-
Polychlorinated Biphenyl (PCBs)	mg/kg	0.1	3.2	1	n/v	n/v	n/v	ND	-	ND	-	-	-	-	-
Pesticides															
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	1,900	19 U	-	19 U	-	-	-	-	-
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	500	19 U	-	19 U	-	-	-	-	-
Aldrin	µg/kg	5$_{n}$	190	680	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Alpha Endosulfan	µg/kg	2,400$_{l}$	102,000	200,000$_{l}$	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Beta Endosulfan	µg/kg	2,400$_{l}$	102,000	200,000$_{l}$	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40$_{n}$	250	500,000$_{c}$	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Dieldrin	µg/kg	5$_{n}$	100	1,400	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Endosulfan Sulfate	µg/kg	2,400$_{l}$	1,000,000$_{d}$	200,000$_{l}$	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Endrin Aldehyde	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Endrin Ketone	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Gamma Chlordane (trans-Chlordane)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	n/v	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Heptachlor Epoxide	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	20	9.4 U	-	19 U	-	-	-	-	-
Methoxychlor	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	900,000	9.4 U	-	19 U	-	-	-	-	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS104_CDE-S		MH-SS104_CSH-S		MH-SS104_GA-DE-S	MH-SS104_GA-SH-S	MH-SS104_GB-DE-S	MH-SS104_GB-SH-S
Sample Date								28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-104_CDE-S	MH-104_CDE-S (480-146045-24)	MH-104_CSH-S	MH-104_CSH-S (480-146045-23)	MH-SS104_GA-DE-S	MH-SS104_GA-SH-S	MH-SS104_GB-DE-S	MH-SS104_GB-SH-S
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-146045-1	P183518	480-146045-1	P183518	480-146045-1	480-146045-1	480-146045-1	480-146045-1
Laboratory Sample ID								480-146045-24	P183518-08	480-146045-23	P183518-07	480-146045-14	480-146045-13	480-146045-16	480-146045-15
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Pesticides (cont'd)															
P,P'-DDD	µg/kg	3.3[m]	14,000	92,000	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
P,P'-DDE	µg/kg	3.3[m]	17,000	62,000	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
P,P'-DDT	µg/kg	3.3[m]	136,000	47,000	n/v	n/v	n/v	9.4 U	-	19 U	-	-	-	-	-
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000[c]	n/v	n/v	n/v	19 U	-	19 U	-	-	-	-	-
Toxaphene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	94 U	-	190 U	-	-	-	-	-
Organophosphorus Compounds															
Aspon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-
Chlorofenvinphos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-
Chlorpyrifos-methyl	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-
Dichlorofenthion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-
Dicrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-
Ethion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-
Fenitrothion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-
Fonofos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-
Monochrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-
Phosphamidon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-
Semi-Volatile Organics															
2-Methylphenol (O-Cresol)	µg/kg	330[m]	330[f]	500,000[c]	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
3-Methylphenol	µg/kg	330[m]	330[f]	500,000[c]	n/v	n/v	n/v	370 U	-	1,900 U	-	-	-	-	-
4-Methylphenol (P-Cresol)	µg/kg	330[m]	330[f]	500,000[c]	n/v	n/v	n/v	370 U	-	1,900 U	-	-	-	-	-
Acenaphthene	µg/kg	20,000	98,000	500,000[c]	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
Acenaphthylene	µg/kg	100,000[a]	107,000	500,000[c]	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
Anthracene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
Benzo(A)Anthracene	µg/kg	1,000[n]	1,000[g]	5,600	n/v	n/v	n/v	33 J	-	990 U	-	-	-	-	-
Benzo(A)Pyrene	µg/kg	1,000[n]	22,000	1,000[q]	n/v	n/v	n/v	33 J	-	990 U	-	-	-	-	-
Benzo(B)Fluoranthene	µg/kg	1,000[n]	1,700	5,600	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	33 J	-	990 U	-	-	-	-	-
Benzo(K)Fluoranthene	µg/kg	800[n]	1,700	56,000	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
Chrysene	µg/kg	1,000[n]	1,000[g]	56,000	n/v	n/v	n/v	44 J	-	990 U	-	-	-	-	-
Dibenz(A,H)Anthracene	µg/kg	330[m]	1,000,000[d]	560	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
Dibenzofuran	µg/kg	7,000	210,000	350,000	500,000[a]	1,000,000[a]	6,200	190 U	-	990 U	-	-	-	-	-
Fluoranthene	µg/kg	100,000[a]	1,000,000[d]	500,000[c]	n/v	n/v	n/v	45 J	-	990 U	-	-	-	-	-
Fluorene	µg/kg	30,000	386,000	500,000[c]	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
Hexachlorobenzene	µg/kg	330[m]	3,200	6,000	500,000[a]	1,000,000[a]	1,400	190 U	-	990 U	-	-	-	-	-
Indeno(1,2,3-C,D)Pyrene	µg/kg	500[n]	8,200	5,600	n/v	n/v	n/v	23 J	-	990 U	-	-	-	-	-
Naphthalene	µg/kg	12,000	12,000	500,000[c]	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
Pentachlorophenol	µg/kg	800[m]	800[f]	6,700	n/v	n/v	n/v	370 UJ	-	1,900 UJ	-	-	-	-	-
Phenanthrene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
Phenol	µg/kg	330[m]	330[f]	500,000[c]	n/v	n/v	n/v	190 U	-	990 U	-	-	-	-	-
Pyrene	µg/kg	100,000	1,000,000[d]	500,000[c]	n/v	n/v	n/v	53 J	-	990 U	-	-	-	-	-
SVOCs - Tentatively Identified Compounds															
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	ND	-	ND	-	-	-	-	-
Volatile Organic Compounds															
1,1,1-Trichloroethane	µg/kg	680	680	500,000[c]	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
1,1-Dichloroethene	µg/kg	330	330	500,000[c]	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 UJ	5.7 U
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000[c]	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 UJ	5.7 U
1,2-Dichloroethane	µg/kg	20[m]	20[g]	30,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 UJ	5.7 U
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 UJ	5.7 U
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 UJ	5.7 U
1,4-Dioxane (P-Dioxane)	µg/kg	100[m]	100[f]	130,000	n/v	n/v	n/v	-	-	-	-	100 R	**110 R[AB]**	**110 R[AB]**	**110 R[AB]**
Acetone	µg/kg	50	50	500,000[c]	n/v	n/v	n/v	-	-	-	-	26 U	27 U	15 J-	28 U
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS104_CDE-S		MH-SS104_CSH-S		MH-SS104_GA-DE-S	MH-SS104_GA-SH-S	MH-SS104_GB-DE-S	MH-SS104_GB-SH-S
Sample Date								28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-104_CDE-S	MH-104_CDE-S (480-146045-24)	MH-104_CSH-S	MH-104_CSH-S (480-146045-23)	MH-SS104_GA-DE-S	MH-SS104_GA-SH-S	MH-SS104_GB-DE-S	MH-SS104_GB-SH-S
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-146045-1	P183518	480-146045-1	P183518	480-146045-1	480-146045-1	480-146045-1	480-146045-1
Laboratory Sample ID								480-146045-24	P183518-08	480-146045-23	P183518-07	480-146045-14	480-146045-13	480-146045-16	480-146045-15
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds (cont'd)															
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Chlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Cymene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	10,000	-	-	-	-	5.2 U	5.4 U	5.3 UJ	5.7 U
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Isopropylbenzene (Cumene)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	2,300	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000$_c$	500,000$_a$	1,000,000$_a$	300	-	-	-	-	26 U	27 U	27 UJ	28 U
Methylene Chloride	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
M-P-Xylene	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	-	-	-	-	10 U	11 U	11 U	11 U
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
N-Butylbenzene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 UJ	5.7 U
N-Propylbenzene	µg/kg	3,900	3,900	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 UJ	5.7 U
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 UJ	5.7 U
T-Butylbenzene	µg/kg	5,900	5,900	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 UJ	5.7 U
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	500,000$_a$	1,000,000$_a$	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Toluene	µg/kg	700	700	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	-	-	-	-	5.2 U	5.4 U	5.3 U	5.7 U
Xylenes	µg/kg	260	1,600	500,000$_c$	n/v	n/v	n/v	-	-	-	-	10 U	11 U	11 UJ	11 U

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS105_cDE-s		MH-SS105_cSH-s		MH-SS105_gA-DE-s	MH-SS105_gA-SH-s	MH-SS105_gB-DE-s	MH-SS105_gB-SH-s	MH-SS106_CDE-S	
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-105_cDE-s	MH-105_cDE-s (480-145878-9)	MH-105_cSH-s	MH-105_cSH-s (480-145878-8)	MH-SS105_gA-DE-s	MH-SS105_gA-SH-s	MH-SS105_gB-DE-s	MH-SS105_gB-SH-s	MH-106_CDE-S	MH-106_CDE-S (480-146045-22)
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF	TALBUFF	PAL
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-145858-1	P183490	480-145858-1	P183490	480-145858-1	480-145858-1	480-145858-1	480-145858-1	480-146045-1	P183518
Laboratory Sample ID								480-145878-9	P183490-06	480-145878-8	P183490-05	480-145878-1	480-145878-22	480-145878-3	480-145878-2	480-146045-22	P183518-06
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
General Chemistry																	
Cyanide	mg/kg	27$_{i}$	40$_{i}$	27$_{i}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	1.0 U	-
Metals																	
Aluminum	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	7,260	-
Antimony	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	17.4 U	-
Arsenic	mg/kg	13$_{n}$	16$_{q}$	16$_{q}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	6.5	-
Barium	mg/kg	350$_{n}$	820	400	n/v	n/v	n/v	-	-	-	-	-	-	-	-	46.1	-
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	-	-	-	-	-	-	-	-	0.33	-
Cadmium	mg/kg	2.5$_{n}$	7.5	9.3	n/v	n/v	n/v	-	-	-	-	-	-	-	-	0.16 J	-
Calcium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	7,540	-
Chromium, Hexavalent	mg/kg	1$_{m,i}$	19$_{i}$	400$_{i}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	2.3 U	-
Chromium, Total	mg/kg	30$_{n,i}$	$_{NS,q}$	1,500$_{i}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	8.9	-
Cobalt	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	5.7	-
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	-	-	-	-	-	-	-	-	13.4	-
Iron	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	**15,100^{ABCDEF}**	-
Lead	mg/kg	63$_{n}$	450	1,000	n/v	n/v	n/v	-	-	-	-	-	-	-	-	10.4	-
Magnesium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	3,260	-
Manganese	mg/kg	1,600$_{n}$	2,000$_{g}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	360	-
Mercury	mg/kg	0.18$_{n}$	0.73	2.8$_{k}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	0.011 J	-
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	-	-	-	-	-	-	-	-	13.6	-
Potassium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	1,090	-
Selenium	mg/kg	3.9$_{n}$	4$_{q}$	1,500	n/v	n/v	n/v	-	-	-	-	-	-	-	-	0.56 J	-
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	-	-	-	-	-	-	-	-	0.70 U	-
Sodium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	65.9 J	-
Thallium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	7.0 U	-
Vanadium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-	-	-	-	-	12.7	-
Zinc	mg/kg	109$_{n}$	2,480	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	53.5	-
Polychlorinated Biphenyls																	
PCB-1016 (Aroclor 1016)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1221 (Aroclor 1221)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1232 (Aroclor 1232)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1242 (Aroclor 1242)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1248 (Aroclor 1248)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1254 (Aroclor 1254)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1260 (Aroclor 1260)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyl (PCBs)	mg/kg	0.1	3.2	1	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Pesticides																	
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	1,900	18 UJ	-	19 U	-	-	-	-	-	19 U	-
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	500	18 UJ	-	19 U	-	-	-	-	-	19 U	-
Aldrin	µg/kg	5$_{n}$	190	680	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Alpha Endosulfan	µg/kg	2,400$_{l}$	102,000	200,000$_{l}$	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Beta Endosulfan	µg/kg	2,400$_{l}$	102,000	200,000$_{l}$	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40$_{n}$	250	500,000$_{c}$	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Dieldrin	µg/kg	5$_{n}$	100	1,400	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Endosulfan Sulfate	µg/kg	2,400$_{l}$	1,000,000$_{d}$	200,000$_{l}$	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Endrin Aldehyde	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Endrin Ketone	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Gamma Chlordane (trans-Chlordane)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	n/v	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
Heptachlor Epoxide	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	20	18 U	-	19 U	-	-	-	-	-	-	-
Methoxychlor	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	900,000	18 U	-	19 U	-	-	-	-	-	-	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS105_cDE-s		MH-SS105_cSH-s		MH-SS105_gA-DE-s	MH-SS105_gA-SH-s	MH-SS105_gB-DE-s	MH-SS105_gB-SH-s	MH-SS106_CDE-S	
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-105_cDE-s	MH-105_cDE-s (480-145878-9)	MH-105_cSH-s	MH-105_cSH-s (480-145878-8)	MH-SS105_gA-DE-s	MH-SS105_gA-SH-s	MH-SS105_gB-DE-s	MH-SS105_gB-SH-s	MH-106_CDE-S	MH-106_CDE-S (480-146045-22)
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF	TALBUFF	PAL
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-145858-1	P183490	480-145858-1	P183490	480-145858-1	480-145858-1	480-145858-1	480-145858-1	480-146045-1	P183518
Laboratory Sample ID								480-145878-9	P183490-06	480-145878-8	P183490-05	480-145878-1	480-145878-22	480-145878-3	480-145878-2	480-146045-22	P183518-06
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Pesticides (cont'd)																	
P,P'-DDD	µg/kg	3.3$_m$	14,000	92,000	n/v	n/v	n/v	18 U	-	19 U	-	-	-	-	-	-	-
P,P'-DDE	µg/kg	3.3$_m$	17,000	62,000	n/v	n/v	n/v	**4.7 J^A**	-	19 U	-	-	-	-	-	-	-
P,P'-DDT	µg/kg	3.3$_m$	136,000	47,000	n/v	n/v	n/v	**6.6 J^A**	-	19 U	-	-	-	-	-	-	-
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000$_c$	n/v	n/v	n/v	18 UJ	-	19 U	-	-	-	-	-	19 U	-
Toxaphene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	180 U	-	190 U	-	-	-	-	-	-	-
Organophosphorus Compounds																	
Aspon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-	0.017 U
Chlorofenvinphos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-	0.017 U
Chlorpyrifos-methyl	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-	0.017 U
Dichlorofenthion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-	0.017 U
Dicrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-	0.017 U
Ethion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-	0.017 U
Fenitrothion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-	0.017 U
Fonofos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-	0.017 U
Monochrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-	0.017 U
Phosphamidon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	0.017 U	-	-	-	-	-	0.017 U
Semi-Volatile Organics																	
2-Methylphenol (O-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
3-Methylphenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
4-Methylphenol (P-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/kg	20,000	98,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/kg	100,000$_a$	107,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Benzo(A)Anthracene	µg/kg	1,000$_n$	1,000$_g$	5,600	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Benzo(A)Pyrene	µg/kg	1,000$_n$	22,000	1,000$_q$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Benzo(B)Fluoranthene	µg/kg	1,000$_n$	1,700	5,600	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Benzo(K)Fluoranthene	µg/kg	800$_n$	1,700	56,000	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/kg	1,000$_n$	1,000$_g$	56,000	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Dibenz(A,H)Anthracene	µg/kg	330$_m$	1,000,000$_d$	560	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/kg	7,000	210,000	350,000	500,000$_a$	1,000,000$_a$	6,200	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/kg	30,000	386,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/kg	330$_m$	3,200	6,000	500,000$_a$	1,000,000$_a$	1,400	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-C,D)Pyrene	µg/kg	500$_n$	8,200	5,600	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	800$_m$	800$_f$	6,700	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Phenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SVOCs - Tentatively Identified Compounds																	
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																	
1,1,1-Trichloroethane	µg/kg	680	680	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
1,1-Dichloroethene	µg/kg	330	330	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 UJ	6.3 U	5.9 U	5.7 U	-	-
1,2-Dichloroethane	µg/kg	20$_m$	20$_g$	30,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
1,4-Dioxane (P-Dioxane)	µg/kg	100$_m$	100$_f$	130,000	n/v	n/v	n/v	-	-	-	-	**110 R^{AB}**	**130 R^{AB}**	**120 R^{AB}**	**110 R^{AB}**	-	-
Acetone	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	-	-	-	-	28 UJ	32 U	29 U	28 U	-	-
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS105_cDE-s		MH-SS105_cSH-s		MH-SS105_gA-DE-s	MH-SS105_gA-SH-s	MH-SS105_gB-DE-s	MH-SS105_gB-SH-s	MH-SS106_CDE-S	
Sample Date								27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	27-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-105_cDE-s	MH-105_cDE-s (480-145878-9)	MH-105_cSH-s	MH-105_cSH-s (480-145878-8)	MH-SS105_gA-DE-s	MH-SS105_gA-SH-s	MH-SS105_gB-DE-s	MH-SS105_gB-SH-s	MH-106_CDE-S	MH-106_CDE-S (480-146045-22)
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	PAL	TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF	TALBUFF	PAL
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-145858-1	P183490	480-145858-1	P183490	480-145858-1	480-145858-1	480-145858-1	480-145858-1	480-146045-1	P183518
Laboratory Sample ID								480-145878-9	P183490-06	480-145878-8	P183490-05	480-145878-1	480-145878-22	480-145878-3	480-145878-2	480-146045-22	P183518-06
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds (cont'd)																	
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Chlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	-	-	-	-	0.93 J	0.45 J	0.63 J	0.68 J	-	-
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Cymene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	10,000	-	-	-	-	5.6 UJ	6.3 U	5.9 U	5.7 U	-	-
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Isopropylbenzene (Cumene)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	2,300	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000$_c$	500,000$_a$	1,000,000$_a$	300	-	-	-	-	28 UJ	32 U	29 U	28 U	-	-
Methylene Chloride	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.4 J	6.3 U	5.9 U	5.7 U	-	-
M-P-Xylene	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	-	-	-	-	11 U	13 U	12 U	11 U	-	-
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
N-Butylbenzene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 UJ	6.3 U	5.9 U	5.7 U	-	-
N-Propylbenzene	µg/kg	3,900	3,900	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 UJ	6.3 U	5.9 U	5.7 U	-	-
T-Butylbenzene	µg/kg	5,900	5,900	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	500,000$_a$	1,000,000$_a$	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Toluene	µg/kg	700	700	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000$_c$	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	-	-	-	-	5.6 U	6.3 U	5.9 U	5.7 U	-	-
Xylenes	µg/kg	260	1,600	500,000$_c$	n/v	n/v	n/v	-	-	-	-	11 U	13 U	12 U	11 U	-	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS106_CSH-S		MH-SS106_GA-DE-S	MH-SS106_GA-SH-S	MH-SS106_GB-DE-S	MH-SS106_GB-SH-S	MH-SS107_CDE-S		MH-SS107_CSH-S	
Sample Date								28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-106_CSH-S	MH-106_CSH-S (480-146045-21)	MH-SS106_GA-DE-S	MH-SS106_GA-SH-S	MH-SS106_GB-DE-S	MH-SS106_GB-SH-S	MH-107_CDE-S	MH-107_CDE-S (480-146045-20)	MH-107_CSH-S	MH-107_CSH-S (480-146045-19)
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory		NYSDEC-Part 375 (2006)			NYSDEC CP-51			TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF	TALBUFF	PAL	TALBUFF	PAL
Laboratory Work Order								480-146045-1	P183518	480-146045-1	480-146045-1	480-146045-1	480-146045-1	480-146045-1	P183518	480-146045-1	P183518
Laboratory Sample ID								480-146045-21	P183518-05	480-146045-10	480-146045-9	480-146045-12	480-146045-11	480-146045-20	P183518-04	480-146045-19	P183518-03
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
General Chemistry																	
Cyanide	mg/kg	27$_{i}$	40$_{i}$	27$_{i}$	n/v	n/v	n/v	1.0 U	-	-	-	-	-	-	-	-	-
Metals																	
Aluminum	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	8,570 J	-	-	-	-	-	-	-	-	-
Antimony	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	16.8 UJ	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	13$_{n}$	16$_{q}$	16$_{q}$	n/v	n/v	n/v	8.8	-	-	-	-	-	-	-	-	-
Barium	mg/kg	350$_{n}$	820	400	n/v	n/v	n/v	53.8	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	0.39	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	2.5$_{n}$	7.5	9.3	n/v	n/v	n/v	0.21 J	-	-	-	-	-	-	-	-	-
Calcium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	**16,600^{ABCDEF}**	-	-	-	-	-	-	-	-	-
Chromium, Hexavalent	mg/kg	1$_{m,i}$	19$_{i}$	400$_{i}$	n/v	n/v	n/v	2.3 UJ	-	-	-	-	-	-	-	-	-
Chromium, Total	mg/kg	30$_{n,i}$	NS$_{q}$	1,500$_{i}$	n/v	n/v	n/v	10.1	-	-	-	-	-	-	-	-	-
Cobalt	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	6.5	-	-	-	-	-	-	-	-	-
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	13.0	-	-	-	-	-	-	-	-	-
Iron	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	**17,100^{ABCDEF}**	-	-	-	-	-	-	-	-	-
Lead	mg/kg	63$_{n}$	450	1,000	n/v	n/v	n/v	12.3	-	-	-	-	-	-	-	-	-
Magnesium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	4,030	-	-	-	-	-	-	-	-	-
Manganese	mg/kg	1,600$_{n}$	2,000$_{g}$	10,000$_{e}$	n/v	n/v	n/v	435 J	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.18$_{n}$	0.73	2.8$_{k}$	n/v	n/v	n/v	0.014 J	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	16.0	-	-	-	-	-	-	-	-	-
Potassium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	1,050 J	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	3.9$_{n}$	4$_{q}$	1,500	n/v	n/v	n/v	4.5 U	-	-	-	-	-	-	-	-	-
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	0.67 U	-	-	-	-	-	-	-	-	-
Sodium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	66.9 J	-	-	-	-	-	-	-	-	-
Thallium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	6.7 U	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	14.6	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	109$_{n}$	2,480	10,000$_{e}$	n/v	n/v	n/v	49.4	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																	
PCB-1016 (Aroclor 1016)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1221 (Aroclor 1221)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1232 (Aroclor 1232)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1242 (Aroclor 1242)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1248 (Aroclor 1248)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1254 (Aroclor 1254)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
PCB-1260 (Aroclor 1260)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyl (PCBs)	mg/kg	0.1	3.2	1	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Pesticides																	
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	1,900	19 UJ	-	-	-	-	-	22 U	-	19 U	-
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	500	19 UJ	-	-	-	-	-	22 U	-	19 U	-
Aldrin	µg/kg	5$_{n}$	190	680	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Alpha Endosulfan	µg/kg	2,400$_{l}$	102,000	200,000$_{l}$	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Beta Endosulfan	µg/kg	2,400$_{l}$	102,000	200,000$_{l}$	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40$_{n}$	250	500,000$_{c}$	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Dieldrin	µg/kg	5$_{n}$	100	1,400	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Endosulfan Sulfate	µg/kg	2,400$_{l}$	1,000,000$_{d}$	200,000$_{l}$	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Endrin Aldehyde	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Endrin Ketone	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Gamma Chlordane (trans-Chlordane)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	n/v	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Heptachlor Epoxide	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	20	-	-	-	-	-	-	44 U	-	96 U	-
Methoxychlor	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	900,000	-	-	-	-	-	-	44 U	-	96 U	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS106_CSH-S		MH-SS106_GA-DE-S	MH-SS106_GA-SH-S	MH-SS106_GB-DE-S	MH-SS106_GB-SH-S	MH-SS107_CDE-S		MH-SS107_CSH-S	
Sample Date								28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-106_CSH-S	MH-106_CSH-S (480-146045-21)	MH-SS106_GA-DE-S	MH-SS106_GA-SH-S	MH-SS106_GB-DE-S	MH-SS106_GB-SH-S	MH-107_CDE-S	MH-107_CDE-S (480-146045-20)	MH-107_CSH-S	MH-107_CSH-S (480-146045-19)
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory		NYSDEC-Part 375 (2006)			NYSDEC CP-51			TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF	TALBUFF	PAL	TALBUFF	PAL
Laboratory Work Order								480-146045-1	P183518	480-146045-1	480-146045-1	480-146045-1	480-146045-1	480-146045-1	P183518	480-146045-1	P183518
Laboratory Sample ID								480-146045-21	P183518-05	480-146045-10	480-146045-9	480-146045-12	480-146045-11	480-146045-20	P183518-04	480-146045-19	P183518-03
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Pesticides (cont'd)																	
P,P'-DDD	µg/kg	3.3$_m$	14,000	92,000	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
P,P'-DDE	µg/kg	3.3$_m$	17,000	62,000	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
P,P'-DDT	µg/kg	3.3$_m$	136,000	47,000	n/v	n/v	n/v	-	-	-	-	-	-	44 U	-	96 U	-
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000$_c$	n/v	n/v	n/v	19 UJ	-	-	-	-	-	22 U	-	19 U	-
Toxaphene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	440 U	-	960 U	-
Organophosphorus Compounds																	
Aspon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	-	-	-	-	0.017 U	-	0.017 U
Chlorofenvinphos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	-	-	-	-	0.017 U	-	0.017 U
Chlorpyrifos-methyl	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	-	-	-	-	0.017 U	-	0.017 U
Dichlorofenthion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	-	-	-	-	0.017 U	-	0.017 U
Dicrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	-	-	-	-	0.017 U	-	0.017 U
Ethion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	-	-	-	-	0.017 U	-	0.017 U
Fenitrothion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	-	-	-	-	0.017 U	-	0.017 U
Fonofos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	-	-	-	-	0.017 U	-	0.017 U
Monochrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	-	-	-	-	0.017 U	-	0.017 U
Phosphamidon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	0.017 U	-	-	-	-	-	0.017 U	-	0.017 U
Semi-Volatile Organics																	
2-Methylphenol (O-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
3-Methylphenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
4-Methylphenol (P-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/kg	20,000	98,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/kg	100,000$_a$	107,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Benzo(A)Anthracene	µg/kg	1,000$_n$	1,000$_g$	5,600	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Benzo(A)Pyrene	µg/kg	1,000$_n$	22,000	1,000$_q$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Benzo(B)Fluoranthene	µg/kg	1,000$_n$	1,700	5,600	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Benzo(K)Fluoranthene	µg/kg	800$_n$	1,700	56,000	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/kg	1,000$_n$	1,000$_g$	56,000	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Dibenz(A,H)Anthracene	µg/kg	330$_m$	1,000,000$_d$	560	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/kg	7,000	210,000	350,000	500,000$_a$	1,000,000$_a$	6,200	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/kg	30,000	386,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/kg	330$_m$	3,200	6,000	500,000$_a$	1,000,000$_a$	1,400	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-C,D)Pyrene	µg/kg	500$_n$	8,200	5,600	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	800$_m$	800$_f$	6,700	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Phenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SVOCs - Tentatively Identified Compounds																	
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																	
1,1,1-Trichloroethane	µg/kg	680	680	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
1,1-Dichloroethene	µg/kg	330	330	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
1,2-Dichloroethane	µg/kg	20$_m$	20$_g$	30,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
1,4-Dioxane (P-Dioxane)	µg/kg	100$_m$	100$_f$	130,000	n/v	n/v	n/v	-	-	**110 R^{AB}**	**110 R^{AB}**	**120 R^{AB}**	**110 R^{AB}**	-	-	-	-
Acetone	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	-	-	28 U	28 U	29 U	28 U	-	-	-	-
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS106_CSH-S		MH-SS106_GA-DE-S	MH-SS106_GA-SH-S	MH-SS106_GB-DE-S	MH-SS106_GB-SH-S	MH-SS107_CDE-S		MH-SS107_CSH-S	
Sample Date								28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-106_CSH-S	MH-106_CSH-S (480-146045-21)	MH-SS106_GA-DE-S	MH-SS106_GA-SH-S	MH-SS106_GB-DE-S	MH-SS106_GB-SH-S	MH-107_CDE-S	MH-107_CDE-S (480-146045-20)	MH-107_CSH-S	MH-107_CSH-S (480-146045-19)
Sampling Company								Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec	Stantec
Laboratory		NYSDEC-Part 375 (2006)			NYSDEC CP-51			TALBUFF	PAL	TALBUFF	TALBUFF	TALBUFF	TALBUFF	TALBUFF	PAL	TALBUFF	PAL
Laboratory Work Order								480-146045-1	P183518	480-146045-1	480-146045-1	480-146045-1	480-146045-1	480-146045-1	P183518	480-146045-1	P183518
Laboratory Sample ID								480-146045-21	P183518-05	480-146045-10	480-146045-9	480-146045-12	480-146045-11	480-146045-20	P183518-04	480-146045-19	P183518-03
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Volatile Organic Compounds (cont'd)																	
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Chlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Cymene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	10,000	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Isopropylbenzene (Cumene)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	2,300	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000$_c$	500,000$_a$	1,000,000$_a$	300	-	-	28 U	28 U	29 U	28 U	-	-	-	-
Methylene Chloride	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
M-P-Xylene	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	-	-	11 U	11 U	12 U	11 U	-	-	-	-
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
N-Butylbenzene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
N-Propylbenzene	µg/kg	3,900	3,900	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
T-Butylbenzene	µg/kg	5,900	5,900	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	500,000$_a$	1,000,000$_a$	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Toluene	µg/kg	700	700	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000$_c$	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	-	-	5.7 U	5.7 U	5.8 U	5.6 U	-	-	-	-
Xylenes	µg/kg	260	1,600	500,000$_c$	n/v	n/v	n/v	-	-	11 U	11 U	12 U	11 U	-	-	-	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS107_GA-DE-S	MH-SS107_GA-SH-S	MH-SS107_GB-DE-S	MH-SS107_GB-SH-S
Sample Date								28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-SS107_GA-DE-S	MH-SS107_GA-SH-S	MH-SS107_GB-DE-S	MH-SS107_GB-SH-S
Sampling Company								Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-146045-1	480-146045-1	480-146045-1	480-146045-1
Laboratory Sample ID								480-146045-6	480-146045-5	480-146045-8	480-146045-7
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary
General Chemistry											
Cyanide	mg/kg	27$_{i}$	40$_{i}$	27$_{i}$	n/v	n/v	n/v	-	-	-	-
Metals											
Aluminum	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-
Antimony	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-
Arsenic	mg/kg	13$_{n}$	16$_{q}$	16$_{q}$	n/v	n/v	n/v	-	-	-	-
Barium	mg/kg	350$_{n}$	820	400	n/v	n/v	n/v	-	-	-	-
Beryllium	mg/kg	7.2	47	590	n/v	n/v	n/v	-	-	-	-
Cadmium	mg/kg	2.5$_{n}$	7.5	9.3	n/v	n/v	n/v	-	-	-	-
Calcium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-
Chromium, Hexavalent	mg/kg	1$_{m,i}$	19$_{i}$	400$_{i}$	n/v	n/v	n/v	-	-	-	-
Chromium, Total	mg/kg	30$_{n,i}$	$_{NS,q}$	1,500$_{i}$	n/v	n/v	n/v	-	-	-	-
Cobalt	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-
Copper	mg/kg	50	1,720	270	n/v	n/v	n/v	-	-	-	-
Iron	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-
Lead	mg/kg	63$_{n}$	450	1,000	n/v	n/v	n/v	-	-	-	-
Magnesium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-
Manganese	mg/kg	1,600$_{n}$	2,000$_{g}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-
Mercury	mg/kg	0.18$_{n}$	0.73	2.8$_{k}$	n/v	n/v	n/v	-	-	-	-
Nickel	mg/kg	30	130	310	n/v	n/v	n/v	-	-	-	-
Potassium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-
Selenium	mg/kg	3.9$_{n}$	4$_{q}$	1,500	n/v	n/v	n/v	-	-	-	-
Silver	mg/kg	2	8.3	1,500	n/v	n/v	n/v	-	-	-	-
Sodium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-
Thallium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-
Vanadium	mg/kg	10,000$_{e}$	10,000$_{e}$	10,000$_{e}$	10,000$_{a}$	10,000$_{a}$	10,000$_{a}$	-	-	-	-
Zinc	mg/kg	109$_{n}$	2,480	10,000$_{e}$	n/v	n/v	n/v	-	-	-	-
Polychlorinated Biphenyls											
PCB-1016 (Aroclor 1016)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-
PCB-1221 (Aroclor 1221)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-
PCB-1232 (Aroclor 1232)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-
PCB-1242 (Aroclor 1242)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-
PCB-1248 (Aroclor 1248)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-
PCB-1254 (Aroclor 1254)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-
PCB-1260 (Aroclor 1260)	mg/kg	$_{o}$	$_{o}$	$_{o}$	n/v	n/v	n/v	-	-	-	-
Polychlorinated Biphenyl (PCBs)	mg/kg	0.1	3.2	1	n/v	n/v	n/v	-	-	-	-
Pesticides											
2,4,5-T (Trichlorophenoxyacetic Acid)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	1,900	-	-	-	-
2,4-D (Dichlorophenoxyacetic Acid)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	500	-	-	-	-
Aldrin	µg/kg	5$_{n}$	190	680	n/v	n/v	n/v	-	-	-	-
Alpha Bhc (Alpha Hexachlorocyclohexane)	µg/kg	20	20	3,400	n/v	n/v	n/v	-	-	-	-
Alpha Chlordane (cis-Chlordane)	µg/kg	94	2,900	24,000	n/v	n/v	n/v	-	-	-	-
Alpha Endosulfan	µg/kg	2,400$_{l}$	102,000	200,000$_{l}$	n/v	n/v	n/v	-	-	-	-
Beta Bhc (Beta Hexachlorocyclohexane)	µg/kg	36	90	3,000	n/v	n/v	n/v	-	-	-	-
Beta Endosulfan	µg/kg	2,400$_{l}$	102,000	200,000$_{l}$	n/v	n/v	n/v	-	-	-	-
Delta BHC (Delta Hexachlorocyclohexane)	µg/kg	40$_{n}$	250	500,000$_{c}$	n/v	n/v	n/v	-	-	-	-
Dieldrin	µg/kg	5$_{n}$	100	1,400	n/v	n/v	n/v	-	-	-	-
Endosulfan Sulfate	µg/kg	2,400$_{l}$	1,000,000$_{d}$	200,000$_{l}$	n/v	n/v	n/v	-	-	-	-
Endrin	µg/kg	14	60	89,000	n/v	n/v	n/v	-	-	-	-
Endrin Aldehyde	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	n/v	n/v	n/v	-	-	-	-
Endrin Ketone	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	n/v	n/v	n/v	-	-	-	-
Gamma Bhc (Lindane)	µg/kg	100	100	9,200	n/v	n/v	n/v	-	-	-	-
Gamma Chlordane (trans-Chlordane)	µg/kg	100,000$_{a}$	1,000,000$_{d}$	n/v	n/v	n/v	n/v	-	-	-	-
Heptachlor	µg/kg	42	380	15,000	n/v	n/v	n/v	-	-	-	-
Heptachlor Epoxide	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	20	-	-	-	-
Methoxychlor	µg/kg	100,000$_{a}$	1,000,000$_{d}$	500,000$_{c}$	500,000$_{a}$	1,000,000$_{a}$	900,000	-	-	-	-

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS107_GA-DE-S	MH-SS107_GA-SH-S	MH-SS107_GB-DE-S	MH-SS107_GB-SH-S
Sample Date								28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-SS107_GA-DE-S	MH-SS107_GA-SH-S	MH-SS107_GB-DE-S	MH-SS107_GB-SH-S
Sampling Company								Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-146045-1	480-146045-1	480-146045-1	480-146045-1
Laboratory Sample ID								480-146045-6	480-146045-5	480-146045-8	480-146045-7
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary
Pesticides (cont'd)											
P,P'-DDD	µg/kg	3.3$_m$	14,000	92,000	n/v	n/v	n/v	-	-	-	-
P,P'-DDE	µg/kg	3.3$_m$	17,000	62,000	n/v	n/v	n/v	-	-	-	-
P,P'-DDT	µg/kg	3.3$_m$	136,000	47,000	n/v	n/v	n/v	-	-	-	-
Silvex (2,4,5-TP)	µg/kg	3,800	3,800	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Toxaphene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Organophosphorus Compounds											
Aspon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Chlorofenvinphos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Chlorpyrifos-methyl	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Dichlorofenthion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Dicrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Ethion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Fenitrothion	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Fonofos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Monochrotophos	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Phosphamidon	mg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Semi-Volatile Organics											
2-Methylphenol (O-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-
3-Methylphenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-
4-Methylphenol (P-Cresol)	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Acenaphthene	µg/kg	20,000	98,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Acenaphthylene	µg/kg	100,000$_a$	107,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Anthracene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Benzo(A)Anthracene	µg/kg	1,000$_n$	1,000$_g$	5,600	n/v	n/v	n/v	-	-	-	-
Benzo(A)Pyrene	µg/kg	1,000$_n$	22,000	1,000$_q$	n/v	n/v	n/v	-	-	-	-
Benzo(B)Fluoranthene	µg/kg	1,000$_n$	1,700	5,600	n/v	n/v	n/v	-	-	-	-
Benzo(G,H,I)Perylene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Benzo(K)Fluoranthene	µg/kg	800$_n$	1,700	56,000	n/v	n/v	n/v	-	-	-	-
Chrysene	µg/kg	1,000$_n$	1,000$_g$	56,000	n/v	n/v	n/v	-	-	-	-
Dibenz(A,H)Anthracene	µg/kg	330$_m$	1,000,000$_d$	560	n/v	n/v	n/v	-	-	-	-
Dibenzofuran	µg/kg	7,000	210,000	350,000	500,000$_a$	1,000,000$_a$	6,200	-	-	-	-
Fluoranthene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Fluorene	µg/kg	30,000	386,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Hexachlorobenzene	µg/kg	330$_m$	3,200	6,000	500,000$_a$	1,000,000$_a$	1,400	-	-	-	-
Indeno(1,2,3-C,D)Pyrene	µg/kg	500$_n$	8,200	5,600	n/v	n/v	n/v	-	-	-	-
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Pentachlorophenol	µg/kg	800$_m$	800$_f$	6,700	n/v	n/v	n/v	-	-	-	-
Phenanthrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Phenol	µg/kg	330$_m$	330$_f$	500,000$_c$	n/v	n/v	n/v	-	-	-	-
Pyrene	µg/kg	100,000	1,000,000$_d$	500,000$_c$	n/v	n/v	n/v	-	-	-	-
SVOCs - Tentatively Identified Compounds											
Total SVOC TICs	µg/kg	n/v	n/v	n/v	n/v	n/v	n/v	-	-	-	-
Volatile Organic Compounds											
1,1,1-Trichloroethane	µg/kg	680	680	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
1,1-Dichloroethane	µg/kg	270	270	240,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
1,1-Dichloroethene	µg/kg	330	330	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
1,2,4-Trimethylbenzene	µg/kg	3,600	3,600	190,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
1,2-Dichlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
1,2-Dichloroethane	µg/kg	20$_m$	20$_g$	30,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/kg	8,400	8,400	190,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
1,3-Dichlorobenzene	µg/kg	2,400	2,400	280,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
1,4-Dichlorobenzene	µg/kg	1,800	1,800	130,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
1,4-Dioxane (P-Dioxane)	µg/kg	100$_m$	100$_f$	130,000	n/v	n/v	n/v	**110 R^{AB}**	**110 R^{AB}**	**110 R^{AB}**	**110 R^{AB}**
Acetone	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	28 U	28 U	27 U	27 U
Benzene	µg/kg	60	60	44,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Sample Location								MH-SS107_GA-DE-S	MH-SS107_GA-SH-S	MH-SS107_GB-DE-S	MH-SS107_GB-SH-S
Sample Date								28-Nov-18	28-Nov-18	28-Nov-18	28-Nov-18
Sample ID								MH-SS107_GA-DE-S	MH-SS107_GA-SH-S	MH-SS107_GB-DE-S	MH-SS107_GB-SH-S
Sampling Company								Stantec	Stantec	Stantec	Stantec
Laboratory								TALBUFF	TALBUFF	TALBUFF	TALBUFF
Laboratory Work Order		NYSDEC-Part 375 (2006)			NYSDEC CP-51			480-146045-1	480-146045-1	480-146045-1	480-146045-1
Laboratory Sample ID								480-146045-6	480-146045-5	480-146045-8	480-146045-7
Sample Type	Units	A	B	C	D	E	F	Primary	Primary	Primary	Primary
Volatile Organic Compounds (cont'd)											
Carbon Tetrachloride	µg/kg	760	760	22,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Chlorobenzene	µg/kg	1,100	1,100	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Chloroform	µg/kg	370	370	350,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Cis-1,2-Dichloroethylene	µg/kg	250	250	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Cymene	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	10,000	5.6 U	5.6 U	5.4 U	5.4 U
Ethylbenzene	µg/kg	1,000	1,000	390,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Isopropylbenzene (Cumene)	µg/kg	100,000$_a$	1,000,000$_d$	500,000$_c$	500,000$_a$	1,000,000$_a$	2,300	5.6 U	5.6 U	5.4 U	5.4 U
Methyl Ethyl Ketone (2-Butanone)	µg/kg	120	120	500,000$_c$	500,000$_a$	1,000,000$_a$	300	28 U	28 U	27 U	27 U
Methylene Chloride	µg/kg	50	50	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
M-P-Xylene	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	11 U	11 U	11 U	11 U
Naphthalene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
N-Butylbenzene	µg/kg	12,000	12,000	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
N-Propylbenzene	µg/kg	3,900	3,900	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
O-Xylene (1,2-Dimethylbenzene)	µg/kg	260$_p$	1,600$_p$	500,000$_{c,p}$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Sec-Butylbenzene	µg/kg	11,000	11,000	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
T-Butylbenzene	µg/kg	5,900	5,900	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Tert-Butyl Methyl Ether	µg/kg	930	930	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Tetrachloroethylene (PCE)	µg/kg	1,300	1,300	150,000	500,000$_a$	1,000,000$_a$	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Toluene	µg/kg	700	700	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Trans-1,2-Dichloroethene	µg/kg	190	190	500,000$_c$	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Trichloroethylene (TCE)	µg/kg	470	470	200,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Vinyl Chloride	µg/kg	20	20	13,000	n/v	n/v	n/v	5.6 U	5.6 U	5.4 U	5.4 U
Xylenes	µg/kg	260	1,600	500,000$_c$	n/v	n/v	n/v	11 U	11 U	11 U	11 U

See notes on last page.

Table 10
Summary of Analytical Results for RI Surface Soil Samples
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

Notes:

NYSDEC-Part 375	NYSDEC 6 NYCRR Part 375 Soil Clean-up Objectives (SCOs) (December 14, 2006). Data were subsequently evaluated against the revised SCOs effective December 31, 2025; additional exceedances for applicable restricted use SCOs are described in the Remedial Action Work Plan text.
A	NYSDEC 6 NYCRR Part 375 - Unrestricted Use Soil Cleanup Objectives
B	NYSDEC 6 NYCRR Part 375 - Restricted Use SCO - Protection of Groundwater
C	NYSDEC 6 NYCRR Part 375 - Restricted Use SCO - Protection of Human Health - Commercial
NYSDEC CP-51	New York State Department of Environmental Conservation, DEC Policy CP-51, October 21, 2010
D	Table 1 Supplemental Soil Cleanup Objectives - Commercial
E	Table 1 Supplemental Soil Cleanup Objectives - Industrial
F	Table 1 Supplemental Soil Cleanup Objectives - Protection of Groundwater
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
0.03 U	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.

A a DEF a	The SCOs for unrestricted use were capped at a maximum value of 100 mg/kg. See 6 NYCRR Part 375 TSD Section 9.3
	SCOs for organic contaminants (volatile organic compounds, semivolatile organic compounds, and pesticides) are capped at 100 ppm for residential use, 500 ppm for commercial use, 1000 ppm for industrial use. SCOs for metals are capped at 10,000 ppm.
c	The SCOs for commercial use were capped at a maximum value of 500 mg/kg. See TSD Section 9.3.
c,p	The SCOs for commercial use were capped at a maximum value of 500 mg/kg. See TSD Section 9.3. The criterion is applicable to total xylenes, and the individual isomers should be added for comparison.
d	The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 mg/kg (Organics) and 10000 mg/kg (Inorganics). See 6 NYCRR Part 375 TSD Section 9.3.
ABC e	The SCOS for metals were capped at a maximum value of 10,000 mg/kg. See 6 NYCRR Part 375 TSD Section 9.3.
f	For constituents where the calculated SCO was lower than the CRQL, the CRQL is used as the SCO value.
BC g	For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.
ABC i	The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
AC l	This SCO is the sum of endosulfan I, endosulfan II, and endosulfan sulfate.
k	This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See 6 NYCRR Part 375 TSD Table 5.6-1.
m	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.
m,i	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. The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
n	For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site.
n,l	For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site. The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
NS,q	No SCO has been established for this compound. No SCO has been established for total chromium; however, see standards for trivalent and hexavalent chromium.
ABC o	Standard is applicable to total PCBs, and the individual Aroclors should be added for comparison.
AB p	The criterion is applicable to total xylenes, and the individual isomers should be added for comparison.

Data Validation Qualifiers:

J	The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control limits. The analyte may or may not be present.
UJ	The analyte was analyzed for, but was not detected. The associated reported quantitation limit is approximate and may be inaccurate or imprecise.
ND	Not detected (TIC results only)

Table 11
Summary of Supplemental Groundwater Event
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

DRAFT

Well/ Location ID	Scope		Sample Information			Analyses
	Gauge	Sample	Sample ID	Sample Date	Associated QC Samples	VOCs[1]
ONSITE						
MW-101-R	x					
MW-102	x					
MW-103	x					
MW-104D-R	x	x	MH-MW104D-W	12/1/2022		x
MW-104S-R	x	x	MH-MW104S-W	12/1/2022		x
MW-105[2]						
MW-106D-R	x					
MW-106S-R	x					
MW-15-R	x	x	MH-MW15R-W	12/5/2022		x
MW-16D	x	x	MH-MW16D-W	12/1/2022		x
MW-16S	x	x	MH-MW16S-W	12/2/2022		x
MW-17	x	x	MH-MW17-W	12/1/2022	FD: MH-FD-W, MS/MSD	x
MW-20	x					
MW-201	x	x	MH-MW201-W	12/2/2022		x
MW-202	x	x	MH-MW202-W	12/2/2022		x
MW-203	x	x	MH-MW203-W	12/5/2022		x
MW-204	x	x	MH-MW204-W	12/5/2022		x
MW-205	x	x	MH-MW205-W	12/2/2022		x
OFFSITE						
MW-1D	x					
MW-11	x					
MW-12[3]	x	x	MH-MW6-W	11/29/2022		x
MW-13	x	x	MW-MW13-W	11/29/2022	FD: MH-FD-W	x
MW-14	x					
MW-18	x	x	MH-MW18-W	11/29/2022	MS/MSD	x
MW-3D	x					
MW-5	x	x	MH-MW5-W	11/30/2022		x
MW-6[3]						
MW-7	x	x	MH-MW7-W	11/29/2022		x
MW-301S	x	x	MH-MW301S-W	11/30/2022		x
MW-301D	x	x	MH-MW301D-W	11/30/2022		x
MW-302	x	x	MH-MW302-W	11/30/2022		x
MW-303	x	x	MH-MW303-W	12/5/2022		x
MW-304S	x	x	MH-MW304S-W	11/30/2022		x
MW-304D	x	x	MH-MW304D-W	11/30/2022		x
MW-305	x	x	MH-MW305-W	12/2/2022		x
QC BLANKS						
Equipment Blanks			MH-ERB-W	12/5/2022	EB (Pump)	x
Trip Blanks			TRIP BLANK	12/2/2022	TB	x
			TB	12/5/2022	TB	x

Notes:
[1] USEPA TCL and NYSDEC CP-51 VOCs (plus up to 10 TICs) by USEPA Method 8260C.
[2] Monitoring well removed from event due to inability to access private property and no owner permission.
[3] Monitoring well removed from event due to observed well damage. Note that the undamaged well in the pair (MW-12: constructed with a deeper screen, and located further from the road) was misidentified as "MW-6" in the sampling label.

Abbreviations:
EB = Equipment (rinse) Blank
FD = Field Duplicate
MS/MSD = Matrix Spike/Matrix Spike Duplicate
MW = Monitoring Well
NYSDEC = New York State Department of Environmental Conservation
QC = Quality Control
TB = Trip Blank
TCL = Target Compound List
TICs = Tentatively Identified Compounds
USEPA = United States Environmental Protection Agency
VOCs = Volatile Organic Compounds

Table 12
Proposed Long-Term Groundwater Monitoring Program
Remedial Action Work Plan
NYSDOT Former Miller Hill Yard, BCP Site #C851045
7578 State Route 21, Fremont, NY

DRAFT

Well ID	Proposed Groundwater Sampling Frequency[1]	Analyses	
		VOCs[2]	MNA Parameters[3]
ONSITE WELLS			
MW-15-R	Quarterly	x	x
MW-16D	Quarterly	x	x
MW-16S	Quarterly	x	x
MW-17	Semi-Annually	x	x
MW-104D-R	Quarterly	x	x
MW-104S-R	Semi-Annually	x	x
MW-105	Quarterly	x	x
MW-106D-R	Semi-Annually	x	x
MW-106S-R	Semi-Annually	x	x
MW-201	Quarterly	x	x
MW-202	Quarterly	x	x
MW-203	Semi-Annually	x	x
MW-205	Semi-Annually	x	x
OFFSITE WELLS			
MW-11	Semi-Annually	x	
MW-12	Quarterly	x	
MW-13	Semi-Annually	x	
MW-18	Quarterly	x	
MW-304D	Quarterly	x	
MW-304S	Quarterly	x	
MW-306D	Quarterly	x	
MW-306S	Quarterly	x	

Abbreviations:

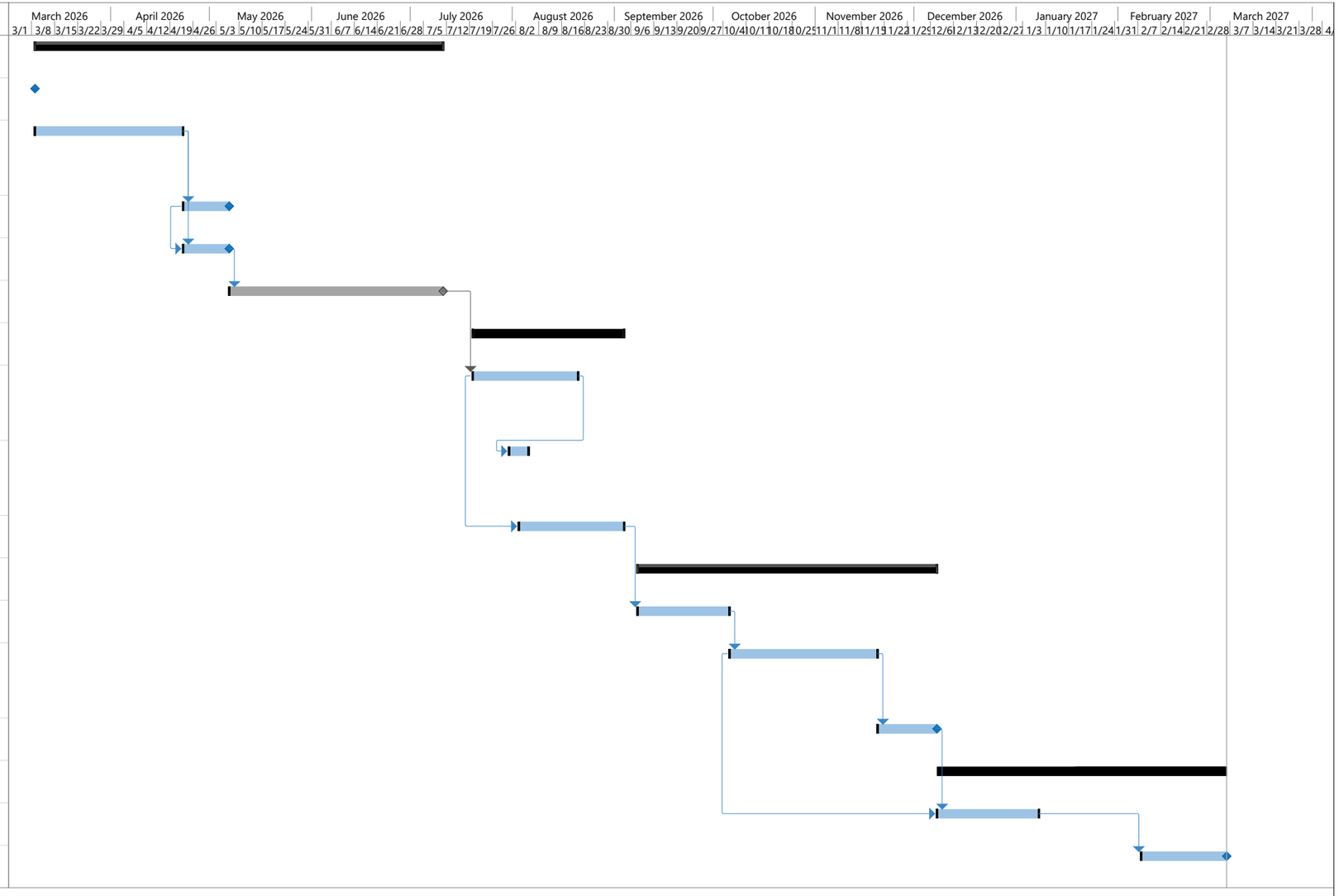
MNA	Monitored Natural Attenuation
MW	Monitoring Well
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAWP	Remedial Action Work Plan
TCL	Target Compound List
TIC	Tentatively Identified Conpound
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

Notes:

1. The baseline event proposed under this RAWP will mirror the proposed long-term monitoring program. Proposed long-term monitoring is anticipated to include quarterly and semi-annual sampling for the first two years, then reduced to an annual frequency pending agency approval. The proposed sampling network, parameters, and frequency is subject to change based on groundwater results obtained during the baseline event and will be recommended in an addendum to the RAWP and/or in the Site Management Plan (SMP). Annual (or other frequency) gauging may be performed at other network wells not proposed for sampling. QA/QC sampling approach is described in the QAPP.
2. USEPA TCL VOCs by USEPA Method 8260D plus up to 10 TICs.
3. MNA Parameters include: Alkalinity (2320B-1997); Nitrogen-Nitrate-Nitrite (353.2-1993 R2.0); Iron/Dissolved Iron (USEPA 6010D); Sulfate and Chloride (300.0 Rev 2.1); Sulfide (SM 4500 S2 F); Total Organic Carbon (USEPA Method 9060); Methane, Ethane, and Ethene (RSK-175). It is anticipated that MNA parameters will be analyzed during the first two years of sampling events and then re-evaluated as needed.

Table 13 Estimated Project Schedule

ID	Task Mode	Task Name	Duration	Start	Finish
1		**Remedial Action Work Plan (RAWP)**	**88 days**	**Mon 3/9/26**	**Fri 7/10/26**
2		Draft RAWP to NYSDEC/NYSDOH	1 day	Mon 3/9/26	Mon 3/9/26
3		45-day (33 working days) NYSDEC/NYSDOH Review	33 days	Mon 3/9/26	Wed 4/22/26
4		Final RAWP	10 days	Thu 4/23/26	Wed 5/6/26
5		Fact Sheet	10 days	Thu 4/23/26	Wed 5/6/26
6		Public Comment Period /Follow-up Support	45 days	Thu 5/7/26	Fri 7/10/26
7		**Remedial Design Field Tasks**	**34 days**	**Mon 7/20/26**	**Thu 9/3/26**
8		Pre-survey and Boring/Well Installation, Development, and Sampling	24 days	Mon 7/20/26	Thu 8/20/26
9		Actual Boring/Well Survey Location/Elevation Survey	4 days	Fri 7/31/26	Wed 8/5/26
10		Data Evaluation	24 days	Mon 8/3/26	Thu 9/3/26
11		**RAWP Addendum**	**63 days**	**Tue 9/8/26**	**Mon 12/7/26**
12		Draft RAWP Addendum to NYSDEC/NYSDOH	20 days	Tue 9/8/26	Mon 10/5/26
13		45-day (33 working days) NYSDEC/NYSDOH Review	33 days	Tue 10/6/26	Thu 11/19/26
14		Final RAWP Addendum to NYSDEC/NYSDOH	10 days	Fri 11/20/26	Mon 12/7/26
15		**PS&E**	**33 days**	**Tue 1/19/27**	**Fri 3/5/27**
16		Draft Plans/Specifications/Estimate	20 days	Tue 12/8/26	Thu 1/7/27
17		Final Plans/Specifications/Estimates	19 days	Mon 2/8/27	Fri 3/5/27

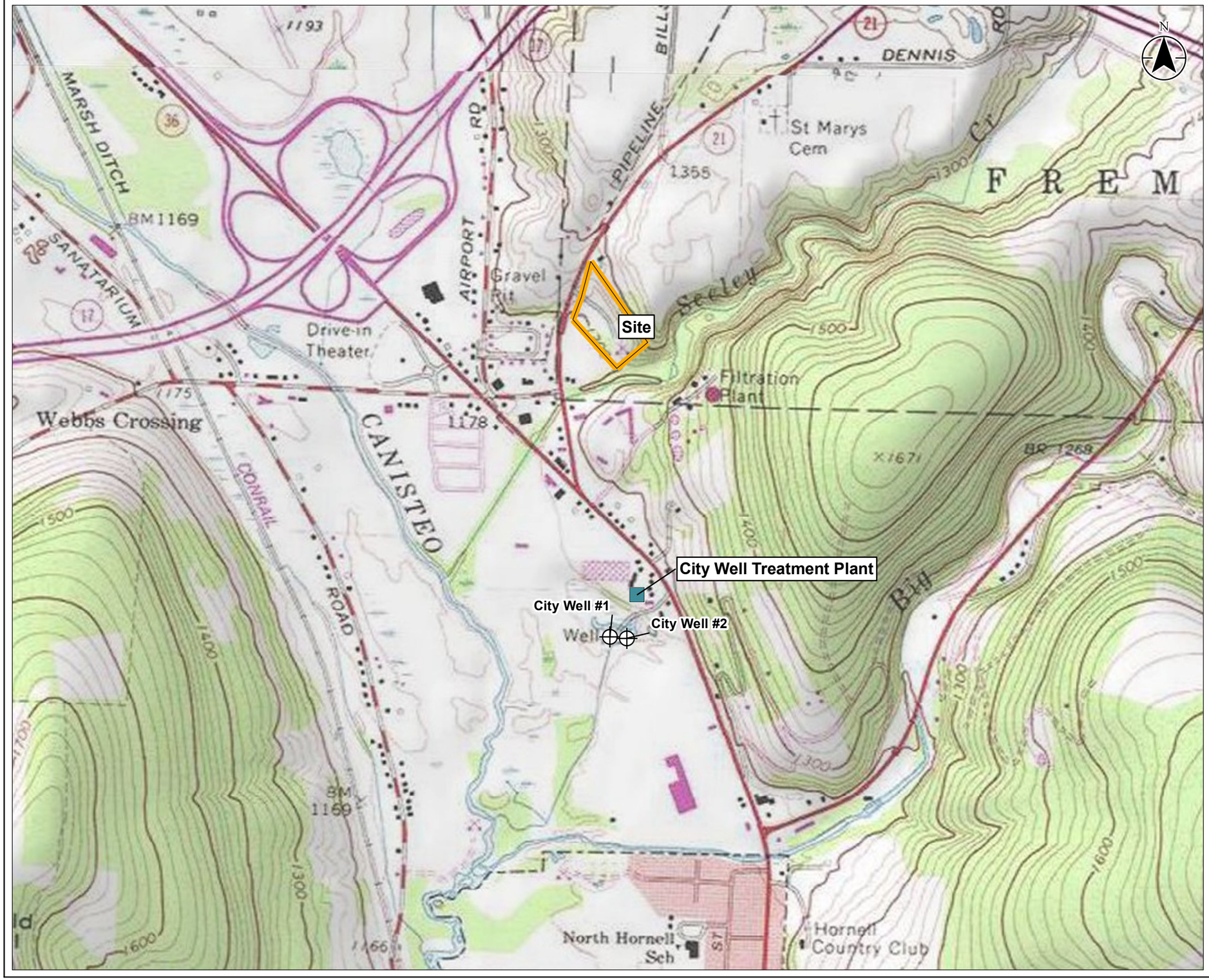


Project: Miller Hill Yard RAWP
Date: Wed 2/11/26

Task	Summary	Inactive Milestone	Duration-only	Start-only	External Milestone	Manual Progress
Split	Project Summary	Inactive Summary	Manual Summary Rollup	Finish-only	Deadline	
Milestone	Inactive Task	Manual Task	Manual Summary	External Tasks	Progress	

Attachments

FIGURES



Stantec

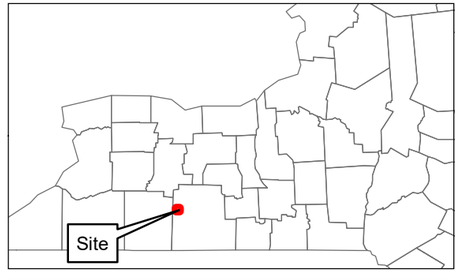
Legend

- City of Hornell Water Supply Wells
- City Well Treatment Plant (approximate location)
- Miller Hill Yard BCP Site (Magde Survey, 2017)

Notes:
1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: ArcGIS Basemap USA Topo Maps.

0 1,000 2,000 Feet

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Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

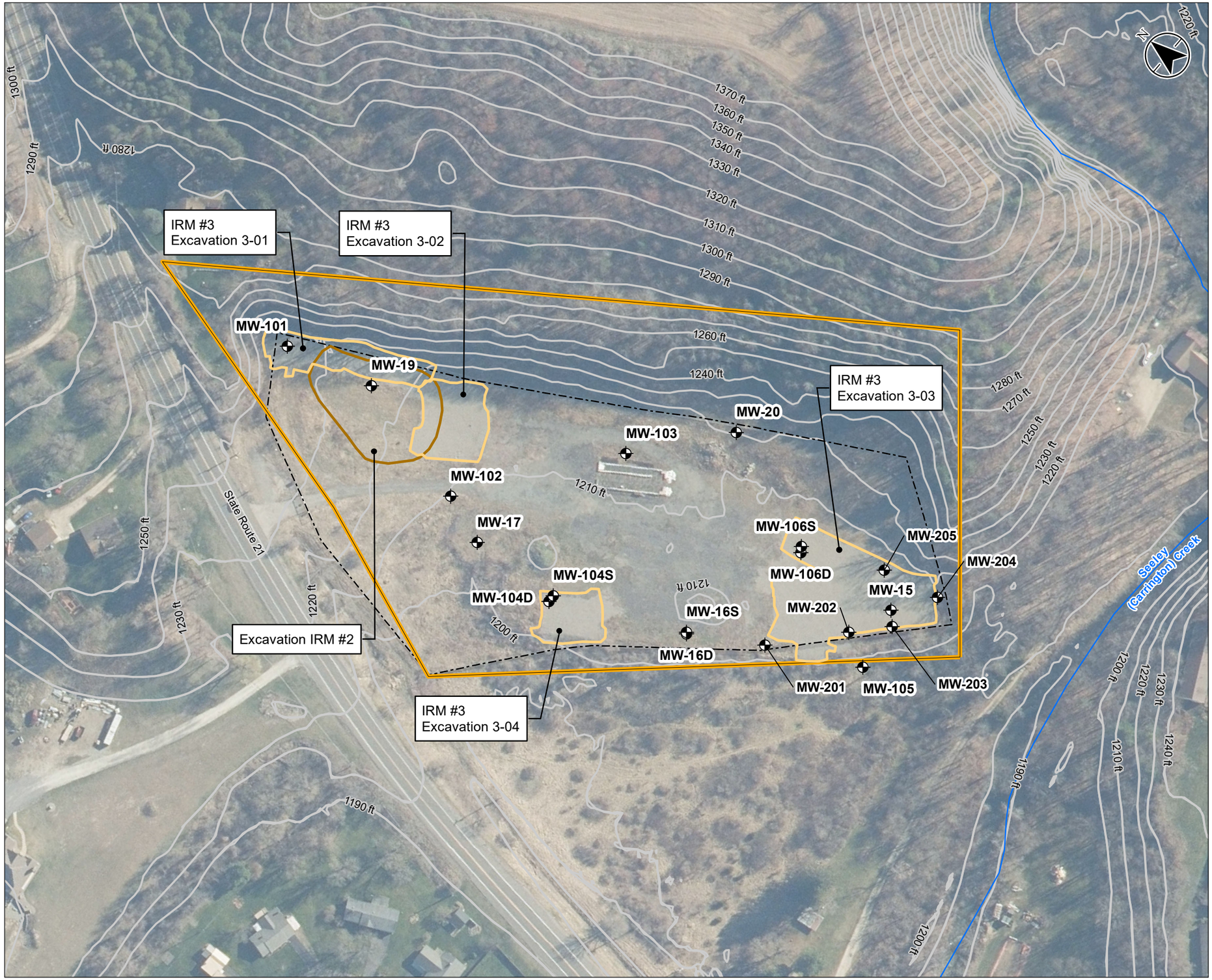
Figure No.
1

DRAFT

Title
Site Location Map

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Stantec

Legend

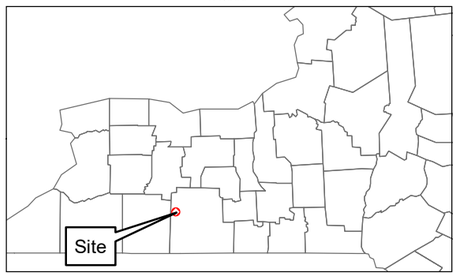
- Onsite Monitoring Wells
- IRM 2 Excavation Limits
- IRM 3 Excavation Limits
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Fenceline (Magde Survey, 2017)
- Streams
- Ground Surface Elevation Contour (10-Foot Interval)

Notes:

1. Coordinate System:
NAD 1983 StatePlane New York Central FIPS 3102 Feet
2. Basemap: Steuben County orthoimagery (2022); downloaded from NYS GIS Clearinghouse (gis.ny.gov).
3. Monitoring wells were surveyed by Clear Creek Land Surveying in May 2020.
4. IRM excavation details are presented in the Construction Completion Reports for IRM#2 and IRM#3.IRM outlines were surveyed at grade.
5. Ground Surface Elevation Contours (2019) for the Towns of Fremont and Hornellsville downloaded from NYS GIS Clearinghouse (gis.ny.gov).

0 125 250 Feet

(At original document size of 11x17)
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Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

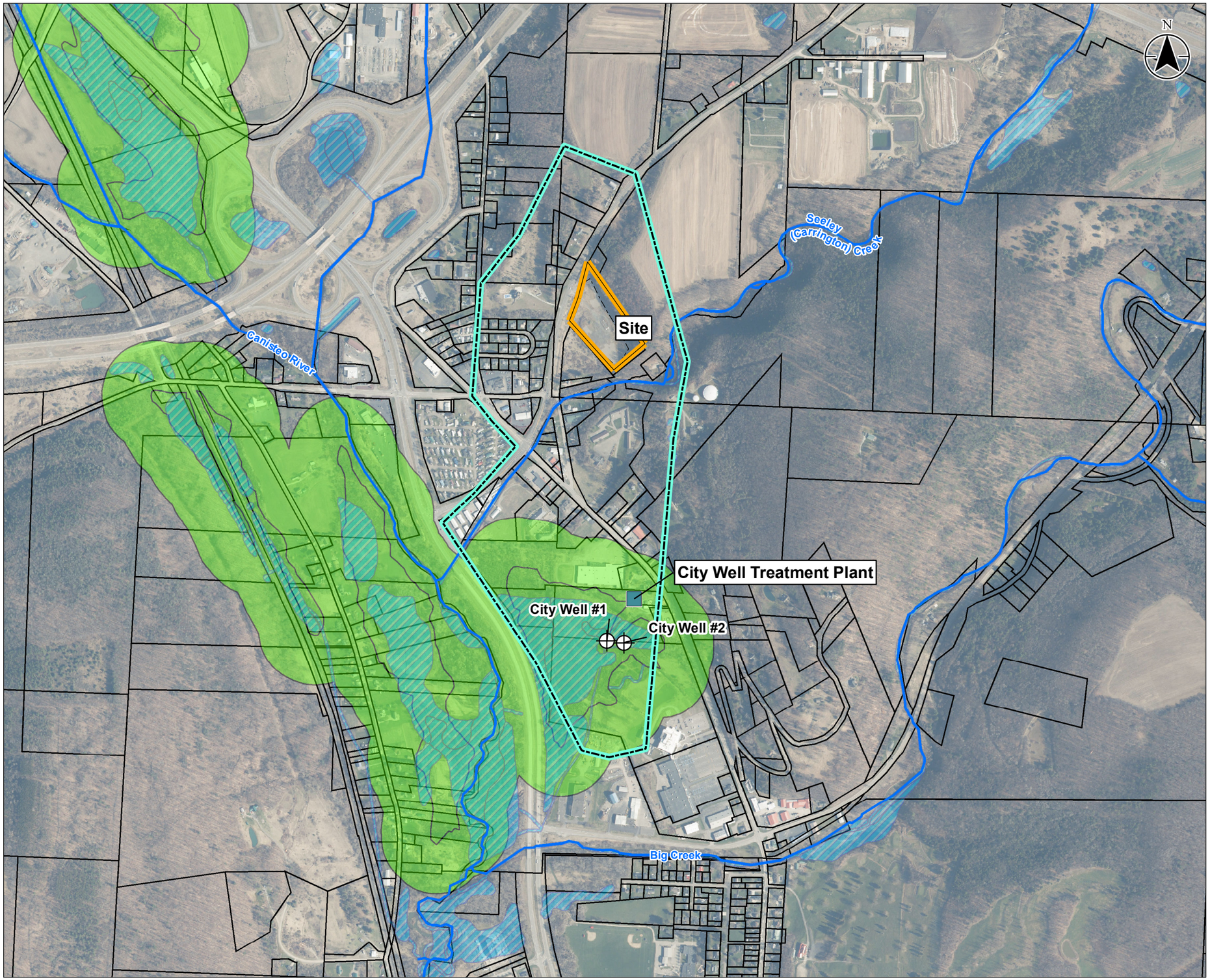
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Title
Site Layout Map

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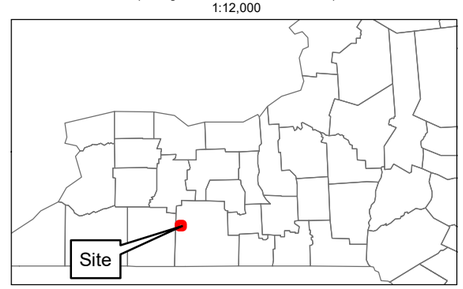
Legend

- City Well Treatment Plant (approximate location)
- City of Hornell Water Supply Wells
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Fenceline (Magde Survey, 2017)
- Approximate Limits of Project Study Area
- Streams
- National Wetlands Inventory Wetlands
- NYSDEC Wetlands and Adjacent 500-ft Checkzone
- Tax Parcels

Notes:
1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: Steuben County orthoimagery (2022); downloaded from NYS GIS Clearinghouse (gis.ny.gov).
3. Study Area limits approximate and incorporate the following features: Site, City of Hornell Supply Wells, existing offsite monitoring wells, and private well properties included in sampling.

0 1,000 2,000 Feet

(At original document size of 11x17)
1:12,000



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

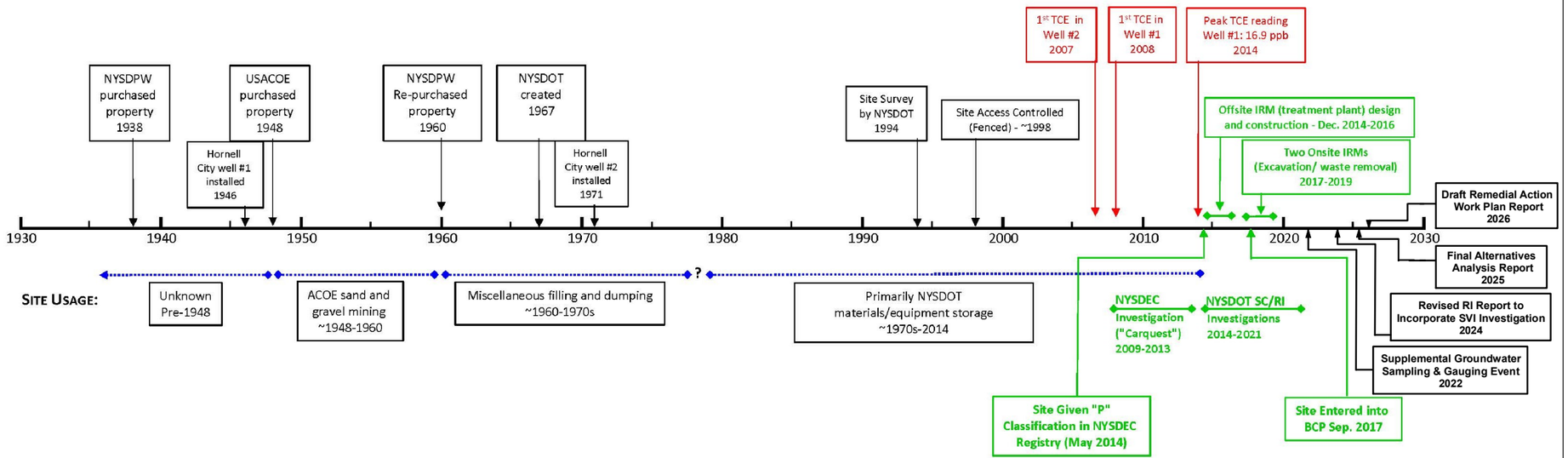
Figure No.
3

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Title
Overview of Site and Surrounding Study Area

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Notes:

1. Acronyms:
NYSDOT: New York State Department of Transportation
NYSDEC: New York State Department of Environmental Conservation
NYSDPW: New York State Department of Public Works (precursor to NYSDOT)
USACOE: United States Army Corps of Engineers
SC: Site Characterization Investigation
RI: Remedial Investigation
AAR: Alternatives Analysis Report
BCP: Brownfield Cleanup Program
TCE: Trichloroethene
IRMs: Interim Remedial Measures
SVI: Soil Vapor Intrusion
2. Timeline dates obtained from multiple sources and are approximate.

Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

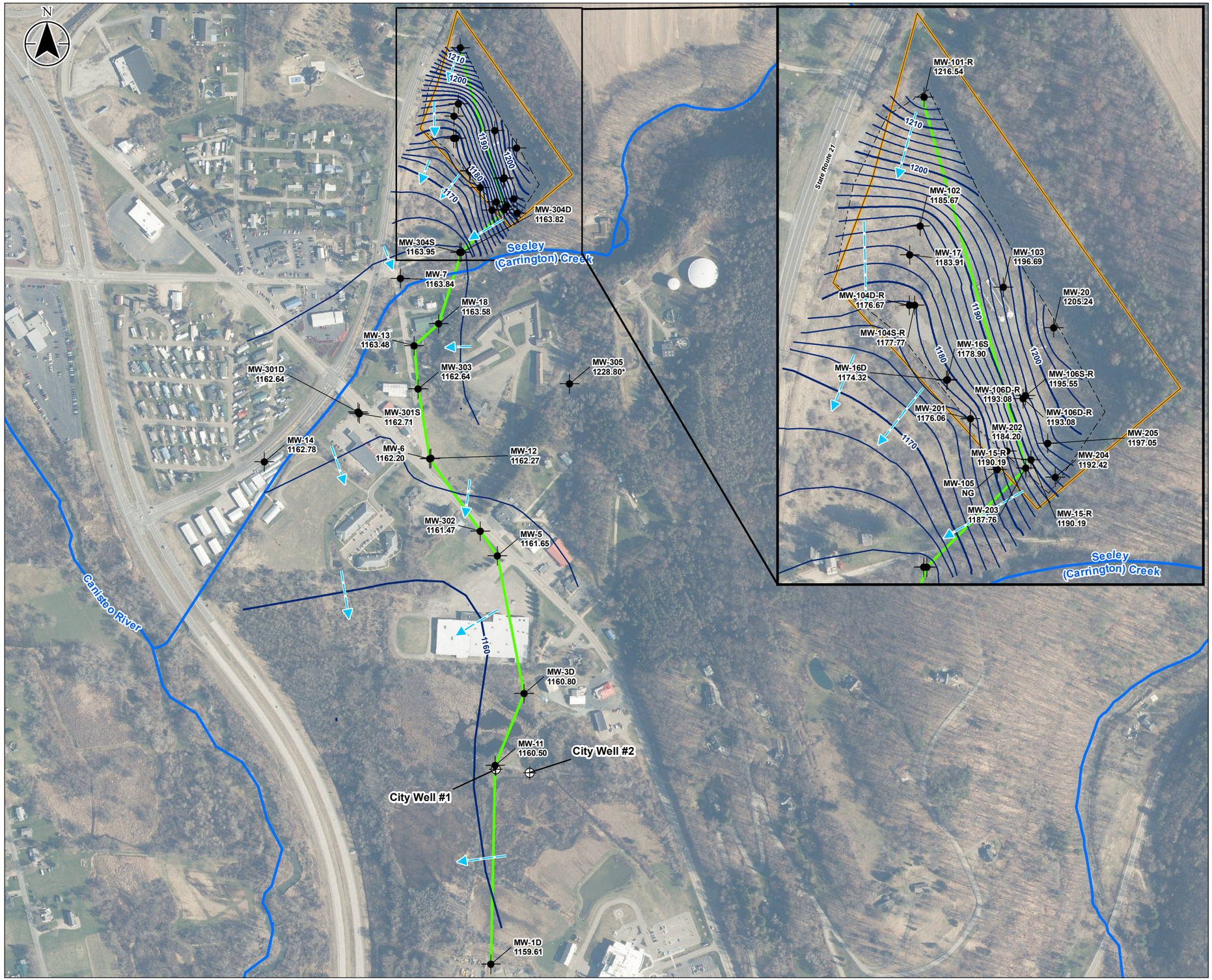
Figure No.
4

DRAFT

Title
Generalized Site History and Project Timeline

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Stantec

Legend

- Monitoring Well Locations in 2021, gauged June 2021 (see Note 4)
- City of Hornell Water Supply Wells
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Fenceline (Magde Survey, 2017)
- Streams

Inferred Study Area Groundwater Elevation Contour (see Notes 5 and 6)

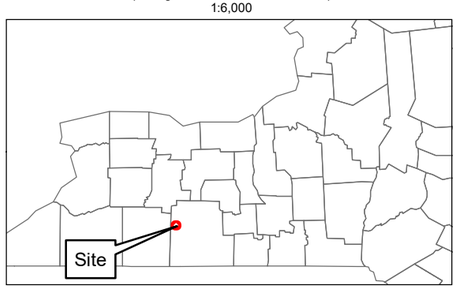
- Major Interval (10-ft)
- Minor Interval (2-ft)
- Inferred direction of groundwater flow (approximate)
- Cross-Section Transect

Notes:

1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: Steuben County orthoimagery (2020); downloaded from NYS GIS Clearinghouse (gis.ny.gov).
3. Monitoring wells surveyed by Clear Creek Land Surveying in May 2020. New RI wells (onsite series 200 wells; offsite series 300 wells) were surveyed by Patriot in March 2021. Onsite wells with "-R" suffix were removed and replaced as part of IRM3 construction.
4. Depth to water measured by Stantec during the groundwater gauging event on 6/17/2021. Monitoring well MW-105 was not gauged (NG) due to property access issues.
5. The inferred water table surface is based on initial kriging interpolation of calculated groundwater elevation and modified manually. The groundwater elevation contours should be considered approximate given (1) the steep gradient between the Site wells and offsite valley floor wells; (2) the sparsity and distribution of data across the valley; and (3) the absence of stage data for Seeley Creek and Canisteo River.
6. *Monitoring well MW-305 was not included in contouring due to its location in the uplands and potential disconnection to the valley aquifer based on development and sampling observations. The groundwater elevation indicates that flow from this location is westward towards the valley.
7. Elevations provided in feet, North American Vertical Datum of 1988 (NAVD88).

0 500 1,000 Feet

(At original document size of 11x17)
1:6,000



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

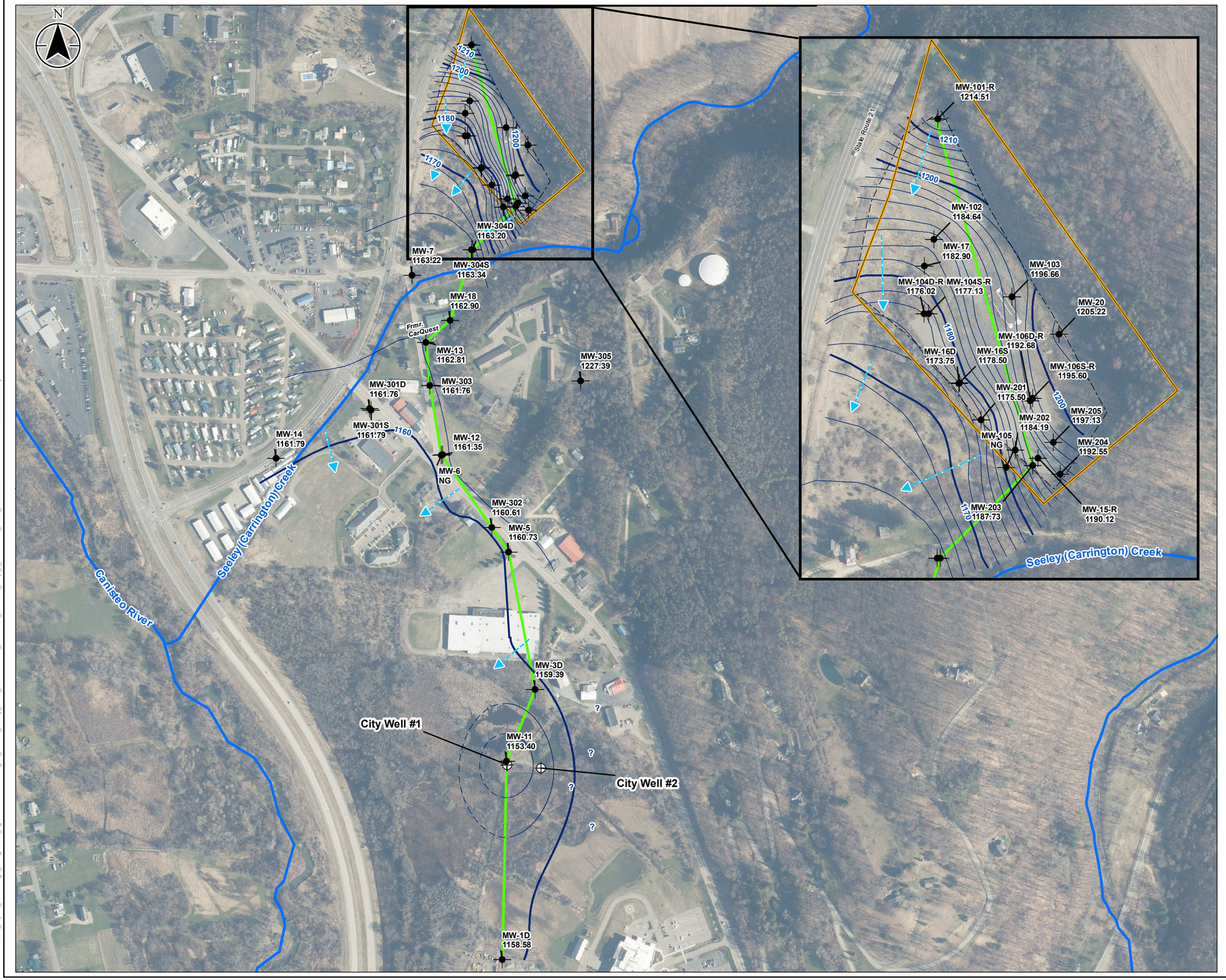
Figure No.
5a

DRAFT

Title
Study Area Groundwater Elevation Contour Map - June 2021

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of information provided by others.

U:\213414012\05_report_deliv\dwgs_design\GIS_figures\RAWP\mxd\fig5a_RAWP_Study_Area_Groundwater_Elevation_Contour_Map_-_June_2021_20260209.mxd Revised: 2026-02-09 By: akita



Stantec

Legend

- Monitoring Well Locations, gauged November 28, 2022
- City of Hornell Water Supply Wells
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Fenceline (Magde Survey, 2017)
- Streams
- Inferred Direction of Groundwater Flow

Inferred Study Area Groundwater Elevation Contour (see Notes 6 and 7)

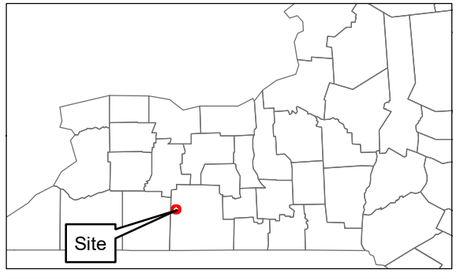
- Major Interval (10-ft)
- Minor Interval (2-ft)
- Cross-Section Transect

Notes:

1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: Steuben County orthoimagery (2020); downloaded from NYS GIS Clearinghouse (gis.ny.gov).
3. Depth to water measured by Watts on November 28, 2022.
4. The inferred water table surface is based on initial kriging interpolation of calculated groundwater elevation and modified manually. For paired well locations, the shallow well elevations were used. The groundwater elevation contours should be considered approximate given (1) the significant gradient difference between the Site wells and offsite valley floor wells; (2) the sparsity and distribution of data across the valley; and (3) the absence of stage data for Seeley Creek and Canisteo River.
5. NG = Not Gauged
6. The inferred direction of gorundwater flow shows a flow towards the City Wells. It is presumed that these wells were operating during the gauging event, thus impacting the groundwater elevation contours.
7. Monitoring well MW-305 was not included in contouring due to its location in the uplands and potential disconnection to the valley aquifer based on development and sampling observations. The groundwater elevation indicates that flow from this location is westward towards the valley.
8. Elevations provided in feet, North American Vertical Datum of 1988 (NAVD88).

0 500 1,000 Feet

(At original document size of 11x17)
1:6,000



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

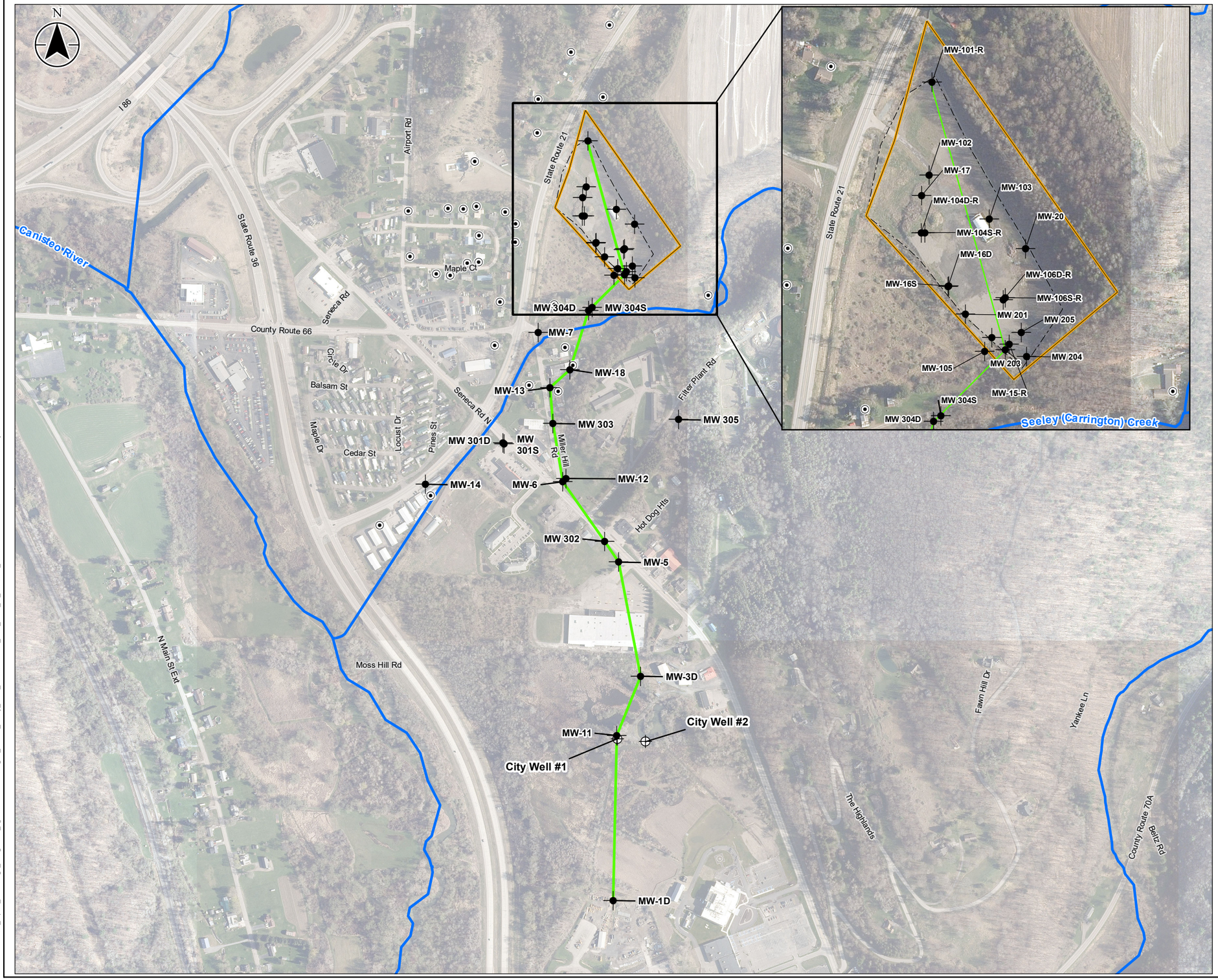
Figure No.
5b

DRAFT

Title
Study Area Groundwater Elevation Contour Map - November 2022

U:\213414012\05_report_deliv\dwgs_design\GIS_figures\RAWP\mxd\fig5b_RAWP_Study_Area_Groundwater_Elevation_Contour_Map_-_November_2022_20260209.mxd Revised: 2026-02-09 By: akita

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Stantec

Legend

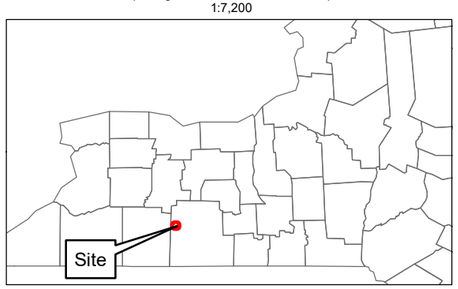
- Existing Monitoring Wells (2021)
- Private Wells Sampled by Stantec
- City of Hornell Water Supply Wells
- Cross-Section Transect
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Fenceline (Magde Survey, 2017)
- Streams

Notes:

1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: 2020 Steuben County Orthoimagery (gis.ny.gov).
3. Monitoring wells surveyed by Clear Creek Land Surveying in May 2020 or by Patriot Surveying for RI wells in March 2021.

0 500 1,000 Feet

(At original document size of 11x17)
1:7,200



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
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NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

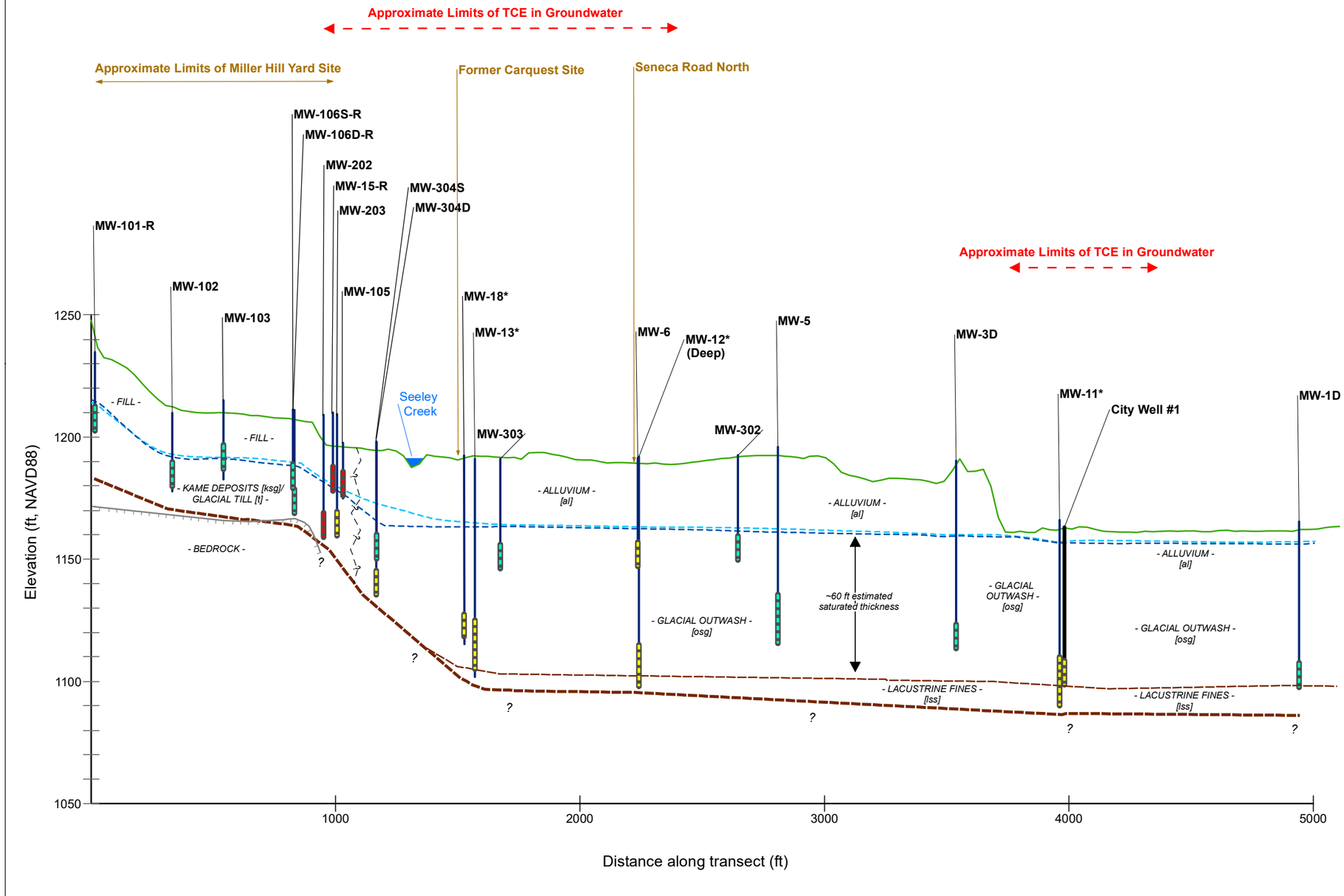
Figure No.
6a

DRAFT

Title
Study Area Cross-Section: Plan View of Transect

U:\213414012\05_report_deliv\dwge_design\GIS_figures\RAWP\mxd\fig6a_RAWP_Study_Area_Cross-Section_Plan_View_of_Transect_20260209.mxd Revised: 2026-02-09 By: akita

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Vertical Exaggeration = 10:1

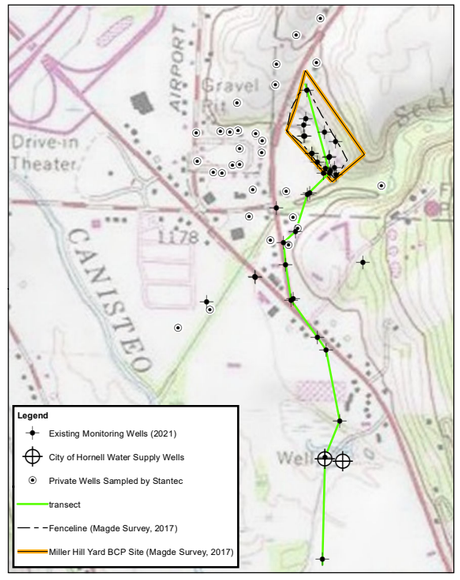
Stantec

Legend

- Ground Surface (USGS Digital Elevation Model; not representative of post-IRM grade at Site)
- Interpolated Water Table Surface (June 2021)
- Interpolated Water Table Surface (January 2020)
- Interpolated Bottom of Exploration (assumed to approximately represent the vertical limits of aquifer thickness, i.e. top of bedrock and/or other underlying confining unit such as lacustrine clay)
- Estimated Bottom of Aquifer based on USGS Estimates of Saturated Thickness (alternate interpretation of underlying lacustrine confining unit)
- Interpolated Top of Bedrock Encountered at the Site
- Approximate Surficial Geologic Contacts (USGS Upstate New York Surficial Aquifer Mapping Program)
- Monitoring Well
- City of Hornell Water Supply Well
- Seeley (Carrington) Creek

Screen Interval (asterisk indicates absence of log; screen length obtained from NYSDEC Carquest Investigation cross-section)

- TCE Exceedance(s)
- TCE Detection(s), No Exceedance(s)
- Non-Detect TCE Result(s)



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

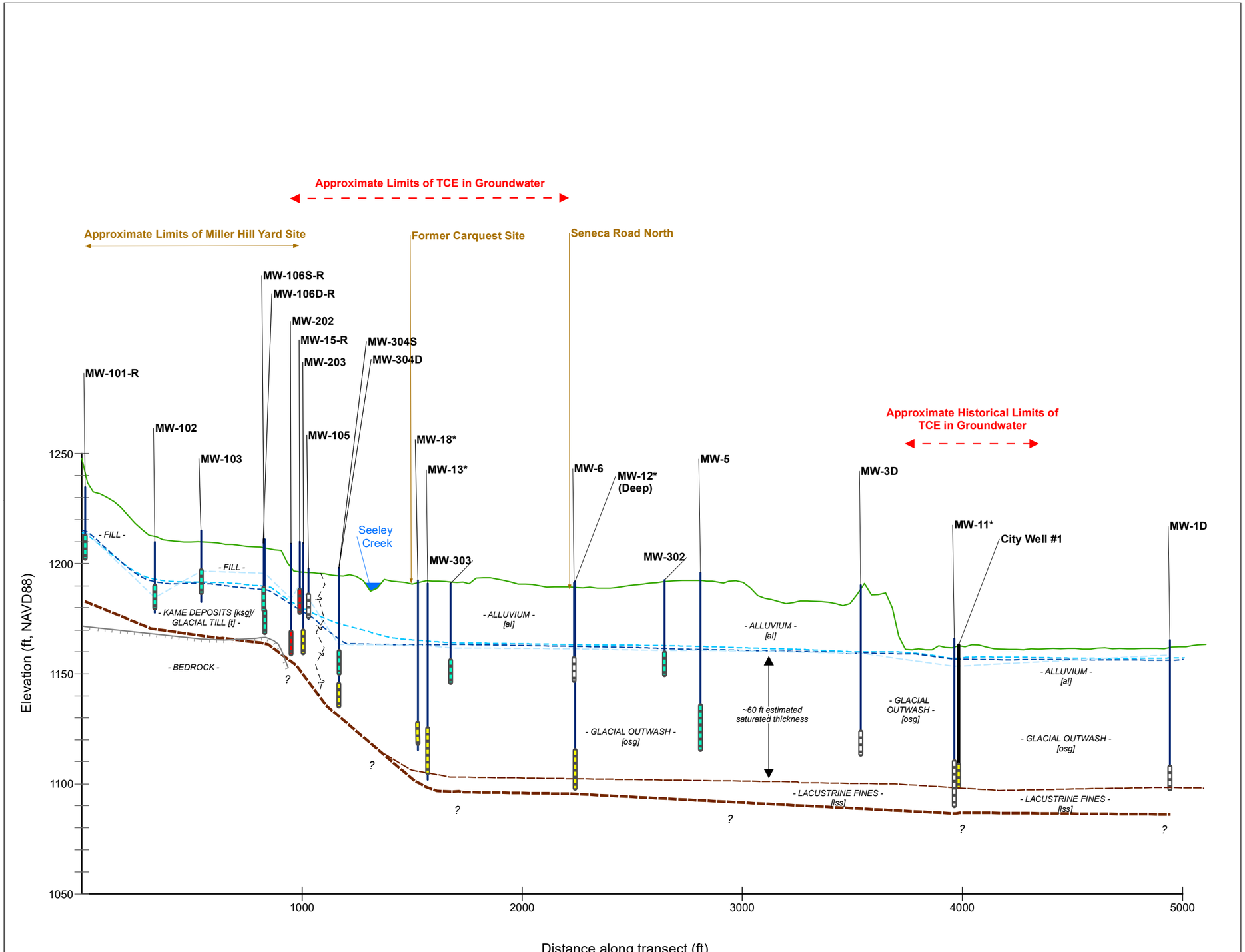
Figure No.
6b

DRAFT

Title
Study Area Cross-Section: Generalized Profile (January 2020)

U:\213414012\05_report_delv\dwgs_design\GIS_figures\RAWP\mxd\fig6b_RAWP_Study_Area_Cross-Section_Generalized_Profile_(January_2020)_20260209.mxd Revised: 2026-02-09 By: akita

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Vertical Exaggeration = 10:1

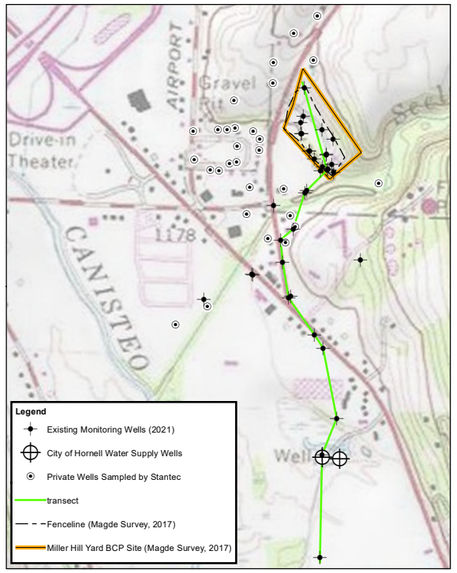
Stantec

Legend

- Ground Surface (USGS Digital Elevation Model; not representative of post-IRM grade at Site)
- Interpolated Water Table Surface (June 2021)
- Interpolated Water Table Surface (January 2020)
- Interpolated Water Table Surface (December 2022)
- Interpolated Bottom of Exploration (assumed to approximately represent the vertical limits of aquifer thickness, i.e. top of bedrock and/or other underlying confining unit such as lacustrine clay)
- Estimated Bottom of Aquifer based on USGS Estimates of Saturated Thickness (alternate interpretation of underlying lacustrine confining unit)
- Interpolated Top of Bedrock Encountered at the Site
- Approximate Surficial Geologic Contacts (USGS Upstate New York Surficial Aquifer Mapping Program)
- Monitoring Well
- City of Hornell Water Supply Well
- Seeley (Carrington) Creek

Screen Interval (asterisk indicates absence of log; screen length obtained from NYSDEC Carquest Investigation cross-section)

- Not Sampled
- TCE Exceedance(s)
- TCE Detection(s), No Exceedance(s)
- Non-Detect TCE Result(s)



Project Location
7578 State Route 21
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Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

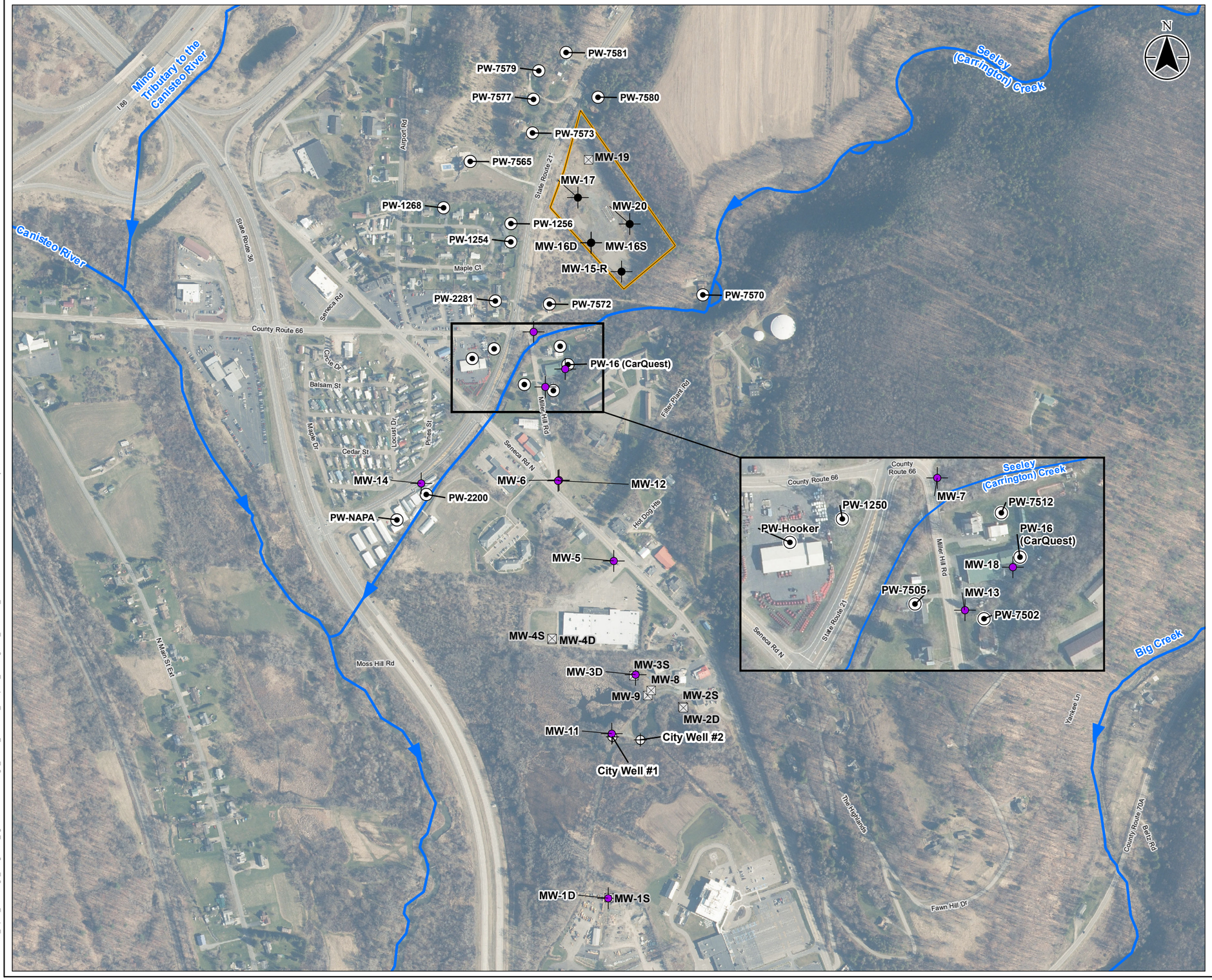
Figure No.
6c

DRAFT

Title
Study Area Cross-Section: Generalized Profile (December 2022)

U:\213414012\05_report_deliv\dwgs_design\GIS_figures\RAWP\mxd\fig6c_RAWP_Study_Area_Cross-Section_Generalized_Profile_(December_2022)_20260209.mxd Revised: 2026-02-09 By: akilta

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Stantec

Legend

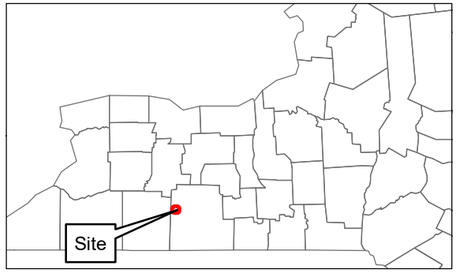
- City of Hornell Water Supply Wells
- Existing Onsite Monitoring Wells (during the Carquest Investigation)
- Existing Offsite Monitoring Wells (during the Carquest Investigation)
- Former Monitoring Well (Now Decommissioned)
- Private Supply Well
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Streams

Notes:

1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: Steuben County orthoimagery (2020); downloaded from NYS GIS Clearinghouse (gis.ny.gov).
3. Monitoring wells installed by NYSDEC were surveyed by Clear Creek Land Surveying in May 2020 as part of Stantec's RI. Location of onsite decomissioned well MW-19 from April 2016 Magde survey. Locations of offsite decomissioned wells and private water wells approximate.

0 600 1,200 Feet

(At original document size of 11x17)
1:7,200



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

Figure No.
7

DRAFT

Title
NYSDEC Carquest Investigation Locations

U:\213414012\05_report_delv\dwgs_design\GIS_figures\RAWP\mxd\fig7_RAWP_NYSDEC_Carquest_Investigation_Locations_20260209.mxd Revised: 2026-02-09 By: akita

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Stantec

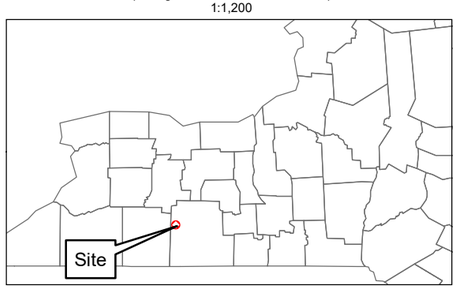
Legend

- Monitoring Well installed by NYSDEC (Carquest Investigation, 2013)
- Monitoring Well installed by Stantec (Site Characterization, 2015)
- Surface Soil Samples (2015)
- Soil Boring (2015)
- Test Pits (2014)
- Test Pits (2015)
- Test Pits (2016)
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Fenceline (Magde Survey, 2017)
- Streams

Notes:
1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: Steuben County orthoimagery (2016); downloaded from NYS GIS Clearinghouse (gis.ny.gov).
3. Monitoring wells were surveyed by Clear Creek Land Surveying in May 2020. Location of onsite well MW-19, which is now decomissioned, from April 2016 Magde survey.

0 100 200 Feet

(At original document size of 11x17)
1:1,200



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

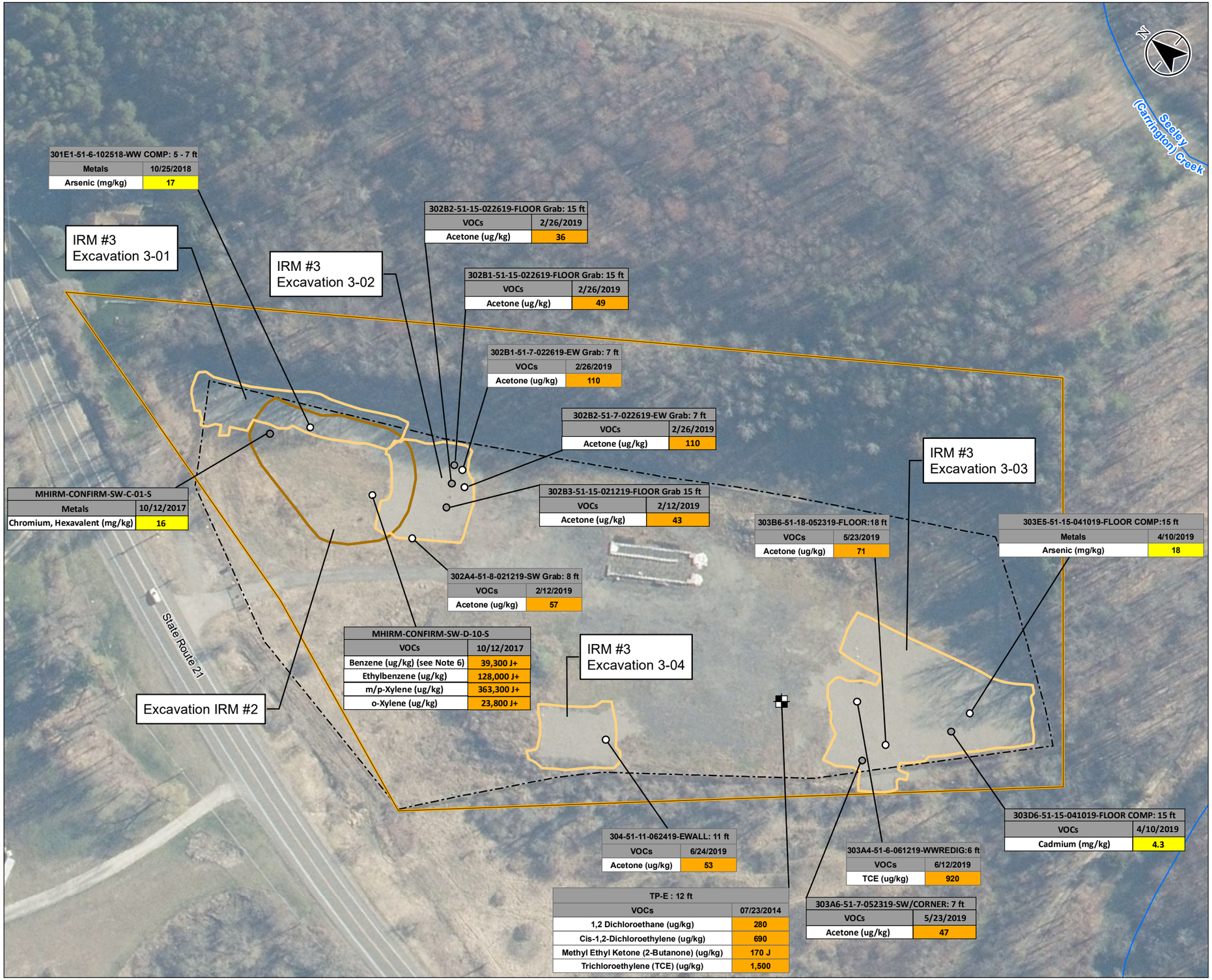
Figure No.
8

DRAFT

Title
Site Characterization Exploration and Sampling Locations

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U:\213414012\05_report_deliv\dwgs_design\GIS_figures\RAWP\mxd\fig8_RAWP_Site_Characterization_Exploration_and_Sampling_Locations_20260209.mxd Revised: 2026-02-09 By: akita



Stantec

Legend

- Confirmatory Soil Samples with Exceedances of 2006 SCOs
- Confirmatory Soil Samples with New SCO Exceedances Relative to the Revised SCOs Effective December 31, 2025
- Test Pits (2014)
- IRM 2 Excavation Limits
- IRM 3 Excavation Limits
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Fenceline (Magde Survey, 2017)
- Streams
- 50 Exceedance of Protection of Groundwater SCOs
- 10 Exceedance of Commercial Use SCOs

Indicates estimated high
Indicates an estimated concentration
Sample Location/ID
Sample Date

TP-F : 12 ft	
VOCs	07/23/2014
Methyl Ethyl Ketone (2-Butanone) (ug/kg)	150 J +
Trichloroethylene (TCE) (ug/kg)	740

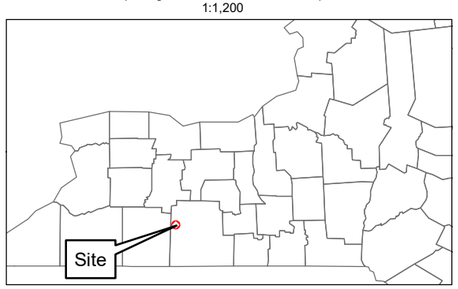
Analyte, concentration in micrograms per kilogram (ug/kg) or milligrams/kilograms (mg/kg)

Exceedance of Protection of Groundwater SCOs

Notes:

1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet
2. Basemap: Steuben County orthoimagery (2016); downloaded from NYS GIS Clearinghouse (gis.ny.gov).
3. Monitoring wells were surveyed by Clear Creek Land Surveying in May 2020. Location of onsite well MW-19, which is now decommissioned, from April 2016 Magde survey. Other investigation locations are approximate. Confirmatory sample locations were surveyed, as reported in the IRM Construction Completion Reports.
4. This figure depicts soil sample location excedances of NYSDEC SCOs in onsite soil samples. Orange shading indicates exceedance of UU/POGW SCOs and yellow shading indicates exceedance of Commercial Use SCOs. Refer to RIR analytical tables for comprehensive results. The following results are not considered exceedances and are therefore excluded from this figure:(1) Concentrations of common, naturally occuring metals including aluminum, calcium, iron, and magnesium; (2) Exceedances of UU/POGW SCOs for parameters other than VOCs;(3) DUSR-rejected 1,4-dioxane results in RI surface soil samples; and(4) Results for waste samples that no longer remain onsite: TP-D tar and TP-101 waste soil piles.
5. IRM excavation details are presented in the Construction Completion Reports for IRM#2 and IRM#3.IRM outlines were surveyed at grade; therefore, due to sloping excavation sides, the surveyed location of confirmatory sidewall soil samples may not align with the at-grade surveyed excavation limits.
6. At the time of IRM reporting, the benzene concentration met the CU SCO of 44,000. The concentration now exceeds the new (as of 12/31/2025) CU SCO of 20,000. Petroleum impacts have not been identified in onsite groundwater.

0 100 200 Feet
(At original document size of 11x17)
1:1,200



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11
Updated by AK on 2026-03-05

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

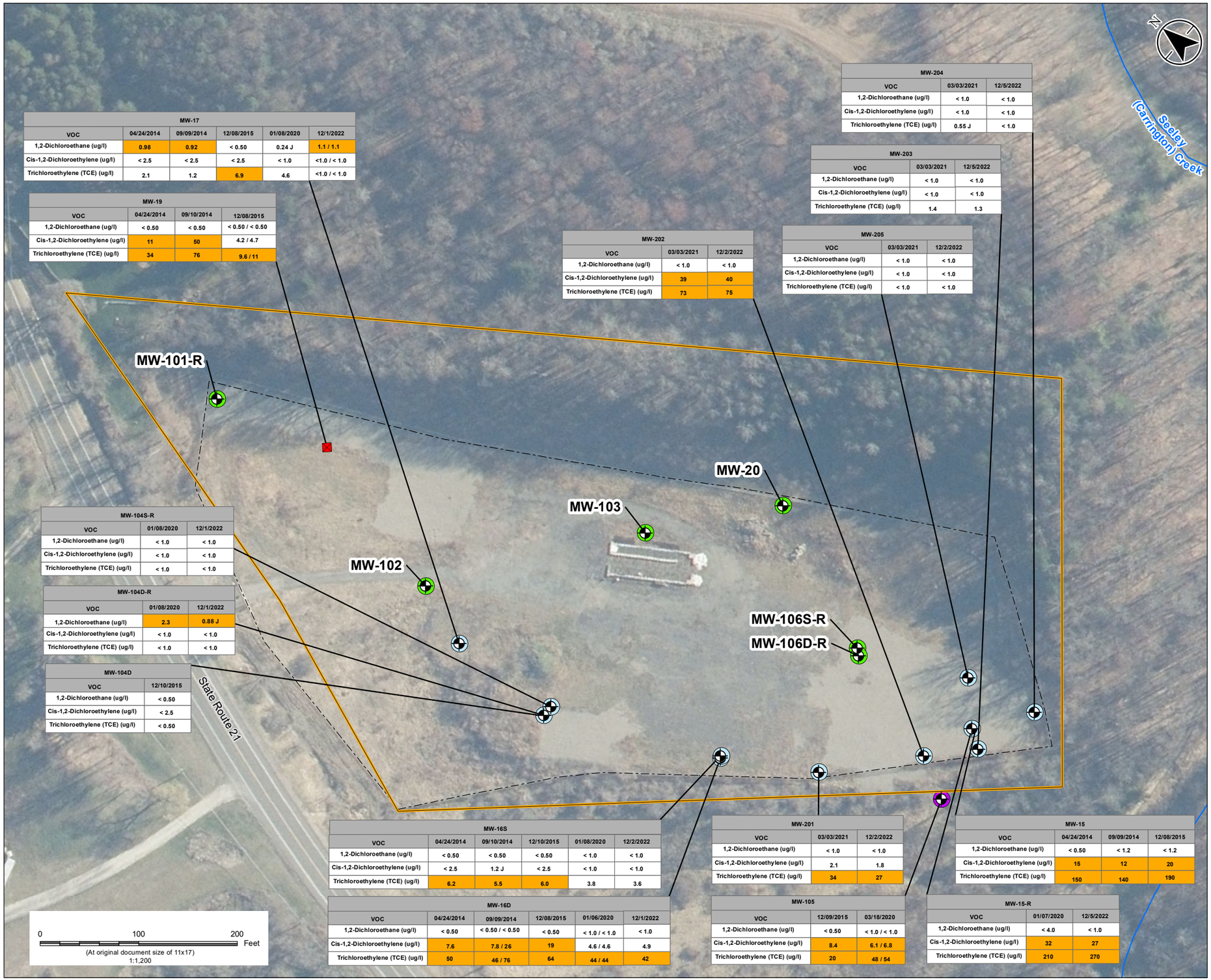
Figure No.
9

DRAFT

Title
Remaining (Post-IRM) Exceedances of SCOs in Onsite Soil Samples

U:\213414012\05_report_deliv\dwgs_design\GIS_figures\RAWP\Pmxd\fig9_RAWP_Remaining_(Post-IRM)_Exceedances_of_SCOs_in_Onsite_Soil_Samples_20260305.mxd Revised: 2026-03-05 By: akta

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of information provided by others.



MW-17					
VOC	04/24/2014	09/09/2014	12/08/2015	01/08/2020	12/1/2022
1,2-Dichloroethane (ug/l)	0.98	0.92	< 0.50	0.24 J	1.1 / 1.1
Cis-1,2-Dichloroethylene (ug/l)	< 2.5	< 2.5	< 2.5	< 1.0	<1.0 / < 1.0
Trichloroethylene (TCE) (ug/l)	2.1	1.2	6.9	4.6	<1.0 / < 1.0

MW-19			
VOC	04/24/2014	09/10/2014	12/08/2015
1,2-Dichloroethane (ug/l)	< 0.50	< 0.50	< 0.50 / < 0.50
Cis-1,2-Dichloroethylene (ug/l)	11	50	4.2 / 4.7
Trichloroethylene (TCE) (ug/l)	34	76	9.6 / 11

MW-104S-R		
VOC	01/08/2020	12/1/2022
1,2-Dichloroethane (ug/l)	< 1.0	< 1.0
Cis-1,2-Dichloroethylene (ug/l)	< 1.0	< 1.0
Trichloroethylene (TCE) (ug/l)	< 1.0	< 1.0

MW-104D-R		
VOC	01/08/2020	12/1/2022
1,2-Dichloroethane (ug/l)	2.3	0.88 J
Cis-1,2-Dichloroethylene (ug/l)	< 1.0	< 1.0
Trichloroethylene (TCE) (ug/l)	< 1.0	< 1.0

MW-104D	
VOC	12/10/2015
1,2-Dichloroethane (ug/l)	< 0.50
Cis-1,2-Dichloroethylene (ug/l)	< 2.5
Trichloroethylene (TCE) (ug/l)	< 0.50

MW-204		
VOC	03/03/2021	12/5/2022
1,2-Dichloroethane (ug/l)	< 1.0	< 1.0
Cis-1,2-Dichloroethylene (ug/l)	< 1.0	< 1.0
Trichloroethylene (TCE) (ug/l)	0.55 J	< 1.0

MW-203		
VOC	03/03/2021	12/5/2022
1,2-Dichloroethane (ug/l)	< 1.0	< 1.0
Cis-1,2-Dichloroethylene (ug/l)	< 1.0	< 1.0
Trichloroethylene (TCE) (ug/l)	1.4	1.3

MW-205		
VOC	03/03/2021	12/2/2022
1,2-Dichloroethane (ug/l)	< 1.0	< 1.0
Cis-1,2-Dichloroethylene (ug/l)	< 1.0	< 1.0
Trichloroethylene (TCE) (ug/l)	< 1.0	< 1.0

MW-202		
VOC	03/03/2021	12/2/2022
1,2-Dichloroethane (ug/l)	< 1.0	< 1.0
Cis-1,2-Dichloroethylene (ug/l)	39	40
Trichloroethylene (TCE) (ug/l)	73	75

MW-16S					
VOC	04/24/2014	09/10/2014	12/10/2015	01/08/2020	12/2/2022
1,2-Dichloroethane (ug/l)	< 0.50	< 0.50	< 0.50	< 1.0	< 1.0
Cis-1,2-Dichloroethylene (ug/l)	< 2.5	1.2 J	< 2.5	< 1.0	< 1.0
Trichloroethylene (TCE) (ug/l)	6.2	5.5	6.0	3.8	3.6

MW-16D					
VOC	04/24/2014	09/09/2014	12/08/2015	01/06/2020	12/1/2022
1,2-Dichloroethane (ug/l)	< 0.50	< 0.50 / < 0.50	< 0.50	< 1.0 / < 1.0	< 1.0
Cis-1,2-Dichloroethylene (ug/l)	7.6	7.8 / 26	19	4.6 / 4.6	4.9
Trichloroethylene (TCE) (ug/l)	50	46 / 76	64	44 / 44	42

MW-201		
VOC	03/03/2021	12/2/2022
1,2-Dichloroethane (ug/l)	< 1.0	< 1.0
Cis-1,2-Dichloroethylene (ug/l)	2.1	1.8
Trichloroethylene (TCE) (ug/l)	34	27

MW-105		
VOC	12/09/2015	03/18/2020
1,2-Dichloroethane (ug/l)	< 0.50	< 1.0 / < 1.0
Cis-1,2-Dichloroethylene (ug/l)	8.4	6.1 / 6.8
Trichloroethylene (TCE) (ug/l)	20	48 / 54

MW-15			
VOC	04/24/2014	09/09/2014	12/08/2015
1,2-Dichloroethane (ug/l)	< 0.50	< 1.2	< 1.2
Cis-1,2-Dichloroethylene (ug/l)	15	12	20
Trichloroethylene (TCE) (ug/l)	150	140	190

MW-15-R		
VOC	01/07/2020	12/5/2022
1,2-Dichloroethane (ug/l)	< 4.0	< 1.0
Cis-1,2-Dichloroethylene (ug/l)	32	27
Trichloroethylene (TCE) (ug/l)	210	270

Stantec

Legend

- Onsite Monitoring Wells
- Location Included in the Supplemental (November-December 2022) Groundwater Event
- Location with No Previous Exceedances (Not Included in the Supplemental [November-December 2022] Groundwater Event)
- Location with Previous Exceedances (Not Sampled During the Supplemental [November-December 2022] Groundwater Event due to No Access)
- Former Monitoring Well (Now Decommissioned) with Historical SGV Exceedances
- Fenceline (Magde Survey, 2017)
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Streams
- 50 Exceedance of NYSDEC SGVs

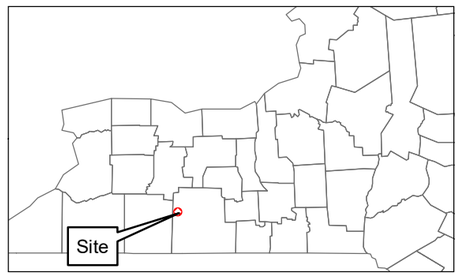
Non - Detect Result
Detection only, No exceedance of NYSDEC SGVs
Well #
Sample Date

MW-201	
VOC	03/03/2021
1,2-Dichloroethane (ug/l)	< 1.0
Cis-1,2-Dichloroethylene (ug/l)	2.1
Trichloroethylene (TCE) (ug/l)	34

Analyte, concentration in micrograms per liter (ug/l)
Exceedance of NYSDEC SGVs

Notes:

1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: Steuben County orthoimagery (2020); downloaded from NYS GIS Clearinghouse (gis.ny.gov).
3. Wells designated with an "-R" indicate wells that were decomissioned due to IRM excavations, then replaced by Stantec.
4. This figure depicts onsite groundwater sampling results for the three VOCs that have exceeded SGVs. Orange shading indicates an exceedance. Refer to RIR analytical tables for comprehensive results. The following results are not considered exceedances and are therefore excluded from this figure: concentrations of common, naturally occurring metals including iron, magnesium, manganese, and sodium. Field duplicate results are shown with the parent sample results preceded by a slash "/".
5. The Carquest Investigation data (2013) are not depicted on this Figure but are included in the RIR analytical tables (Stantec, 2021).
6. Abbreviations:
J = indicates an estimated concentration.
< = indicates the analyte was not detected above the listed reporting limit.



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

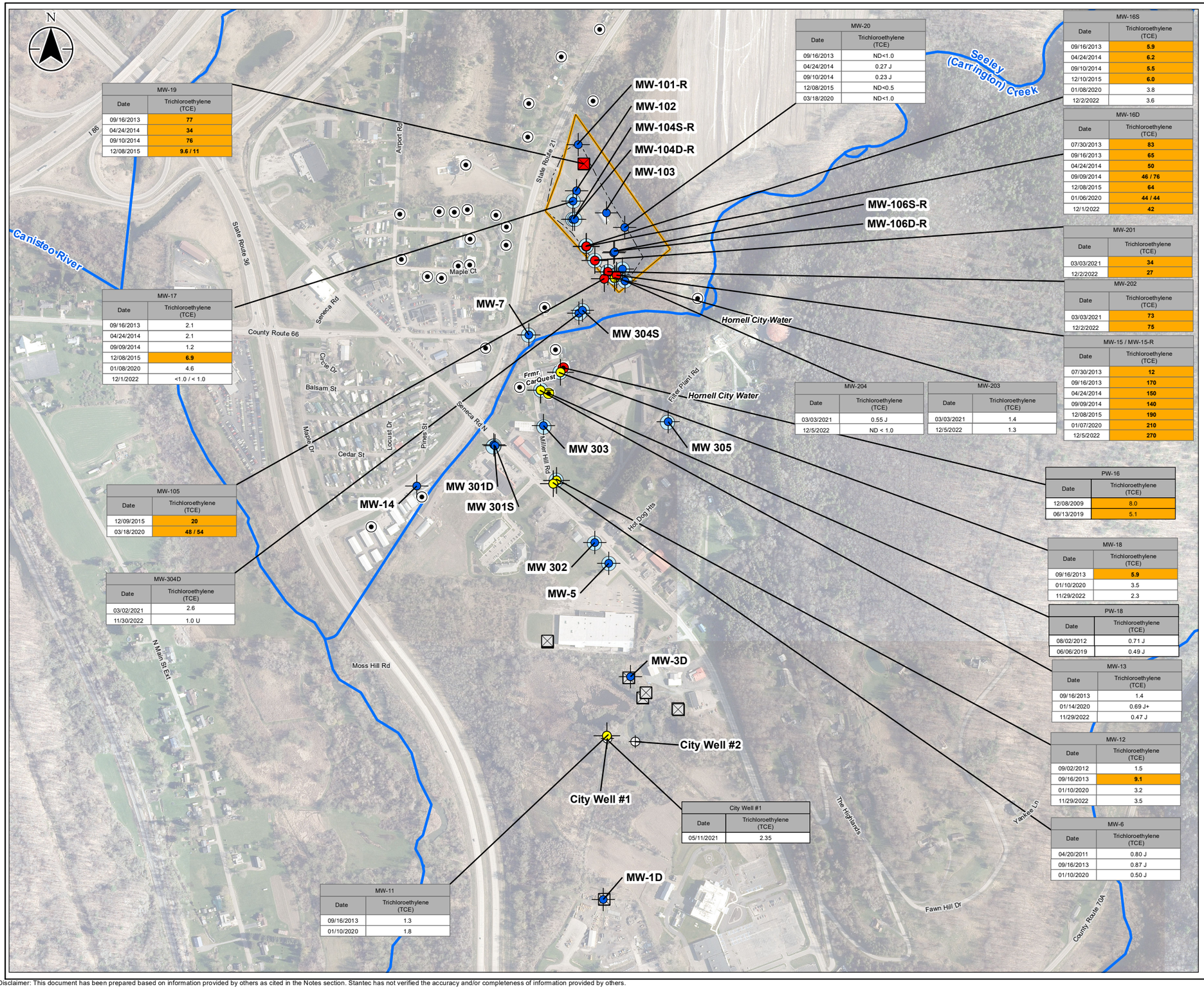
Figure No.
10

DRAFT

Title
Exceedances of SGVs in Onsite Groundwater Samples

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MW-19	
Date	Trichloroethylene (TCE)
09/16/2013	77
04/24/2014	34
09/10/2014	76
12/08/2015	9.6 / 11

MW-17	
Date	Trichloroethylene (TCE)
09/16/2013	2.1
04/24/2014	2.1
09/09/2014	1.2
12/08/2015	6.9
01/08/2020	4.6
12/1/2022	<1.0 / < 1.0

MW-105	
Date	Trichloroethylene (TCE)
12/09/2015	20
03/18/2020	48 / 54

MW-304D	
Date	Trichloroethylene (TCE)
03/02/2021	2.6
11/30/2022	1.0 U

MW-11	
Date	Trichloroethylene (TCE)
09/16/2013	1.3
01/10/2020	1.8

MW-20	
Date	Trichloroethylene (TCE)
09/16/2013	ND<1.0
04/24/2014	0.27 J
09/10/2014	0.23 J
12/08/2015	ND<0.5
03/18/2020	ND<1.0

MW-204	
Date	Trichloroethylene (TCE)
03/03/2021	0.55 J
12/5/2022	ND < 1.0

MW-203	
Date	Trichloroethylene (TCE)
03/03/2021	1.4
12/5/2022	1.3

City Well #1	
Date	Trichloroethylene (TCE)
05/11/2021	2.35

MW-16S	
Date	Trichloroethylene (TCE)
09/16/2013	5.9
04/24/2014	6.2
09/10/2014	5.5
12/10/2015	6.0
01/08/2020	3.8
12/2/2022	3.6

MW-16D	
Date	Trichloroethylene (TCE)
07/30/2013	83
09/16/2013	65
04/24/2014	50
09/09/2014	46 / 76
12/08/2015	64
01/06/2020	44 / 44
12/1/2022	42

MW-201	
Date	Trichloroethylene (TCE)
03/03/2021	34
12/2/2022	27

MW-202	
Date	Trichloroethylene (TCE)
03/03/2021	73
12/2/2022	75

MW-15 / MW-15-R	
Date	Trichloroethylene (TCE)
07/30/2013	12
09/16/2013	170
04/24/2014	150
09/09/2014	140
12/08/2015	190
01/07/2020	210
12/5/2022	270

PW-16	
Date	Trichloroethylene (TCE)
12/08/2009	8.0
06/13/2019	5.1

MW-18	
Date	Trichloroethylene (TCE)
09/16/2013	5.9
01/10/2020	3.5
11/29/2022	2.3

PW-18	
Date	Trichloroethylene (TCE)
08/02/2012	0.71 J
06/06/2019	0.49 J

MW-13	
Date	Trichloroethylene (TCE)
09/16/2013	1.4
01/14/2020	0.69 J+
11/29/2022	0.47 J

MW-12	
Date	Trichloroethylene (TCE)
09/02/2012	1.5
09/16/2013	9.1
01/10/2020	3.2
11/29/2022	3.5

MW-6	
Date	Trichloroethylene (TCE)
04/20/2011	0.80 J
09/16/2013	0.87 J
01/10/2020	0.50 J

Stantec

Legend

Study Area Monitoring Wells and TCE Sampling Result (see Note 5)

- No Detected
- Detection, No Exceedance
- Exceedance

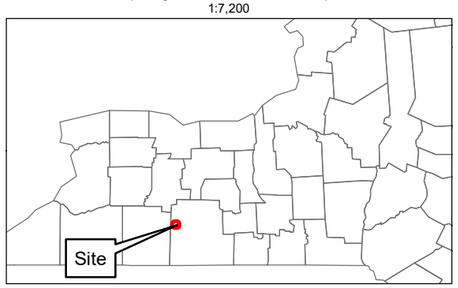
Private Wells Sampled by Stantec

- No Detection
- Detection, No Exceedance
- Exceedance
- Location Included in the Supplemental (November-December 2022) Groundwater Event
- Former Monitoring Well with No TCE Detection (Now Decommissioned)
- Former Onsite Monitoring Well (Now Decommissioned) with Historical SGV Exceedances
- City of Hornell Water Supply Well
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Fenceline (Magde Survey, 2017)
- Streams
- 50 Exceedance of TOGS 1.1.1 Standard

Notes:

1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: Steuben County orthoimagery (2020); downloaded from NYS GIS Clearinghouse (gis.ny.gov).
3. TCE Results in µg/L (micrograms per liter; equivalent to parts per billion).
4. Data Qualifiers:
ND - TCE not detected above indicated reporting limits.
J - estimated value.
J+ - estimated value, potentially biased high.
5. Values for the City of Hornell supply wells represent the most recent data provided by the City of Hornell. Historically, Well #1 has exhibited exceedances and Well #2 has exhibited detections (but no exceedances). The May 2021 data depicted herein are understood to represent the current conditions of the influent groundwater quality.
6. Results for sampling of offsite monitoring wells prior to Stantec's sampling in 2020 were obtained from NYSDEC-provided data for sampling performed by others. For the following locations, multiple samples from various depths were reported for the same date(s) but only the maximum [non-estimated] concentration is shown on this Figure: MW-12, MW-15, MW-16D, MW-17, MW-18, MW-19, MW-20.

0 500 1,000 Feet
(At original document size of 11x17)
1:7,200



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

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Figure No.
11

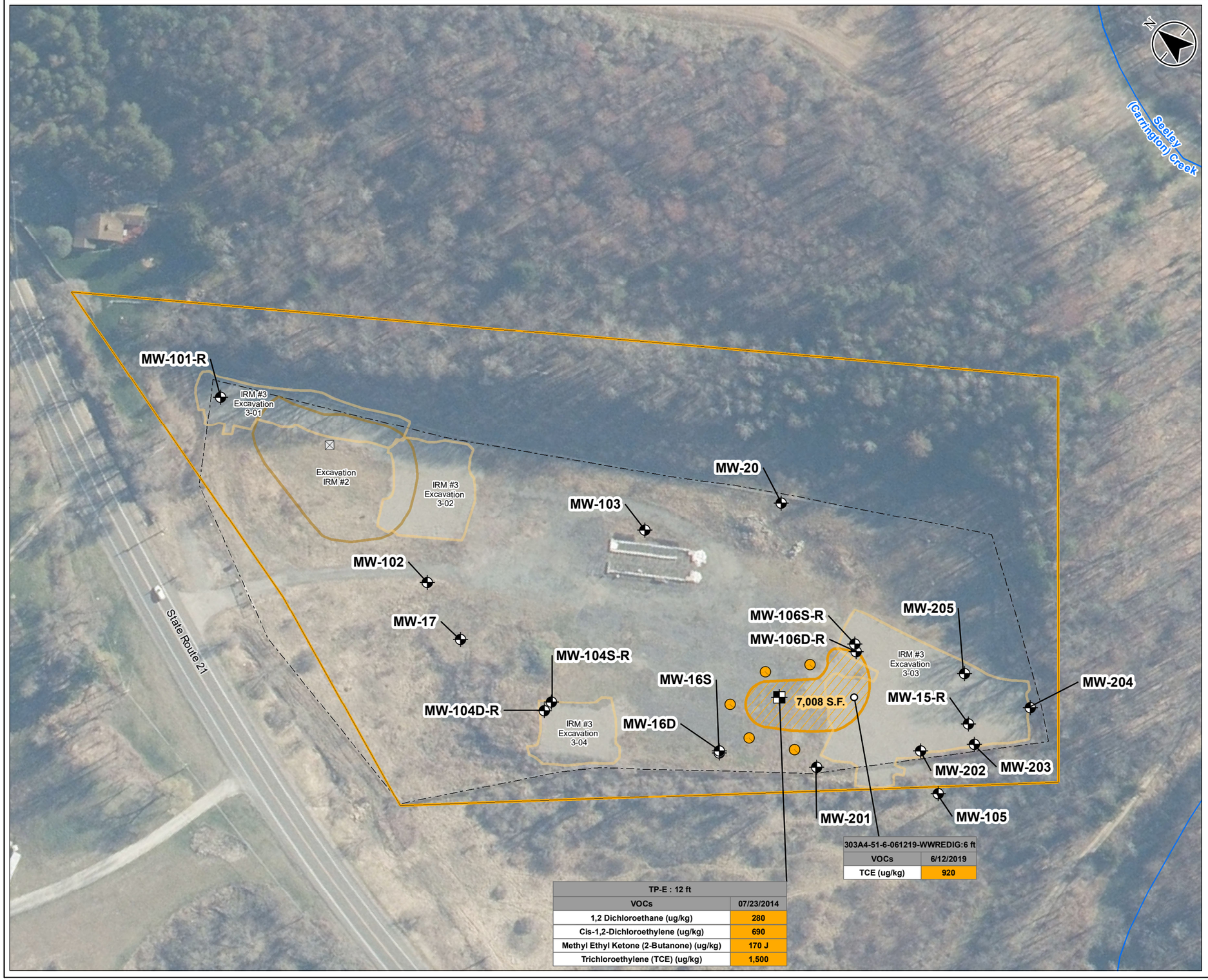
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Title

Concentration of TCE in Study Area Groundwater Monitoring Well Samples - Sampling Events Through 2022

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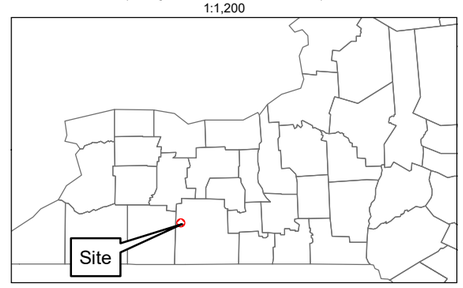
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- Onsite Monitoring Wells
- Test Pits (2014)
- Confirmatory Soil Sample (With Exceedance)
- Former Monitoring Well (Now Decommissioned) with Historical SGV exceedances
- IRM 3 Excavation Limits
- IRM 2 Excavation Limits
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Fenceline (Magde Survey, 2017)
- Streams
- Proposed Geoprobe Soil Borings 2026 (Approx. 50 feet on-center)
- Proposed Area of Soil Excavation and Removal (see Note 7)
- 50 Exceedance of Protection of Groundwater SCOs
- 10 Exceedance of Commercial Use SCOs

Notes:

1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: Steuben County orthoimagery (2020); downloaded from NYS GIS Clearinghouse (gis.ny.gov).
3. Monitoring wells were surveyed by Clear Creek Land Surveying in May 2020. Location of onsite well MW-19, which is now decommissioned, from April 2016 Magde survey. Other investigation locations are approximate. Confirmatory sample locations were surveyed, as reported in the IRM Construction Completion Reports.
4. This figure depicts soil sample location excedances of NYSDEC SCOs in onsite soil samples. Orange shading indicates exceedance of UU/POGW SCOs and yellow shading indicates exceedance of Commercial Use SCO. Refer to RIR analytical tables for comprehensive results. The following results are not considered exceedances and are therefore excluded from this figure:(1) Concentrations of common, naturally occuring metals including aluminum, calcium, iron, and magnesium; (2) Exceedances of UU/POGW SCOs for parameters other than VOCs;(3) DUSRrejected 1,4-dioxane results in RI surface soil samples; and(4) Results for waste samples that no longer remain onsite: TP-D tar and TP-101 waste soil piles.
5. IRM excavation details are presented in the Construction Completion Reports for IRM#2 and IRM#3.IRM outlines were surveyed at grade; therefore, due to sloping excavation sides, the surveyed location of confirmatory sidewall soil samples may not align with the at-grade surveyed excavation limits.
6. Abbreviations:
J = indicates an estimated concentration.
RAWP = Remedial Action Work Plan
7. Extent and timing of excavation subject to findings of the design-stage boring program and screening during construction.

0 100 200 Feet
(At original document size of 11x17)
1:1,200



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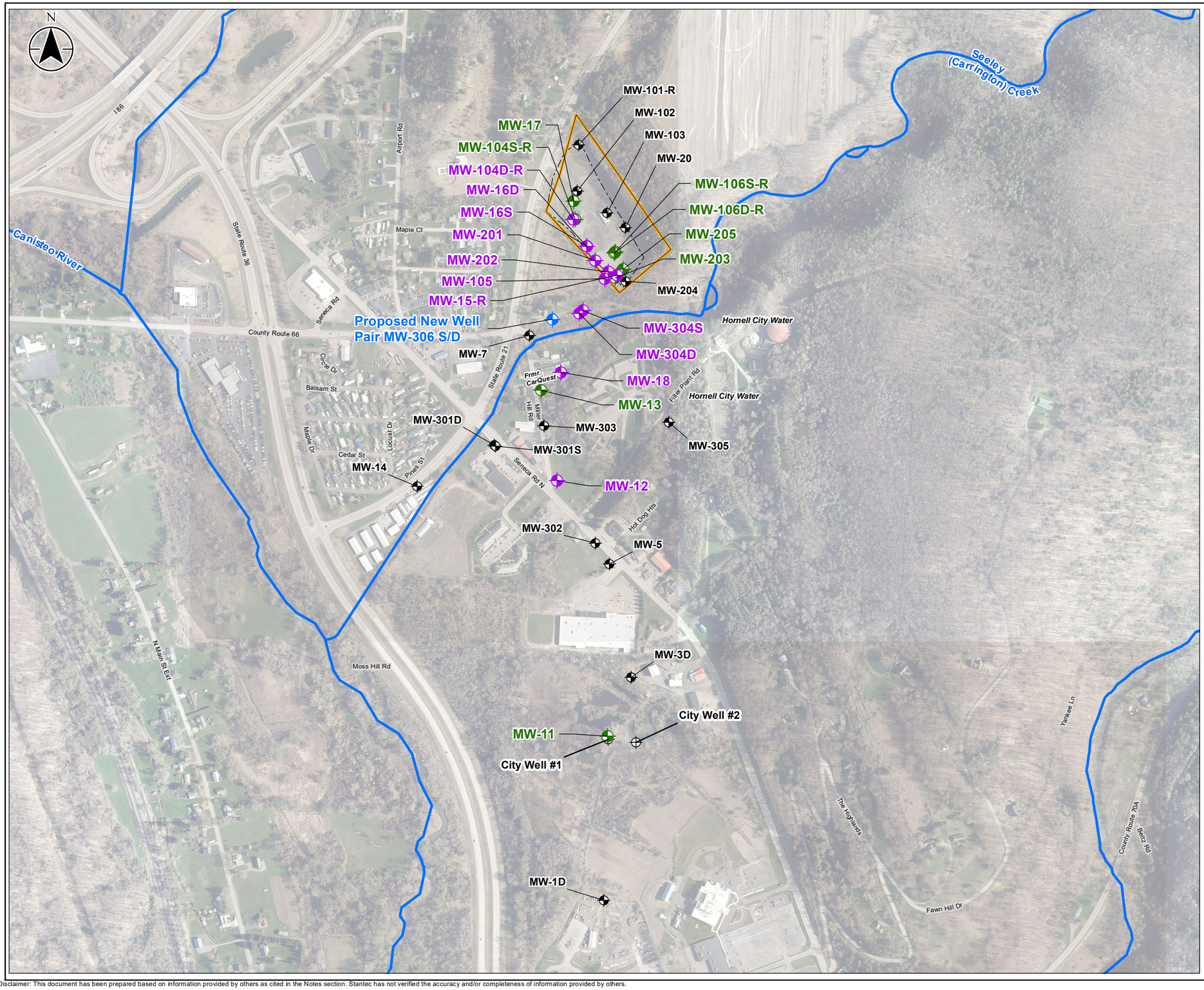
Figure No.
12

DRAFT

Title
Proposed RAWP Approximate Soil Excavation Area and Delineation Boring Locations

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Legend

Study Area Monitoring Wells and Proposed Sampling Frequency

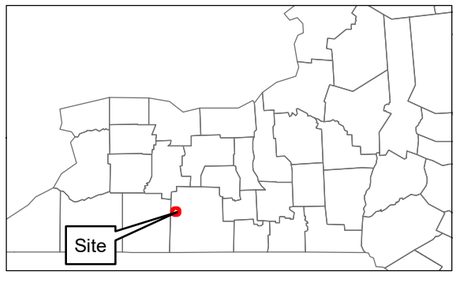
- Quarterly
- Semi-Annually
- Proposed New Well Pair to be Installed as part of the Remedial Action (Proposed to be Sampled Quarterly)
- Monitoring Well Included in Gauging Program
- City of Hornell Water Supply Well
- Miller Hill Yard BCP Site (Magde Survey, 2017)
- Fenceline (Magde Survey, 2017)
- Streams

Notes:

1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: Steuben County orthoimagery (2020); downloaded from NYS GIS Clearinghouse (gis.ny.gov).

0 500 1,000 Feet

(At original document size of 11x17)
1:7,200



Project Location
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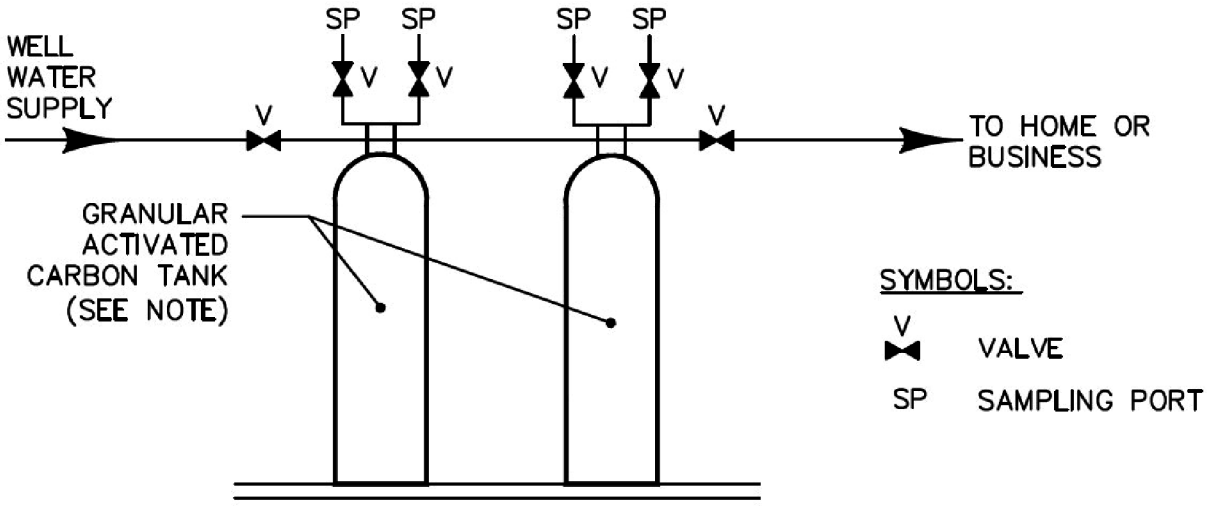
Figure No.
13

DRAFT

Title
Proposed RAWP New Monitoring Well Location Map and Long-Term Monitoring Well Network

U:\213414012\05_report_deliv\dwgs_design\GIS_figures\RAWP\mxd\fig13_RAWP_Proposed_RAWP_New_Monitoring_Well_Location_Map_and_Long-Term_Monitoring_Well_Network_20260210.mxd Revised: 2026-02-10 By: akita

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of information provided by others.



NOTE:

1. THE CARBON TREATMENT SYSTEM CONSISTS OF TWO CULLIGAN NON-BACKWASHING, 9" X 48" RFP TANKS WITH 1 CU. FT OF CALGON FILTERSORB 600 ACTIVATED CARBON, EACH.

2. POET : POINT-OF-ENTRY TREATMENT

Stantec

Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

Figure No.
14

DRAFT

Title
Installed POET System Schematic

U:\213414012\05_report_deliv\dwgs_design\GIS_figures\RAWP\mxd\fig14_RAWP_Installed_POET_System_Schematic_20260209.mxd Revised: 2026-02-09 By: akita

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Attachments

APPENDIX A

Health and Safety Plan (HASP)

Health and Safety Plan for Remedial Action Work Plan

NYSDOT Former Miller Hill Yard
NYSDEC BCP Site #851045
7578 State Route 21
Fremont, Steuben County, New York

Date:

March 5, 2026
Revision 5

DRAFT

Prepared for:
New York State Department of Environmental Conservation
6724 East Avon-Lima Road
Avon, New York 14414

Prepared on behalf of:
New York State Department of Transportation
50 Wolf Road, 6th Floor
Albany, New York 12232

Prepared by:
Stantec Consulting Services, Inc.
61 Commercial Street, Suite 100
Rochester, New York 14614

NEW YORK STATE DEPARTMENT OF TRANSPORTATION (NYSDOT) MILLER HILL YARD – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) SITE # 851045 REMEDIAL ACTION WORK PLAN HEALTH AND SAFETY PLAN REVISION 5

Health and Safety Plan Modification Log			
Version	**Date**	**Sections**	**Description**
Original	January 2016	All	N/A
Revision 1	May 2017	All	Updates based on observed Site conditions, additional contaminants added to App. A, modifications to PPE, and physical hazards updated.
Revision 2	October 2017	All	Updates based on RIWP activities.
Revision 3	January 2021	All	Updates based on Supplemental RIWP activities (Drilling/Well Installation).
Revision 4	February 2022	All	Updates based on Soil Vapor Intrusion Work Plan activities and changes in Project contacts.
Revision 5	February/ March 2026	All	Updates based on RAWP activities (Borings/Drilling/Well Sampling).

This Health and Safety Plan (HASP) will be amended (with changes recorded on the Health and Safety Plan Modification Log above) if site conditions, scope of work, training, personnel, or other critical items change.

NEW YORK STATE DEPARTMENT OF TRANSPORTATION (NYSDOT) MILLER HILL YARD – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) SITE # 851045 REMEDIAL ACTION WORK PLAN HEALTH AND SAFETY PLAN REVISION 5

HASP Use Declaration

This New York State Department of Transportation (NYSDOT) Miller Hill Yard – New York State Department of Environmental Conservation (NYSDEC) Site # 851045 Remedial Action Work Plan Health and Safety Plan Revision 5 was prepared by and for Stantec Consulting Services Inc. operations. Any reliance on this document by a third party is strictly prohibited. Stantec subcontractors are responsible for assessing the hazards of their operations and preparing a project specific Health and Safety Work Plan (HASP) as applicable to their scope of work and conditions. A copy of this HASP will be provided to Stantec Subcontractors conducting field work related to site activities as a means of communicating recognized hazards at the site of which Stantec has knowledge.

For subcontractors, the methods to identify hazards, implement controls, enforce the precautions and requirements for ensuring the health and safety of its employees and property; remain the subcontractor's responsibility. The material in this HASP reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document as well as in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Leadership Preparation, Review and Approval (HASP are to be reviewed and approved annually)

Client: New York State Department of Transportation **Project Name: Miller Hill Yard BCP** **Start Date:** March 5, 2026 **Plan Review Date:** March 5, 2027		**Site Name: NYSDEC Site #851045** **Project Numbers:** 213414012 **End Date:** March 5, 2027
Amanda Matkosky Site Health and Safety Officer (SHSO)	Signature:	Date: 2/3/2026
Brandon Gallagher Project Manager	Signature:	Date: 3/x/2026
Tony Speer HSSE Senior Advisor, Environmental Services	Signature:	Date: 3/x/2026
Gene Florentino Reviewer	Signature:	Date:2/4/2026

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Acknowledgement and Agreement

This Site-Specific Health and Safety Plan (HASP) has been developed for the purpose of aiding Stantec employees in identifying, understanding, and mitigating the risks/hazards they are likely to encounter at the site. This HASP is a means of communicating recognized hazards at the site of which Stantec has knowledge and may also be used as a guidance document by properly trained and experienced Stantec subcontractors and clients to assist them in their hazard evaluation process. Stantec is available to assist subcontractors in identifying recognized hazards of which Stantec is knowledgeable; however, subcontractors and other contractors at the site must develop and enforce their own HASP or other safety planning documents as appropriate to their work at the site to address the hazards faced by their own employees. The methods to identify hazards, implement controls, and enforce the precautions and requirements for ensuring the health and safety of its employees and property, remain the subcontractor's responsibility.

All parties conducting site activities under the scope of this HASP are required to coordinate their activities and practices with the Stantec Project Manager or their designee, the Site Health and Safety Officer (SHSO). Stantec has provided a copy of this HASP to our subcontractors and other contractors to assist in identifying hazards of which Stantec is aware and to satisfy Stantec's responsibilities under the Occupational Safety and Health Administration (OSHA) Hazard Communication standard. Similarly, Stantec's subcontractors and other contractors are required to inform Stantec of any hazards they are aware of or that their work on site may pose to Stantec employees including, but not limited to, the Safety Data Sheets for chemicals the contractor may bring on site.

Your signature below confirms the following: you have read and understand the hazards and associated mitigation measures discussed in this HASP; you have received training and medical surveillance according to this HASP and the OSHA Standard for Hazardous Waste Operations and Emergency Response (HAZWOPER) found in 29 Code of Federal Regulations (CFR) 1910.120/ 29 CFR 1926.65 or state equivalent; you understand that subcontractors and other contractors must develop their own HASP for their employees; and that you will complete your tasks in a manner conforming to this HASP and your employer specific Safe Work Practices, Safety Plans or guidance. Furthermore, you understand that you could be prohibited by the SHSO from working on this project due to failure to comply with any aspect of this HASP. Finally, you understand that you have the authority and responsibility to call for "Stop Work" when unsafe conditions are recognized until safe methods are developed and implemented.

Acknowledgement and Agreement

Name	Signature	Company	Date

Name	Signature	Company	Date

Abbreviations

ACOE	Army Corps of Engineers
AED	Automated external defibrillator
ANSI	American National Standards Institute
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CGI	Combustible Gas Indicator
CPR	Cardiopulmonary resuscitation
CVOC	Chlorinated Volatile Organic Compound
dBA	decibels, A-weighted scale
DCR	Designated Company Representative
DEET	N,N-Diethyl-meta-toluamide
DOT	Department of Transportation
EFAP	Employee and Family Assistance Plan
EHS	Environmental, Health and Safety
ERP	Emergency Response Plan
eV	Electron volt
ft	Feet
HASP	Health and Safety Plan
HAZCOM	Hazard Communication Standard (29 CFR 1910.1200)
HAZMAT	Hazardous Materials Response
HAZWOPER	Hazardous Waste Operations and Emergency Response
HRAC	Hazard Recognition, Assessment, and Control
HSSE	Health, Safety, Security, and Environment
ICOC	In Case Of Crisis



IDLH	Immediately dangerous to life or health
IRM	Interim Remedial Measure
JSA	Job Safety Analysis
kV	Kilovolts
LMRA	Last-Minute Risk Assessment
LTT	Lock, Tag, Try
MOC	Management of Change
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Administration
NRR	Noise Reduction Rating
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
OEL	Occupational Exposure Limit
OSEC	Office Safety and Environmental Coordinator
OSHA	U.S. Occupational Safety and Health Administration
PCBs	Polychlorinated biphenyls
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PJO	Planned Job Observation
POGW	Protection of Groundwater
PPE	Personal Protective Equipment
ppm	Parts per million
PRM	Practice and Risk Management
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RMS	Risk Management Strategy



ROW	Right-of-Way
SCBA	Self-contained Breathing Apparatus
SCG	Standards, Criteria and Guidance
SDS	Safety Data Sheet
SHSO	Site Health and Safety Officer
Stantec	Stantec Consulting, Inc.
SWP	Stantec Safe Work Practice
TPH	Total Petroleum Hydrocarbons
TSD	Treatment, storage and disposal
TWA	Time Weighted Average
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WCCC	Workers Compensation Claims Coordinator



Glossary

Buddy System	A system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.
Clean-up operation	An operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment.
Competent Person	Person capable of identifying existing and predictable hazards and has the authority and responsibility to take prompt measures to eliminate or control the hazards.
Decontamination	The removal of hazardous substances from employees and their equipment (including their personal protective equipment [PPE]) to the extent necessary to preclude the occurrence of foreseeable adverse health effects.
Emergency response	A response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses. Responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.
Hazard	A hazard is any condition, device, substance, or practice that has the potential to cause loss, such as injury to people or damage to equipment, materials, environment, or property.
Hazardous materials response (HAZMAT) team	An organized group of employees, designated by the employer, who are expected to perform work to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The team members perform responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of the incident. A HAZMAT team is not a fire brigade nor is a typical fire brigade a HAZMAT team. A HAZMAT team, however, may be a separate component of a fire brigade or fire department
Hazardous substance	Any substance designated below, exposure to which results or may result in adverse effects on the health or safety of employees. Designated substances include: • Any substance defined under section 103(14) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (42 U.S.C. 9601). • Any biologic agent and other disease causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from



	the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring. • Any substance listed by the U.S. Department of Transportation as hazardous materials under 49 Code of Federal Regulations (CFR) 172.101 and appendices; and • Hazardous waste as defined by Resource Conservation and Recovery Act (RCRA) and in 40 CFR 261.3, or those substances defined as hazardous wastes in 49 CFR 171.8.
Hazardous waste	A waste or combination of wastes as defined in 40 CFR 261.3, or those substances defined as hazardous wastes in 49 CFR 171.8.
Health hazard	A chemical or a pathogen where acute or chronic health effects may occur in exposed employees. It also includes stress due to temperature extremes. The term health hazard includes chemicals that are classified in accordance with the Hazard Communication Standard, 29 CFR 1910.1200, 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); aspiration toxicity or simple asphyxiant.
Immediately dangerous to life or health (IDLH)	An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would interfere with an individual's ability to escape from a dangerous atmosphere.
Near Miss	Potentially fatal events not resulting in injury, illnesses, or property damage; minor spills that are not reportable, are controlled, and immediately cleaned up; and any other event nearly resulting in injury, property damage, or loss not covered here.
Occupational Safety and Health Administration (OSHA)	United States federal agency responsible for overseeing and implementing safe and healthy working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.
Oxygen deficiency	The concentration of oxygen by volume below which atmosphere-supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen by volume is less than 19.5 percent.
Permissible exposure limit (PEL)	The maximum exposure concentration of a chemical as identified in PESH Permissible Exposure Limits (800.5) and Occupational Safety and Health Administration Permissible Exposure Limits Annotated Tables.
Post emergency response	That portion of an emergency response performed after the immediate threat of a release has been stabilized or eliminated and clean-up of the site has begun. If post emergency response is performed by an employer's own employees who were part of the initial emergency response, it is considered to be part of the initial response and not post emergency response. However, if a group of an employer's own employees, separate from the group providing initial response, performs the clean-up operation, then the separate



	group of employees would be considered to be performing post-emergency response and subject to 29 CFR 1910.120(q)(11).
Published exposure level	Exposure limits published in "NIOSH Recommendations for Occupational Health Standards" dated 1987, which is incorporated by reference as specified in § 1910.6, or if none is specified, the exposure limits published in the standards specified by the American Conference of Governmental Industrial Hygienists in their publication "Threshold Limit Values and Biological Exposure Indices for 1987-88" dated 1987, which is incorporated by reference as specified in § 1910.6.
Qualified person	A person with specific training, knowledge and experience in the area for which the person has the responsibility and the authority to control.
Risk	Risk is the likelihood of a potential loss actually occurring, and the severity of the loss if it does occur. When determining likelihood, consideration needs to be given to the frequency of exposure and the probability of loss occurring.
Site health and safety officer (SHSO)	The individual located on a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.
State Only Hazardous Waste	A waste or combination of wastes as defined by OAR 340-101-0033, which include pesticide residues and mixtures of wastes containing constituents of federal P (3 percent) and U (10 percent) listed wastes
Uncontrolled hazardous waste site	An area identified as an uncontrolled hazardous waste site by a governmental body, whether Federal, state, local or other where an accumulation of hazardous substances creates a threat to the health and safety of individuals or the environment or both. Some sites are found on public lands such as those created by former municipal, county or state landfills where illegal or poorly managed waste disposal has taken place. Other sites are found on private property, often belonging to generators or former generators of hazardous substance wastes. Examples of such sites include, but are not limited to, surface impoundments, landfills, dumps, and tank or drum farms. Normal operations at treatment, storage and disposal (TSD) sites are not covered by this definition.

1.0 INTRODUCTION

This New York State Department of Transportation (NYSDOT) Miller Hill Yard – New York State Department of Environmental Conservation (NYSDEC) Site # 851045 Remedial Action Work Plan Health and Safety Plan Revision 5 was prepared by Stantec Consulting Services Inc. ("Stantec") on behalf of NYSDOT Miller Hill Yard NYSDEC Site #851045 (also referred to herein as "the site"). Stantec does not have responsibility for initiating, maintaining, monitoring, supervising, or determining the adequacy or implementation of the safety precautions, programs, or plans of any additional party outside of their direct control operating or working within the Project Area(s) but outside Stantec's site controls. The information in this Health and Safety Plan (HASP) should not be used for advising, issuing direction, or assuming control over any safety precautions or programs of the Client or Subcontractors.

Where this HASP addresses safe practices for various specific work activities, this information is provided solely as directives or guidelines for protecting Stantec employees (including "employee like" sub consultant employees that are supervised by Stantec on a day-to-day basis) and establishing minimum requirements for Stantec subcontractors. Any implementation questions for this plan should be addressed to the Project Manager, designated project Site Health and Safety Officer (SHSO) or a Stantec Health, Safety, Security, and Environment (HSSE) team member.

Stantec subcontractors are contractually responsible for assuring the safety and health of their employees and shall effectively carry out all requirements referenced in the contract documents, and as required by State and/or Federal law. Any precautions, programs or HASP of any Stantec subcontractor must, at a minimum, meet the requirements of this HASP. However, this HASP is not intended in any way to be a substitute for any subcontractor's own risk analysis, or to otherwise relieve any subcontractor of any applicable contractual and regulatory requirements for health and safety. Stantec subcontractor's will be provided a copy of this HASP and shall acknowledge that it is only intended as minimum HASP requirements, and shall provide and enforce their own HASP, including any changes or revisions specific to their activities and scope of work.

1.1 HEALTH AND SAFETY PLAN OBJECTIVE

This HASP is issued by Stantec to establish the work practices necessary for the protection of Stantec employees and site visitors during the performance of their work activities. The scope of services for Stantec work activities is summarized in **Section 2.2**. The detailed scope of work for individual activities conducted under this HASP are within the Remedial Action Work Plan (RAWP) established for the Project Work Plan prepared under separate cover.

The objective of this HASP is to address known and reasonably anticipated health and safety hazards to the Stantec employees providing services under Stantec's contract with the Client. This HASP provides information designed to prevent and minimize personal injuries, illnesses to Stantec employees and physical damage to equipment, supplies and property. Stantec requires Stantec subcontractors to have their own HASP. The Stantec subcontractor's HASP must meet or exceed the minimum requirements within this HASP.

1.1.1 Regulatory and Other Requirements

All project activities will be performed in accordance with applicable sections of the Code of Federal Regulations (CFRs), including the Occupational Safety and Health Administration (OSHA) Standards 29 CFR 1910.120 (General Industry) and 29 CFR 1926.65 (Construction). The following table outlines federal Hazardous Waste Operations and Emergency Response (HAZWOPER) regulatory requirements cross referenced to the appropriate HASP section.

Requirement	Regulatory Reference	HASP Section
A safety and health risk or hazard analysis for each site task and operation found in the workplan.	1910.120(b)(4)(ii)(A)	Section 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0 and **Appendix B**.
Employee training assignments to assure compliance with 29 CFR 1910.120(e).	1910.120(b)(4)(ii)(B)	Section 12.0
Personal protective equipment to be used by employees for each of the site tasks and operations being conducted as required by the personal protective equipment program requirements found in 29 CFR 1910.120(g)(5).	1910.120(b)(4)(ii)(C)	Section 14.0 and **Appendix B**.
Medical surveillance requirements in accordance with 29 CFR 1910.120(f).	1910.120(b)(4)(ii)(D)	Section 15.0
Site control measures in accordance with the site control program requirements found in 29 CFR 1910.120(d).	1910.120(b)(4)(ii)(F)	Section 10.0
Decontamination procedures in accordance with 29 CFR 1910.120(k).	1910.120(b)(4)(ii)(G)	Section 10.5
An emergency response plan meeting the requirements of 29 CFR 1910.120(l) for safe and effective responses to emergencies, including the necessary personal protective equipment (PPE) and other equipment.	1910.120(b)(4)(ii)(H)	Section 17.0
A spill containment program meeting the requirements of 29 CFR 1910.120(j).	1910.120(b)(4)(ii)(J)	Section 17.6
Policy statements of the line of authority and accountability for implementing the program, the objectives of the program and the role of the site safety and health supervisor or manager and staff;	29 CFR 1910.120/1926.65 Appendix C	Section 3.0
Mean or methods for the development of procedures for identifying and controlling workplace hazards at the site.	29 CFR 1910.120/1926.65 Appendix C	Section 4.0
Means or methods for the development and communication to employees of the various plans, work rules, standard operating procedures (SOP) and practices that pertain to individual employees and supervisors.	29 CFR 1910.120/1926.65 Appendix C	Section 3.2, 4.0
Means for the training of supervisors and employees to develop the needed skills and knowledge to perform their work in a safe and healthful manner.	29 CFR 1910.120/1926.65 Appendix C	Section 12.0
Means to anticipate and prepare for emergency situations	29 CFR 1910.120/1926.65 Appendix C	Section 17.0

Requirement	Regulatory Reference	HASP Section
Means for obtaining information feedback to aid in evaluating the program and for improving the effectiveness of the program	29 CFR 1910.120/1926.65 Appendix C	Section 1.5 and 1.6

1.1.2 Client Requirements

Project activities will be performed in accordance with Client Health and Safety (EHS) requirements, and other policies and/or procedures incorporated into the contract for the contracted work activities.

1.2 STATEMENTS OF STANTEC HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

Stantec is committed to providing and maintaining a healthy, safe, and secure workplace for our staff, clients, partners, and subcontractors. Stantec's Health, Safety, Security, and Environment (HSSE) Program is a cornerstone of Stantec's ISO 45001-certified Occupational Health and Safety Management System which is part of Stantec's global Integrated Management System. Everyone working for Stantec is responsible and accountable for Stantec's health, safety, and security performance. Management, supervisors, employees, and subcontractors are expected to understand their roles and responsibilities as outlined by the HSSE Program and to comply with the practices of the Occupational Health and Safety Management System.

Through Stantec's HSSE program, the Company strives to:

- Visibly demonstrate a commitment to Health Safety and Security (HSS) by providing responsible leadership and clearly communicating expectations.
- Assist and support employees in developing an awareness and understanding of the health, safety and security issues related to their work.
- Identify, assess, and manage the HSS hazards and risks to which its employees are exposed
- Comply with legislation, regulations, and appropriate industry standards
- Monitor and enhance the HSS practices through inspections, audits, reviews, investigations, corrective actions, shared learnings, review of best practices, and behavior-based processes
- Share lessons learned and integrate best HSSE practices into our businesses
- Provide a framework which supports the continual improvement of the system
- Work collaboratively with employees to achieve HSSE objectives, at work and at home
- Foster a culture of being Safer Together, in which all employees, partners, and subcontractors, share a commitment to HSS.

Stantec is committed to minimizing the environmental impacts of our business operations and complying with legal and other requirements. In the execution of our professional and project delivery services, we will manage environmental risks and promote a philosophy of environmental stewardship and sustainability.

Stantec's HSSE Program is a foundation of Stantec's ISO 14001-certified Environmental Management System which is part of Stantec's global Integrated Management System. These, along with our Sustainability Policy, have been adopted by Stantec to guide our actions to:

- Purposefully incorporate climate solutions and sustainability advice into our operational decisions and project work.



- Ensure continued compliance with environmental laws and regulations as we complete our work.
- Set corporate targets focused on continually improving our environmental performance, including reducing waste, greenhouse gas emissions, and non-renewable energy use.
- Evaluate our business practices and performance against our corporate targets to ensure that our processes and systems are effective in achieving our sustainability and net zero objectives.
- Continually improve our programs and processes based on available information, audits, and feedback from employees, clients, and other parties.
- Everyone working for Stantec is responsible and accountable for Stantec's environmental performance and are expected to understand their roles and responsibilities and to comply with the practices of the Environmental Management System.
- The Environmental Management System is monitored, evaluated, and continually improved by executive leadership, with regular reporting and communication on the status and effectiveness across the organization. We report on our environmental performance against our environmental targets in the annual Sustainability Report.

Stantec Strives to:

- Empower our teams to design with climate action in mind and apply a sustainability lends to every action and every decision.
- Take reasonable and practicable measures to reduce the environmental impact of our activities and projects.
- Provide training and resources to ensure employees are familiar with our Environmental Management System, are aware of the environmental impacts of their work, and can successfully embed sustainability and climate solutions into their work.
- Support our value chain, clients, and communities to establish and meet their own climate solution goals by sharing our environmental and sustainability philosophies, knowledge, and expertise.
- Employ our expertise to promote sustainable planning, climate solutions, and to conserve ecosystems and biodiversity.

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1.3 EMPLOYEE EMPOWERMENT AND STOP WORK AUTHORITY

Employees are Stantec's most valuable asset; their safety is of vital concern. If at any time, a Stantec employee or contractor feels an unsafe condition exists, they have not only the authority, but ALSO the responsibility to call for "Stop Work" until safe methods are developed and implemented. It is the intent on this project for employees to accept responsibility and ownership of the HSSE Program. This HASP is a

living document, and the goal of Stantec is that employees are involved in the development and evolution of the HASP.

1.4 RIGHT TO UNDERSTAND

All employees have the right to know what hazards are present on the job, understand how these hazards can affect them, and participate in the selection of controls used to mitigate these hazards. Employees will learn about the job-specific hazards during training and through on-the-job instruction. Employees will participate in the selection of safety mitigations during the Hazard Recognition, Assessment and Control (HRAC) process.

1.5 SAFETY MANAGEMENT AND PLAN FEED BACK

The objective of safety management is to integrate safety, health, and environmental protection into all work practices. Stantec will accomplish this objective by involving all employees in the work planning process through development of task level assessments and Job Safety Analysis (JSAs), through project safety plans up to and including development of the HSSE Program. Feedback on site hazards and controls should be provided to the SHSO and if not addressed, can be raised to the employee's supervisor or a member of the HSSE Team. Hazards and safety concerns may also be reported directly to regional HSSE Management using the Risk Management Strategy 3 (RMS3) Event Reporting Form or through the In Case of Crisis (ICOC) Mobile App. As identified in **Section 1.3** all employees have Stop Work Authority.

1.6 CONTINUOUS IMPROVEMENT

This section describes the field inspection and observation process to maintain compliance with third party certifications. Formal activities include project audits, safety file reviews, management walk arounds, contractor conformance reviews, site inspections, and project job observations as summarized below:

Type	Purpose	Frequency	Documented (Yes/No)	Responsible Party(s)
Safety Compliance File Review	Formal review of contractual, Stantec, and regulatory safety requirements.	As needed	Yes, using RMS6 (Project File Safety Review)	Any project personnel or leadership team member
Jobsite Safety Inspections	Identify hazards and observe health and safety program implementation by employees.	As needed	Yes, using RMS5 (Worksite Inspection – Field) or approved equivalent	SHSO
SAFE Observations/ Planned Job Observation (PJO)	Identify hazards and reinforce safe work practices of peers.	As needed	Yes, using SAFE Observation Card or RMS10 (Planned Job Observation)	Any Site Personnel

1.7 MODIFYING THE HEALTH AND SAFETY PLAN

This HASP and RMS 2 field level risk assessment (blank copies found in **Appendix A,** or using eFLRA app) must be modified if; new hazards are identified, the scope of work is revised, or the provisions specified in the HASP are not adequate to protect the health and safety of all personnel. Additionally, in accordance with Stantec policy, this HASP will be reviewed and updated periodically, not to exceed at least annually. Modifications will be accomplished in consultation with associated project health and safety personnel, who in turn shall recommend appropriate modifications after approval by the Project Manager and Stantec's HSSE Manager or their designee. Significant changes to the HASP shall be documented with the appropriate revision number in the revision log found in the HASP preface. Minor changes which can be adequately controlled in the field can be documented on the RMS2 form as appropriate. The HSSE Manager or their designee and the Project Manager must approve the changes to this document. This process is to be documented in the HASP and the project files. The Project Manager will be responsible for informing staff and Stantec subcontractors of all changes.

1.8 MANAGEMENT OF CHANGE

The purpose of a Management of Change (MOC) procedure is to identify risks, both real and potential, associated with change and reduce them to acceptable levels. An MOC procedure provides a process by which the impact of changes to HSSE practices are recognized, reviewed, approved, communicated, and documented. This section is primarily applicable to situations where even small changes in processes could result in significant risks of injury or damage, such as equipment/valve lock-out procedures, implementing underwater inspection operations, etc., and when required by regulation, such as client processes involving Highly Hazardous Chemicals as identified by OSHA.

MOC applies to changes in operating parameters, equipment, maintenance practices, product compositions, chemicals used, procedures, equipment and personnel. Examples of where a MOC process may become necessary are confined space operations, or when client requirements dictate changes to our internal processes, or utility clearance procedures. Regulatory changes must also be considered and may impact permit limits or other operating parameters. These changes could take the form of new or emerging regulations, or changes to existing regulations. Changes may be permanent, or temporary in nature.

1.8.1 Responsibility

The MOC owner is typically the project manager or other designated responsible person who is looking to implement the proposed change. The reviewers will likely be technical experts familiar with the impacts that could be caused by the proposed change. The approver is a sufficient level of management to authorize the change, given the potential impacts. Input from the appropriate HSSE resources should also be sought and is required whenever a change involves a change to a Stantec Safe Work Practice (SWP) or HSSE practice or procedure.

The Management of Change (MOC) Form (RMS 11) must clearly identify:

- The new hazards being addressed or existing SWP procedures to be modified.

- The alternative controls and procedures to be utilized to maintain a safe work environment.
- Who is responsible for initiating the MOC (the MOC owner);
- Who needs to review and approve the MOC;
- Who manages the MOC process; and,
- How the MOC is communicated to affected personnel and what review/audit process is in place.

The completed MOC form shall be maintained in the Project File, with a copy sent to the appropriate Stantec Regional HSSE Representative.

1.8.2 Condition Limits

Temporary changes must be time limited. MOC's are only valid for up to one year before needing to be reviewed and re-approved by leadership. If the change must continue beyond the intended time limit, then an additional MOC is required. Additionally, if a change is approved within given physical parameters, and any of these parameters are to be exceeded, then another MOC review is required.

1.8.3 Emergency Changes

On rare occasions, a provision for emergency changes may be required. Using the MOC form and process provides a mechanism for authorizing an emergency change and a requirement to have the change formally reviewed in a prompt fashion.

1.9 H&S TRAINING FOR PROJECT WORK AND SITE ACCESS

Stantec PMs working with the SHSO will verify that their employees are current with the proper training required for their work tasks. At a minimum, any Stantec employee or subcontractor performing work at the site will be briefed on Client safety requirements and the requirements of this HASP, including the incident reporting and emergency response protocol. Acknowledgement of this training will be documented by signature on the Acknowledgement Form found in the preface of this HASP. Stantec visitors will be briefed in accordance with **Section 3.3**. Hazard specific training requirements are found in **Section 12.0**.

1.10 STANTEC SUBCONTRACTORS SITE HEALTH AND SAFETY PLAN

Stantec subcontractors are responsible for preparing a project specific HASP/Program as applicable to their scope of work. Their HASP shall provide for the means and methods to identify hazards, implement controls, and enforce the precautions and requirements for ensuring the health and safety of its employees and property. At a minimum, the Stantec subcontractor must meet or exceed the requirements of this HASP and those identified by OSHA 29 CFR 1910 and 1926.

A copy of this HASP will be provided to all Stantec subcontractors for their review and acknowledgement of understanding in advance of performing any activities on site. This HASP is intended to be a guidance document conveying site hazards of which Stantec has knowledge.

2.0 PROJECT DESCRIPTION

2.1 SITE DESCRIPTION

The Former Miller Hill Yard site consists of an approximately 8.8-acre parcel located at 7578 State Route 21 in the Town of Fremont, Steuben County, New York. Approximately 5.7 acres of the Site are contained within a chain-link fence. The Site is currently owned by the NYSDOT after NYSDOT (then, the New York State Department of Public Works) reportedly obtained the property from the Army Corp of Engineers (ACOE). The Site is planned to receive implementation of the Remedial Action Work Plan beginning in 2026 serving as the currently planned final remedy of the Site, actions related to which are further described below.

Soil Component of Remedy

The selected remedy component to target soil impacts includes excavation and offsite disposal of Chlorinated Volatile Organic Compound (CVOC)-impacted soils from remaining potential source areas located in the area between the western portion of Interim Remedial Measure (IRM) #3 Excavation 3-03 and the area west of TP-E that exceeds Site Standards, Criteria and Guidance (SCGs) based on previous sampling results. The proposed excavation limits will be refined as part of the design-stage field drilling program and subject to field screening and confirmatory sampling results during the excavation program. Based on prior source area excavations, there is the potential that paint waste may be encountered and require further management for disposal.

Groundwater Component of Remedy

Since the proposed use of the Site will continue to remain commercial, the preferred groundwater remedy is a continued long-term monitoring program to document that the remedial activities completed to date will continue to be protective of human health and the environment. The preferred groundwater remedy is proposed to be paired with additional potential source soil area removal described above. Long-term groundwater monitoring will allow for the continued monitoring of the groundwater conditions in response to supplemental soil excavations.

In an effort to address the unknown plume conditions in the property directly adjacent and to and south of the Site, a new offsite well pair (MW-306S/D) is proposed to be installed and included in the long-term monitoring program. The proposed new offsite well pair would be located between MW-304S/D and MW-7 if NYSDOT can obtain access permission and the proposed well installation and sampling on that property can proceed. Otherwise, the new well pair will be installed in the Right-of-Way (ROW). A baseline groundwater gauging and sampling event will be performed as part of the design-stage field program following installation, development, and survey of the new well pair.

2.2 SCOPE OF WORK

This HASP was prepared for the use of Stantec personnel while performing the following scope of work:

1. Installation/soil sampling of on-site Geoprobe® soil borings to a depth of approximately 20 ft each;

2. Excavation of identified remaining soil/fill exhibiting CVOC concentrations exceeding Protection of Groundwater (POGW) SCOs;

3. Screening for indications of contamination (by visual means, odor, and monitoring with Photoionization Detector (PID) of all excavated soil during any intrusive Site work;

4. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track 4 Commercial Use and Protection of Groundwater SCOs;

5. Appropriate off-Site disposal of all excavated material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;

6. Import of materials to be used for backfill and cover in compliance with: (1) Commercial Use and Protection of Groundwater SCOs chemical limits and other specifications included in Chapter 5 of DER-10, (2) all Federal, State and local rules and regulations for handling and transport of material, and (3) NYSDOT construction specifications;

7. Maintenance of a site cover consisting of existing surface cover materials including non-impacted soil, imported stone from IRM backfill activities, and compacted roadbed materials to prevent human exposure to residual contaminated soil/fill remaining under the Site;

8. Installation, development, survey, gauging, and sampling of two new downgradient off-site monitoring wells to support the long-term monitoring component of the selected remedy. (Note: gauging/sampling of the new wells to be performed with the balance of the proposed long-term monitoring network.)

The above-stated tasks will be conducted in a manner consistent with the methods and assumptions outlined in the Client contract and/or the Work scope prepared by the project manager. All work plans referenced in this HASP will be available for Stantec personnel on-site.

2.3 CURRENT OPERATIONS

The site is currently used, and has been historically used, as a storage facility for NYSDOT equipment and materials.

2.4 SITE TOPOGRAPHY AND PREVAILING WINDS

The majority of the site area inside the fence is generally flat or gently sloping in the south-southwesterly direction, with a steeper slope in the northern portion. Portions of this area are weed covered, although much of the interior of the Site is now covered with crushed stone as a result of grading from the recent IRM construction activities. The area outside the perimeter of the fence is primarily grass/brush-covered or wooded. Outside the fence, the property slopes upward steeply to the northeast, and downward steeply along the southwest property boundary. Prevailing winds are typically from the southwest to the northeast but will vary based on weather conditions. Weather conditions will be checked daily, before the start of work using publicly available weather forecast data provided on the National Oceanic and Atmospheric Administration (NOAA) website.



3.0 PROJECT ROLES AND RESPONSIBILITIES

3.1 PROJECT ORGANIZATION

The following staff will comprise the project leadership team:

Role	Name – Phone
Client Contact/Project Coordinator:	Lauren Richardson – NYSDOT (607) 324-8532 (office); (607) 438-7628 (cell)
Agency Representative	Evelyn Hussey Division of Environmental Remediation, Remedial Bureau E, Remedial Section B New York State Department of Environmental Conservation P: (518) 402-6787 | Cell: (518) 646-3143 |
Stantec Project Manager:	Brandon Gallagher – (508) 591-4318 (office); (585)-489-4739 (cell)
Task Manager	Gene Florentino – (716) 271-3503 (office); (716) 982-1952 (cell)
SHSO	Amanda Matkosky – (585) 413-5208 (office); (585)-285-3598 (cell)
Stantec Project Staff	Laura Best – (585) 413-5327 (office); (585)-301-0166 (cell)
Stantec Project Staff	Amanda Stone – (585) 319-9499
Stantec Project Staff	Kate Audino – (585) 775-1787
Stantec Project Staff	Rose Richelsen – (585) 733-2921
Stantec Project Staff	Steve Rife – (585) 363-0365
Stantec Project Staff	Patrick Suter – (585) 559-9625
Stantec Director of Health, Safety, Security and Environment Operations – US:	Mike Doherty – (503) 220-5434
HSSE ES BL Manager	Andrew Martin – (805) 719-9307
Stantec Office Safety and Environment Coordinator (OSEC):	Lauren Fenclau – (585) 413-5282
Stantec Regional HR:	Michele Byam – (781) 221-1115
Public Relations:	Jessica Love – (916) 472-3907
Stantec Workers Compensation Claims Coordinator:	Cameron Cole – (317) 829-4401
Medical Consultation Line	WorkCare (888) 449-7787

A table summarizing key responsibilities for project personnel is provided below.

Project Role	General Project Responsibilities
Client Contact	Provide access to the site, locate utilities, provide emergency response, etc.. Grants approval to all changes to scope of work and is notified of any site incidents or near-misses.
Agency Representative	. Ensures work is being conduced in accordance with NYSDEC guidance and policy documents
Stantec Account Manager	• Take reasonable precaution to provide a safe work environment • Demonstrate a commitment to safety • Provide general direction to Project Managers, HSSE Team Members and employees about their responsibilities and roles in providing a safe and healthy workplace. • Notify Client of HSSE Incidents • Provide the support and training necessary for employees to carry out their HSSE responsibilities • Encourage employees to express concerns and suggest improvements on HSSE issues • Intervene when at-risk behavior is observed • Support team members who use stop work authority • Demonstrate accountability through performance reviews, counselling and disciplinary action • Participate in investigations into injuries, accidents and high potential incidents, contributing to the reports and ensuring follow up of actions and provision of feedback • Conducting management site visits and reporting findings
Stantec Project Manager	• Overall financial, safety, quality, and logistics responsibility for the project • Contact client and subcontractors to understand all hazards and discuss with SHSO to develop an effective HASP. • Follow-up all incidents upon notice. Contact Regional HSSE Manager and Stantec Account Manager when notified of an onsite incident. • Demonstrate a commitment to safety • Implement and enforce necessary risk control and HSSE programs • Verify that required HSSE policies are applied at the site and communicated to the project team • Clearly communicate HSSE expectations to subcontractors • Assist in identifying and eliminating or controlling site hazards during project planning • Participate in periodic jobsite HSSE audits • Support team members who use stop work authority • Remove team members and subcontractors from the site when their actions are considered dangerous or contrary to these HSSE requirements • Provide access to and maintain protective equipment, devices, and clothing, and require that they be used in accordance with Safe Work Practices and other instructions. • Be familiar with Stantec's HSSE Program and their role in its operation. • Communicate foreseeable hazards to employees, along with information and training on appropriate control measures. • Participate in investigations of unsafe acts and conditions, incidents, and near misses reported to them and facilitate prompt corrective action. • Manage project team resources to adequately implement HSSE policies, standards, and best practices • Ensure on-site field staff have current required training
Stantec Site Health and Safety Officer (SHSO)	• Serve as the project lead for all issues related to health and safety. • Conduct work in accordance with JSA and this HASP.

Project Role	General Project Responsibilities
	• Report all incidents and near misses immediately to Project Manager and Affected Employee's Supervisor. • Validate safe work practices are conducted per the project plan. • Lead the daily Field Level Risk Assessment (RMS2) process and safety meeting. • Maintain all project and regulatory required health and safety documentation and records. • Verify PPE is readily available onsite and that employees wear the prescribed level of PPE. • Verify that the project bulletin board, where applicable, contains the necessary health and safety postings and that the information is current. • Update and maintain a current JSA that addresses potential hazards and associated controls. • Lead incident response operations until relieved by a qualified individual following the incident command system. • Work with PM to ensure on-site staff have current required training certificates
Stantec Human Resources	Assist with incident review, policy interpretation, recordkeeping, and discipline.
Stantec Director of Health, Safety and Environment	Respond with corporate resources to all incidents as appropriate. Assist in incident investigation.
Stantec HSSE Manager and HSSE Business Line Manager	Respond with corporate resources to all incidents as appropriate. Assist in incident investigation. Review and comment on HASP. Provide technical guidance on HSSE requirements.
Stantec US – Workers Compensation Claims Coordinator (WCCC)	Assist with incident review, medical case management, and recordkeeping.
Medical Consultation Line	Provide advice on work related-related injuries and medical symptoms. Administer medical surveillance program.
Stantec OSEC	Manage Health and Safety responsibilities for personnel in Office. Assist in HASP review. Assist employees with setting up training and attending/completing necessary courses.
Stantec Project Staff	• Perform work in accordance with HASP and Stantec Policies and Practices. • Participate in RMS2 development and daily tailgate meetings. • Assess the work area for hazards before starting a task • Immediately report all injuries and hazards. • Use Stop Work Authority when a hazardous condition exists. • Only conduct work that the personnel are trained and authorized to complete • Participate in incident investigations when applicable • Always use the proper safety equipment/PPE.
Subcontractor Safety Lead	Subcontractor shall designate a competent person (capable of recognizing hazards, with the authority to immediately correct) in a supervisory position, to administer its HASP.
Subcontractor Project Manager	• Implement and enforce necessary risk control and HSSE programs • Verify that required HSSE policies are communicated to the team • Assist in identifying and eliminating or controlling site hazards during project planning • Participate in periodic jobsite HSSE audits • Support team members who use stop work authority • Remove team members from the site when their actions are considered dangerous or contrary to these HSSE requirements



Project Role	General Project Responsibilities
	• Provide access to and maintain protective equipment, devices, and clothing, and require that they be used in accordance with company policy and other instructions. • Communicate foreseeable hazards to Stantec and company employees. • Participate in investigations of unsafe acts and conditions, incidents, and near misses reported to them and facilitate prompt corrective action. • Manage project team resources to adequately implement HSSE policies, standards, and best practices

3.2 PROJECT COMMUNICATIONS

Two general types of communications systems will be available for workers assigned to field projects. One system will ensure adequate communication between site personnel, and the other will ensure the ability to contact personnel and emergency assistance off the site.

3.2.1 Onsite Communication

Internal communication is used to:

- Alert team members to emergencies;
- Pass along safety information, such as weather conditions that could affect heat stress, cold stress or general safety, etc.;
- Maintain site control; and,
- Facilitate site work by being able to call to the appropriate party for information, without having to decontaminate the work party and equipment and secure the site.

Verbal communication can be impeded by on-site background noise and the use of PPE. Thus, pre-arranged signals of communication will be established prior to the initiation of site activities, particularly when heavy equipment work is involved. Internal communication devices to be used onsite to facilitate communications over distance or in loud noise areas include:

- Cell Phones (where reliable);
- Vehicle horns;
- Air horns; and,
- Hand/arm signals as shown in SWP216 Working Near Mobile Equipment or as documented during the Tailgate Safety meeting.
- Air horns / vehicle horns shall be tested regularly to ensure they are working properly.

3.2.2 Offsite Communication

External communication systems between on-site and off-site personnel are necessary to:

- Coordinate emergency response efforts;
- Report to leadership and the client about site activities;
- Maintain contact with essential off-site personnel; and,
- Maintain contact with emergency responders or regulatory agencies (where applicable).

The site is in a developed, suburban area; therefore the primary means of external communication devices are cell phones and computer networks. These means shall be verified prior to conducting field activities.

3.3 SITE VISITORS

All personnel visiting the site who are invitees (visitors), clients, employees, or subcontractors will be permitted to enter the project site only with prior approval by the Project Manager or their designee (Task Leader or SHSO). The SHSO must provide visitors with a project briefing that covers the current hazards and controls including required PPE.

All personnel will comply with site entry requirements (if any) for each facility listed in **Section 1.9**. Site visitors require a full-time escort by a Stantec employee and must follow the procedures required by each facility. Visitors must have the necessary training and medical clearance for access to areas that are restricted due to specific training, medical surveillance, and PPE requirements.

3.4 INCIDENT INVESTIGATION AND REPORTS

Accidents and incidents, including near misses, involving Stantec and/or Stantec subcontractor employees shall be immediately reported to the SHSO and will be investigated. The SHSO will begin the Stantec incident reporting procedure by calling the ES BL HSSE Manager and the Project Manager identified in **Section 3.1** (above).

Stantec utilizes a standard electronic HSSE reporting tool, Pro-Sapien, for incident reporting that simplifies the process for recording and communicating information about an incident, near miss, or loss. Employees can initially document the event utilizing the Risk Management Strategy (**RMS 3)** but are required to upload the event information into Pro-Sapien within 24-hours. This is used to document and thoroughly investigate the incident and for recommending and implementing corrective actions that will reduce the chances of recurrence on this site and other sites with similar hazards. The reporting process is not complete until all corrective actions have been implemented and signed off by the Stantec Project Manager.

Refer to **Appendix B** for the Stantec incident reporting process and forms.

The Stantec HSSE Manager or their designee is responsible for leading incident investigations, documenting root cause and corrective actions, and sharing lessons learned with the project team, the Client, and affected employers as applicable. Subcontractors shall also follow their employer's incident reporting process but also alert the SHSO, for project-related incidents.

The Project Manager shall alert the Client Account Manager (if applicable), the Client (if applicable), and the affected employee's supervisor or employer (in the case of a subcontractor). The Project Manager shall work with the HSSE ES Business Line Manager to determine root cause and implement any required corrective actions (if applicable).

Incident Type	Definition (Current Stantec Corporate Definitions)
Report Only	An employee needs to document a happening which may be relevant in the future. Examples include: witnessing an accident or a non-work-related injury, an incident on a worksite not involving Stantec personnel, physical signs and symptoms related to workstation ergonomics and/or materials handling
Incident	Any unplanned event that adversely affects our employees, our business, its physical assets, the clients we serve, or the environment. Any injury (medical and first aid), illnesses, fatality, near misses, damage to property or product, documented industrial hygiene exposure events (e.g., permissible exposure limit exceeded, or employee entry into a mandated medical surveillance program due to an exposure), notices of violation for agencies having jurisdiction, spills, fires, and environmental releases.
Serious Incident	Any work-related incident where there is property damage greater than $5,000, employee hospitalization, fatality, facility/site shutdown, or involves a third party (public). A near miss with the potential for any of the above consequences would also be considered a serious incident.
Near-Miss	Any event that could adversely affect our employees, our business, its physical assets, the customers we serve, or the environment, given any change in circumstances
Hazard Identification	The identification of a condition or practice that has the potential for an incident or loss.
Property Damage (Vehicle)	Damage to any vehicle used for Stantec business, includes normal wear and tear (e.g. tire damage, minor scratches, stone chips to paint or windshield, mechanical wear), whether the vehicle is attended or not.
Property Damage (Other)	Damage to equipment, materials, etc., excluding vehicle damage.
Theft	Theft of any property under the care and control of Stantec.
Non-compliance	Where an employee or project is identified as operating outside the parameters of Stantec policy and/or legislative requirements.
***Near Miss – Injury**	An employee reports physical symptoms related to work activities which have not yet resulted in treatment of any type, nor have they impacted the employee's working ability.
First Aid	An injury or illness requires first aid treatment only
Medical Treatment	Medical treatment above and beyond first aid, without loss of work time beyond the day of injury or illness.
Restricted Work	Change in job duties and/or shortened workday resulting from a work-related injury or illness, affecting the employee's ability to engage in one or more routine work activities (i.e. an activity carried out at least once per week).
Lost Time	Health care professional recommends one or more days away from work due to a work-related injury or illness.
Fatality	Work related fatality.
Motor Vehicle Incident	An incident involving a vehicle driven by an employee, whether on or off the road, that has resulted in damage to assets, the environment or Stantec's reputation, irrespective of cost or responsibility for cause. This does not include damage as a result of normal wear and tear (see Property Damage – Vehicle).
Spill or Release	Discharge of material or substance which is reportable to a third party such as a regulatory agency or a client, or which may expose an employee to a health risk.

Incident Type	Definition (Current Stantec Corporate Definitions)
Contractor Recordable Injury	Definitions as above, including Medical Aid – No Lost Time, Restricted Work, Lost Time or Fatality) but applied to a Stantec subcontractor.
Fire / Explosion / Flood	A natural or man-made hazard including fire, explosion or flood that causes damage or injury.
Violence or Harassment	Any act in which a person is abused, threatened, intimidated or assaulted in the course of their employment.
3rd Party Incident	Incident involves someone who is not party to the work being completed but may be impacted. Example: Member of the public.
Utility Strike	Compromising or disrupting of service to buried and/or overhead utility service lines, municipal or third party owned utility services, underground storage tank (UST) system components and other subsurface property service lines or systems
Work Refusal	An employee has enacted their legislated Right to Refuse dangerous work.
Stop Work Authority	An employee has enacted Stantec's Stop Work Authority provisions upon observing the presence of unsafe conditions associated with Stantec work activities. All employees have the right to stop or refuse work when they perceive an immediate danger to their health and safety or that of their colleagues.
High Potential Incident	A Near Miss, First Aid injury, Medical Aid injury, Modified Work injury or Lost Time injury can often have the potential to be a fatality or a Significant Injury with disability if the circumstances would have been slightly different. For example, a Lost Time incident due to a back soft tissue injury would only be counted as a Lost Time with low potential for a serious injury, whereas a First Aid incident involving a remotely operated machine striking a worker and imparting a small cut would be counted as a First Aid incident with high potential for a Fatality or a Significant Injury. Any incident with energy exchange that had the potential to be a Fatality or a Significant Injury if the circumstances would have been slightly different should be counted as High Potential; all others should be counted as low potential and reported as normal incidents (see above). In terms of Risk Assessment language when the exposure, probability and consequence of the hazard(s) that created the injury calculate to a High or Extreme Risk Level, the incident should be counted as a High Potential; all others should be counted as low potential.

4.0 HAZARD RECOGNITION

4.1 CRITICAL RISK CONTROLS

Stantec has identified twelve critical risks based upon our evaluation of tasks with the greatest potential to cause serious injuries, incidents, and fatalities to Stantec employees. To reduce or eliminate the potential for serious incidents, we have established controls for employees to follow when engaged in critical risk work. These controls can be found in the Critical Risk Controls Information Sheets, and are incorporated into our SWPs and RMS forms. The following critical risks have been identified at the Site:

 Driving	 Working at Heights	 Traffic Control	 Wildlife, Insects, and Vegetation
☒ Applicable	☐ Applicable	☒ Applicable	☒ Applicable
 Mobile and Heavy Equipment	 Environments with Water or Ice	 Ground Disturbance	 Ergonomic Hazards and Manual Handling
☒ Applicable	☒ Applicable	☒ Applicable	☒ Applicable
 Hazardous Materials and Environments	 Hazardous Energy	 Hot Work	 Confined Spaces
☒ Applicable	☐ Applicable	☐ Applicable	☐ Applicable

4.2 ENERGY WHEEL HAZARD RECOGNITION

The Energy Wheel is a simple, yet effective, method to focus worker's attention on the various types of energy present in the workplace which if released in an uncontrolled manner could cause an injury. By identifying the energies, workers can also identify the hazards associated with the energy sources. Both task related and site/location related hazards including time of day, time of year and project stages must be considered. Foreseeable energy hazards are described in the sections that follow.

4.2.1 Chemical Hazard Recognition

The following chemical hazards have been identified at the site. Information on the specific controls for these hazards are found in **Section 5.0** of this HASP, and the referenced Stantec Safe Work Practices accessible on Stantec's corporate website The Lens and included as **Appendix C**. Required Work Plans and/or supplemental safety forms such as pre-ground disturbance worksheets and checklists are also found in **Appendix C**.

Energy		Hazard		Administrative Controls for Selected Energy Hazards
Chemical 	☒	Hazardous Material(s)/Chemicals	☒	SWP 104 - Hazard Communication
	☐	Oxygen deficient atmosphere	☒	SWP 105 - Personal Protective Equipment (PPE)
	☐	Carbon Monoxide	☒	SWP 107 - First Aid
	☐	Oxygen enriched atmosphere	☒	SWP 108 - Bloodborne Pathogens
	☐	H_2S (Hydrogen sulfide)	☒	SWP 111 - Medical Surveillance
	☐	Asbestos	☐	SWP 304 - Asbestos Safety
	☐	Silica	☐	SWP 305 - Benzene Safety
	☐	Acids	☐	SWP 306 - Hydrogen Sulfide
	☐	Caustics	☐	SWP 309 - Silica Awareness
	☐	Oxidizer	☒	SWP 310 - Compressed Gas Cylinders
	☒	Petroleum hydrocarbons	☒	SWP 312 - Fueling Gasoline Engines
	☒	Solvents/Flammables	☒	SWP 314 - Working Around Hazardous Waste and Wastewater
	☒	Volatile organic compounds (VOCs)	☒	SWP 315 - Arsenic Safety
	☒	Heavy metals	☐	SWP 319 - Hydrogen Fluoride/Hydrofluoric Acid Safety
	☒	Benzene	☒	SWP 409 - Respiratory Protection
	☒	Lead	☐	SWP 411 - Confined Space Entry
	☒	Arsenic	☐	SWP 414 - Hot Work
	☒	Polycyclic Aromatic Hydrocarbons (PAH)	☒	JSA
	☒	Polychlorinated biphenyls (PCBs)	☒	Field Level Risk Assessment (RMS2; **Appendix A**)
	☐	Dioxins/Furans	☐	Client Specific Controls

Energy	Hazard		Administrative Controls for Selected Energy Hazards	
	☐	Munitions of concern (MEC) and/or Unexploded Ordnance (UXO)		
	☐	Pesticides/Herbicides		
	☐	Hydrogen fluoride / Hydrofluoric acid		
	☒	Hazardous Waste		
	☐	Other:		
	☐	Other:		

4.2.2 Biological Hazard Recognition

The following biological hazards have been identified at the site. Information on the specific controls for these hazards are found in **Section 6.0** of this HASP, and the referenced Stantec Safe Work Practices accessible on The Lens and included as **Appendix C**.

Energy	Hazard		Administrative Controls for Selected Energy Hazards	
Biological 	☒	Wildlife	☒	HSSE-100 – Alcohol and Drug Practice
	☒	Domestic animals (dogs, cattle)	☒	SWP 102 - Workplace Violence Prevention Program
	☒	Bees / wasps / hornets	☒	SWP 104 - Hazard Communication
	☒	Ticks	☒	SWP 105 - Personal Protective Equipment (PPE)
	☒	Black flies	☒	SWP 107 - First Aid
	☒	Other stinging or biting insects	☒	SWP 108 - Bloodborne Pathogens
	☒	Pedestrians / onlookers	☒	SWP 111 - Medical Surveillance
	☒	Protesters	☒	SWP 118 - Working Alone in the Field
	☒	Poison ivy	☒	SWP 118a - Working Alone in the Field Checklist
	☒	Poison oak	☒	SWP 124 - Safe Driving
	☐	Giant hogweed	☐	SWP 124b - Journey Management Plan
	☐	Wild parsnip	☒	SWP 125 - Workstation Ergonomics
	☒	Brush clearance	☒	SWP 314 - Working Around Hazardous Waste and Wastewater
	☒	Thorns/ brambles	☒	SWP 407 - Traffic Control and Protection Planning
	☐	Sewage	☒	SWP 407a - Traffic Protection Plan or equivalent (**Appendix C**)
	☐	Wastewater	☒	SWP 407c - Traffic Protection Plan - Construction, Parking, and Forecourts
	☐	Domestic waste/refuse	☒	SWP 409 - Respiratory Protection
	☐	Medical waste	☐	SWP 501 - Using the Spot Messenger System
	☒	Bloodborne pathogens	☒	SWP 508 - Wildlife Encounter
	☒	Rodents/Droppings	☒	SWP 511 - Ticks and Tickborne Diseases
	☐	Birds/Droppings	☐	SWP 517 - Safe Machete Use

Energy	Hazard		Administrative Controls for Selected Energy Hazards	
	☐	Bacterial cultures or bioaugmentation	☐	SWP 518 - Using a Chainsaw
	☐	Fungal affected soil/materials	☐	SWP 519 - Post-Disaster Building Entry
	☒	Fatigue	☐	SWP 519b - Safety Precautions and Field Equipment Checklist
	☐	Working under the influence	☒	JSA
	☐	Working alone	☒	Field Level Risk Assessment (RMS2; **Appendix A**)
	☒	Ergonomics		
	☐	Hazardous waste	☐	Client Specific Controls
	☐	Other:		

4.2.3 Physical Hazard Recognition

The following physical hazards have been identified at the site. Information on the specific controls for these hazards are found in **Section 7.0, 8.0, 9.0 and 10.0** of this HASP, and the referenced Stantec Safe Work Practices accessible on The Lens and included as **Appendix C**.

Energy	Hazard		Administrative Controls for Selected Energy Hazards	
Thermal 	☒	Cold stress	☒	SWP 113 - Heat Stress
	☐	Cold surfaces	☐	SWP-113a - California Heat Illness Prevention Plan
	☐	Refrigerated or Cryogenic Equipment	☒	SWP 114 - Working in Cold Environments
	☒	Heat stress	☐	SWP 414 - Hot Work, SWP 414a - Hot Work Permit
	☐	Hot surfaces	☐	SWP 514 - Working on or Near Ice
	☐	Hot work	☒	JSA
	☒	Weather conditions	☒	Field Level Risk Assessment (RMS2; **Appendix A**)
	☐	Vessel/container temperature change	☐	Client Specific Controls
	☐	Other:		
Radiation 	☒	Solar (UVA/UVB)	☒	SWP 104 - Hazard Communication
	☐	Non-ionizing	☐	SWP 414 - Hot Work, SWP 414a - Hot Work Permit
	☐	Welding	☐	SWP 516 - Radiation Safety (US)
	☐	Nuclear densometers	☒	JSA
	☐	Naturally Occurring Radioactive Materials (NORMs)	☒	Field Level Risk Assessment (RMS; **Appendix A**)
	☐	Microwave	☐	Client Specific Controls
	☐	X-ray		
	☐	Ionizing / Radioactive		
	☐	Other:		
Noise	☒	Mobile equipment	☒	SWP 105 - Personal Protective Equipment (PPE)



	☒	Stationary equipment	☒	SWP 106 - Hearing Conservation
	☒	Manual equipment	☒	SWP 206 - Hand and Portable Power Tools
	☐	Impact	☒	SWP 215 - Supervision of Hydro-Excavation Activities (Daylighting)
	☒	Vibration	☒	SWP 216 - Working Near Mobile Equipment
	☒	Impact on communications	☒	JSA
	☒	Traffic	☒	Field Level Risk Assessment (RMS2; **Appendix A**)
	☐	Other:	☐	Client Specific Controls
	☐	Other:		
Gravity	☒	Slip / Trip / Fall	☒	SWP 105 - Personal Protective Equipment (PPE)
	☒	Manual lifting	☒	SWP 115 - Material Handling and Safe Lifting
	☐	Work from heights	☐	SWP 201 - Fall Protection/Working from Heights, Rescue Plan
	☒	Falling objects	☐	SWP 202 - Ladder Safety , SWP 202a - Ladder Inspection Checklist
	☐	Damaged walking surface	☐	SWP 203 - Aerial Work Platforms
	☐	Work on Ice	☐	SWP 205 - Scaffold Safety
	☐	Work on/over water	☐	SWP 208 - Hoisting and Lifting
	☐	Falling trees/branches	☒	SWP 214 - Working In or Near Excavations
	☐	Demolition of structure or component	☐	SWP 217 - Forklift Operations, SWP 217a - Forklift Pre-Operation Checklist
	☐	Jacking equipment, vehicle, or structure	☐	SWP 411 - Confined Space Entry
	☒	Unsecure load	☐	SWP 505 - Off-Road Vehicles, Pre-operation Checklist
	☒	Work on slope (unstable ground/surface)	☐	SWP 510 - Working in Abandoned Buildings
	☒	Work on slope (greater than 1:1 / 45°)	☐	SWP 513 - Boat and Water Safety
	☐	Unmaintained or damaged structure	☐	SWP 514 - Working on or Near Ice
	☐	Rigging/hoist/crane	☐	SWP 517 - Safe Machete Use
	☒	Loading trailer/flat bed/ truck	☐	SWP 518 - Using a Chainsaw
	☐	Engulfment	☐	SWP 519 - Post-Disaster Building Entry, SWP 519b - Safety Precautions and Field Equipment Checklist
	☐	Other:	☒	JSA
	☐	Other:	☒	Field Level Risk Assessment (RMS2; **Appendix A**)
	☐	Other:	☐	Client Specific Controls
	☐	Other:		
Motion	☒	Working near traffic	☒	SWP 105 - Personal Protective Equipment (PPE)
	☒	Automobile/truck/trailer	☒	SWP 124 - Safe Driving,
	☒	Mobile equipment (construction, forklift)	☒	SWP 124a - Vehicle Pre-Use Checklist
	☐	Elevated work platform	☐	SWP 124b - Journey Management Plan

	☒	Pedestrians	☐	SWP 125 - Workstation Ergonomics
	☒	Cyclists	☐	SWP 201 - Fall Protection/Working from Heights, Rescue Plan
	☐	Rail	☐	SWP 202 - Ladder Safety , SWP 202a - Ladder Inspection Checklist
	☐	ATV	☐	SWP 203 - Aerial Work Platforms
	☐	ARGO	☐	SWP 205 - Scaffold Safety
	☐	Watercraft / water	☒	SWP 206 - Hand and Portable Power Tools
	☐	Snowmobile	☐	SWP 208 - Hoisting and Lifting
	☐	Aircraft (fixed wing or rotary)	☒	SWP 214 - Working In or Near Excavations
	☐	UAVs/Drones	☒	SWP 216 - Working Near Mobile Equipment
	☒	Walking/Hiking	☐	SWP 217 - Forklift Operations, SWP 217a - Forklift Pre-Operation Checklist
	☒	Lifting	☒	SWP 407 - Traffic Control and Protection Planning
	☒	Pushing/Pulling	☒	SWP 407a - Traffic Protection Plan or equivalent
	☒	Bending	☒	SWP 407c - Traffic Protection Plan - Construction, Parking, and Forecourts
	☒	Posture/position	☐	SWP 408 - Lock, Tag & Try (LTT)
	☐	Climbing	☐	SWP 411 - Confined Space Entry
	☒	Twisting	☐	SWP 504 - Backpack and Boat Mounted Electrofishing
	☐	Limited Motion/Entrapment	☐	SWP 505 - Off-Road Vehicles, Pre-operation Checklist
	☒	Cutting (Blade Use)	☐	SWP 506 - Rail Safety
	☐	Diving	☐	SWP 507 - Aircraft Safety
	☐	Repetitive Stress	☐	SWP 513 - Boat and Water Safety
	☐	Other:	☐	SWP 514 - Working on or Near Ice
	☐	Other:	☐	SWP 517 - Safe Machete Use
	☐	Other:	☒	JSA
	☐	Other:	☒	Field Level Risk Assessment (RMS2; **Appendix A**)
	☐	Other:	☐	Client Specific Controls
	☐	Other:		
Mechanical	☐	Cutting edges	☒	SWP 105 - Personal Protective Equipment (PPE)
	☒	Blades	☒	SWP 115 - Material Handling and Safe Lifting
	☒	Rotating parts (e.g., drill/auger)	☐	SWP 203 - Aerial Work Platforms
	☐	Wrap points	☒	SWP 206 - Hand and Portable Power Tools
	☐	Shear points	☒	SWP 213 - Ground Disturbance and Overhead Utility
	☒	Pinch points	☒	SWP 213a - Pre-Ground Disturbance Worksheet and Approval Form
	☐	Freewheeling point	☒	SWP 213b - Aboveground/Underground Utilities Checklist

	☐	Chains	☐	SWP 217 - Forklift Operations, SWP 217a - Forklift Pre-Operation Checklist
	☐	Cables	☐	SWP 408 - Lock, Tag & Try (LTT)
	☒	Lift Gate	☐	SWP 411 - Confined Space Entry
	☐	Other:	☒	SWP 416 - Supervision of Contracted Drilling Activities
	☐	Other:	☐	SWP 517 - Safe Machete Use
	☐	Other:	☐	SWP 518 - Using a Chainsaw
	☐	Other:	☒	JSA
	☐	Other:	☒	Field Level Risk Assessment (RMS2; **Appendix A**)
	☐	Other:	☐	Client Specific Controls
	☐	Other:		
Pressure	☒	Spoil piles	☒	SWP 105 - Personal Protective Equipment (PPE)
	☒	Hydraulic systems	☒	SWP 113 - Heat Stress
	☐	Pneumatic systems/tools	☐	SWP-113a - California Heat Illness Prevention Plan
	☐	Pressure Testing	☐	SWP 203 - Aerial Work Platforms
	☐	Fire System Impact/Use	☒	SWP 206 - Hand and Portable Power Tools
	☒	Pressure Washing	☐	SWP 208 - Hoisting and Lifting
	☐	Pigging	☒	SWP 213 - Ground Disturbance and Overhead Utility
	☒	Steam	☒	SWP 213a - Pre-Ground Disturbance Worksheet and Approval Form
	☐	Vacuum	☒	SWP 213b - Aboveground/Underground Utilities Checklist
	☐	Cylinders	☒	SWP 214 - Entering Excavations and Trenches
	☐	Powder Actuated Tools	☐	SWP 215 - Supervision of Hydro-Excavation Activities (Daylighting)
	☐	Insitu Injection	☒	SWP 216 - Working Near Mobile Equipment
	☐	Other:	☐	SWP 217 - Forklift Operations, SWP 217a - Forklift Pre-Operation Checklist
	☐	Other:	☒	SWP 310 - Compressed Gas Cylinders
	☐	Other:	☐	SWP 408 - Lock, Tag & Try (LTT)
	☐	Other:	☐	SWP 411 - Confined Space Entry
	☐	Other:	☒	SWP 416 - Supervision of Contracted Drilling Activities
	☐	Other:	☒	JSA
	☐	Other:	☒	Field Level Risk Assessment (RMS2; **Appendix A**)
	☐	Other:	☐	Client Specific Controls

4.2.4 Electrical Hazard Recognition

The following electrical hazards have been identified at the site. Information on the specific controls for these hazards are found in **Section 8.0 and 10.0** of this HASP, the attached JSA (**Appendix B**), and the referenced Stantec Safe Work Practices accessible on The Lens and included as **Appendix D**.

Energy	Hazard		Administrative Controls for Selected Energy Hazards	
Electrical 	☒	Power and communication lines	☒	SWP 105 - Personal Protective Equipment (PPE)
	☐	Static charge	☒	SWP 213 - Ground Disturbance and Overhead Utility
	☐	Wiring	☒	SWP 213a - Pre-Ground Disturbance Worksheet and Approval Form
	☐	Batteries	☒	SWP 213b - Aboveground/Underground Utilities Checklist
	☐	Lighting levels	☒	SWP 312 - Fueling Gasoline Engines
	☐	Wet environment with power source	☐	SWP 406 - Electrical Safety Program
	☐	Non-GFCI cords/plugs	☐	SWP 406a - Electrical Job Briefing / Hazard Awareness
	☐	Non-Double insulated tools	☐	SWP 408 - Lock, Tag & Try (LTT)
	☐	Exposed circuit/ live part	☐	SWP 411 - Confined Space Entry
	☒	Lightning	☐	SWP 414 - Hot Work, SWP 414a - Hot Work Permit
	☐	Electrofishing	☐	SWP 504 - Backpack and Boat Mounted Electrofishing
	☒	Damaged/down power lines	☐	SWP 506 - Rail Safety
	☐	Transformer yard	☐	SWP 510 - Working in Abandoned Buildings
	☐	Induced current	☐	SWP 513 - Boat and Water Safety
	☐	Arc Welding	☐	SWP 518 - Using a Chainsaw
	☐	Other: Additional hazards to be considered in supplemental dive plan(s)	☐	SWP 519 - Post-Disaster Building Entry, SWP 519b - Safety Precautions and Field Equipment Checklist
	☐	Other:	☒	JSA
	☐	Other:	☒	Field Level Risk Assessment (RMS2; **Appendix A**)
	☐	Other:	☐	Client Specific Controls
	☐	Other:		

4.3 ONSITE HRAC PROCESS

Since preparation of this HASP is a planning exercise, when crews report to the field, they must verify that all hazards and controls have been identified before executing work. A Field Level Risk Assessment will be used to identify any new or previously unidentified conditions, as well as to review hazards and controls outlined in the HASP, SWPs, client safety requirements, and/or task specific JSAs. As part of a pre-start tailgate meeting, the Field Level Risk Assessment is to be completed by appropriate on-site project personnel and shall identify the specific site controls to be implemented for the particular tasks being performed that day. The Field Level Risk Assessment should consider impacts from subcontractor activities (e.g., traffic control, maintenance, drilling), as well as other operations not under Stantec control, that are occurring at the same site, and which can affect our personnel (i.e., simultaneous operations). If Stantec employees are participating in onsite risk reviews led by a client, general contractor or a prime contractor, this participation must also be documented at least daily.

An Energy Wheel RMS2 form or equivalent eFLRA will be used onsite as the Field Level Risk Assessment on this project. The form will be completed daily to reflect the potential for changing

situations on the worksite. The "Seven Day Extension" form can be used for tasks/activities that extend beyond a single day and should reflect daily changes in on-site field personnel and weather conditions. Blank copies of the forms are available in **Appendix A**.

Before beginning or restarting work, supervisors and employees need to conduct a Last-Minute Risk Assessment (LMRA). This is not a form to be filled out, but a deliberate stop in the process to check for potential hazards and to determine whether appropriate controls are in place. Utilize the Energy Wheel described in **Section 4.2** to identify hazards from the 10 sources of energy that cause hazards: gravity, mechanical, motion, noise, pressure, radiation, thermal, biological, chemical and electrical during this LMRA process. Remember, all Stantec employees have the authority and responsibility to stop unsafe work.



5.0 CHEMICAL HAZARDS

5.1 HAZARD COMMUNICATION



The SHSO is charged with the responsibility for maintaining a Hazard Communication Program as outlined in SWP 104 - Hazard Communication. This program is designed to effectively manage information related to hazardous materials on the Site and the training of our employees who are required to work with hazardous materials. All chemicals that employees will encounter including those present in the site, those generated on site by processes or equipment, and those brought onto the Site by Stantec or by a Stantec subcontractor shall have a Safety Data Sheet (SDS). The Stantec SHSO shall request SDS of chemicals used at the site to which our employees may be exposed in the course of our field activities. SDSs shall be maintained onsite in a project SDS file.

5.2 CONSUMABLE CHEMICAL HANDLING AND STORAGE

No hazardous chemicals will be used onsite and used in support of field activities with exception of preservatives present in laboratory supplied containers that will be used for environmental sampling and petroleum-based fuels and oils for equipment and vehicles. Only mild cleaning products, cleaning wipes and calibration gas standards for the PID are anticipated to be used on this project by Stantec employees.

5.2.1 Sample Preservatives and Reagents

Corrosive (Acid/Base)	Flammable/Combustible	Specialized Reagents
☒ Hydrochloric acid (HCl)	☐ Methanol (CH_3OH)	☐ Sodium thiosulfate ($Na_2O_3S_2$)
☒ Nitric acid (HNO_3)	☐ Other:	☐ HACH kit (Specify Below)
☒ Sulfuric acid (H_2SO_4)	☐ Other:	☐
☒ Zinc acetate ($C_4H_6O_4Zn$)	☐ Other:	☐
☒ Sodium hydroxide (NaOH).	☐ Other:	☐
☐ Acetic acid ($C_2H_4O_2$)	☐ Other:	☐ Gas detector tube (Specify Below)
☐ Ascorbic acid ($C_6H_8O_6$)	☐ Other:	☐

5.2.2 Cleaners and Decontamination Supplies

General	Flammable/Combustible
☒ Alconox	☐ Isopropyl alcohol (IPA)
☒ Liquinox	☐ Methanol
☒ Simple Green	☐ Hexane
☐ Nitric Acid (Note: **Corrosive**)	☐ Acetone
☒ Tecnu (Poison Ivy/Oak Cleanser)	☒ Other: Disinfectant wipes for Cleaning
☒ Respirator Wipes - Benzalkonium Chloride and Alcohol	☐ Other:
☐ Trisodium phosphates (TSP)	☐ Other:

☒	Disposable decon wipe	☐	Other:
☐	Dish Soap	☐	Other:
☐	Other:	☐	Other:

5.2.3 Calibration Supplies and Probe Electrolyte

General		Compressed Gases	
☒	pH standards (4 - 7 - 10)	☒	Isobutylene
☒	Conductivity standard	☐	Methane
☒	ORP / Zobell solution	☐	Hydrogen
☒	Turbidity standard	☐	Propane
☒	Electrode storage solution	☐	Hydrogen sulfide
☐	Other:	☐	Carbon monoxide
☐	Other:	☐	Nitrogen
☐	Other:	☐	Mixture (Specify):
☐	Other:	☐	Other:

5.2.4 Other Chemicals

General		Flammable / Combustible	
☒	Hand Soap	☒	Gasoline
☒	Eye wash buffer solution	☒	Diesel
☐	Leak detector (Soap)	☒	Motor oil
☐	Pipe joint compound	☒	Hydraulic oil
☐	Anti- seize compound	☒	Air compressor oil
☐	Other:	☒	Marking paint
☒	Other:Chemicals known to be present in the soils and water on site.	☒	Spray paint
☐	Other:	☒	WD-40
☐	Other:	☒	Plastic cement/ primer (e.g., PVC)
☐	Other:	☐	Propane
☐	Other:	☒	Hand Sanitizer
☐	Other:	☐	Other:

5.3 CARBON MONOXIDE

Carbon monoxide (CO) is a poisonous, colorless, odorless and tasteless gas. Carbon monoxide is a common construction and industrial hazard resulting from the incomplete burning of material containing carbon such as natural gas, gasoline, kerosene, oil, propane, coal, or wood. The most common sources of exposure in the workplace are the internal combustion engine, faulty exhaust flues from fuel burning equipment, and welding. Any work with internal combustion engines onsite shall ensure proper ventilation and comply with Stantec SWP 203 - Aerial Work Platforms, SWP 206 - Hand and Portable Power Tools, SWP 216 - Working Near Mobile Equipment, and SWP 217 - Forklift Operations.

5.4 PROCESS CHEMICALS

The site does not contain operations which are storing or using chemicals in quantities which would cause harm or affect Stantec operations.

5.5 ANITICPATED CHEMICALS OF CONCERN

The tasks associated with the scope of work can expose personnel to chemicals, primarily associated with the potential presence of environmental contaminants in sampling media. Based on previous sampling data for the area of the site, the primary contaminants of concern consist of:

Soil Constituents of Potential Concern and Maximum Concentrations			
Substance	**Date of Sample**	**Media**	**Concentration**
1,2-DCA	July 2014	Soil	280 µg/kg
2-butanone	July 2014	Soil	170 µg/kg
Acetone	February 2019	Soil	110 µg/kg
Arsenic	April 2019	Soil	18 mg/kg
cis-1,2 DCE	July 2014	Soil	690 µg/kg
TCE	July 2014	Soil	1,500 µg/kg
Groundwater Constituents of Potential Concern and Maximum Concentrations			
Substance	**Date of Sample**	**Media**	**Concentration**
1,2-DCA	January 2020	Groundwater	2.3 µg/L
cis-1,2 DCE	September 2014	Groundwater	50 µg/L
TCE	December 2022	Groundwater	270 µg/L

Notes:

mg/kg = milligram per kilogram

µg/kg = microgram per kilogram

µg/L = microgram per liter

DCA = Dichloroethane

DCE = Dichloroethene

Employees could also be exposed to those consumable chemicals described in **Section 5.2**. **Table1** presents Occupational Health Exposure and Toxicological Properties for these chemicals of concern.

5.5.1 Chemical Routes of Exposure

Occupational exposure to chemical hazards associated with the scope of work could potentially occur through the following pathways.

Inhalation

The sampling media is not anticipated to be an inhalation hazard due to the nature of the material (i.e. soil, wet sediment, and groundwater). Employees could be exposed to carbon monoxide and residual volatile organic compounds from vehicle exhaust.

As indicated in **Section 9.5**, any drills used for coring concrete must have a water mist or shroud attachment to control silica dust.

Skin Contact

Employees could be exposed to equipment, waste, and materials that have been exposed to residuals containing contaminants of concern by skin contact or absorption. Employees will be required to wear PPE (i.e. gloves, clothing, eye protection, etc.) to limit the exposure.

Ingestion

Employees could be exposed to equipment, waste, and materials that have been exposed to residuals containing contaminants of concern by incidental ingestion. This exposure can occur if PPE is not used or personal hygiene is not practiced. Proper decontamination procedures must be used. No eating or drinking is allowed in situations where employees could be exposed to environmental sampling media (see **Section 10.6**).

5.5.2 Chemical Exposure Limits

The Occupational Health Exposure and Toxicological Properties for the project's chemicals of concern are provided on attached Table 1.

5.6 AIR MONITORING

Air monitoring during invasive soil work, hazard material management and sampling, or activities which affect the potential for airborne exposures shall be monitored to determine if respirator use is required. The following sections describe monitoring requirements. It should be noted that volatile compounds are not a contaminant of concern in soil, sediment, or groundwater at the site.

5.6.1 Air Monitoring Equipment

Photoionization Detector

A direct-reading PID with a 10.6 electron volt (eV) lamp and a sensitivity range of 0.1 parts per million (ppm) or better will be used on site to screen for volatile vapors during intrusive soil work, soil and sediment sampling and similar operations which could release VOCs. PID readings should be taken



during sample collection when airborne exposures may occur. PID readings should also be measured and documented during each main work phase (e.g., drilling, purging, and sampling). If detectable readings occur, measurements will also be collected from worker breathing zones throughout the shift.

The PID will be calibrated with 100 ppm isobutylene calibration gas before each shift. Calibrations will be performed at the beginning of each day of PID use and recorded on a calibration record or log. The PID will be operated in accordance with the manufacturer's instructions. During regular use, the PID will be kept on the most sensitive scale.

5.6.2 Colorimetric Indicator Tubes

The use of a colorimetric detection tubes is not anticipated unless PID measurements over the action level are detected. If PID measurements indicate the presence of unknown VOC concentrations, this HASP will be revised to identify and quantify airborne concentrations of VOCs.

5.6.3 Air Monitoring Action Levels

Air Monitoring Action Levels					
Chemical (or Class)	**Monitoring Equipment**	**Task**	**Monitoring Frequency/ Location**	**Level for Respirator Use**	**Level for Work Stoppage**
VOCs and total petroleum hydrocarbons (TPH)	PID with 10.6 eV bulb calibrated with 100 ppm Isobutylene	While onsite during disruption of soil, hazardous material removal, excavation, or sampling where VOCs are likely to be present.	Air monitoring instrument should be either calibrated or "bump checked" with standard calibration gas prior to use. Monitoring will be continuous if any detectable concentrations of VOC are measured.	• Any sustained concentration of detectable concentration of VOC greater than 5 ppm detected on the PID will require VOC investigation using colorimetric tubes • Respirator to be used will be full-face piece respirator with organic vapor/P 100 combination cartridges over any sustained level of 5 ppm of unknown VOC	At **25 ppm** in breathing zone, Stop Work immediately. Spills of unknown chemicals. Continuously attempt to determine cause of exposure and usage of engineering controls to attempt to never reach the stop work level.

6.0 BIOLOGICAL HAZARDS

Due to the size and location of the Site, site workers are at risk from several biological hazards. The SWP hazard controls selected in **Section 4.2.2** are incorporated herein by reference. The subsections below briefly describes the hazards and control measures for each hazard identified in **Section 4.2.2** for which an existing SWP, policy, or practice does not apply.



6.1 BEES AND YELLOW JACKETS

Most encounters with bees and yellow jackets occur when nests in low human traffic areas are disturbed. Before entering an area or opening an enclosure that is not frequently disturbed, take a few moments to observe whether insects are entering or exiting. If they are flying to or from the area or enclosure, avoid it if possible. Stinging insects fly around the top of their target, so if you get into trouble, cover your head if possible and run away. Insects often are less active during colder weather and early mornings, so observe where you place your hands before attempting to operate equipment during colder parts of the day or year.

If you get stung, remove yourself from the hazardous area then look for a stinger, and, if present, remove following first aid procedures. Contact WorkCare for information on treatment. If the sting is followed by severe symptoms, or if the sting occurs on the neck, the mouth, or near the eye, seek medical attention immediately because swelling could cause suffocation or limit your vision.

If you need to destroy a nest, consult with the SHSO first. Commercially available stinging insect control aerosols are very effective but could potentially contaminate the area. Once the nest is destroyed, fine mesh may be applied over the exit and entry points of an enclosure to prevent re-infestation.

Employees with a known bee sting allergy should carry an EpiPen® prescribed by their personnel physician. These employees should let the SHSO about this allergy and where the EpiPen® will be kept while that employee is onsite, however volunteering this information is a personal choice.

6.2 MOSQUITOS

Mosquitoes in the U.S. have been known to carry several diseases such as West Nile Virus, St. Louis encephalitis, and Dengue Fever. The Multnomah County Vector Control indicates that West Nile Virus is the greatest risk. Symptoms of the disease include flu-like symptoms, including fever, headache, body weakness, nausea, or rash. Less than one percent of victims show serious neurological complications such as tremors, paralysis, or coma. To avoid mosquito bites:

- Apply insect repellent containing N,N-Diethyl-meta-toluamide (DEET) when you are outdoors. Be mindful that this may contaminate environmental samples however and should be applied prior to start of the field work, and only if allowed by the client. Always read and follow the product directions whenever you use insect repellent.

- Wearing long-sleeved clothes and long pants treated with repellent to further reduce your risk, as will staying indoors during peak mosquito feeding hours (dusk until dawn).
- Limit the number of places available for mosquitoes to lay their eggs by eliminating standing water sources from around the work area.

6.3 SPIDERS

The most dangerous spiders to humans in North America are Black Widows and Brown spiders (also known as Brown Recluse or Fiddleback spiders). Although Black Widows and Brown Recluse spiders are rare in New York State, they have a tendency to be found in isolated locations such as vaults. Similar to stinging insects, observe where you put your hands and body for signs of spiders prior to entering an area. Wear general duty gloves and long pants and shirts. A guide to identifying these spiders is presented below.

Black Widow Spider Identification	
Abdomen usually shows hourglass marking; the female is 3-4 centimeters in diameter; have been found in well casings and flush-mount well covers; not aggressive, but more likely to bite if guarding eggs; symptoms include light, local swelling and reddening of the bite are early signs of a bite, followed by intense muscular pain, rigidity of the abdomen and legs, difficulty breathing, and nausea. **If bitten, immediately seek medical help**.	

Brown Spiders (Recluse) Identification	
Has a ¼- to ½-inch-long body, full grown are approximately the size of a silver dollar, legs included. It can vary from cream to dark brown depending on diet. It has a dark brown violin shape on the cephalothorax. The neck of the violin points toward the abdomen. Prefers to hide in baseboards, ceiling cracks, and undisturbed piles of material. At first the bite may either go unnoticed or be followed by a severe localized reaction, including scabbing, necrosis of affected tissue, and very slow healing. **If bitten, immediately seek medical help.**	

6.4 POISONOUS PLANTS

Any person working outdoors is at risk of exposure to poisonous plants, such as poison ivy, poison oak, and poison sumac. When in contact with skin, the sap oil (urushiol) of these plants can cause an allergic reaction. Be prepared when going into the field when you know there are poisonous plants present. Conduct a walk around of your field site prior to beginning work to identify any poisonous plants in the area. Mark any areas found which contain poisonous plants.

Workers may become exposed through:

- Direct contact with the plant
- Indirect contact (touching tools, animals, or clothing with urushiol on them)
- Inhalation of particles containing urushiol from burning plants

What Do Some Poisonous Plants Look Like?

				
Poison Ivy	Poison Oak	Poison Sumac	Giant Hogweed	Wild Parsnip

General Prevention



- Be able to identify poisonous plants in your work areas.
- Minimally wear long sleeves, long pants, boots, safety glasses and nitrile or other disposable glove.
- Poison Ivy, Poison Oak, and Poison Sumac Prevention:
- Use barrier skin creams, such as Ivy Block lotion, which offers protection for parts of the body exposed.
- Wear and have available extra disposable gloves.
- Consider wearing a lightweight Tyvek suit when you must be heavy foliaged work locations.



- After use, clean tools with rubbing alcohol or soap and lots of water. Urushiol can remain active on the surface of objects for up to 5 years.



Poison Ivy, Poison Oak and Poison Sumac Treatment:

- Use Technu Extreme wipes, poison plant wash, or degreasing soap (such as dishwashing soap) or detergent, on affected areas of the body. Use ample amounts of cool water to rinse away any remaining urushiol to prevent spreading to other areas of the body.
- Rinse frequently so that wash solutions do not dry on the skin and further spread the urushiol.
- Scrub under nails with a brush and a void scratching to prevent secondary infection.
- Apply wet compresses, calamine lotion, or hydrocortisone cream to the skin to reduce itching and blistering.
- An antihistamine may help relieve itching. NOTE: Drowsiness may occur.
- In severe cases or if the rash is on the face or genitals, seek professional medical attention call WorkCare 1-888-449-7787 for treatment suggestions. In case of a severe allergic response such as swelling or difficulty breathing, immediately call “911”



Poison Ivy, Poison Oak, and Poison Sumac Reactions

Most people are sensitive to the plants' oily sap known as urushiol. Urushiol is in the root, stems, leaves and fruit of these plants. If it gets on your skin, it can cause blistering skin rash.

Giant Hogweed & Wild Parsnip Reactions

Giant hogweed and wild parsnip differ in that the sap contains a photosensitizing furanocoumarins, contacts human skin in conjunction with sunlight, it can cause phytophotodermatitis - a serious skin inflammation. In brief, the sap prevents your skin from protecting itself from sunlight which leads to a severe sunburn. Heat and moisture (sweat or dew) can worsen the skin reaction. The phototoxic reaction can begin as soon as 15 minutes after contact, with sensitivity peak between 30 minutes and two hours after contact.

Giant Hogweed & Wild Parsnip Prevention



- Apply sunblock before working in areas impacted by these plants
- Wear and have available extra disposable gloves
- Consider wearing a coverall suit in these work locations .
- Always wear eye protection; sap can splash when plant is cut.
- When cutting plants do not use a brush cutter or weed whacker, sap can splatter from the cut the stems.
- Wash equipment immediately with rubbing alcohol when possible.

Giant Hogweed & Wild Parsnip Treatment

- Wash the affected area thoroughly with soap and cold water as soon as possible.
- Keep exposed area away from sunlight for 48 hours.
- If a reaction occurs, topical steroids applied early can reduce the severity of the reaction and ease discomfort.
- If blisters form seek medical attention. Call WorkCare 1-888-449-7787 for treatment suggestions or if you think you need to see a doctor.
- If sap enters eyes, rinse them with copious amounts of water and wear sunglasses.
- If a skin reaction has occurred, the area of skin may be sensitive to sunlight for a few years, and you may want to apply sun block or keep the affected area covered from the sun when possible.

6.5 RATS, SNAKES AND OTHER VERMIN

Certain animals, particularly those that feed on garbage and other wastes, can represent significant sources (vectors) of disease transmission. Therefore, precautions to avoid or minimize potential contact with (biting) animals (such as rats) or animal waste (such as pigeon droppings) should be considered prior to all field activities. Also wearing of appropriate gloves to protect against rats, snakes and other wild animals which can inflict painful bites. These bites can be poisonous (as in the case of some snakes) or disease causing (as in the case of rabid animals). Avoidance of these animals is the best protection. Observe areas with garbage or limited human interaction prior to entering abandoned or remote worksites or thick brush.

6.6 FATIGUE

While there are no specific limitations to work hours or consecutive days worked, worker fatigue is a concern and should be considered when developing the work schedule. In general, workers should not be working longer than 12-hour shifts for five consecutive days or more. A mandatory day of rest should be

taken after six days of consecutive work. If work periods routinely exceed these guidelines, then shift rotations and/or additional personnel support should be implemented. If worker fatigue issues arise and if determined necessary by either the Project Manager or HSSE Management, a Fatigue Management Plan may be prepared. Workers experiencing fatigue on a regular basis and due to the hours worked should alert the Project Manager, SHSO, or HSSE Lead of their concerns.

Some general fit for duty guidelines are listed below.

- Understand what fit-for-duty means when you sign in and out each day;
- Obtain plenty of rest between shifts;
- Limit alcohol consumption;
- Give your body time to adapt to changing shifts or work hours (i.e. transitioning from night or evening shift to day shift);
- To the extent possible, eat meals at regular intervals and stay hydrated; and,
- Document worker fitness for duty on the RMS2 form.

6.7 HEAT AND COLD STRESS

Overexposure to temperature extremes can represent significant risks to personnel if simple precautions are not observed. All work occurring under this HASP is anticipated to occur over various seasons. Typical control measures designed to prevent heat/cold stress also include dressing properly and establishing an appropriate work/break regimen. SWP-113 and SWP-114 both provide guidance and requirements of all Stantec employees while working in extreme heat and cold. Review these practices if the hazards are anticipated to be relevant at the time of the work. The SHSO must assure that the following appropriate heat and cold stress control measures are implemented.

- Selection of appropriate PPE to reduce the risk of heat and/or cold related illnesses (Select PPE based on Site data and working conditions);
- Hydration (fluid replacement with cool water or electrolyte replacement);
- Cool rest areas (provide shaded rest areas);
- Engineering controls (if feasible provide air-conditioned or heated cabs in heavy equipment, cool water drenching during breaks during warm weather);
- Administrative controls (adjust work schedules by starting work earlier in the day, acclimate work force to working in heat/cold, and provide appropriate work/rest regimens);
- PPE (provide ice vests, heat packs, and vortex tubes where appropriate);
- Monitoring (body core temperature with thermometer, check pulse rate of workers);
- Identification of heat-related illness (Including heat cramps, heat exhaustion, and heat stroke); and,
- Employee training (train employees on health effects of heat and cold stress related illnesses).

6.8 HUMAN ENCOUNTERS AND DRUG PARAPHERNALIA

The site is located on fenced property. Ensure that all Stantec equipment, devices and personal items are properly secured/locked in a field vehicle or in the secure sample processing facility. Avoid eye-contact and communication with the public when possible.

If an unsafe condition occurs, leave the site in the field vehicle and/or call 911. Additional workplace safety information can be found in SWP 102 – Workplace Violence Prevention.

If drug paraphernalia (i.e. used needles) is found at the site, field staff should notify their Stantec supervisor. Field staff should not touch or attempt to dispose of these items. Instead, a cone or other warning device should be placed near or on top of the items to warn others not to touch them.

6.9 PERSONAL HYGIENE AND WELLNESS / CONTAGIOUS ILLNESS PRACTICE

The following personal hygiene and wellness practices are recommended to prevent or control the transmission of bacteria and/or viruses:

- Wash your hands with soap and water for at least 20 seconds after using toilet facilities, before and after eating, after handling potentially contaminated/infectious materials, after removing hand protection and other PPE, and after sneezing, coughing, or touching your face. When soap and water is not available use an alcohol-based hand cleaner.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Cover your mouth and nose with a tissue or crooked elbow when coughing or sneezing. Throw the used tissue in the trash and wash your hands.
- Maintain lunchroom facilities through cleaning and disinfecting objects and surfaces. Leave contaminated tools, materials, or clothing outside.
- Maintain vehicles through regular cleaning and disinfecting of surfaces.
- Avoid close contact with those who are unwell.
- Avoid unnecessary, unprotected contact with wild or farm animals, and wash hands after any contact.
- Stay home if you're feeling unwell. If you have symptoms of a cold or flu, call or visit a medical professional and do not continue to work around others.
- Get adequate rest, eat a healthy, balanced diet, and stay hydrated.
- Don't share personal items that can't be disinfected. Furthermore, any protective clothing or other safety device that is worn next to the skin must be cleaned and disinfected prior to use by another employee.

6.10 FITNESS FOR DUTY

Prior to mobilization each day, Stantec field personnel are asked to affirm their Fitness for Duty using the Stantec's RMS 2 Field Level Risk Assessment. Field employees are reminded to include contagious illness symptoms as part of their fitness for duty evaluations.

Stantec employees shall adhere to our Contagious Illness Practice maintained on The Lens. Those employees with symptoms of any contagious illness must not attend any Stantec office or work site but may work from home at their discretion if they are well and able to do so.



7.0 WEATHER AND NATURAL DISASTERS

Hazards associated with weather and natural disasters may include, but are not limited to, effects of extreme heat (heat exhaustion, heat stroke), effects of cold (hypothermia, frostbite), high winds, heavy rain or snow, lightning, and flooding. Information on heat illness prevention can be found in **Section 6.7** and SWP-113. Information on inclement weather, the most likely weather and natural disaster hazards for this project are found below.

7.1 SEVERE WEATHER

Personnel will consult publicly available weather forecast data provided on the NOAA website daily to understand expected weather conditions. If severe weather is expected, such as snow, flooding, or a severe storm the PM will consult with the SSHO and subcontractors as applicable, by the SHSO each day to determine if field work should occur. In the event of thunderstorms or similar high wind and storm events, site personnel will:

- Immediately get into the nearest permanent building (preferred) or vehicle;
- Close windows and avoid touching metal or other surfaces that conduct electricity in and outside the vehicle;
- Do not go outside for at least 30 minutes after the last sign/sound of lightning and thunder; and
- During heavy winds avoid parking or working under trees or unstable structures. Do not carry objects with a large surface area, such as plywood during storm events. Avoid drilling when storms are expected.

7.2 DAILY CONTINGENCY PLANNING

To address potential hazards related to weather and/or natural disasters, the daily HRAC briefings (**Section 4.3**) completed during the tailgate safety meetings and documented on the RMS2 Field Level Risk Assessment form. Potential weather and natural disaster hazards include but are not limited:

- A summary of the daily weather forecast and any associated additional hazards (i.e. high winds, rain, below freezing temperatures, etc.);
- Primary emergency muster points (**Appendix D**); and,
- Any additional muster point location(s) to be determined based on daily work locations, weather conditions, simultaneous work operations, etc.

8.0 ELECTRICAL HAZARDS



SWP 406 – Electrical Safety Program is designed to increase worker safety by:

- Raising awareness of electrical hazards;
- Providing instruction on electrical hazard recognition;
- Providing ways to eliminate and prevent electrical hazards in the workplace;
- Providing procedures, controls and PPE to exposed employees; and,
- Emphasizing the importance of observing all electrical safety requirements and practices.

Although not anticipated in the scope of work, some components could require deenergizing power systems following SWP 408 - Lock, Tag & Try (LTT). Only trained and authorized personnel electrical workers are allowed to energize or de-energize electrical circuits, or perform work of an electrical nature, including validation testing of circuits. Subcontractors will be used to perform electrical work, including de-energization of treatment system components, however site personnel with potential exposure to unguarded live electrical parts should become familiar with the shock and arc flash protection boundaries and protective measures established in SWP 406 - Electrical Safety Program.

9.0 OTHER SPECIALIZED HAZARDS

9.1 TRAVEL TO SITE

The Site is approximately 75 miles from the Stantec office at 61 Commercial Street, Suite 100, Rochester, NY 14614. Review and follow the Stantec Safe Driving Procedures provided in SWP-124. Utilize the SWP 124a - Vehicle Pre-Use Checklist at least once a day for each vehicle driven for Stantec business to identify potential vehicle issues/hazards. A copy of the Stantec vehicle insurance policy (United States Insurance Certificates) will be kept in every vehicle used for Stantec project work. A first aid kit and fire extinguisher shall be placed in each Stantec vehicle.

9.2 UNDERGROUND AND OVERHEAD UTILITIES



Underground and overhead utilities may be affected by drilling for subsurface sampling. SWP 213 - Ground Disturbance and Overhead Utility must be followed prior to intrusive work. Site soils may contain subgrade conduits and piping which need to be adequately located prior to the start of work. Personnel shall also inspect work areas for indications of subsurface utilities such as penetrations, pavement cuts, and irrigation or hydrant lines. See **Section 10.4** for details on utility locate requirements.

Overhead hazards can include low hanging structures that can cause injury due to bumping into them. Other overhead hazards include falling objects, suspended loads, swinging loads and rotating equipment. Hardhats must be worn by personnel in areas where these types of physical hazards may be encountered. Barriers or other methods must also be used to exclude personnel from these areas were appropriate. Electrical wires are another significant overhead hazard. SWP-406, Electrical Safety Program, provides more guidance on safety requirements when working near or on electrical equipment and overhead lines. According to OSHA (29 CFR 1926.550), the minimum clearance which must be maintained from overhead electrical wires is 10 feet from an electrical source rated less than 50 kilovolts (kV). Sources rated greater than 50 kV require a minimum clearance of 10 feet plus 0.4 inches per kV above 50 kV. Below is a chart referencing the minimum required distance for work near electrical wires/equipment.

Minimum Distances from Overhead Powerlines	
Power lines Nominal System kV	**Minimum Required Distance**
0 – 50	10 feet (3 meters)
51 – 100	12 feet (3.6 meters)
101 – 200	15 feet (4.6 meters)
201 – 300	20 feet (6.1 meters)
301 – 500	25 feet (7.6 meters)
501 – 750	35 feet (10.7 meters)
751 – 1000	45 feet (13.7 meters)

9.3 HEAVY EQUIPMENT OPERATION



SWP 216 - Working Near Mobile Equipment shall be followed when drilling equipment is being operated as part of sampling activities. Stantec should maintain a safety buffer of at least 30-feet from drilling equipment where possible. Where proximity to heavy equipment cannot be avoided, then a heightened level of awareness and visibility should be stressed with all personnel affected by such activities. Do not approach a vehicle unless you have made eye contact with the operator, you receive a positive acknowledgment, and it is known that you plan to approach. Wear a Class 2 high visibility safety vest while on site and discuss segregation of personnel and equipment with operators at the start of each shift.

9.4 SLIP, TRIP, AND FALL HAZARDS

Slip, trip, and fall hazards may include uneven terrain, sharp debris, electrical fencing, holes, wet surfaces, etc. The most likely physical hazards at the site are uneven terrain, wet surfaces, and sharp debris. To protect yourself, look before you step, plan your path, do not walk while distracted, and wear proper PPE for the task being performed such as a sturdy ankle supporting shoe.

When water is used for dust control, care must be taken to avoid creating muddy or slippery conditions. If slippery conditions are unavoidable, barriers and warning signs must be used to warn of these dangers.

9.5 HAND AND POWER TOOL USE

SWP 206 – Hand and Portable Power Tools has been developed to describe the safe work practices required by all Stantec employees who will utilize hand and power tools. All Stantec employees are required to read, be familiar with, and abide by all the requirements detailed in the SWP in additional to the manufacturer's recommendations. All tools will be properly maintained and inspected prior to each use. Drills used on concrete must have a water mist or shrouded attachment to control silica dust.

9.6 NOISE AND HEARING CONSERVATION

All Stantec employees exposed to an 8-hour Time Weighted Average (TWA) sound pressure level of 82 decibels, A-weighted scale (dBA) or greater are required to be included in our Hearing Conservation Program and be familiar with SWP 106 - Hearing Conservation, SWP 105 - Personal Protective Equipment (PPE) , and SWP 111 - Medical Surveillance address requirements for hearing protection and our hearing conservation program. A noise survey matrix is included in SWP 106a - Noise Level Assessment Tool. The survey should be completed at the beginning of each new task or if new equipment (i.e. a drill rig) is brought to the site.

Employees participating in field work are required to fill out a Medical Surveillance Assessment Form (RMS9). Elements of the Hearing Conservation Program include:

- Initial and annual audiometry
- Employee training in hearing conservation and the safe use of hearing protection
- Supervisory oversight in the correct application and use of hearing protection

In general, when you need to raise your voice to be heard, hearing protection is required. If planning to be near (within 10-feet) of heavy equipment, generators, air compressors, or similar load stationary equipment for more than four hours a day, hearing protection should be used to mitigate the effects of constant noise. Monitoring of noise levels can be coordinated by the SSHO, or a noise level check can be conducted using the National Institute for Occupational Safety and Health (NIOSH) noise level meter app on a company phone. Accommodations for adequate communication between team members, such as radios or hand signals shall be arranged during the daily tailgate safety meeting.

9.7 MANUAL MATERIAL HANDLING

SWP 115 - Material Handling and Safe Lifting has been developed to provide guidance to Stantec employees for protection of hazards associated with manual material handling. All employees should be familiar with the SWP and exercise the requirements. Information specific to drum handling is found in **Section 11.1**.



9.8 FIRE AND EXPLOSION

The possibility of flammable materials being encountered during field activities must be recognized and the appropriate steps necessary to minimize fire and explosion must be observed. This includes situations where excessive organic vapors or free product are encountered. When this occurs, monitoring with a combustible gas indicator (CGI) and PID is required.

In situations where flammable materials (gasoline, acetylene cylinders, hexane, methanol) are used onsite, the following precautions must be observed: keep flammable and combustible materials away from heat, sparks and open flames; do not smoke around flammable or combustible materials; keep all flammable and combustible liquids in approved and properly labeled safety containers and segregate all flammable materials from other incompatible materials such as oxidizers.

Stantec personnel will use compressed gas (isobutylene) to calibrate air monitoring equipment for personal air quality monitoring. Stantec personnel will follow instructions provided when calibrating air monitoring equipment. Stantec personnel may use compressed gas (carbon dioxide) to pressurize the air compressor during groundwater sampling.

Key guidelines to remember during transportation and storage of compressed gas cylinders include:

- Cylinders should not be transported with the regulator attached to the cylinder.
- Cylinders should be stored in a well-ventilated area away from flames, sparks or any source of heat or ignition. Keep cylinders away from electrical circuits.
- Cylinders should not be exposed to an open flame or to any temperature above 125°F (52°C) including storing in enclosed vehicles.

Additional guidelines required by Stantec's Safe Work Practice, SWP-310 Compressed Gas Cylinders, if gas cylinders are intended to be used at the site.

9.9 TRAFFIC SAFETY



Traffic Control

Where exposed to vehicle traffic, it is necessary for employees on foot to remain aware of vehicle traffic and to wear a minimum of a Class 2 high-visibility safety vest. Personnel shall follow the requirements in SWP 407 - Traffic Control and Protection Planning.

9.10 HAZARDS IDENTIFIED DURING WORK

9.10.1 Hazards Created by or Identified During Work Controlled by Stantec or Stantec Subcontractors

When apparent non-compliance to the HASP or unsafe conditions or practices are observed, the Stantec Project Manager, and/or SHSO will be notified and corrective actions implemented. For Stantec's subcontractor, the subcontractor's SHSO or Project Manager will be notified, and corrective actions will be required. For work activities performed by the subcontractor, the subcontractor is responsible for determining and implementing necessary controls and corrective actions.

When Stantec employees or subcontractors may be exposed to an imminent danger, immediately stop work and alert all affected individuals. Remove all affected Stantec and Stantec subcontractor employees from the danger and notify the Project Manager, and/or SHSO, and the subcontractor's SHSO or Project Manager where appropriate. Do not allow work to resume until adequate corrective measures are implemented and documented and accepted by the SHSO or his/her designee.

9.10.2 Hazards Identified with Client or other Contractor Work Activities

In carrying out Stantec's responsibilities of assuring safety compliance for Stantec personnel, the following guidelines are implemented when employees identify hazardous conditions created by the Client or Contractors (third party) within or adjacent to their work area:

If a condition is identified that could immediately result in an accident resulting in severe injury or death:

- Take appropriate measures to ensure your own safety and all other Stantec and Stantec subcontractor employees by immediately removing yourself from the immediate danger of the hazard zone.
- Advise others in the area of your potential concern. This would include notifying the Client's representative and third-party management (if applicable). Do not advise how to correct the immediate hazard, only that one appears to exist.
- If the potential concern is not addressed, the Stantec employee should notify the Project Manager or his/her designee, who then may notify Client Management of the potential concern. It is the Client's responsibility to determine, and implement if appropriate, the issuance of a stop work order or to suspend the affected activity.

If a condition is identified that may not be an immediate danger, but could result in an accident involving less serious or minor injury, damage to equipment, or environmental release:

- Take appropriate measures to ensure your own safety and the safety of all other Stantec and/or Stantec subcontractor personnel by immediately removing yourself/them from the immediate hazard zone.
- Advise others in the area of your concern. This would include notifying the client representative. Do not advise how to correct the deficiency; only that it appears that one exists.
- Notify the Project Manager and/or SHSO. The situation will be evaluated, and protective actions taken to ensure the safety of Stantec and Stantec subcontractor personnel during the performance of their work activities.

10.0 SITE CONTROL AND SITE REQUIREMENTS

Procedures described in this section are intended to aid Stantec personnel in mitigating site risks/hazards.

10.1 PRE-ENTRY BRIEFING

All on-site workers and visitors will receive a pre-entry briefing prior to accessing work areas of the site. The briefing will include reviewing contents of the HASP and signing the Acknowledgement and Agreement Form. The briefing for visitors may be abbreviated to be fit-for-purpose based on the intent of the visit.

10.2 SITE ACCESS AND LAYOUT

Before mobilizing to the site for an event, the property owners will be notified per applicable Site Access Agreements. A site map is provided as **Figure 1.** Additional site plan(s) will be added to this HASP as site conditions are refined during the project, such as after completion of utility locating events. The site plan(s) will be updated and annotated with work zones, site ingress/egress, staging areas, etc.

10.3 SITE WORK ZONES

No eating, drinking, or smoking within the exclusion zone. These activities will be conducted only in designated areas of the site or within field vehicles. Use of handheld electronic devices such as cell phones, pagers, iPads, or other electrical devices (with the exception of intrinsically safe devices) are prohibited in the exclusion zone.

Work zones will be designated daily during the tailgate meeting and documented on the RMS2 Field Level Risk Assessment form. Additional factors to consider when evaluating daily work zone(s) include weather and natural disasters (**Section 7**), other specialized hazards identified in **Section 9**, and emergency muster point(s)/emergency route maps (**Appendix D**).

10.4 UTILITY CLEARANCE

The identification of USTs, pipes, utilities and other underground hazards is critically important prior to drilling, excavating and other intrusive activities. In accordance with OSHA 29 CFR 1926.650, the estimated location of utility installations, such as gas, sewer, telephone, electric, water lines and other underground installations that may reasonably be expected to be encountered during intrusive activities.

All intrusive activities conducted by Stantec or Stantec subcontractors must be conducted in accordance with Stantec's SWP-213 - Ground Disturbance and Overhead Utility.

The Stantec PM has the following responsibilities for implementing intrusive work.

- Require that applicable equipment be maintained and used in accordance with this practice.

- Verify that a Utility Services Pre-Ground Disturbance Worksheet & Approval Form (SWP 213a) is completed for each project as required (according to scope of work) prior to work commencing and that it is available for reference on the worksite.
- Review the tasks and procedures prior to commencing work and sign off on SWP 213a.
- Use only employees who are trained on the hazards anticipated with the work and are aware of the required controls and precautions as outlined in this safe work practice and in the hazard assessment.
- Underground utilities will be marked in the field, where accessible. Submerged utilities will be located in the field by the utility owner and/or Stantec in accordance with SWP-213 (Ground Disturbance and Overhead Utility).

Onsite Stantec employees have the below listed responsibilities while conducting or overseeing intrusive earthwork.

- Applicable services are to be cleared prior to commencing intrusive activities using the Above Ground/Underground Utilities Checklist (SWP-213b) to document all locates, shut-offs or any other activities to identify above ground and below ground hazards.
- At the completion of work, use the Backfill Observation Form (SWP-213c) to document that all work has been completed, and that all ground disturbances have been returned to their regular state to the satisfaction of the owner. Sediment borings collected from the river will not be backfilled.
- Report to the PM any concerns they may have with the location of the intrusive work and/or equipment being used to perform the intrusive work.

10.5 DECONTAMINATION

Personnel will properly decontaminate after leaving designated exclusion zones. Decontamination procedures may involve disposing of Tyvek® coveralls, boot covers, disposable gloves, etc. in a decontamination zone located at the edge of the exclusion zone. Disposable sampling equipment will also be bagged for disposal in this area. At a minimum, personnel will wash exposed skin before leaving a site using soap and water or pre-moistened cleansing towels. Sampling equipment will be decontaminated using the existing wash rack attached to the driller's vehicle or in a wash rack constructed onsite. Disposable equipment will be containerized and disposed of in accordance with the waste management plan (**Section 11.0**).

10.6 PERSONAL HYGIENE AND SANITATION

Work breaks, eating, drinking, and conducting paperwork tasks will be performed in the field vehicle, office or other suitable location outside the exclusion zone or off the site. Field personnel will wash their hands prior to eating or drinking.

Stantec does not have access to site buildings. During work a portable toilet will be installed. Separate sex toilet facilities will be required if there are more than 20 people at a project site. All rental toilets will be equipped with a door that is lockable from the inside. Rental toilets and hand wash stations will come equipped with a minimum of a bi-weekly cleaning service. A visual search for spiders (particularly black

widow and brown recluse spiders) should be conducted prior to using any portable toilet. Disinfection materials will be accessible to staff to clean high touch points.

10.7 SITE SECURITY

Security of our staff, subcontractors, equipment, and the public is of paramount importance to Stantec. Employees are trained in hazard recognition and will follow standard policies and procedures to report and mitigate site security issues/hazards if identified. Note that security consideration is different than traffic guidance and control, which also impacts security to some extent. Security refers to personal safety and freedom from theft or violence. The following items will be evaluated when considering security measures at the site:

- Daytime activities at the site (e.g., gas station only, gas station with convenience store, etc.);
- Recent criminal activity at the site and nearby areas (ask site owner/operator and the police);
- Work hours (security concerns may be different depending on the time of day); and,
- Lighting at the site (thieves are generally dissuaded from stealing on well-lit sites).

Standard security measures will be implemented on site to minimize the potential for loss at the site. Standard security measures include properly maintained lighting, functioning locks for windows/doors/ equipment storage areas and maintaining control of tools and equipment when not in use. Security may be implemented in a variety of ways:

- Orange construction fence (minimal security);
- Chain link fencing;
- Extra lighting;
- Specialized locks; and/or,
- Contract security.

10.8 PERMITS

This HASP will serve as the general permit to work for this site. Client specific work permits will be available in the field, when applicable.

10.9 WORK HOURS

Work on this project will be generally conducted during daylight hours on weekdays.

10.10 PUBLIC QUESTIONS AND PRESS

Questions about the site posed by neighbors, the press, or other interested parties will be directed to the Stantec Project Manager.

11.0 WASTE MANAGEMENT

Waste management plans for work activities conducted under this HASP are within the specific FSPs established for this project prepared under separate cover. The following provides a general summary of the anticipated waste streams and their management.

A. Waste Generation (Type(s)/Quantities Expected):

Anticipated (YES/NO): Yes

Types: Liquid _X_ Solid _X_ Sludge __ Other (describe) _____

Quantity (Expected Volume): To be determined.

Hazardous wastes may not stay onsite for more than 30-days.

B. Characteristics (Expected):

Corrosive _____ Flammable/Ignitable _____ Radioactive _____ Toxic _ ___

Reactive _____ Unknown _X_____ Other (specify) _____

C. Packaging Requirements for Waste Material (Expected):

DOT-approved Drums __**X**___ Baker Tanks (possibly tankers if trucked off-site) _____

Lined Waste Bins __X___ Temporary Stockpile __X___

D. Disposal and/or Treatment Methods Proposed (Expected):

All wastes will be labeled, sampled, and analyzed for all applicable chemicals of potential concern and physical properties (e.g., pH, vapor pressure, etc.) to ensure proper waste characterization. Results of analysis will determine how and where impacted materials may be disposed. Approved vendors will be responsible for the categorization and transportation of waste generated on this Site. Materials will be disposed of or treated in accordance with federal, state and local regulations. Stantec will assist in coordinating with the waste disposal facilities. If NYSDOT cannot be onsite during pick-up, the Remedial Contractor will be responsible for signing hazardous and non-hazardous waste manifests (on behalf of NYSDOT the generator).

11.1 DRUM AND CONTAINER HANDLING

Before you move a drum, put on a pair of thick gloves and observe the area. Check to see how much room there is to move the drum and plan out your route. Check the route for anything that might cause you or your equipment to trip or slip. Then, check the drum to make sure it is not warped, leaking, or bulging. Check the bung and/or lid to make sure they are tight enough to prevent leaks.

If the drum is safe to use, use a drum dolly to move the drum to the new location. If a drum starts to fall, get away from it as quickly as possible. If the contents spill, follow the spill response procedure in **Section 17.4**.

If rolling a drum is the only option and the drum is not overweight, place your left hand high on the chime and your right hand low and use both hands to roll the drum on the bottom edge. As your right hand reaches the top, switch the left hand to the top position. Lift your hands and place them into position. Do not slide your hands because you may cut them. Keep your feet separated and do not slide them, use a sidestep. Turn your body slightly away from the drum and stay ahead of it.



12.0 HEALTH AND SAFETY TRAINING REQUIREMENTS

12.1 TRAINING REQUIREMENTS FOR SITE ACCESS

The SHSO will conduct a site orientation for all Stantec and Stantec subcontractor personnel to include sponsored visitors. The site orientation will include an overview of this HASP, emergency information, and other relevant information that would provide the worker with safety and health information prior to entering the project site (Field Level Risk Assessment).

12.2 ACTIVITY SPECIFIC HEALTH AND SAFETY TRAINING

Health and safety training are an integral part of the total project health and safety program. The objectives of such training are to educate workers about the potential health and safety hazards associated with working at the project site. The Project Manager is expected to instruct employees about the hazards of the project and site before allowing them to perform work on site. If at any time an employee feels that have not been adequately trained to safely perform the work, they have the authority and responsibility to “Stop Work” for that activity until properly trained.

The health and safety training that applies to work activities, as applicable and cited in the activities’ JSA may vary based on the scope of work to be performed and the anticipated hazards. The PM or SHSO will conduct a review of each individual’s planned job activities and evaluate whether the training and competencies have been completed and are recorded in the project record. Stantec training that applies to the scope of this project include:

- 40-hour HAZWOPER training;
- Annual 8-Hour Refresher;
- Supervisory 8-Hour Training for the SHSO;
- First Aid/Cardiopulmonary resuscitation (CPR)/Automated external defibrillator (AED);
- Stantec HSE 1201/1202: Safety Training for Supervisors and Project Managers;
- Stantec HSE 1220: Hazard Communication Standard (HAZCOM);
- Stantec HSE 1230: HSSE Orientation;
- Stantec HSE 1260: Safer Together;
- Stantec HSE 7003: Green Defensive Driver Training or equivalent; and,
- Emergency Response (onsite)

Additional training may be required based upon site duties and anticipated hazards. These could include:

- Stantec HSE 1270: Work zone Traffic Control;
- Stantec HSE 1271: Ground Disturbance;
- Stantec HSE 1282: Situational Awareness;
- Boat and Water Safety (SWP 513);
- Hand and Power Tool Safety (SWP 206);
- Fall Protection (SWP 201);
- Lock Tag and Try (SWP 408);



- Hot Work (SWP 414);
- Confined Space (HSE 502 and SWP 411);
- Personal Protective Equipment (SWP 105);
- Respiratory Protection (SWP 409);
- Fire extinguisher training; and/or,
- Other potentially applicable SWP documents listed in **Section 4**.

Site personnel responsible for hazardous waste transportation and/or hazardous waste management will also be trained and certified in the following:

- DOT Hazardous Materials Transportation (49 CFR 172.704[a][1][3]);
- DOT Security Awareness (49 CFR 172.704[a][4]); and,
- Resource Conservation and Recovery Act (RCRA) Hazardous Waste Management (40 CFR 262.34 and 265.16).

Fit tests are required where respirator use may occur.

As work scope changes and new training requirements are identified, they will be incorporated into the program. Subcontractors are required to verify that their employees have received the necessary training for their work task and that documentation is available and supplied to the SHSO prior to work execution.

Prior to commencement of site activities, the SHSO will provide a copy of the HASP to site workers and conduct a project safety briefing. Employees and subcontractor employees engaged in a work activity must be informed of the nature and degree of exposure to chemical, biological, and physical hazards that are likely to result from performance of work.

12.3 RECORDKEEPING

The Project shall establish reporting and recordkeeping requirements in accordance with Federal and/or State law and Stantec HSSE Procedures, Occupational Injury and Illness Reporting and recordkeeping, including reporting as required by OSHA. Examples of reports or records are:

- HSSE Event Report – RMS3;
- Daily Field Level Risk Assessment – RMS2/ eFLRA;
- Weekly Worksite Inspection: Field – RMS5;
- Project File Safety Review – RMS6;
- Quantified Hazard Assessment – RMS7;
- Medical Surveillance Assessment – RMS9;
- Weekly Planned Job Observation – SAFE form or RMS10;
- Management of Change – RMS11;
- Subcontractor variances;
- Visitor sign in sheets;
- HASP and completed acknowledgement forms;
- Air monitoring forms;
- Employee medical clearance;
- Employee fit tests;

- Noise monitoring results;
- Safety training records;
- Float Plan;
- Vehicle Inspection forms;
- Utility Clearance forms;
- Operator certifications (driller, vessel captain, hoist operator, etc.); and,
- Permits (Hot work, Confined Space, etc.).



13.0 REQUIRED MEETINGS

Stantec and Stantec Subcontractor employees are to attend a project safety orientation, as well as periodic safety meetings.

Stantec meeting safety topics discussed are to be documented accompanied with an attendance signature sheet. The Stantec meetings to be conducted are as follows:

Meeting Type	Purpose	Length	Frequency
Project Orientation	To acquaint employees with the Stantec Project scope of work, field activities Stantec HASP requirements.	Approximately one hour.	At time of first assignment to the Project.
Daily "Tailgate" Safety Briefs	To ensure that hazards and controls associated with work to be performed are understood by all those involved. Discuss relevant JSAs, emphasis items, weather, any unusual or special conditions. Documented in project files.	As needed, typically 15 to 30 minutes.	At the start of every work shift when field work is performed. Additional briefs may be required for new tasks or scope change.

The Field Level Risk Assessment – (e.g., RMS2/eFLRA form) is used as a means of documenting these meetings.

13.1 DAILY PRODUCTION HEALTH AND SAFETY BRIEFINGS

A safety meeting will be conducted prior to initiating site activity, and at other appropriate times (each morning and change or addition of work) at the site to discuss the health and safety issues for the activities to be conducted that day. The topics of the meeting will include, at a minimum, general health and safety procedures, expected weather conditions, reviewing health and safety policies and reviewing the job hazard analyses for the tasks to be conducted. Additional safety meetings may be conducted if the scope of work changes during the day, or if other health and safety issues are identified. The Field Level Risk Assessment form (RMS2/eFLRA) will be used to document daily health and safety briefings. Blank RMS2 forms are included in **Appendix A**. Completed RMS2 forms should be routinely provided to the Stantec Project Manager and saved in the project files.

13.2 DAILY HEALTH AND SAFETY INSPECTIONS

A safety and health inspection will be completed daily and the minimum inspection requirements documented in the Daily Field Report. Findings and associated corrective actions will be documented in the Daily Field Report. An RMS5, worksite inspection form, with relevant EHS hazards to be considered should be completed and updated upon identification of any deficiencies. A blank RMS5 is included in **Appendix A**.

14.0 PERSONAL PROTECTIVE EQUIPMENT

14.1 MINIMUM PPE REQUIREMENTS (LEVEL D)

PPE is worn to reduce exposure to hazards to an acceptable level after all other reasonable control measures have been implemented. Using PPE is the last step in the hierarchy of controls discussed in the HRAC process. Information on selection and use of PPE, can be found in Stantec SWP 105 – Personal Protective Equipment.

Employees are expected to wear the PPE required by occupational health and safety legislation, Stantec SWPs, client directives, and as identified in task-specific JSAs.

During fieldwork, where PPE requirements are not identified by the Client, facility, jurisdictional regulation or hazard assessment, all employees, guests, and visitors will wear the following minimum protective equipment, special equipment may be required for a specific task as defined elsewhere in the HASP or in task specific JSAs:

Item	Specifications
Exterior garments	Long pants, shirt with long sleeves (no tank tops or shorts).
Foot protection	Safety toed footwear/boots with ankle support (per ASTM F2413).
Gloves	When required to handle hazardous or corrosive chemicals or environmental samples compatible, durable chemical rated nitrile gloves will be worn. General duty work gloves (e.g., cotton, leather, mechanics) may be used when handling material or performing work unrelated to chemical contamination.
Eye and face protection	Safety glasses with side shields. (per American National Standards Institute [ANSI] Z87.1). Additional face shield or goggles when there is a danger of chemical splashes or flying debris.
Head protection	Type I G or better Hard hats (per ANSI Z89.1). Hard hats shall be worn with the brim pointed forward.
Hearing protection	Earplugs or muffs with a noise reduction rating (NRR) of at least 22 dB, when working on or near operating equipment or machinery. Double hearing protection required at 100 dBA or greater.
Traffic vest	Workers will wear a high-visibility traffic safety vest per ANSI 107, class 2 or 3 depending on project site requirements

Personnel shall only use PPE for which they have been trained to use and medically capable of utilizing safely. Personnel who perform field tasks which significantly stress the body, have the potential to expose personnel above an occupational exposure limit (OEL), require the use of respirators or hearing protection, or work with certain toxic compounds or bloodborne pathogens, will be entered into Stantec's Medical Surveillance program. Project managers shall work with affected personnel to complete RMS9 (Medical Surveillance Assessment) forms for field staff to document medical surveillance requirements for

personnel. These forms shall be managed by the local OSEC. See **Section 15.0** for more information on Stantec's Medical Surveillance program.

14.2 HAZARD SELECTION AND EQUIPMENT SELECTION

The Project Manager and SHSO shall, in consultation with field teams, identify actual or potential hazards and the need for PPE. If respiratory protection or chemically protective clothing/gloves are required, the appropriate PPE was selected with the assistance of an HSSE Team Member. Two conditions typically dictate the necessity for PPE: general hazards present in the work area and hazards created by the tasks being performed. Some work areas have actual or potential hazards that can be present at any time, thereby potentially exposing any personnel working or walking through the area. Such areas will be posted as PPE-required areas, or personnel will be informed of the requirements in an equivalent manner. In addition, the actual task being performed may create a hazard and require personnel who perform this task to wear appropriate PPE. The areas where these tasks are taking place may become PPE-required areas for the duration of that specific task. For this project, each JSA specifies the exact PPE required for each task. This is accomplished using established levels of PPE and then, if necessary, specifying the exact features of appropriate equipment items.

14.3 LEVELS OF PPE

This HASP uses the PPE levels of protection outlines in OSHA's 29CFR1910.120 Appendix B. Activities on this site require at least Level D as described in **Section 14.1**. Certain tasks, such as intrusive work or spill response activities may require a higher level of protection as described below and in the air monitoring action level portion of this HASP (**Section 5.6.3**). Consult with task specific JSAs and Airborne Action Levels found in **Section 5.6.3** to understand the level of protection required during routine and potential emergency situations at this Site.

14.3.1 Respiratory Protection

In the event the elevated levels of volatiles are found and respiratory protection will be necessary to continue work, all affected employees will be subject to a respiratory protection program in accordance with Stantec SWP 409: Respiratory Protection. All personnel required to respiratory protection will be medically cleared and have had a successful respirator fit test for the respirator they intend to use.

14.3.2 Level A

Level A is selected when the greatest level of chemical or biological skin, respiratory, and eye protection is required. **Level A will not be used for this project.**

The following constitute Level A equipment.

- Positive pressure, full face-piece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA, approved by the NIOSH;
- Totally encapsulating chemical-protective suit;
- Coveralls (optional);

- Long underwear (optional);
- Gloves, outer, chemical-resistant;
- Gloves, inner, chemical-resistant;
- Boots, chemical-resistant, steel toe and shank; and,
- Hard hat (under suit) (optional, may be required for some activities).

To protect the critical components of the ensemble, disposable protective suit, gloves and boots (depending on suit construction, may be worn over totally encapsulating suit).

14.3.3 Level B

Level B is selected when the highest level of respiratory protection is necessary, but a lesser level of skin protection is needed. **Level B will not be used for this project.**

The following constitute Level B equipment.

- Positive pressure, full-facepiece SCBA, or positive pressure supplied air respirator with escape SCBA (NIOSH approved);
- Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls);
- Coveralls (optional);
- Gloves, outer, chemical-resistant;
- Gloves, inner, chemical-resistant;
- Boots, outer, chemical-resistant steel toe and shank;
- Boot-covers, outer, chemical-resistant (disposable) (optional, depends on activity);
- Hard hat;
- Face shield (optional); and,
- Safety glasses (Required if not using a full-face tight-fitting respirator).

14.3.4 Level C

Level C is selected when the concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air purifying respirators are met. Level C will be used when action levels are exceeded as specified in **Section 5.6.3**.

The following constitute Level C equipment; it may be used when air monitoring indicates an exceedance of the Action Level but at a concentration that is below the Stop Work Level.

- Full-face or half-mask, air purifying respirator (NIOSH approved);
- Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls, disposable coveralls, optional depends on activity);
- Gloves, outer, chemical-resistant (optional depends on activity);
- Gloves, inner, general duty;
- Boots (outer), chemical-resistant steel toe and shank (optional, depends on activity);
- Boot-covers, outer, chemical-resistant (disposable) (optional, depends on activity);
- Hard hat;



- Boots/shoes, steel toe and shank;
- Escape mask (optional, depending on hazards);
- Face shield (optional depending on activity); and,
- Safety Glasses (if not using full face respirator).

14.3.5 Level D/ Modified level D

Level D is a work uniform affording minimal protection: used for nuisance contamination only and to provide protection from impact, cuts, and flying debris. Level D is the standard level of PPE for field work.

Examples of Level D equipment are found below. Specific PEP requirements are found in the task specific JSAs. Minimum requirements to work on the site are found in **Section 14.1**.

- Chemical resistant coveralls (required in exclusion zone) or durable pants and long-sleeved shirt;
- Gloves (depends on activity);
- Boots/shoes, steel toe and shank;
- Boots, outer, chemical-resistant (disposable or rubber) (optional, depends on contaminant);
- Safety glasses;
- Chemical splash goggles (optional);
- Hard hat;
- Escape respirator (optional, depends on hazards and concentration);
- Face shield (optional, depends on activity);
- High visibility traffic vest;
- Hearing protection;

15.0 MEDICAL SURVEILLANCE

15.1 PERSONS COVERED

All employees engaged in or overseeing intrusive activities (e.g. sampling, drilling, or other investigation activities) will be enrolled in our medical surveillance program in addition to those that meet the following regulatory triggers.

- All employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year
- All employees who wear a respirator for 30 days or more a year or as required by 1910.134
- All employees who are injured, become ill, or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation

15.2 FREQUENCY (SCHEDULE)

- Prior to assignment
- At least once every twelve months for each employee covered; unless the attending physician believes a longer interval (not greater than biennially) is appropriate
- At termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last six months.
- As soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards, or that the employee has been injured or exposed above the permissible exposure limits or published exposure levels in an emergency situation.

15.3 PROGRAM REQUIREMENTS

The elements of the medical surveillance program are maintained in SWP 111 - Medical Surveillance, The program includes at least an annual review of an employee's exposures using a Medical Surveillance Assessment Form (RMS9) regardless of the triggers identified in **Section 15.1** above. HAZWOPER surveillance includes special emphasis on symptoms related to the handling of hazardous substances, health hazards affecting fitness for duty including the ability to wear any required PPE under conditions (i.e., temperature extremes) that may be expected at the work site.

15.4 EATING, DRINKING AND SMOKING RESTRICTIONS

Stantec desires to provide a tobacco-free environment and does not condone the use of tobacco products by its employees while serving clients or during the course of work. Further, all facilities, including vehicles, owned or operated by Stantec are strictly tobacco-free. To prevent ingestion of toxins, eating, drinking, smoking or applying cosmetics is not allowed while in an area of known contamination

(Exclusion Zone/Hot Zone or Support Zone), when working with chemicals or contaminated items, or when wearing PPE that prevents chemical exposure (respirator, gloves, chemical apron, etc.). After exposure to any chemical or contaminants and prior to eating, drinking or smoking workers must thoroughly wash their hands and face.

15.5 DRUG AND ALCOHOL POSSESSION AND USE

Stantec's Alcohol and Drug Practice (HSSE-100) details requirements for Stantec employees on project sites. Key requirements include:

- Employees must arrive fit for duty and remain fit for duty during their period of work.
- Employees must understand the alcohol and drug practice, their role, and the resources available.
- Employees shall take responsibility to ensure their safety and the safety of others. This may include contacting a supervisor, HSSE, Human Resources, the Employee and Family Assistance Plan (EFAP), or the Integrity Hotline for confidential advice on what action to take.
- Employees shall use medications responsibly, be aware of potential side effects and notify their supervisor of any potential unsafe side-effects where applicable.
- Employees shall not sell, distribute, possess, consume or use alcohol, drugs (other than authorized medications), drug paraphernalia, or any device or product that could tamper with any sample for an alcohol or drug test.

Following an incident, Stantec will follow the incident reporting procedures. If appropriate, Stantec will include drug and alcohol testing, consistent with Stantec's Policies and Procedures, as well as the client's contractual requirements for testing.

16.0 WORKING ALONE AND USE OF THE BUDDY SYSTEM

Stantec has established a buddy system which is applicable to most situations governed by this HASP. SWP 118 - Working Alone in the Field requires the completion of a risk assessment to determine the appropriateness of lone work and development of methods to monitor the condition of all employees who are working alone. Stantec personnel will work with a subcontractor, client, or another Stantec employee when onsite.

17.0 EMERGENCY RESPONSE PLAN

The following sections outline the Emergency Response Plan (ERP). The ERP describes procedures to be used in the event of an accident or emergency at the site. Stantec's Incident Reporting Protocol (Appendix B) Incident Reporting Protocol - United States - EN shall be followed for handling and reporting all incidents.

17.1 EMERGENCY INCIDENT CONTACT AND HOSPITAL ROUTE

The person responsible for responding in the event of an emergency at the site during execution of the work covered under this HASP is the SHSO:

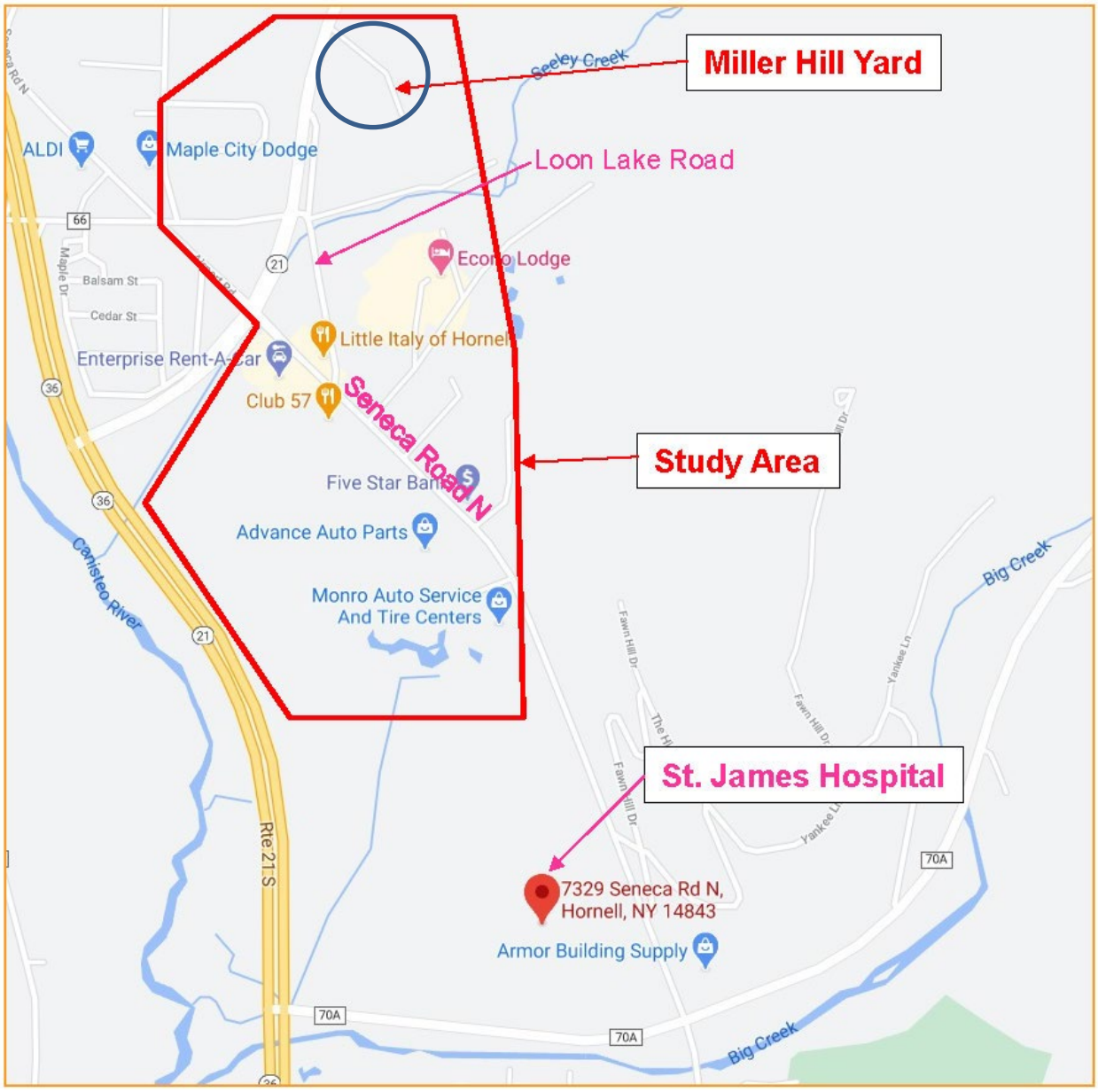
Amanda Matkosky
Direct: (585) 413-5208
Mobile: (585) 285-3598
amanda.matkosky@stantec.com

Appendix D, *Emergency Response Procedures and Contacts*, provides emergency notification/contact information of local Emergency Medical Services and route information and maps to the nearest emergency medical facility.

17.2 EMERGENCY RESPONSE PROCEDURES: EVACUATION

In the event of an on-site or off-site emergency requiring site evacuation (e.g., fire, release, explosion, etc.), the following procedures will be followed:

- Stop Work and notify the SHSO.
- Evacuate the site and go to the emergency meeting location if safe conditions exist. Unless otherwise noted, the emergency meeting location is indicated in the associated RMS-1 document for the particular job:



Due to the size of the site and varying work activities, the emergency meeting locations will be confirmed and updated (if necessary) during the tailgate safety meeting on a daily basis, including identifying muster points, as necessary. If safe conditions prevent evacuation to the designated location, move upwind, away from the source of the emergency. Maintain a safe distance from the source.

- Check in with the SHSO at the emergency meeting location. The SHSO will take attendance once all personnel have gathered.
- Dial the appropriate emergency response number(s). State the problem clearly and completely and remain on the line until dismissed by the operator.

- Only attempt extinguishing small fires with portable dry chemical equipment on-hand. When in doubt, emergency response personnel shall be notified.
- Do not reenter the emergency site without specific approval from emergency response personnel.

Randomly scheduled evacuation drills may be conducted at any time during field activities.

17.3 EMERGENCY RESPONSE PROCEDURES: INJURY OR ILLNESS

If an injury or illness occurs, take the following action:

1. Stop Work, stabilize the situation, and secure the site.
2. If it is safe to do so, administer First Aid for the person immediately using a first aid and blood-borne pathogens kit. Ensure Universal Precautions are taken (i.e. avoid contact with patient's bodily fluids by means of wearing nonporous articles such as gloves, goggles, and face shield).
3. Determine if emergency response (fire/ambulance) is necessary. WorkCare may be contacted if employees are unsure of the extent of injury. If emergency response is required, call appropriate emergency response numbers on closest available phone. Meet the emergency vehicle at the emergency muster point identified for that day during the tailgate safety meeting, then direct them to the incident area. Provide the location of the injured person and other details as requested. Advise personal of potential contamination or exposure concerns. Drive the individual to the hospital only if it makes sense and there are at least two staff available to go with the injured person, one first aid trained person to attend to the individual in the vehicle and one driver.
4. If emergency decontamination is required:
   - Immediately remove contaminated PPE or clothing.
   - If possible, wash contaminated area with mild soap and water.
   - Use eyewash station if necessary. Portable eyewash bottles will be available with First Aid Kit.
   - Personnel assisting the contaminated individual will don the proper PPE to avoid unnecessary exposures.
5. For all injuries or illness, even minor cuts, scratches, and bruises, notify the SHSO immediately. The SHSO is responsible for initiating incident reporting procedures immediately after the victim(s)/site have been stabilized. The SHSO will assume responsibility during a medical emergency until more qualified emergency response personnel arrive at the site as needed.
6. As promptly as possible following an injury or illness, ensure appropriate notification has been made to the family of the individual involved by contacting the Project Manager who will inform the HR Lead.
7. Please see **Section 3.4** for incident reporting procedures.

17.3.1 Injuries or Illnesses Requiring Hospital Service WITHOUT Ambulance Service

Injuries or illnesses requiring hospital service without ambulance services include minor lacerations, minor sprains, etc. The following procedures will be taken immediately.

1. The SHSO will ensure prompt transportation of the injured person to a physician or hospital.

2. A representative of Stantec will drive the injured employee to the medical facility and remain at the facility until the employee is ready to return. A second first aid trained person shall accompany the individual to allow for continuation of care on the ride to the medical facility.
3. If the driver of the vehicle is not familiar with directions to the hospital, an additional person shall accompany the driver and the injured employee and navigate the route to the hospital.
4. If it is necessary for the SHSO to accompany the injured employee, provisions will be made to have another qualified employee, properly trained and certified in First Aid, to act as the temporary SHSO.
5. If the injured employee is able to return to the job site the same day, he/she will bring with him/her a statement from the doctor containing such information as:
   - Date
   - Employee's name
   - Diagnosis
   - Date he/she is able to return to work, regular or light duty
   - Date he/she is to return to doctor for follow-up appointment, if necessary
   - Signature and address of doctor
6. As promptly as possible following an injury or illness, ensure appropriate notification has been made to the family of the individual involved by contacting the Project Manager who will inform the HR Lead.
7. Please see **Section 3.4** for incident reporting procedures.

If the injured employee is unable to return to the job site the same day, the employee who transported him will bring this information back to the job site and report it to the Project Manager, office OSEC, HSSE Manager, Stantec's Practice and Risk Management (PRM - via email to hsse@stantec.com), and their regional Human Resources Specialist.

17.3.2 Injuries or Illnesses Requiring Hospital Service WITH Ambulance Service

Injuries or illnesses requiring hospital service with ambulance services include severe head injuries, amputations, heart attacks, heat stroke, etc. The following procedures will be taken immediately:

1. Call for ambulance service and notify the SHSO.
2. If the incident takes place during an over-water operation, have the vessel proceed to the either the primary or secondary emergency muster location identified during the daily tail gate meeting, whichever is practical and/or faster.
3. Administer First Aid until ambulance service arrives.
4. While the injured employee is being transported, the SHSO will contact the medical facility to be utilized.
5. One designated representative will accompany the injured employee to the medical facility and remain at the facility until final diagnosis and other relevant information is obtained.
6. As promptly as possible following an injury or illness, ensure appropriate notification has been made to the family of the individual involved by contacting the Project Manager who will inform the regional Human Resources Specialist.
7. Please see **Section 3.4** for incident reporting procedures.

17.3.3 Death of an Individual or In-Patient Hospitalization of Employees

Title 29 CFR 1904.39 requires notification to OSHA for incidents that involve a fatality, hospitalization of an employee, amputation, or loss of eye. The emergency response procedures above will be followed. If the injured person dies or is admitted to the hospital for treatment (not observation), follow the incident reporting procedures. The HSSE Manager will notify the Human Resources Department, and institute Stantec's Crisis Communications Plan. A designated company representative will notify the local OSHA office within 8 hours of the incident in the event of a fatality or the hospitalization of. one or more employees. Notification of OSHA for admitted to the hospital must occur within 24 hours. Other injuries involving amputations or loss of eyesight must also be reported to OSHA in 24 hours.

17.4 EMERGENCY RESPONSE PROCEDURES: SPILLS OR CUT LINES

If any event occurs during the performance of the work activities that causes or threatens to cause a release of waste material on, at, or from the Site and that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, the following actions will be conducted:

- All appropriate actions will be taken to immediately prevent, abate, or minimize such a release or threat of a release (see plan below);
- The Project Coordinator will immediately orally notify NYSDEC using the NYS Spill Hotline (NYS Spill Hotline: 1-800-457-7362); and,
- The contacts for this project will be the local fire department and/or 911.

Stantec employees or subcontractors are not expected to take action or participate in rescues or response to chemical releases beyond the initial discovery and the immediate mitigation actions described herein. In the event of a spill/release, follow this plan:

1. Stop Work, stabilize the situation, and secure the site;
2. Call Fire Department immediately if the spill cannot be contained or in case of fire or another emergency;
3. Stay upwind of the spill/release;
4. Wear appropriate PPE;
5. Turn off equipment and other sources of ignition. Do not turn off electrical equipment or lights as a small arc may occur and ignite a flammable atmosphere (if applicable);
6. Turn off pumps and shut valves to stop the flow/leak;
7. Plug the leak or collect drippings, when possible;
8. Use sorbent pads to collect product and impede its flow, if possible;
9. Notify the SHSO to begin the incident reporting procedures. All spills/releases will be reported to the Client Project Manager within 24 hours;
10. Determine if the client wants Stantec to repair the damage or if the client will use an emergency repair contractor;
11. Based on agreements, contact emergency spill contractor for containment of free product. The contacts for this project will be the local fire department and/or 911; and,
12. Advise the client of spill discharge notification requirements and determine who will complete and submit forms. Document each interaction with the client and regulators and note, in writing; name, title, authorizations, refusals, decisions, and commitments to action.

Specific actions for a spill or cut line during a diving operation will be described in supplemental dive plans prepared by the diving subcontractor and submitted under separate cover.

If investigative derived waste (e.g. sediment or soil) is spilled from a drum, it will be collected with shovels and returned to the drum. Decontamination procedures will take place as described in **Section 11.5**. Any decontamination fluids will be decanted into the waste drum. Waste will be disposed of in accordance with federal, state, and local regulations. Do not transport or approve transportation of contaminated soils or product until proper manifests have been completed and approved. Be aware that soils / product may meet criteria for hazardous waste. Do not sign manifests as generator of wastes unless you have been given appropriate training and approval for signing on behalf of the generator; contact the Project Manager to discuss waste transportation.

17.5 FIRST AID/EMERGENCY TRAINING AND EQUIPMENT

First Aid training is required when working at sites where there is no infirmary, clinic, or hospital in near proximity to the workplace (3-4 minutes) and there is no client or contractor personnel onsite who is trained in first aid. When required, a minimum of two employees per shift shall have First Aid and CPR training consistent with the requirements of the American Red Cross or American Heart Association. This training shall also be provided for an adequate number of people to provide support during an emergency situation and to comply with OSHA regulations.

The first aid kits will contain SHSO-approved supplies in a weatherproof container with individual sealed packages for each type of item. It should also include rubber gloves to prevent the transfer of infectious diseases. Provisions should also be made to provide for quick drenching or flushing of the eyes should any person be working around corrosive materials. Eye flushing must be done with water containing no additives. The contents of the kit shall be checked before being sent out on each job and at least weekly to ensure the expended items are replaced. Eyewash bottles should be checked before being sent out on each job and routinely to ensure that they do not expire.

17.6 LEVELS OF TRAINING

- **First-Aid and CPR** training will be from either the American Red Cross or the American Heart Association and will include a hands-on component. At least two individuals on every shift will have this training, which may include the SHSO;
- **Fire Protection** training will be limited to training employed alarm/warning systems, the proper use and limitations of handheld fire extinguishers, and notification of local emergency services. Every on-site employee will receive this training as part of orientation; and,
- **Spill Containment** training will be provided to all personnel working with or near hazardous materials or waste which might suffer a spill. Training shall include spill response procedures (notification, personal protection, spill containment, clean-up, and reporting) and clearly convey the limits of spill response by on-site personnel. Only those trained in spill response/containment procedures are authorized to take such actions.

17.7 LIST OF ON-SITE EQUIPMENT AND SUPPLIES

An itemized list and the location of on-site emergency response and first aid equipment is below.

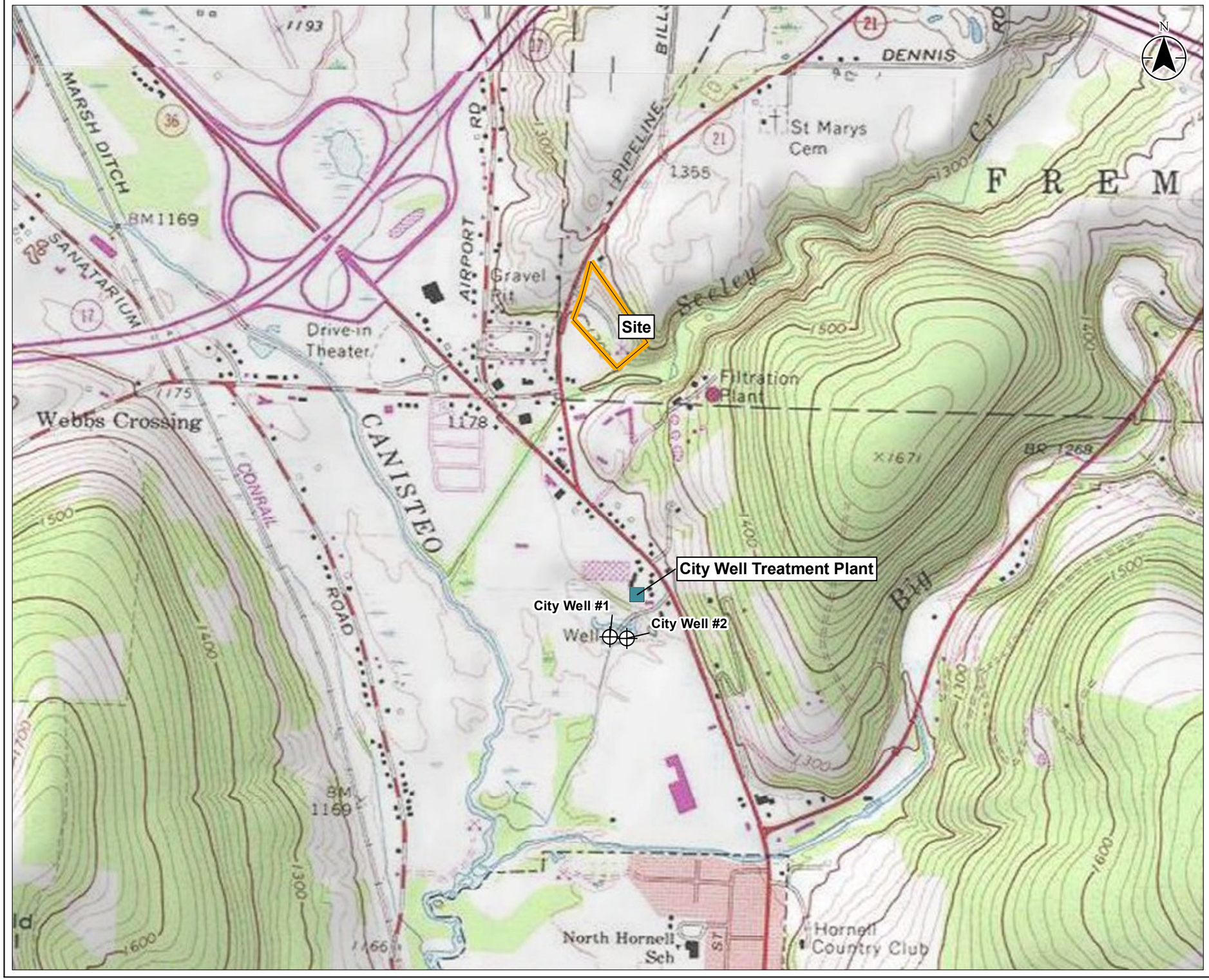
Equipment	Location
First Aid Kit	In Stantec Field Vehicle
Emergency Eye Wash	Two, 1-Liter Bottles with First Aid Kit
Fire Extinguisher	In Stantec Field Vehicle
Appropriately sized spill kits, as needed	• In Stantec Field Vehicle • On Vessel • In Sample Processing Facility • Other Locations as determined by the SHSO

17.8 PRE-EMERGENCY PLANNING

Emergency response procedures must address possible or anticipated situations and the appropriate actions to be taken. The Project Manager will ensure that the emergency response section of this health and safety plan is modified as needed to reflect project changes. During site-specific orientation and at the daily tailgate safety meetings, all employees will be trained in and reminded of the provisions of the emergency response plan, the communication systems, posted names and phone numbers, and evacuation routes. This plan will be reviewed and revised, if necessary, on a regular basis. This will ensure that the emergency plan is adequate and consistent with prevailing Site conditions. Periodic emergency drills may be conducted using the discretion of the SHSO.

A windsock, flag, or other device may be utilized to show the wind direction to Site workers.

FIGURES



Stantec

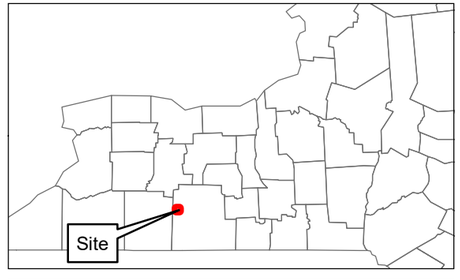
Legend

- City of Hornell Water Supply Wells
- City Well Treatment Plant (approximate location)
- Miller Hill Yard BCP Site (Magde Survey, 2017)

Notes:
1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: ArcGIS Basemap USA Topo Maps.

0 1,000 2,000 Feet

(At original document size of 11x17)
1:12,000



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

Figure No.
1

DRAFT

Title
Site Location Map

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Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of information provided by others.

TABLES

Table 1
Occupational Health Exposure and Toxicological Properties for Chemicals of Concern
Remedial Action Work Plan
Health and Safety Plan
Miller Hill Yard
7578 State Route 21, Fremont, NY

Compound	OSHA PEL	NIOSH REL	ACGIH TLV	ACGIH/OSHA STEL	OSHA/NIOSH IDLH	IP (eV)	Vapor Pressure (mmHg)	Physical Description	Odor Threshold in Air	Route of Exposure	Symptoms	Target Organs
VOCs												
Benzene	1 ppm	0.1 ppm	0.5 ppm	5.0 ppm	500 ppm	9.24	75	Colorless to light yellow liquid with a characteristic sweet aromatic odor	1.5 ppm	Inhalation, Skin Absorption, Ingestion, Skin/Eye Contact	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression	Carcinogen; Eyes, Skin, Respiratory System, Blood, Central Nervous System, Bone Marrow
Dichloroethane, 1,2-(1,2-DCA)	50 ppm TWA 100 ppm C	1 ppm	10 ppm	NE	50 ppm	11.05	64	Colorless liquid with a pleasant, chloroform-like odor. [Note: Decomposes slowly, becomes acidic & darkens in color.]	6 ppm	Inhalation, ingestion, skin absorption, skin and/or eye contact	Irritation eyes, corneal opacity; central nervous system depression; nausea, vomiting; dermatitis; liver, kidney, cardiovascular system damage; [potential occupational carcinogen]	Eyes, skin, kidneys, liver, central nervous system, cardiovascular system
cis-1,2- dichloroethene (cis-1,2-DCE)	200 ppm	200 ppm	200 ppm	NE	1000 ppm	9.65	180-265	Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor	17 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; central nervous system depression	Eyes, respiratory system, central nervous system
Ethylbenzene	100 ppm	100 ppm	20 ppm	125 ppm	800	8.76	7	Colorless liquid with an aromatic odor.	2.3 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma	Eyes, skin, respiratory system, central nervous system
Isopropylbenzene	50 ppm	50 ppm	50 ppm	NE	900 ppm	8.75	8	Colorless liquid with a sharp, penetrating, aromatic odor.	0.088 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma	Eyes, skin, respiratory system, central nervous system
Methyl Ethyl Ketone (2-butanone or MEK)	200 ppm	200 ppm	200 ppm	NE	3000 ppm	9.54	78	Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor	5.4 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis	Eyes, skin, respiratory system, central nervous system
Propylbenzene, n-	NE	NE	NE	NE	NE	8.73	7.52	Colorless liquid.	NE	Inhalation, Ingestion, Skin/Eye Contact	Irritate or burn skin and eyes; respiratory tract irritation, suffocation, aspiration hazard if swallowed	Lungs, Eyes, Kidney
Toluene	200 ppm TWA 300 ppm C	100 ppm TWA 150 ppm STEL	20 ppm	150 ppm (NIOSH) 300 ppm (C-OSHA) (NIOSH)	500 ppm	8.82	21	Colorless liquid with a sweet, pungent, benzene-like odor	2.9 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys
Trichloroethene (TCE)	100 ppm 200 ppm C	25 ppm	10 ppm 25 ppm STEL	200 ppm	1000 ppm	9.45	58	Colorless liquid with a chloroform-like odor	28 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system
Trimethylbenzene, 1,2,4-(1,2,4-TMB)	NE	25 ppm	25 ppm	NE	NE	8.27	1	Clear, colorless liquid with a distinctive, aromatic odor	0.4 ppm (2.4 ppm)	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system, blood
Trimethylbenzene, 1,3,5-(1,3,5-TMB)	NE	25 ppm	25 ppm	NE	NE	8.39	2	Clear, colorless liquid with a distinctive, aromatic odor	2.2 ppm	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system, blood

Table 1
Occupational Health Exposure and Toxicological Properties for Chemicals of Concern
Remedial Action Work Plan
Health and Safety Plan
Miller Hill Yard
7578 State Route 21, Fremont, NY

Compound	OSHA PEL	NIOSH REL	ACGIH TLV	ACGIH/OSHA STEL	OSHA/NIOSH IDLH	IP (eV)	Vapor Pressure (mmHg)	Physical Description	Odor Threshold in Air	Route of Exposure	Symptoms	Target Organs
Xylenes	100 ppm	100 ppm	100 ppm	150 ppm	900 ppm	8.45-8.56	4.8 – 7.1	Colorless flammable liquid, sweet aromatic odor.	1 ppm	Inhalation, Skin Absorption, Ingestion, Skin/Eye Contact	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	Eyes, Skin, Respiratory System, Central Nervous System, Gastrointestinal Tract, Blood, Liver, kidneys
SVOCs												
Acenaphthylene	NE	NE	NE	NE	NE	8.15	0.0068	Yellow solid powder	NE	Inhalation, Skin Absorption, Ingestion, Skin/Eye Contact	NE	NE
Anthracene	0.2 mg/m^3	0.1 mg/m^3	0.2 mg/m^3	NE	80 mg/m^3	7.43	1	White to yellow solid with a weak aromatic odor	0.2 mg/m3	Inhalation, Skin Absorption, Ingestion, Skin/Eye Contact	Eye and skin irritant, carcinogen. Toxic to kidneys, lungs, mucous membranes.	Eyes, skin, kidneys, lungs, mucous membranes
Benzo (a) anthracene	0.2 mg/m^3	0.1 mg/m^3	0.2 mg/m^3	NE	80 mg/m^3	6.98	1.90E-06	Colorless crystals with violet fluorescence when pure; yellow with green fluorescence when impure; faint aromatic odor	0.2 mg/m3	Inhalation, Ingestion, Skin/Eye Contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory System, Skin, Bladder, Kidneys
Benzo (a) pyrene	0.2 mg/m^3	0.1 mg/m^3	0.2 mg/m^3	NE	80 mg/m^3	7.12	5.5E-09	Yellow to brown powder with faint aromatic odor	0.2 mg/m3	Inhalation, Ingestion, Skin/Eye Contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory System, Skin, Bladder, Kidneys
Benzo (b) fluoranthene	0.2 mg/m^3	0.1 mg/m^3	0.2 mg/m^3	NE	NE	7.50	5.00E-07	Solid; colorless crystals	0.2 mg/m3	Inhalation, Ingestion, Skin/Eye Contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory System, Skin, Bladder, Kidneys
Benzo(ghi)perylene	0.2 mg/m^3	0.1 mg/m^3	NE	NE	NE	7.20	1E-10	Yellow, odorless solid.	0.2 mg/m3	Inhalation, Ingestion, Skin/Eye Contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory System, Skin, Bladder, Kidneys
Benzo (k) fluoranthene	0.2 mg/m^3	0.1 mg/m^3	NE	NE	NE	7.15	9.59E-11	Crystalline.	0.2 mg/m3	Inhalation, Ingestion, Skin/Eye Contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory System, Skin, Bladder, Kidneys
Bis (2-Ethylhexyl) phthalate	5 mg/m^3	5 mg/m^3	5 mg/m^3	10 mg/m^3	5000 mg/m^3	NE	1.42E-07	Colorless to light yellow oily liquid with a slight odor	NE	Inhalation, Ingestion, Skin/Eye Contact	Irritation eyes, mucous membrane; liver damage; teratogenic effects; [potential occupational carcinogen]	Eyes, respiratory system, central nervous system, liver, reproductive system, gastrointestinal tract
2-Butoxyethanol	50 ppm (240 mg/m^3)	5 ppm (24 mg/m^3)	20 ppm (97 mg/m^3)	NE	700 ppm	10.00	0.8	Colorless Liquid with ether/pleasant odor	0.35 ppm	Inhalation, Ingestion, Skin/Eye Contact	Eye irritation, ski irritation, may affect behavior (analgesia), nausea, vomiting, respiratory problems (dyspnea), [potential occupational carcinogen]	Eyes, respiratory system, circulatory system, reproductive system, nervous system
Chrysene	0.2 mg/m^3	0.1 mg/m^3	0.2 mg/m^3	NE	80 mg/m^3	7.60	6.23E-09	Light beige solid	0.2 mg/m3	Inhalation, Ingestion, Skin/Eye Contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory System, Skin, Bladder, Kidneys
Dibenzo (a,h) anthracene	0.2 mg/m^3	0.1 mg/m^3	NE	NE	80 mg/m^3	7.38	1E-10	White to yellow crystalline solid	0.2 mg/m3	Inhalation, Ingestion, Skin/Eye Contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory System, Skin, Bladder, Kidneys
Fluoranthene	0.2 mg/m^3	0.1 mg/m^3	0.2 mg/m^3	NE	NE	7.7	0.01	Solid; colorless crystals	0.2 mg/m3	Inhalation, Ingestion, Skin/Eye Contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory System, Skin, Bladder, Kidneys
Indeno (1,2,3-cd) pyrene	0.2 mg/m^3	NE	NE	NE	NE	7.2	1.25E-10	Solid; yellow crystals	0.2 mg/m3	Inhalation, Ingestion, Skin/Eye Contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory System, Skin, Bladder, Kidneys
Naphthalene	10 ppm (50 mg/m^3)	10 ppm (50 mg/m^3) TWA 15 ppm (75 mg/m^3) STEL	10 ppm (52 mg/m^3)	15 ppm	NE	8.13	0.087	Colorless to brown solid with an odor of mothballs	0.015 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage	Eyes, skin, blood, liver, kidneys, central nervous system

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Occupational Health Exposure and Toxicological Properties for Chemicals of Concern
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Health and Safety Plan
Miller Hill Yard
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Compound	OSHA PEL	NIOSH REL	ACGIH TLV	ACGIH/OSHA STEL	OSHA/NIOSH IDLH	IP (eV)	Vapor Pressure (mmHg)	Physical Description	Odor Threshold in Air	Route of Exposure	Symptoms	Target Organs
Phenanthrene	0.2 mg/m^3	0.1 mg/m^3	0.2 mg/m^3	NE	80 mg/m^3	7.8	9.00E-05	Solid	0.2 mg/m3	Inhalation, skin absorption, ingestion, skin and/or eye contact	Causes photosensitivity, may cause respiratory irritation	Respiratory system, eyes.
Pyrene	0.2 mg/m^3	0.1 mg/m^3	0.2 mg/m^3	NE	NE	7.41	4.50E-06	Colorless or yellow crystalline or powdered solid	0.2 mg/m3	Inhalation, Ingestion, Skin/Eye Contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory System, Skin, Bladder, Kidneys
Metals												
Arsenic	0.1 mg/m^3	0.2 mg/m^3	0.1 mg/m^3	NE	5 mg/m^3	NA	0.0	Silver-gray or tin-white, brittle odorless, lustrous solid.	NE	Inhalation, Skin Absorption, Ingestion, Skin/Eye Contact	Dermatitis; ulceration of nasal septum; gastrointestinal and/or respiratory irritation; peripheral neuropathy	Carcinogen, CNS, kidneys, lungs, liver, skin, mucous membranes
Barium	0.5 mg/m^3	0.5 mg/m^3	0.5 mg/m^3	NE	50 mg/m^3	5.21	5.00E-06	Soft, silvery, odorless, lustrous metal.	NE	Inhalation, Ingestion, Skin/Eye Contact	Eye/skin irritation, inflammation, or rash; burns; nausea, vomiting, headache; fever; irregular breathing	CNS, kidneys
Cadmium	0.005 mg/m^3	NE	0.01 mg/m^3	NE	9 mg/m^3	NA	0.0	Lustrous solid	NE	Inhalation, Ingestion, Skin/Eye Contact	Irritation skin, eye, ingestion	Eyes, skin, kidneys, lungs, liver
Chromium	1.0 mg/m^3	0.5 mg/m^3	0.1 mg/m^3	NE	250 mg/m^3	NA	0.0	Blue-white to steel-gray, lustrous, brittle, hard, odorless solid.	NE	Inhalation, Ingestion, Skin/Eye Contact	Irritation eyes, skin; lung fibrosis (histologic)	Eyes, skin, respiratory system
Lead	0.05 mg/m^3 0.03 mg/m^3 AL	0.05 mg/m^3	0.05 mg/m^3	NE	100 mg/m^3	NA	0.0	A heavy, ductile, soft, gray solid	NE	inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension	Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue
Mercury	0.01 mg/m^3 0.04 mg/m^3 C	0.01 mg/m^3	0.01 mg/m^3	NE	10 mg/m^3	NE	0.0012	Silver-white odorless heavy liquid.	NE	Inhalation, Skin Absorption, Ingestion, Skin/Eye Contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria	Eyes, skin, respiratory system, central nervous system, kidneys
Selenium	0.2 mg/m^3	0.2 mg/m^3	0.2 mg/m^3	NE	1 mg/m^3	NE	0.0	Solid lustrous	NE	Inhalation, dermal, ingestion, eyes	Eye irritant. Respiratory system irritant. Slightly skin irritant	Repeated exposure it not known to aggravate medical condition.
Silver	0.1 mg/m^3	0.1 mg/m^3	0.1 mg/m^3	NE	10 mg/m^3	NA	0.0	Solid lustrous	NE	Inhalation, dermal, ingestion, eyes	Eye irritant. Respiratory system irritant	General accumulation in many organs
Polychlorinated Biphenyls (PCBs)	NE	0.001 mg/m^3	NE	NE	5 mg/m^3	NE	6.00E-05	Range in color from clear to pale yellow with a mild petroleum odor	NE	Inhalation, dermal, ingestion, eyes	Irritation to eyes, skin; headaches	Skin irritation, liver injury

Table 1
Occupational Health Exposure and Toxicological Properties for Chemicals of Concern
Remedial Action Work Plan
Health and Safety Plan
Miller Hill Yard
7578 State Route 21, Fremont, NY

Abbreviations:

ACGIH	American Conference of Governmental Industrial Hygienists
C	Ceiling limits are not to be exceeded during any part of the workday
eV	electron Volt
IDLH	Immediately Dangerous to Life or Health
IP	Ionization Potential
mg/m3	milligrams per cubic meter
mm Hg	millimeters of mercury
NE	Not established
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
ppm	parts per million
REL	Recommended Exposure Limit
STEL	Short-Term Exposure Limit (15-min TWA)
TLV	Threshold Limit Value
TWA	Time-weighted average

Appendix A STANTEC RMS FORMS



Appendix A Table of Contents – RMS Forms

HSSE/SWP No.	Title
RMS2	Field Level Risk Assessment
RMS2	Field Level Risk Assessment – 7 Day
RMS3	HSSE Event Report
RMS5	Worksite Inspection: Field
RMS7	Quantified Hazard Assessment
RMS9	Medical Surveillance Assessment Form
RMS10	Planned Job Observation
RMS11	Management of Change (MOU) Form

Field Level Risk Assessment (RMS2)

Project Number: **Date:**

Project Name:

Project Location:

Description of Work:

HASP/RMS1 reviewed with staff on site	Yes	☐
Review of STOP Work Authority with staff and subs	Yes	☐
Emergency plan adequate and communicated	Yes	☐
Tools and appropriate PPE inspected before use	Yes	☐
Last Minute Risk Assessment process reviewed	Yes	☐

If the answer to any of the above questions is not "YES" stop work and contact your supervisor

Field crews have certifications on site	Yes	☐	N/A	☐
Utility locates on site and understood	Yes	☐	N/A	☐
Working alone plan in place	Yes	☐	N/A	☐
Work permits completed	Yes	☐	N/A	☐
Client site safety meeting conducted/attended	Yes	☐	N/A	☐

CRITICAL RISKS

Driving	Working at Heights	Traffic Control	Wildlife, Insects and Vegetation	Mobile and Heavy Equipment	Environments with water or ice
☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes
Ground Disturbance	Ergonomic Hazards and Manual Handling	Hazardous Materials and Environments	Control of Hazardous Energy	Hot Work	Confined Spaces
☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes

ENERGY HAZARD

Thermal: Open flame, electric ignition sources (including phones and friction), hot or cold surfaces, liquids or gasses, weather conditions including humidity levels and snow/ice	**Gravity**: Falling objects, collapsing objects, slipping, tripping or falling
Chemical: Flammable vapors, reactive hazards, carcinogens or other toxic compounds, corrosives, pyrophorics, combustibles, oxygen deficient atmospheres, fumes, dusts, naturally occurring gases	**Motion**: Vehicles (car, truck, ATV, ARGO, boat, snowmobile, bicycles, transit, mobile equipment, trailer), workers and other people (lifting, pushing, pulling, carrying, use of hand and power tools, body position, walking), flowing water, sprung branches
Biological: Animals, bacteria, viruses, insects, blood borne pathogens (needles), poisonous and noxious plants, contaminated water, human behaviors (protesters, concerned citizens, onlookers)	**Mechanical**: Rotating equipment (augers, pulleys, drive shafts), compressed springs, drive belts, conveyors and motors
Radiation: Welding, NORMs (Naturally Occurring Radioactive Material), X rays, Nuclear Densometers, Lasers, Microwaves, Solar, Radioactive waste and sources	**Electrical**: Power and communication lines (overhead and buried), static charge, lightning, energized equipment, wiring, batteries, GFCI cords/plugs, lighting levels, double insulated tools, wet environment
Noise: Stationary or mobile equipment, impact noise, high pressure release, impact of noise on communication	**Pressure**: pressure piping, compressed cylinders (fire extinguisher, calibration gas, propane), control lines, vessels, tanks, hoses, pneumatic and hydraulic equipment

JOB SAFETY ANALYSIS (JSA)

	Basic Job Steps	Describe Energy Hazard	Controls	Person Responsible
1				
2				
3				
4				
5				
6				
7				
8				

Stantec

Field Level Risk Assessment (RMS2)

Toolbox Meeting		
Pre-Start Time:	Date:	
Weather:	Toolbox Discussion Leader Name:	Toolbox Leader Signature:
Notes:		
Mid-Day Time:		
Weather:	Toolbox Discussion Leader Name:	Toolbox Leader Signature:
Notes:		
End of Day Time:		
Weather:	Toolbox Discussion Leader Name:	Toolbox Leader Signature:
Notes:		

Review / Sign-off

Print the company that you work for, your name and initial beside your fitness level under the corresponding time column:
Fit for Duty = F Alternate Plan = AP

Company Name	Print your Name	Pre-Start	Mid-Day	End of Day
		F:	F:	F:
		AP:	AP:	AP:
		F:	F:	F:
		AP:	AP:	AP:
		F:	F:	F:
		AP:	AP:	AP:
		F:	F:	F:
		AP:	AP:	AP:
		F:	F:	F:
		AP:	AP:	AP:
		F:	F:	F:
		AP:	AP:	AP:
		F:	F:	F:
		AP:	AP:	AP:
		F:	F:	F:
		AP:	AP:	AP:
		F:	F:	F:
		AP:	AP:	AP:
		F:	F:	F:
		AP:	AP:	AP:

In North America, for work-related symptoms or injuries, and to speak to a medical professional for guidance and treatment options contact:

Work Care
1-888-449-7787

For questions regarding work-related symptoms or injuries, contact your Workers' Compensation Claims Coordinator
(Canada) Tel: 905-944-6854 / Cell: 416-951-5663
(US) Tel: 317-210-8980
(Global) local HR business partner



Field Level Risk Assessment (RMS2)
Seven (7) Day

This form is intended for projects of up to 7 consecutive days on one site. If work will last longer than the days provided on this form, please start a new RMS2 to refresh hazard awareness.

Project Number: Project Number **Date:**

Project Name: Project Name

Project Location: Project Location

Description of Work: Description

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
HASP/RMS1 reviewed with staff on site	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐
Review of STOP Work Authority with staff & subs	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐
Emergency plan adequate and communicated	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐
Tools and appropriate PPE inspected before use	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐
Last Minute Risk Assessment process reviewed	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐	Yes ☐

If the answer to any of the questions above is not "Yes" Stop work and contact your supervisor.

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Field crews have certifications on site	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐
Utility locates on site and understood	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐
Working alone plan in place	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐
Work permits completed	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐
Client site safety meeting conducted/attended	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐
Are there additional critical risks, JSA tasks or energy hazards? If yes, update the JSA and communicate to the team		Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐	Yes ☐ N/A ☐

In North America, for work-related symptoms or injuries, and to speak to a medical professional for guidance and treatment options contact:

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1-888-449-7787

For questions regarding work-related symptoms or injuries, contact your Workers' Compensation Claims Coordinator
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(US) Tel: 317-210-8980
(Global) local HR business partner



JOB SAFETY ANALYSIS (JSA)				
	Basic Job Steps	Describe Energy Hazard	Controls	Person Responsible
1				
2				
3				
4				
5				
6				
7				
8				

Field Level Risk Assessment (RMS2)
Seven (7) Day

CRITICAL RISKS						
 Driving ☐ Yes	 Working at Heights ☐ Yes	 Traffic Control ☐ Yes	 Wildlife, Insects and Vegetation ☐ Yes	 Mobile and Heavy Equipment ☐ Yes	 Environments with water or ice ☐ Yes
 Ground Disturbance ☐ Yes	 Ergonomic Hazards and Manual Handling ☐ Yes	 Hazardous Materials and Environments ☐ Yes	 Control of Hazardous Energy ☐ Yes	 Hot Work ☐ Yes	 Confined Spaces ☐ Yes

ENERGY HAZARD			
	**Thermal:** Open flame, electric ignition sources (including phones and friction), hot or cold surfaces, liquids or gasses, weather conditions including humidity levels and snow/ice		**Gravity**: Falling objects, collapsing objects, slipping, tripping or falling
	**Chemical:** Flammable vapors, reactive hazards, carcinogens or other toxic compounds, corrosives, pyrophorics, combustibles, oxygen deficient atmospheres, fumes, dusts, naturally occurring gases		**Motion**: Vehicles (car, truck, ATV, ARGO, boat, snowmobile, bicycles, transit, mobile equipment, trailer), workers and other people (lifting, pushing, pulling, carrying, use of hand and power tools, body position, walking), flowing water, sprung branches
	**Biological**: Animals, bacteria, viruses, insects, blood borne pathogens (needles), poisonous and noxious plants, contaminated water, human behaviors (protesters, concerned citizens, onlookers)		**Mechanical**: Rotating equipment (augers, pulleys, drive shafts), compressed springs, drive belts, conveyors and motors
	**Radiation**: Welding, NORMs (Naturally Occurring Radioactive Material), X rays, Nuclear Densometers, Lasers, Microwaves, Solar, Radioactive waste and sources		**Electrical**: Power and communication lines (overhead and buried), static charge, lightning, energized equipment, wiring, batteries, GFCI cords/plugs, lighting levels, double insulated tools, wet environment
	**Noise**: Stationary or mobile equipment, impact noise, high pressure release, impact of noise on communication		**Pressure**: pressure piping, compressed cylinders (fire extinguisher, calibration gas, propane), control lines, vessels, tanks, hoses, pneumatic and hydraulic equipment

Meeting details	
Day 1	
Date:	Weather:
Pre-start time: ☐ am ☐ pm	
Notes:	
Mid-day time:	
Notes:	
End of day time:	
Notes:	
Toolbox Discussion Leader Name:	Toolbox Leader Signature:

Meeting details	
Day 2	
Date:	Weather:
Pre-start time: ☐ am ☐ pm	
Notes:	
Mid-day time:	
Notes:	
End of day time:	
Notes:	
Toolbox Discussion Leader Name:	Toolbox Leader Signature:
Day 3	
Date:	Weather:
Pre-start time: ☐ am ☐ pm	
Notes:	
Mid-day time:	
Notes:	
End of day time:	
Notes:	
Toolbox Discussion Leader Name:	Toolbox Leader Signature:
Day 4	
Date:	Weather:
Pre-start time: ☐ am ☐ pm	
Notes:	
Mid-day time:	
Notes:	
End of day time:	
Notes:	
Toolbox Discussion Leader Name:	Toolbox Leader Signature:

Field Level Risk Assessment (RMS2)
Seven (7) Day

Meeting details	
Day 5	
Date:	Weather:
Pre-start time: ☐ am ☐ pm	
Notes:	
Mid-day time:	
Notes:	
End of day time:	
Notes:	
Toolbox Discussion Leader Name:	Toolbox Leader Signature:
Day 6	
Date:	Weather:
Pre-start time: ☐ am ☐ pm	
Notes:	
Mid-day time:	
Notes:	
End of day time:	
Notes:	
Toolbox Discussion Leader Name:	Toolbox Leader Signature:
Day 7	
Date:	Weather:
Pre-start time: ☐ am ☐ pm	
Notes:	
Mid-day time:	
Notes:	
End of day time:	
Notes:	
Toolbox Discussion Leader Name:	Toolbox Leader Signature:

Review/Sign-off

Print the company that you work for, your name and indicate which fitness level you are under the corresponding time column:
Fit for Duty = F Alternate Plan = AP

		Date:			**Date:**			**Date:**			**Date:**		
Company name	**Print your name**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**
		F: AP:	F: AP:	F: AP:	F: AP:	F: AP:	F: AP:	F: AP:	F: AP:	F: AP:	F: AP:	F: AP:	F: AP:
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Review / Sign-off

Print the company that you work for, your name and indicate which fitness level you are under the corresponding time column:
Fit for Duty = F Alternate Plan = AP

		Date:			**Date:**			**Date:**		
Company name	**Print your name**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**	**Time:**
		F:	F:	F:	F:	F:	F:	F:	F:	F:
		AP:	AP:	AP:	AP:	AP:	AP:	AP:	AP:	AP:
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HSSE Incident Report (RMS3)

For Internal Use Only

To be submitted in Pro-Sapien

Incidents involving injury, potential injury, or report of pain, soreness, or discomfort must be reported immediately (within one hour) to a supervisor. Supervisors will then immediately contact their HSSE manager/advisor to discuss incident severity and determine further notification. This form must be completed and **entered into Pro-Sapien within 24 hours** of any incident.

This document contains privileged and confidential information prepared at the request of Stantec's Legal Counsel. The contents of this report are restricted to HSSE, HR personnel, Risk Management Representatives, Project Manager and BC Leader, and Stantec's Insurer, Adjuster and Legal Counsel. Information collected will be used solely for the purpose of meeting the requirements of Stantec's HSSE and insurance programs, complying with applicable legislation, and will be used in accordance with any governing privacy legislation. The information collected will be maintained electronically and may be included in **required** reports.

***Fields marked with a red asterisk are required.**

Incident Title (Email Subject Line)*			
General Information			
Region*		**Business Line***	
Office*		**Business Center (BC)***	
Location Details			
Date of Incident*		**Time of Incident (24-hour format)***	
Date Reported*		**Time Reported***	
Project Number		**Project Name** (required when project # is populated)	
Project Manager (required when project # is populated)			
Person in Charge of Incident – Stantec*		**Person in Charge Contact Information***	
Client			
Client Notification Required	☐ Yes ☐ No	**Account Manager**	
Involved Stantec Employee Information **(if more than one, identify extra employees in Brief Description of Incident details in the Incident Details section)**			
Stantec Employee*			
Type of Employment*	☐ Seasonal ☐ Contract ☐ Full Time ☐ Visitor ☐ Volunteer		
Job Title*		**Contact Number***	
Time Began Work*		**Job Experience in Years***	
Your Supervisor or Line Manager*		**Supervisor Contact Information***	

Incident Details **See The Lens for list of Incident Type Definitions**

For Incident Types/Subtypes identified with a "+", please complete additional information below.

Incident Type*	**Incident Subtype***
☐ Injury / Illness+	☐ First Aid ☐ Medical Treatment ☐ Restricted Work ☐ Lost Time ☐ Fatality
☐ Near Miss	☐ Injury/Illness ☐ Environmental ☐ Security ☐ Damage
☐ Security	☐ Suspicious Activity ☐ Theft+ ☐ Vandalism+ ☐ Workplace Violence / Harassment
☐ Damage	☐ Motor Vehicle Incident+ ☐ Property Damage – Vehicle+ ☐ Property Damage – Other+ ☐ Fire/Explosion/Flood ☐ Utility Strike
☐ Environmental+	☐ Spill or Release
☐ Report Only	☐ Ergonomics Signs & Symptoms ☐ Stantec ☐ Third Party
☐ Non-compliance+	☐ Regulatory ☐ Program ☐ Client-related ☐ Requirements

Injury/Illness Additional Information

Received Outside Treatment*	☐ Yes ☐ No	Admitted to Hospital for Treatment*	☐ Yes ☐ No
Body Part(s) Affected*	☐ Abdomen ☐ Ankle ☐ Arm ☐ Back ☐ Buttocks ☐ Chest ☐ Ear ☐ Elbow	☐ Eye ☐ Face ☐ Finger ☐ Foot ☐ Groin ☐ Hand ☐ Head ☐ Hip	☐ Knee ☐ Leg ☐ Mouth ☐ Neck ☐ Nose ☐ Pelvis ☐ Respiratory Tract ☐ Shoulder
			☐ Skin ☐ Tailbone ☐ Toe ☐ Tooth ☐ Wrist ☐ Whole Body ☐ N/A

Theft/Vandalism Additional Information			
Stantec Property Damaged / Breached / Stolen?*	☐ Yes ☐ No		
What was Damaged / Breached / Stolen?*			
Client Property Damaged / Breached / Stolen?*	☐ Yes ☐ No		
What from Client was Damaged / Breached / Stolen?			
Motor Vehicle Incident Additional Information			
Owner*	☐ Company ☐ Third Party ☐ Employee/Involved party		
Rental Vehicle*	☐ Yes ☐ No		
Distance Travelled on the Day of the Incident*	☐ Yes ☐ No	Distance Unit of Measure*	☐ Km ☐ Miles
Weather Condition*	☐ Clear ☐ Fog ☐ Ice ☐ Rain ☐ Sleet ☐ Snow ☐ Not Reported		
Light Condition*	☐ Darkness ☐ Dawn/Dusk ☐ Daylight ☐ Overcast ☐ Not Reported		
Driving Surface*	☐ Pavement ☐ Gravel ☐ Dirt ☐ Offroad		
Road Condition*	☐ Dry ☐ Icy Section ☐ Muddy ☐ Snow Covered ☐ Under Repair ☐ Wet ☐ Not Reported		
Primary Vehicle Action*	☐ Backing ☐ Changing lanes/merging ☐ Crossing intersection ☐ Driving Straight ☐ Parked ☐ Passing ☐ Stationary Work Position ☐ Stopped ☐ Turning		
Other Vehicle Action*	☐ Backing ☐ Changing lanes/merging ☐ Crossing intersection ☐ Driving Straight ☐ Parked ☐ Passing ☐ Stationary Work Position ☐ Stopped ☐ Turning ☐ No other vehicle involved		
Traffic Violation Charge*	☐ Yes ☐ No	Driving Light On*	☐ Yes ☐ No
Property Damage - Vehicle – Additional Information			
Owner*	☐ Company ☐ Third Party ☐ Employee/Involved party		
Rental Vehicle?*	☐ Yes ☐ No		
Property Damage – Other – Additional Information			
Property Owned By*	☐ Stantec ☐ Client ☐ Third Party		
Environmental/Non-Compliance Additional Information			
Regulatory Agency Involved?* (if answering "Yes", complete Name of Agency	☐ Yes ☐ No		
Name of Agency*			
Actual Incident Severity* (0-no injury to 4-serious)		**Severity Category*** (People, Environment, Assets, Reputation)	
Other Incident Types to Report (Select an Incident Type and Incident Subtype from the list above.)			

Description of Incident*	
Immediate Actions Taken*	
Did the Incident involve a non-Stantec Employee?*	☐ Yes ☐ No (if answering "Yes" complete Third Party Type and Third Party Details sections)
Third Party Type	☐ Subcontractor (Supervised) ☐ Subcontractor (Unsupervised) ☐ Client ☐ Public ☐ Volunteer ☐ Visitor ☐ Stantec for Client or Owner
Third Party Details	

Stantec Witnesses		Other Witnesses	
Critical Risks*	☐ Confined Spaces ☐ Control of Hazardous Energy ☐ Driving ☐ Environments with Water or Ice ☐ Ergonomic Hazards and Manual Handling ☐ Ground Disturbance ☐ Hazardous Materials and Environments ☐ Hot Work ☐ Mobile and Heavy Equipment ☐ Traffic Control ☐ Wildlife Insects, and Vegetation ☐ Working at Heights ☐ N/A	**Energy Sources***	☐ Radiation ☐ Thermal ☐ Biological ☐ Chemical ☐ Electrical ☐ Gravity ☐ Mechanical ☐ Motion ☐ Noise ☐ Pressure ☐ N/A

HSSE Contacts	Name	Phone
North America Business Lines		
Buildings	Kyle Ferguson	902-240-3847
Energy & Resources	Scott Purves	403-258-7215
Environmental Services (Canada)	Landon Tait	416-209-1125
Environmental Services (US)	Andrew Martin	805-719-9307
Infrastructure (Community Development)	Ruth O'Haire	780-231-5290
Infrastructure (Transportation)	Tina Blair	604-358-6624
Water	Jim Castaneda	503-220-5423
North America FST / Corporate / Regional G&A and Shared Services		
CA Atlantic/Ontario	Tim Hoveland	416-275-1730
CA British Columbia/Prairies & Territories	Shawna Robichaud	587-894-2635
CA Quebec	Nathalie Dimitri	514-669-8941
NA Export	Kev Metcalfe	780-231-2185
US Northeast	Fred Miller	610-235-7315
US North Central	Wes Cline	916-281-7459
US South	David Williamson	407-768-7860
US West	Tony Wong	805-234-6227
Global		
Asia Pacific	Matt Wallace	+61 7 3113 5027
Europe	Igor Schols	+31 15 751 1607
Latin America	Cristóbal Corpancho	+ 51 995 384 734
Middle East	Adrian Black	+971 56 422 3365
United Kingdom	Claire Hyde	+44 (0) 7715 237169

Stantec

Inspection - Field (RMS5)

To be submitted in Pro-Sapien

Fields marked with a red asterisk are required.

Region*		**Business Line***	
Office*		**Business Center (BC)***	
Date*		**Time***	
Lead*			
Team (with Stantec email accounts)		**Team (without Stantec email accounts)**	
Project Number*		**Project Name***	
Responsible Manager (Action Owner)*			
Responsible Parties (with Stantec Email accounts)		**Responsible Parties (without Stantec Email accounts)**	
Additional Comments			
Reviewer*		**Distribution List**	

Purpose: To identify hazards in the field where Stantec personnel are working.
Responsibility: The Project Manager will determine how often work site inspections are required. OSEC may assist.
NOTE: For pre-use vehicle inspection, record inspection on SWP-124a – Vehicle Pre-Use Checklist.

	Status					**Action (to be completed for items identified as Needs Work)***						
	Okay	**Needs Work (new issue)**	**Needs Work (repeat issue)**	**N/A**	**Potential Severity Ranking (1-4)***	**Priority (P4 – Critical P3 – High P2 – Medium P1 – Low)**	**Category (Corrective or Preventative)**	**Description**	**Assigned To**	**Assigned To (w/out Stantec email)**	**Due Date**	**Evidence Required (Comment Only or Comment and Attachment)**
HSSE Documentation												
RMS1 – hazard assessment*	☐	☐	☐	☐								
Health and Safety Plan (HASP) *	☐	☐	☐	☐								
Toolbox meeting/RMS2*	☐	☐	☐	☐								
Permits (e.g., work, confined space, hot work, etc.)*	☐	☐	☐	☐								

*Rank severity of potential hazards from 1-4, with 1 being Minor to 4 being Serious. If hazards are observed with a potential severity ranking of 4, the unsafe practice or condition must be reported as soon as possible to supervision for investigation and corrective action.

	Status					Action (to be completed for items identified as Needs Work)*						
	Okay	Needs Work (new issue)	Needs Work (repeat issue)	N/A	Potential Severity Ranking (1-4)*	Priority (P4 – Critical P3 – High P2 – Medium P1 – Low)	Category (Corrective or Preventative)	Description	Assigned To	Assigned To (w/out Stantec email)	Due Date	Evidence Required (Comment Only or Comment and Attachment)
Clearances*	☐	☐	☐	☐								
Training requirements met*	☐	☐	☐	☐								
Safe Work Practices*	☐	☐	☐	☐								
Inspection forms (e.g., ladder, chainsaw, client-specific excavation, etc.) *	☐	☐	☐	☐								
Other (Specify; if not applicable, check N/A)*	☐	☐	☐	☐								
Emergency Preparedness												
Emergency Response Plan current & available*	☐	☐	☐	☐								
Muster point*	☐	☐	☐	☐								
First aid kit stocked/available*	☐	☐	☐	☐								
Emergency eyewash available*	☐	☐	☐	☐								
First aid providers on-site*	☐	☐	☐	☐								
Fire extinguisher*	☐	☐	☐	☐								
Communication available*	☐	☐	☐	☐								
Spill response kit*	☐	☐	☐	☐								
Other (Specify; if not applicable, check N/A)*	☐	☐	☐	☐								

*Rank severity of potential hazards from 1-4, with 1 being Minor to 4 being Serious. If hazards are observed with a potential severity ranking of 4, the unsafe practice or condition must be reported as soon as possible to supervision for investigation and corrective action.

	Status					Action (to be completed for items identified as Needs Work)*						
	Okay	Needs Work (new issue)	Needs Work (repeat issue)	N/A	Potential Severity Ranking (1-4)*	Priority (P4 – Critical P3 – High P2 – Medium P1 – Low)	Category (Corrective or Preventative)	Description	Assigned To	Assigned To (w/out Stantec email)	Due Date	Evidence Required (Comment Only or Comment and Attachment)
Protective Equipment												
Hard hats*	☐	☐	☐	☐								
Safety glasses*	☐	☐	☐	☐								
Hearing protection*	☐	☐	☐	☐								
High visibility vests*	☐	☐	☐	☐								
Proper work gloves*	☐	☐	☐	☐								
Safety boots*	☐	☐	☐	☐								
18" PVC orange traffic cones*	☐	☐	☐	☐								
Road signs as required*	☐	☐	☐	☐								
Fall arrest/restraint*	☐	☐	☐	☐								
Personal floatation device*	☐	☐	☐	☐								
Other (Specify; if not applicable, check N/A)*	☐	☐	☐	☐								
Tools and Equipment												
Maintenance - tools in good condition*	☐	☐	☐	☐								
Used properly*	☐	☐	☐	☐								
Appropriate for job*	☐	☐	☐	☐								
Stored and/or secured safely*	☐	☐	☐	☐								
Lockout system established*	☐	☐	☐	☐								

*Rank severity of potential hazards from 1-4, with 1 being Minor to 4 being Serious. If hazards are observed with a potential severity ranking of 4, the unsafe practice or condition must be reported as soon as possible to supervision for investigation and corrective action.

	Status					Action (to be completed for items identified as Needs Work)*						
	Okay	Needs Work (new issue)	Needs Work (repeat issue)	N/A	Potential Severity Ranking (1-4)*	Priority (P4 – Critical P3 – High P2 – Medium P1 – Low)	Category (Corrective or Preventative)	Description	Assigned To	Assigned To (w/out Stantec email)	Due Date	Evidence Required (Comment Only or Comment and Attachment)
Clearance from panels/overhead wires*	☐	☐	☐	☐								
Guards in place*	☐	☐	☐	☐								
Other (Specify; if not applicable, check N/A)*	☐	☐	☐	☐								
Chemicals												
Controlled products labeled properly*	☐	☐	☐	☐								
Stored properly*	☐	☐	☐	☐								
SDS available*	☐	☐	☐	☐								
TDG compliance*	☐	☐	☐	☐								
Other (Specify; if not applicable, check N/A)*	☐	☐	☐	☐								
Site												
Parking*	☐	☐	☐	☐								
Accessibility*	☐	☐	☐	☐								
Work area demarcated*	☐	☐	☐	☐								
Visibility*	☐	☐	☐	☐								
Slipping and tripping hazards*	☐	☐	☐	☐								
Drainage*	☐	☐	☐	☐								
Overhead hazards identified*	☐	☐	☐	☐								

*Rank severity of potential hazards from 1-4, with 1 being Minor to 4 being Serious. If hazards are observed with a potential severity ranking of 4, the unsafe practice or condition must be reported as soon as possible to supervision for investigation and corrective action.

	Status					Action (to be completed for items identified as Needs Work)*						
	Okay	Needs Work (new issue)	Needs Work (repeat issue)	N/A	Potential Severity Ranking (1-4)*	Priority (P4 – Critical P3 – High P2 – Medium P1 – Low)	Category (Corrective or Preventative)	Description	Assigned To	Assigned To (w/out Stantec email)	Due Date	Evidence Required (Comment Only or Comment and Attachment)
Buried utilities located/marked and exposed by hand*	☐	☐	☐	☐								
Pits/excavations barricaded*	☐	☐	☐	☐								
Excavation/trench supports/slope*	☐	☐	☐	☐								
Traffic hazards controlled (including pedestrian walkways)*	☐	☐	☐	☐								
Other (Specify; if not applicable, check N/A)*	☐	☐	☐	☐								
Environment												
Sensitive areas identified*	☐	☐	☐	☐								
Noise levels (</= 85dBA – 8hr shift; refer to SWP-106 for additional noise limit information) *	☐	☐	☐	☐								
Chemical hazards identified*	☐	☐	☐	☐								
Working near water*	☐	☐	☐	☐								
Heat/cold*	☐	☐	☐	☐								
Gas, fumes, dusts, vapors, asbestos*	☐	☐	☐	☐								
Ventilation*	☐	☐	☐	☐								
Confined space (including monitor and attendants(s)) *	☐	☐	☐	☐								

*Rank severity of potential hazards from 1-4, with 1 being Minor to 4 being Serious. If hazards are observed with a potential severity ranking of 4, the unsafe practice or condition must be reported as soon as possible to supervision for investigation and corrective action.

	Status					Action (to be completed for items identified as Needs Work)*						
	Okay	**Needs Work (new issue)**	**Needs Work (repeat issue)**	**N/A**	**Potential Severity Ranking (1-4)***	**Priority (P4 – Critical P3 – High P2 – Medium P1 – Low)**	**Category (Corrective or Preventative)**	**Description**	**Assigned To**	**Assigned To (w/out Stantec email)**	**Due Date**	**Evidence Required (Comment Only or Comment and Attachment)**
Other (Specify; if not applicable, check N/A)*	☐	☐	☐	☐								
General (including Buildings/Trailers)												
Exits marked and accessible*	☐	☐	☐	☐								
Stairs and walkways clean and dry*	☐	☐	☐	☐								
Handrails sturdy*	☐	☐	☐	☐								
Emergency lighting*	☐	☐	☐	☐								
General housekeeping*	☐	☐	☐	☐								
Body positioning, ergonomics (resources available on The Lens)*	☐	☐	☐	☐								
Other (Specify; if not applicable, check N/A)*	☐	☐	☐	☐								

*Rank severity of potential hazards from 1-4, with 1 being Minor to 4 being Serious. If hazards are observed with a potential severity ranking of 4, the unsafe practice or condition must be reported as soon as possible to supervision for investigation and corrective action.

Stantec

Project HSSE Review (RMS6)

To be submitted in Pro-Sapien

The Project HSSE Review is intended for projects that have a field component.

Fields marked with a red asterisk are required.

Region*		**Business Line***	
Office*		**Business Center (BC)***	
Date*		**Time***	
Audits Lead*			
Audits Team (with Stantec Email accounts)		**Audits Team (w/out Stantec Email accounts)**	
Project Number*		**Project Name**	
Project Manager (default Action Owner)*			
Responsible Parties (with Stantec Email accounts)*		**Responsible Parties (w/out Stantec Email accounts)**	
Additional Comments			
Reviewer*			
Distribution List			

Pre-Job Hazard Assessment – RMS1 **N/A ☐ If N/A, complete HASP section below.**	**Yes**	**No**	**Details**
Was the version of the RMS1 used on this project current at the time it was completed? (Verify on The Lens)	☐	☐	
Has the project description been filled in with sufficient detail (who, what, where, when, how)?	☐	☐	
Have the critical risks been identified?	☐	☐	
Have the sources of energy been identified?	☐	☐	
Do the applicable SWPs correspond to the identified hazards?	☐	☐	
Have site-specific controls been identified?	☐	☐	
Does the PPE identified meet the standards outlined in the applicable SWPs, local legislation and site requirements?	☐	☐	
Does the employee's training meet the standards outlined in the applicable SWPs? (Verify by reviewing LMS)	☐	☐	
Is the 'Emergency Resources' section complete and appropriate for the task and location?	☐	☐	
Is there a map to the nearest emergency medical facility attached to the RMS1?	☐	☐	
Are all contacts listed complete and current?	☐	☐	
Has appropriate site information been provided (first aid, etc.)?	☐	☐	
Form signed & dated by required personnel?	☐	☐	

Has the RMS1 been updated as required throughout the project/task? (i.e., A scope change that exposes staff to new critical risks or energy hazards or a staffing change. The minimum standard is for the RMS1 to be reviewed and updated at a minimum 1 x /yr.)	☐	☐	
Has the signed RMS1 been saved in the project files?	☐	☐	
Project-Specific Health & Safety Plan **N/A ☐ If N/A, complete RMS1 section above.**	**Yes**	**No**	**Details**
Project-Specific Health & Safety Plan (HASP) required for the job? If no, move to next section.	☐	☐	
If yes, is the HASP complete and signed in the project file?	☐	☐	
If this is replacing an RMS1 are all components of the RMS1 covered? (Document this in RMS1 section above).	☐	☐	
On-Site Hazard Assessment - **RMS2 (Field Level Risk Assessment)**	**Yes**	**No**	**Details**
Was the version of the RMS2 used on this project current at the time the form was completed? (Verify on The Lens)	☐	☐	
Are all sections of the RMS2 complete and thorough?	☐	☐	
If additional hazards were identified when compared to the RMS1, were controls outlined?	☐	☐	
Is the energy wheel RMS2 being used?	☐	☐	
Has the form been signed and dated by required personnel?	☐	☐	
Ground Disturbance and Overhead Utilities **N/A ☐**	**Yes**	**No**	**Details**
Is there a completed copy of all public and private utility clearance reports on file?	☐	☐	
Were the SWP 213A, SWP 213B (and if required SWP 213C) forms completed?	☐	☐	
Other HSSE Documents – Types **(e.g., Traffic Protection Plans, Client-Specific)** **N/A ☐**	**Yes**	**No**	**Details**
Were other types of documents used/required? If yes, indicate type (e.g., TPP, etc.)	☐	☐	
Other HSSE Documents – Forms Completed **N/A ☐**	**Yes**	**No**	**Details**
Form(s) complete?	☐	☐	
Form(s) signed & dated by required personnel?	☐	☐	

Other HSSE Documents – Subcontractor Approval **N/A** ☐	**Yes**	**No**	**Details**
Is a subcontractor approval required?	☐	☐	
Other HSSE Documents – Subcontractor Approval Evidence **N/A** ☐	**Yes**	**No**	**Details**
If so, is a copy of the approval (or Variance) with the project files?	☐	☐	
Safe Work Practices (SWPs)	**Yes**	**No**	**Details**
Has the Project Manager (PM) reviewed and completed the tests for the core SWPs and project related SWPs on the LMS?	☐	☐	

Are follow-up actions required by the Project Manager?	☐	**Yes**	☐	**No**	

*****Provide a copy of the completed Project HSSE Review to the Project Manager, BCOL, and maintain a copy in the project files*****

Complete the Actions section on the next page for actions to be issued as a result of a "no" answer to any of the questions above.

Stantec

Project HSSE Review (RMS6) Actions

To be submitted in Pro-Sapien

Fields marked with a red asterisk are required.

Action*	Priority* (P4 – Critical P3 – High P2 – Medium P1 – Low)	Category* (Corrective or Preventative)	Description*	Assigned To*	Assigned To (w/out Stantec email)	Due Date*	Evidence Required* (Comment Only or Comment and Attachment)

RMS7 – QUANTIFIED HAZARD ASSESSMENT

A proactive approach to safety requires systematic analysis of the tasks each occupation is required to perform regularly. The objectives of this hazard assessment process are to review and quantify the risk inherent in each task, to assess the effectiveness of existing controls and to develop new controls if necessary. Tasks with high levels of inherent risk are ***critical tasks*** and require detailed and stringent controls. It is important that the people who perform the tasks are involved in this analysis, as their experience and knowledge are essential to the process. The controls identified and created should be used as tools for training and orienting new employees and contractors.

Using the attached risk matrix, rate each task using severity and likelihood. Once this evaluation is complete, critical tasks will be identified and the existing controls evaluated.

Instructions:

1. List all the tasks that are completed as part of the job, even if they are not daily occurrences.

2. List the hazards associated with completing the task (consider hazard categories: chemical, physical, ergonomic, biologic, or environmental).

3. Using the attached Risk Matrix, use Tables 1 and 2 to determine the severity and likelihood rating for each task.

4. Determine the Risk Ranking according to the coloured Risk Matrix.

5. Using Table 3, tasks which are ranked A or B require immediate/prompt attention and may be considered critical tasks. Critical tasks require further hazard analysis and assessment of controls.

6. As a baseline for the organization as a whole, a critical task inventory has been created for Stantec operations. Please contact your HSSE representative for information and guidance.

Reminder: At Stantec, we've developed some supporting resources for our 12 most critical risks. These risks were selected based on the work that we do and are consistent with industry standards and reflect our incident history. Please click here for the Critical Risk Control page on The Lens.

RMS7 – QUANTIFIED HAZARD ASSESSMENT: RISK MATRIX

TASK ASSESSMENT			Date:			
Occupation:			**Name:**			
Task	**Hazards**	**Severity (1 to 4)**	**Likelihood (1 to 4)**	**Risk Level (A to D)**	**Selected Controls**	
Example: Vehicle Operation	*Other drivers, poor vehicle maintenance, loose objects in the cab, animals, fatigue, weather conditions, darkness, inexperience, distractions*	*4*	*3*	*A*	*Online Green Defensive Driving course, review of SWP 124 and discussion of vehicle inspection and Journey Management planning.*	

RMS7 – QUANTIFIED HAZARD ASSESSMENT: RISK MATRIX

LIKELIHOOD					
	4	C	B	A	A
	3	C	B	B	A
	2	D	C	B	B
	1	D	D	C	C
		1	**2**	**3**	**4**
		SEVERITY			

Table 1: Incident Severity

Severity Level	People	Environment	Assets	Reputation
(0)	**No Injury**	**No Effect**	**No Damage**	**No Impact**
Minor (1)	Not affecting work performance or daily life activities; first aid cases, exposure to irritation or temporary effects (reversible after exposure stops).	Release with incidental or insignificant effects within facility.	Operational upset or damage to equipment. Total loss less than <$5,000	Public awareness of an incident may exist; little public concern.
Moderate (2)	Medical treatment or restricted/modified work case. Use of Stop Work authority.	Release within or outside boundaries with known consequences. Localized effect with mild environmental effects.	Operational upset and/or equipment damage. Total loss between $5,000 - $25,000	Some local public concern; complaints; slight media with potentially negative aspects for operations and client relationships.
Significant (3)	Lost time injuries.	Release outside boundaries with known detrimental effects. Requires response from outside agencies (Hazmat units, police, and fire department). Requires reporting to regulatory authorities.	Operational upset and/or equipment damage. Total loss between $25,000 and $100,000	Regulatory orders written; civil charges; regional public concern with negative attention in the local media, slight national media, action groups, restrictive measures, client impact.
Serious (4)	Death, disability, hospitalization of personnel, multiple injuries from a single event.	Release outside boundaries with known detrimental effects. Requires an ongoing cleanup requiring significant resources. Regulatory or other charges are possible.	Major damages or complete loss to essential equipment. Total loss more than $100,000	Criminal charges laid against company or employees. Operation of site or operation halted by regulatory agency attributed to Stantec. Company-wide negative effects to operations. National public attention with complaints, action groups, and restrictions to operations.

ver. May 2017

Table 2: Likelihood Result Criteria	
Likelihood Level	***Result Criteria (where Likelihood = Frequency x Probability)***
1 Unlikely	Very low frequency of exposure to the risk. Task or activity performed or may occur once per month or less. Incidents are very unlikely and may not have occurred in the past.
2 Possible	Low frequency of exposure to the risk. Task or activity is performed or may occur two or three times per month. Incidents have happened within the Company, or more than once per year in the Industry.
3 Probable	Regular exposure to the risk. Task or activity is performed or may occur once per week or more. Incidents have happened locally, or more than once per year in the Company.
4 Very Likely	Constant or continuous exposure to the risk. Task or activity is performed or may occur daily on a continuing basis. Incidents have occurred several times per year either locally, or within the Company.

Table 3: Required Action for Each Risk Level		
Risk Level	**Category**	**Action Required**
A	Unacceptable	Must be mitigated with appropriate controls to a risk ranking of C or D immediately.
B	Undesirable	Must be mitigated with appropriate controls to a risk ranking of C or D as soon as possible.
C	Acceptable with Controls	Risk mitigation to risk ranking of D is optional; procedures and controls must be verified.
D	Acceptable as is	No risk mitigation required.

MEDICAL SURVEILLANCE ASSESSMENT FORM (RMS9)

Stantec

Employee Name: _____ **Date:** _____

Job Title: _____ **BC:** _____

Business Line: _____ **Office:** _____

Supervisor: _____

Choose One: _____

Category	Question	Select an answer
HAZWOPER	Do you perform work at a site where the client requires you to be HAZWOPER-compliant?	
	Do you perform work on a site where any of the following are true? - There is uncontrolled hazardous waste and clean-up is required by a government agency or department. - A government agency or department has recognized it as an uncontrolled hazardous waste site and there are voluntary clean-up operations going on - There are corrective actions involving clean-up operations at a site covered by RCRA - There are hazardous waste operations at a TSD facility regulated by RCRA - Emergency response operations for releases of, or substantial threats of releases of, hazardous substances at any location in the US	
	If you answered yes to the previous question, do any of the following conditions apply? - I will be or may be exposed to hazardous substances or health hazards above the permissible exposure limit for 30 or more days per year. - I wear a respirator 30 or more days per year. - I am a designated member of a hazardous materials emergency response team that goes in to shut down or stabilize the source of a release or spill.	
DOT Driving	Do you operate a vehicle that with a gross vehicle weight rating (GVWR) of 10,001 pounds or more that is subject to US DOT driver requirements?	
Altitude	Do you perform work at altitudes exceeding 8,200 ft (25000 m) above mean sea level?	
Respirator	Do you perform work that requires or may require you to wear a respirator?	
Noise	Do you perform work where you will or may be exposed to noise levels in excess of 85 dBA on an 8-hour TWA, or instantaneous noise levels at or above 140 decibels?	
Asbestos	Do you perform intrusive work with asbestos or perform other work in areas where there may be airborne concentrations of asbestos in excess of permitted exposure levels?	
Arsenic (Inorganic)	Do you perform work where you will or may be exposed to airborne concentrations of inorganic arsenic at or above the Action Level for 30 or more days per year?	
Benzene	Do you perform work where you will or may be exposed to airborne concentrations of benzene at/above the Action Level for 30 or more days per year, or to concentrations at/above the TWA Limit or STEL for 10 or more days per year?	
Crystalline Silica	Do you perform work where you will or may be exposed to airborne concentrations of crystalline silica at or above the Action Level for 30 or more days per year?	

MEDICAL SURVEILLANCE ASSESSMENT FORM (RMS9)

Stantec

Employee Name: _____ **Date:** _____

Job Title: _____ **BC:** _____

Business Line: _____ **Office:** _____

Supervisor: _____

Choose One:

Lead	Do you perform work where you will or may be exposed to airborne concentrations of lead at or above the Action Level for 30 or more days per year?	
Commerical Diving	Do you perform commercial diving work?	
Scientific Diving	Do you perform scientific diving work?	

Required Medical Surveillance

Based on your answers above, you require the following medical surveillance services.	
	HAZWOPER Exam
	DOT Driver Exam
	Altitude Exam
	Respirator Evaluation
	Audiometric Testing
	Asbestos Exam
	Arsenic Exam
	Benzene Exam
	Crystalline Silica
	Lead Exam
	Commercial Diving Exam
	Scientific Diving Exam

Employee Signature _____ Date: _____

Supervisor Signature _____ Date: _____

Stantec

Planned Job Observation (SAFER)

To be submitted in Pro-Sapien

Fields marked with a red asterisk are required.

Region*		**Business Line***	
Office*		**Business Center (BC)***	
Other Location Details			
Date of Activity or Observation*		**Work Environment***	☐ Office ☐ Field ☐ Lab ☐ Other
Additional Stantec Participants		**Other Participants: Non-Stantec**	
Project Number (if applicable)		**Project Name (if applicable)**	
Project Manager /Responsible Manager		**Client (if applicable)**	

Describe activity or conditions observed*
What Critical Risks and controls were the team focusing on for the day's activities? Were other Critical Risks and controls discussed or identified during your conversations?*
How did you demonstrate your commitment to safety leadership while on-site and in your conversations with the team?*
What Energy Hazards and controls were the team focusing on for the day's activities? Were other Energy Hazards and controls discussed or identified during your conversations?*
What feedback did you hear from the team during your conversations?*
What feedback did you provide to the team during your conversations?*

Based on your observations and conversations, was work on-site*	☐ Safe ☐ Needs Improvement

Were actions implemented on-site to improve safe execution of the work? Are there any follow-up actions needed to support continual improvement, share best practices or address concerns?*

Distribution List	
Should an incident be raised?*	☐ Yes ☐ No **If "Yes" is selected, include a copy of the incident report.**

Complete the Actions section on the next page for additional actions to be issued as a result of the observation.

Stantec

Planned Job Observation (SAFER) Actions

To be submitted in Pro-Sapien

Fields marked with a red asterisk are required.

Action*	Priority* (P4 – Critical P3 – High P2 – Medium P1 – Low)	Category* (Corrective or Preventative)	Description*	Assigned To*	Assigned To (w/out Stantec email)	Due Date*	Evidence Required* (Comment Only or Comment and Attachment)

MANAGEMENT OF CHANGE (MOC) FORM – RMS11

Management of Change

All changes to project* personnel, systems, procedures, equipment, products, materials, or substances will be evaluated and managed to confirm that HSSE risks arising from these changes remain at an acceptable level. **Changes to the HSSE Program, SWPs, or the Occupational Health and Safety Management System must be reviewed by the HSSE Manager, then approved by the HSSE Director or above.**

Project/BC/ Office/Region: _____ Project No: _____

Client: _____

Location: _____

Type of Change:

☐ Safe Work Practice ☐ Personnel/Job ☐ Systems/Process

☐ Safe Operating Procedure ☐ Equipment ☐ Products/Materials/Substances

☐ Regulatory

Effective Dates: From: To: **Maximum 1 year duration**

Description of Change:	
Reason for Change:	

Risk Assessment/Work Plan

Critical Changes	Identified Hazard	Potential Risk Level	Controls to be put in place and/or actions to be completed prior to change	Mitigated Risk Level	Responsible Person	Change Date

MOC Owner:		
MOC Review:		
MOC Approval*:		

*Please note: MOC Approval must come from a sufficient level of authority to authorize the change. A project is defined as a temporary endeavour undertaken to create a unique product, service, or result.

Appendix B STANTEC INCIDENT REPORTING PROCESS

Incident Reporting Protocol - US

Health, Safety, Security, & Environment

Immediate actions for all injuries/illness and for Serious* or Significant* incidents

1. **Implement Emergency Response Plan.** At a minimum…
   a) **Stabilize the scene,**
   b) **Provide care for ill/injured people** (as needed),
      - For life-threatening injuries or serious injuries such as fractures or deep cuts, **call local emergency number** or transport injured employee to a medical facility and **inform the Worker's Compensation Claims Coordinator (WCCC)** listed below.
      - For all other work-related symptoms or injuries/illness, **call WorkCare at 1-888-449-7787.** If WorkCare recommends a clinic visit or the injured employee requests medical attention, **immediately inform the supervisor and the WCCC.** In most cases, WorkCare will provide guidance about which clinic is available and provide directions. Some job sites already have prescribed clinics. Use this *Clinic Search link* to access additional clinic locations.
2. **Call your supervisor** (within 1 hour). Leaving a voicemail does not count. If you cannot contact your supervisor or project manager, call the HSSE Contact listed below.
3. **Supervisor Responsibilities**
   a) **Immediately call your HSSE Contact** to discuss severity and required notifications (e.g., BCOL/PM/Account Manager).
   b) **Require that an 'Incident Report' be submitted in** Pro-Sapien (within 24 hrs.) **and complete the** 'Initial Review'.
   c) If the employee sought treatment at a medical facility, **obtain the medical note and call the WCCC.**

HSSE Contacts		Cell
Buildings	Kyle Ferguson	902-240-3847
Energy & Resources	Scott Purves	403-542-9751
Environmental Services	Andrew Martin	747-244-1914
Infrastructure / Community Development	Ruth O'Haire	780-231-5290
Infrastructure / Transportation	Tina Blair	604-358-6624
Water	Jim Castaneda	971-335-4033
FST / Corporate / Regional G&A and Shared Services (see Region Map - North America)		
North Central	Wes Cline	916-281-7459
Northeast	Fred Miller	610-235-7315
South	David Williamson	407-768-7860
West	Tony Wong	805-234-6227
NA Export employees reporting to a US office	Kev Metcalfe	780-231-2185

Other HSSE Contacts		Office	Cell
WCCC	Cameron Cole	317-210-8980	317-829-4401
Director HSSE Operations – United States	Mike Doherty	503-220-5434	971-998-8377
HSSE Senior Vice President	Dave Flynn	519-585-7378	519-580-3881
Your OSEC or HSSE Advisor	Office Safety Environment Coordinator (OSEC) Contacts		

* Significant and Serious incidents are levels 3 and 4 severity incidents: Examples include gas line strike, reportable spill/release, damages greater than $25k, involvement of a regulatory agency and negative media attention.

Please note: All incidents must be reported in Pro-Sapien, regardless of severity If you are not sure, call HSSE.

Last Updated: October 2025
Printed copy uncontrolled—current version on The Lens

Document Owner: HSSE
Page 1 of 1

Appendix C STANTEC SAFE WORK PRACTICES



Appendix C Table of Contents – Stantec Safe Work Practices

HSSE/SWP No.	Title
HSSE 100	Alcohol and Drug Practice
SWP 102	Workplace Violence Prevention Program
SWP 104	Hazard Communication
SWP 105	Personal Protective Equipment (PPE)
SWP 105a	PPE Hazard Assessment form
SWP 106	Hearing Conservation
SWP 107	First Aid
SWP 108	Bloodborne Pathogens
SWP 111	Medical Surveillance
SWP 113	Heat Stress
SWP 114	Working in Cold Environments
SWP 115	Material Handling and Safe Lifting
SWP 118	Working Alone in the Field
SWP 118a	Working Alone in the Field Checklist
SWP 124	Safe Driving
SWP 124a	Vehicle Pre-Use Checklist
SWP 125	Workstation Ergonomics
SWP 206	Hand and Portable Power Tools
SWP 213	Ground Disturbance and Overhead Utility
SWP 213a	Pre-Ground Disturbance Worksheet and Approval Form
SWP 213b	Aboveground/Underground Utilities Checklist
SWP 214	Entering Excavations and Trenches
SWP 215	Supervision of Hydro-Excavation Activities
SWP 216	Working Near Mobile Equipment
SWP 310	Compressed Gas Cylinders
SWP 312	Fueling Gasoline Engines
SWP 315	Arsenic Safety
SWP 409	Respiratory Protection
SWP 416	Supervision of Contracted Drilling Activities
SWP 508	Preparing for Animal Encounters
SWP 511	Ticks and Tickborne Diseases

1 Purpose

Stantec is committed to health, safety, and preservation of the environment throughout its operations. The Alcohol and Drug practice has been developed to support Stantec's Health, Safety, Security, and Environment (HSSE) policy, which is reviewed and endorsed yearly by the President and CEO. The use of illegal drugs and the inappropriate use of alcohol, drugs or medications can have serious adverse effects on the safety and well-being of employees, contractors, clients, and the public.

This practice outlines availability of awareness, education, training, and access to assistance, support and treatment, as well as the alcohol and drug testing procedures when such testing is required. All employees will be treated fairly and with respect.

By pursuing the purposes of this Alcohol and Drug practice, Stantec promotes

a) the safety and dignity of its employees,

b) the welfare of its employees, their families, and the public

c) protection of the environment, and

d) the best interests of the Company and its stakeholders.

2 Scope

This practice pertains to all Stantec employees while they are engaged in Company business, regardless of location. Any company or individual contracted to provide services for, or on behalf of, Stantec will be advised by the Project Manager or designate of the practice requirements and will be expected to comply to this or an equivalent standard. A violation of this practice is sufficient grounds for discipline, up to and including termination of employment/contract.

The standards, procedures and testing protocols in this practice represent minimum requirements. Employees designated to work on certain projects may be required to meet additional, potentially more restrictive, standards specific to our clients and will be advised by the Supervisor, Project Manager, or BC leader of such requirements in advance of the work being assigned.

US employees that are subject to Department of Transportation (DOT) regulations due to the nature of their work may have additional requirements as outlined in the applicable legislation.

While this practice refers specifically to alcohol and drugs, it is intended to apply to all other forms of substance abuse. Stantec will comply with all applicable Federal and Provincial related drug and alcohol laws and/or regulations, or this practice, whichever is more stringent. Please note that international law may require significantly different practices as penalties may be drastic and significant. Employees must familiarize themselves with substance-related restrictions and prohibitions before beginning any international work. Please contact international@stantec.com.

This practice will be evaluated annually. The review will be led by HSSE, in coordination with Human Resources and Risk Management.

This practice complies with the Canadian Model for Providing a Safe Workplace: A best practice of the Construction Owners Association of Alberta.

3 Responsibilities

3.1 Stantec will:

- Provide appropriate awareness to all employees outlining safety implications, and their roles in identifying and addressing the use of alcohol and drugs in the workplace. Supervisors and management will require additional education and training.

- Coordinate the Company alcohol and drug practice with employee performance management.
- Make employee assistance services available to employees, including assessment, counseling, referral and when found necessary and reasonable, assist in the provision of return-to-duty services.
- Communicate the content and requirements of the alcohol and drug practice to all employees.
- Establish and maintain a testing contract with a Third Party Administrator (TPA).
- Establish that the alcohol and drug testing is performed by accredited labs.
- Identify Safety-Sensitive Work (SSW) within the Company.
- Notify US federal contracting agencies 10 days after receiving notice that an employee has been convicted of a criminal drug violation in the workplace.

3.2 Managers and Supervisors are expected to:

- Be knowledgeable about their role in Stantec's alcohol and drug practice and procedures.
- Comply with the work standards (Section 4.1) as part of their responsibility to perform their work-related activities in an effective and safe manner.
- Monitor and evaluate work performance and practice compliance with an objective of early identification and handling of all performance issues.
- Ensure that investigations of work-related incidents are carried out in accordance with the Company incident investigation practices and procedures.
- Take appropriate action on reported or suspected alcohol or drug use by employees, as outlined by this practice.
- Consult with an HR representative on substance abuse issues as appropriate.
- Arrange for safe transportation of an employee to their residence or to a medical facility as appropriate under this practice.

3.3 Employees are expected to:

- Arrive fit for duty and remain fit for duty during their period of work.
- Understand the alcohol and drug practice, their role, and the resources available.
- Take responsibility to ensure their safety and the safety of others. This may include contacting a supervisor, HSSE, HR, the Employee and Family Assistance Plan (EFAP), or the Integrity Hotline for confidential advice on what action to take.
- Comply with the work standards (Section 4.1) as part of their obligation to perform work activities in a safe manner.
- Seek advice on appropriate counseling or treatment if they suspect they have a dependency or an emerging substance abuse issue.
- Comply with the practice and follow appropriate treatment, as recommended.
- Use medications responsibly, be aware of potential side effects and notify their supervisor of any potential unsafe side-effects where applicable.
- Notify the Company of any drug statute conviction within five (5) working days. For impaired driving, please refer to section 4.1.4.

3.4 Subcontractors/Subconsultants will:

- Ensure their representatives adhere to this alcohol and drug practice or to an equivalent standard as identified in the prequalification process.
- Investigate a situation if there is any reason to believe that an individual in the employ of a subcontractor/subconsultant is working in contravention of the provisions of this practice, and when notified will remove the individual to a safe place and take any required follow up action.

- Not allow an individual who has breached this alcohol and drug practice to return to an assignment with Stantec until such time as the subcontractor/subconsultant can demonstrate compliance with the testing, rehabilitation and return to duty requirements in this practice. Written permission from Stantec will be required.
- Failure by a subcontractor/subconsultant or by a subcontractor's employee to meet these expectations will be considered a breach of contract, and may result in triggering penalty clauses under the contract, or lead to suspension or termination of the contract.

3.5 Corporate Health, Safety, Security, and Environment (HSSE) will:

- Act as an objective resource within the Company on matters related to the alcohol and drug practice.
- In their role as Designated Company Representatives (DCR), selected team members will coordinate alcohol and drug testing through a Third Party Administrator (TPA).
- Maintain and update this practice.
- Assist with interpretation of this practice and methods of compliance.
- Perform periodic formal and informal audits that verify requirements within the practice are being met.
- Maintain privacy standards regarding testing results and performance issues related to safety.
- Liaise with Human Resources and/or Designated Company Representatives (DCR) when post-incident or reasonable grounds testing is required, and when a positive result is obtained.

3.6 Human Resources will:

- Act as an objective resource within the company on matters related to the alcohol and drug practice.
- In their role as Designated Company Representatives (DCR), selected team members will coordinate alcohol and drug testing through a Third Party Administrator (TPA).
- Advise the employee's supervisor, where appropriate, of work limitations, suspension or termination considerations.
- Liaise with HSSE on testing requirements, assessment and treatment documentation related to return-to-duty agreements
- Facilitate access to Stantec's EFAP, and to a rehabilitation provider as necessary.

3.7 Designated Company Representatives (DCR) will:

- Coordinate alcohol and drug testing through a Third Party Administrator (TPA).
- Receive results from the TPA and communicate the information to appropriate recipients – employee, supervisor, or Human Resources representative.
- Manage and maintain documentation to preserve confidentiality, chain of custody, and regulatory requirements
- Listing of DCRs and appropriate contact information will be listed on The Lens.

4 Controls

4.1 Work Standards

To minimize the potential for unsafe or unsatisfactory performance due to the inappropriate use of alcohol or drugs, the following standards have been set out for all employees and contract workers covered by this practice.

Employees are expected to report fit for work and remain fit throughout their workday or shift. For practice violations, refer to Section 5.9.

An employee will not, during their work day or shift:

- Sell, distribute, possess, consume or use alcohol, drugs (other than authorized medications), drug paraphernalia, or any device or product that could tamper with any sample for an alcohol or drug test.
- Possess prescribed medications without a legally obtained prescription or distribute or offer prescription medications for sale.
- Report to work or be at work under the influence of alcohol or drugs that may or will affect their ability to work safely and competently.
- Test positive for an alcohol level equal to or in excess of 0.04% BAC (0.04 grams per 210 litres of breath) or drugs at concentrations as specified in section 5.8 of this practice.
- Misuse of prescription or non-prescription drugs. If an employee is taking a prescription or non-prescription drug for which there is a potential unsafe or detrimental side effect, he or she has an obligation to report it to the supervisor prior to commencing work (see Section 4.1.2).
- Refuse to comply with a request from a Company representative for alcohol or drug testing identified under the standards and procedures of this practice.
- Tamper with a sample for an alcohol or drug test. This includes taking an alcohol or drug test on behalf of another employee.

4.1.1 Social or Hosting Situations

Limited exceptions may be made for alcohol use in social situations or when hosting others, provided responsible hosting practices are followed, the individuals involved drink responsibly and act in compliance with local statutes and within the standards identified in this practice. Express authorization by the direct supervisor of the area and the appropriate vice president is required for this exception. Employees and guests are expected to use alcohol responsibly and not to engage in unsafe, illegal, unprofessional, or disruptive behavior.

Under no circumstances are employees allowed to possess, consume, distribute or sell any cannabis or cannabis related products in any form, while on Company premises, or at any Company sponsored event including any social hosting of guests, visitors, or other employees.

Contact Risk Management for additional considerations and guidance.

4.1.2 Medications

Employees are expected to use prescribed and over-the-counter medications responsibly. The intentional misuse of prescribed or over-the-counter medications (e.g. using the medication other than as prescribed, using another person's prescription medication, combining medication and alcohol, and/or using medication against medical direction) while on Company business or premises, is prohibited.

Medications of concern are those that inhibit or that may inhibit an individual's ability to perform their job safely and productively including cannabis for medicinal purposes. An employee who is taking medication is expected to investigate (e.g. through his or her physician, pharmacist, or other licensed health care practitioner) whether the medication can affect his or her ability to work safely, and to take appropriate steps to minimize the associated risk. If the medication (s)he is using could affect his or her ability to work safely, (s)he is expected to advise his or her supervisor of the medication use and participate in any assessment of accommodations need for modified work, and to abide by the modified work requirements.

4.1.3 Outside Regular Working Hours

If unexpected circumstances arise where an employee is requested to perform services outside of regular working hours, and (s)he is under the influence of alcohol, drugs or medications (prescription or non-prescription) that may affect their ability to work safely, it is the responsibility of that individual to decline the request. Please refer to Stantec's Stop Work Authority as endorsed by the President and CEO, for additional information.

4.1.4 Impaired Driving Charges, Convictions, or Administrative Suspensions

An employee who is required to operate a motor vehicle on behalf of Stantec must maintain, among other requirements, a valid driving license. A loss of license must be reported to management immediately and the individual will no longer be qualified to drive on behalf of the Company until such time as the license is reinstated and approval is obtained from the Company's in-house legal counsel. An employee whose driving license is suspended may be transferred to an alternative position where available and practical and at the Company's sole discretion.

In addition to this general standard, any individual charged with an impaired driving offense (including, but not limited to, driving while impaired, or refusal to provide a breath, oral fluid, or blood sample) while operating a vehicle on behalf of Stantec, must inform their supervisor immediately. The situation will be considered an incident and fully investigated. Depending on the circumstances, actions may include a fit-for-duty assessment, alternative work assignment, or discipline up to and including dismissal, or any other action deemed appropriate by the Company.

A conviction for an impaired driving offense when driving on Company business is grounds for termination of employment. Each situation will be fully investigated, and the actions taken will depend on the circumstances surrounding the event. Failure to report the loss of license is likewise grounds for termination of employment.

Additional requirements may be applied to Stantec's commercial drivers as regulated by the US DOT. Contact your DCR for details.

4.1.5 Safety-Sensitive Work (SSW)

Safety-Sensitive Work (SSW) is defined as a position in which the individual has a key and direct role in an operation where performance limitations due to substance use could result in a serious or high potential incident or near miss. The potential consequences of such an incident or near miss may include fatalities, serious injury to workers or the public, significant property damage, significant environmental damage or detrimental impact to reputation.

Additionally, on or before the commencement of contract, and where required by an individual client, the Company (i.e., Project Manager or BC leader) and the Client shall reach agreement on the positions that are safety sensitive. The Company representative will contact their Designated Company Representative (DCR) to coordinate required pre-access testing.

The designation SSW may be determined by Stantec, the client (for a specific project, location, or type of work), or by regulation.

Please refer to HSSE-100a - Identifying Safety-Sensitive Work (SSW) for guidance, and the HSSE Program Manual, s. 14.2 for complete definition of incident types.

4.1.6 Searches

Stantec reserves the right to conduct searches when there are reasonable grounds to believe that alcohol, drugs or drug paraphernalia are present on premises owned, contracted or otherwise controlled by the Company, or on project premises, property or work sites. Supervisors are responsible for advising management, HR and Risk Management of any situation they believe warrants a search. All searches will be directed by the Company following appropriate procedures and local legislation, conducted in a safe and respectful manner, including the involvement where necessary of qualified professionals (police, law enforcement, legal, HR). Searches on client property may be conducted in conjunction with a representative of the client.

Stantec recognizes and has informed its employees and subcontractors that some of its clients may, by prior agreement:

- Conduct unannounced inspections of vehicles and their contents upon entering, leaving, and while on the client's worksite;
- Conduct unannounced inspections of worksite property including office desks, field areas, building equipment, lockers and toolboxes;
- Conduct unannounced searches and inspections of all personal property including purses, briefcases, backpacks, and lunch boxes ("Personal Property"); and,
- Use professional investigators and trained search dogs to assist in surveillance, inspections and searches.

Employees subjected to search activities on a client site will inform their supervisor of the search within 24 hours or otherwise as soon as possible. If a search determines there has been a violation of the work standards as outlined in Section 4.1, Stantec will follow the process as set in Section 5.9 Practice Violation.

Employees should refrain from using for work purposes Personal Property that may have come into contact with cannabis, illegal, or controlled substances.

Any illegal or controlled substances found during inspections or searches will be turned over to law enforcement authorities as appropriate.

5 Procedures

For additional guidance, please refer to HSSE-100b – Testing Procedures.

5.1 Self-help

The Company encourages employees who believe that they may require the help provided by substance abuse experts (SAEs) and Employee and Family Assistance Plans (EFAPs) to voluntarily request that help. An employee requesting help will not be disciplined unless he or she has failed to comply with the Alcohol and Drug practice.

An employee who believes that he or she may be unable to comply with the Alcohol and Drug practice should seek help by 1) establishing contact with the Human Resources department and/or anyone within the Company responsible for the administration of the EFAP, 2) informing a family member or friend and asking for assistance in contacting EFAP, or 3) enlisting the assistance of a co-worker, a supervisor, or any other representative of the Company in his or her wish for assistance in contacting the EFAP.

In responding to an employee's request for help, a supervisor or manager must inform the employee of the assistance available under the EFAP, and encourage the employee to utilize the EFAP. Additionally, the employee will be informed that if he or she fails to utilize the EFAP the Company may insist that the employee submit to an assessment conducted by a substance abuse expert (SAE) and/or alcohol and drug testing as set out in this practice, and that failure to do so may result in the termination of his or her employment.

An employee who receives assistance from the EFAP on account of his or her use of alcohol and/or drugs must comply with the terms and conditions of any program established by an SAE as a condition of his or her continued employment. An employee who is at work and enrolled in such a program must comply with this Alcohol and Drug practice.

5.2 Pre-Employment Screening

Applicants for safety-sensitive positions/work may be drug tested after a conditional offer of employment. Employment is conditional to the successful completion (and subsequent negative result) of the pre-employment drug test in addition to evaluation of other factors related to the candidate's suitability for the position. This may include applicants for functions that are expected to be either entirely or in-part within the scope of what has been determined by the Company to be safety-sensitive, and those that will work at locations where it is a client requirement.

All candidates for positions regulated by the US Department of Transportation (DOT) will participate in pre-employment screening, as designated by regulation.

5.3 Pre-Access and Other Testing Circumstances

Stantec may require employees and/or contract workers to be tested in other circumstances as part of a client contract. Prior to being assigned work with such a client, individuals will be advised of client-specific testing requirements beyond those set out in this practice. This may be referred to as pre-access or site access testing and may be required to gain or maintain access to client worksites.

5.4 Reasonable Grounds – Observed Behavior or Evidence

Testing will take place where a Company supervisor or other official has reasonable grounds to suspect that an employee is or may be unable to work in a safe manner because of the use of alcohol and/or drugs; a violation of the Alcohol and Drug practice.

Alcohol and drug testing for Reasonable Grounds must be conducted as soon as reasonably practicable once the determination has been made by a supervisor that reasonable grounds exist. Where possible and practical, this decision should be substantiated by a second supervisory employee or manager. The Supervisor must immediately contact a Designated Company Representative (DCR) who will arrange for employee alcohol and/or drug testing at a Company approved testing facility.

The basis for the decision to test will be documented by the employee's supervisor or delegate and/or Human Resources using the HSSE-100c Reasonable Grounds Investigation Form. Barring factors that may be linked to known medical conditions, the referral for a test will be based on specific, clearly-stated, personal observations. The observations may also include indications of the chronic and withdrawal effects of alcohol and drug use. Examples include, but are not limited to:

- Observed use or evidence of use of an illicit drug (e.g. smell of marijuana);
- Odor of alcoholic beverage on breath;
- Alcohol, drugs or drug paraphernalia found on premises owned or controlled by Stantec;
- Erratic or atypical behavior;
- Changes in physical appearance;
- Glassy eyes;
- Flushed face;
- Disorientation or drowsiness;
- Repeated errors in job performance, including HSSE incidents;
- Unsteadiness in walking or standing;
- Slurred speech;
- Excessive absenteeism or lateness;
- Credible complaints of drug or alcohol use at work.

The Company will provide training for supervisors and managers to enable them to determine whether or not an employee is to be tested for reasonable cause (see Section 6.0 for details).

5.5 Post-Incident

Testing is required after a serious work-related incident, unless there is clear evidence that the acts or omissions of the employee could not have been a potential contributing factor. Testing may also be required, at the Company's discretion, for near misses or other high potential incidents if they are considered to have had potential for significant consequences.

Testing must be conducted as soon as possible and reasonably practicable following the incident. The decision to refer an employee for a test will be made by a supervisor investigating the incident, in conjunction with the Regional HSSE Manager/Advisor wherever practicable. The DCR will arrange for the post incident test at a Company approved testing facility. The following considerations apply:

- Testing will never delay necessary medical attention for injured employees following an incident;
- The need for a test must be documented as part of the preliminary investigation as soon as practical after the triggering event;
- A test will not be necessary if there is clear evidence that the acts or omissions of employees could not have been a contributing factor (e.g. structural or mechanical failure, no-fault auto accident); this does not preclude a reasonable ground test;
- Employee(s) referred for a test will be those found to be directly involved in the chain of acts or omissions leading up to an event;
- Alcohol testing should occur within 2 (two) hours of the incident with attempts to test for up to 8 (eight) hours post incident. An employee who is to be tested must not consume alcohol within the first 8 (eight) hours after a workplace incident, or until tested, or advised by the Company that a test is not required; and
- Drug testing should occur within 2 (two) hours of the incident with attempts to test for up to 32 (thirty-two) hours of the incident.

5.6 Random Testing

Stantec employees identified as working under United States Department of Transportation (US DOT) regulations will be subject to random selection for unannounced alcohol and drug testing. Selection will be made by the approved Third Party Administrator contracted for alcohol and drug testing, through the use of a random number table or generator. A lawful computer-generated random alcohol and drug testing program will be in accordance with the US DOT Workplace Drug and Alcohol Testing Programs, in force at the date of publication of this practice. Tests will be scheduled throughout the year and annually will be equal to the percentage of employees in the program using the current published rates for the US DOT Federal Motor Carrier Safety Administration (FMCSA), US DOT Pipeline and Hazardous Materials Safety Administration (PHMSA), or the US DOT Federal Railroad Administration (FRA) – Maintenance of Way.

Should there be a requirement for other SSW at Stantec to participate in a random testing program, a written notice will be delivered to each affected employee of the implementation of random alcohol and drug testing at least 30 (thirty) days prior to implementation of the program.

5.7 Return to Duty

Alcohol and/or drug testing will be required of an employee who has violated a condition of this practice and is returning to work after an assessment by a SAE, following compliance with the recommendations of the SAE. Recommendations may include follow-up testing on an unannounced basis. Frequency and duration of testing requirements will be determined by the substance abuse expert (SAE) in consultation with Human Resources and/or DCR.

An employee may be expected to complete all return to duty requirements as outlined by the SAE before being permitted to return to a worksite or job tasks, as designated by client agreement and/or regulatory requirements.

5.8 Testing and Reporting Results

Stantec agrees to retain the services of a Third Party Administrator (TPA) for breath alcohol testing. Alcohol testing will be conducted by TPA personnel in accordance with the United States

Department of Transportation (US DOT) Workplace Drug and Alcohol Testing Programs standards and procedures as they relate to alcohol testing, as available at the implementation date of this practice. These standards and procedures are also applicable in Canada.

Stantec agrees to retain the services of a Third Party Administrator (TPA) for testing purposes under this practice. Any contracted TPA agrees to retain an accredited laboratory to conduct urine drug testing in accordance with those parts of the United States Department of Transportation Workplace Drug and Alcohol Testing Programs in force as of the date of implementation of this practice. These standards and procedures are also applicable in Canada.

Stantec will confirm the drug-screen-by-urinalysis tests carried out under this practice by the TPA are capable of detecting the following drug classes: (meth)amphetamines, cannabinoids, cocaine, opioids (including heroin), and phencyclidine. Testing procedures are to be according to United States Department of Transportation (US DOT) protocols.

Individual clients may reserve the right to require tests for other drug class(es) or specific drugs. When testing for DOT regulated employees, testing for additional drug classes or specific drugs must be performed using separate sample(s) and test(s).

The testing program will not include testing for any medical conditions.

By continuing his or her employment with Stantec the employee accepts the terms of this alcohol and drug practice and authorizes the laboratory to provide the test results to the Company or any other person with legal authority to require the disclosure of the test results. Further, the employee authorizes the medical review officer (MRO) to provide test results to a SAE to whom the employee has been referred under the provisions of this practice.

Alcohol and drug tests can be negative, positive, tampered and invalid or inconclusive. A negative test result means the employee is in compliance; a positive test result means non-compliance; a tampered result means non-compliance; and, an invalid or inconclusive test result cannot be relied upon to determine compliance or non-compliance. All test results will be provided in a confidential written report from the medical review officer (MRO) to the DCR.

To preserve the confidentiality of test results, the designated Company representative and any person to whom disclosure is permitted under this alcohol and drug practice must not disclose the test results to any person other than a person who needs to know the test results to discharge an obligation under this alcohol and drug practice.

For the purpose of this practice, a positive alcohol test will be one in which the blood alcohol concentration (BAC) is equal to or in excess of 0.04% BAC (0.04 grams per 210 litres of breath). However, in those instances where an employee is subject to a return-to-duty test as a condition of continued employment after a practice violation, a positive test will be one in which the blood alcohol concentration (BAC) is equal to 0.02% BAC or more.

Drug test results must be considered positive when the laboratory is able to certify the presence in the urine sample of a prohibited substance in an amount in excess of the test levels as specified in the United States Department of Transportation (US DOT) regulation, 49 CFR 40. These standards and procedures are also applicable in Canada. Individual clients may request alternative testing levels, but these must meet or exceed the DOT regulation.

Table 1: Urine drug concentration limits (US DOT 49 CFR 40, § 40.87):

Drugs or classes of drugs	Screening concentration equal to or in excess of ng/ml	Confirmation concentration equal to or in excess of ng/ml
Marijuana metabolites	50	15
Cocaine metabolites	150	100

Opioids • Codeine • Morphine • 6-Acetylmorphine (heroin marker) • Hydrocodone/Hydromorphone • Oxycodone/Oxymorphone	2000 10 300 100	 2000 2000 10 100 100
Phencyclidine (PCP)	25	25
Amphetamines/Methamphetamines • Amphetamine • Methamphetamine MDMA • MDMA • MDA	500 500	 250 250 250 250

A report from the medical review officer (MRO) to the designated Company representative that the employee's sample produced a negative test result means the employee is in compliance with the standards identified in this practice. The designated Company representative must notify the employee of the negative test result and that no other steps under this alcohol and drug practice will be taken. It may be appropriate to pursue procedures under other policies or take other steps, including a medical assessment, to assist the employee to perform at a satisfactory level.

Confirmed positive test results will be reviewed by a qualified medical review officer (MRO) and the employee given an opportunity to explain the findings to the medical review officer before the results are communicated to the Company.

- If the medical review officer is satisfied that there is a legitimate medical explanation for the positive test result, it will be reported to the Company in a confidential written report from the medical review officer to the designated Company representative as a negative. A fitness-for-duty assessment should be conducted. There may also have been a violation of the alcohol and drug practice under Section 4.1.2 (Medications).
- If the medical review officer determines there is not a legitimate medical explanation for the positive result, the medical review officer will provide a confidential written report to the designated Company representative that the employee's sample produced a positive test result and the employee is in violation of the standards identified in this alcohol and drug practice.
- An employee has 72 hours to request testing of the split sample.

Where a post incident or reasonable cause drug test is requested of an employee, the Company will suspend the employee until the test results are received by the Company.

A positive test result will be considered a violation of this practice, whether or not the drugs or alcoholic beverage were actually consumed on Company business or premises.

A positive result on a test conducted **before** client site access has been issued to an employee shall be considered a confidential matter between Stantec and the employee and will not be disclosed to any client. Where a test is conducted after site access has been granted, Stantec must report a confirmed positive result to the client, if the client has specified this in their contract.

A tampered sample test result determination will be provided in a written report from the medical review officer to the designated Company representative and means the employee is in violation of this alcohol and drug practice.

An invalid or inconclusive test result determination will be provided in a written report from the medical review officer to the designated Company representative. An invalid or inconclusive test result means the test cannot be relied upon for the purposes of this practice.

5.9 Practice Violation

- Where a violation of any provision of this practice occurs, a documented investigation will be conducted.
- Alcohol and/or drug testing will be required and conducted as outlined in this practice.
- A positive result of a pre-employment drug test will result in the offer of employment for safety-sensitive work, as designated by US DOT, not being made.
- Failure to report directly for an alcohol or drug test when required, refusal to submit to an alcohol or drug test, refusal to agree to the disclosure of an alcohol or drug test result to the Company, or a confirmed attempt to tamper with an alcohol or drug test sample will be considered a practice violation.
- Failure to report an HSSE incident may be considered the same as a refusal to be tested for alcohol or drugs.
- Unless otherwise required by regulation or a client, a dilute-negative drug test result will not require the employee to undergo an immediate urine recollection.
- An employee suspected of violating this practice will be, at the discretion of the Company, suspended, provided transportation to a collection site and/or placed in the care of a third party designated by the employee.
- An employee or candidate whose sample produces a positive alcohol or drug test will be referred to a Substance Abuse Expert (SAE) for an assessment. As a condition of employment, the employee must meet with the SAE. The employee will be advised in writing of these requirements for all positive test results and other practice violations.
- Based on the assessment of the SAE, the Company will implement appropriate corrective actions:
    - If the employee is diagnosed by the SAE with a disability, the Company will follow reasonable treatment recommendations and corrective action recommended by the SAE.
    - The Company may choose to implement and follow a corrective and/or rehabilitative course of action recommended by the SAE, if the employee is not diagnosed with a disability. As part of the corrective or rehabilitative course, the employee will be expected to remain alcohol and drug free. The employee will be placed into a random testing program outlined and monitored by the SAE. Failure to comply with this testing requirement, or positive results from one of the tests, will be considered a failure to follow the course of corrective or rehabilitative action recommended by the SAE, and may result in termination.
    - The Company may choose to terminate the employee based on facts of the case, including the nature of the violation, the existence of prior violations, the response to prior corrective programs, and the seriousness of the violation.
- Employees may request a retest of their positive test results within 72 hours of notification by the Company of such positive test results. This retest is at the expense of the individual, unless the original test is called into question by the retest.

5.10 Compliance Audits

Stantec may honor individual client requirements for periodic audits of records to verify:

- Alcohol and drug tests are being conducted as required;
- Procedures for handling drug test samples establish a chain of custody that prevents tampering and/or switching of samples; and,
- The laboratory being used has been appropriately accredited and is conducting drug testing using scientifically-sound methodology.

6 Training or Qualifications

Stantec recognizes that employee education on substance abuse and on the Alcohol and Drug practice is a critical step in achieving the objectives of the program.

6.1 Employee Training

Employees will receive information and access to resources regarding this practice and how it applies to everyone, its implementation and application including: the risks of alcohol and drug use and their potential impact on safety in the workplace, consequences for policy violation, available resources for employee and family assistance services and other treatment and support resources, explanation of the testing procedures and situations when testing will occur. Duration and delivery method of training may vary by region; please contact HSSE or your DCR for information.

6.2 Supervisor/Manager Training

Supervisors and managers will be given training on how to recognize signs and symptoms of drug and alcohol use in the workplace and appropriate responses. Duration and delivery method of training may vary by region and legislation; please contact HSSE or your DCR for information.

7 Confidentiality

Any information concerning the consumption of, or dependence on, drugs or alcohol by an employee, including the results of tests undertaken under this practice, will be kept strictly confidential by the Company.

This information will only be accessible to individuals requiring access to it as part of their duties, such as for the determination of fitness for duty, the implementation of corrective measures, the administration of a return-to-duty program, a conditional reinstatement agreement or other similar program, or as otherwise required by law.

8 Resources

Drug-Free Workplace Act of 1988, U.S. Department of Labor

Canadian Model for Providing a Safe Workplace: A best practice of the Construction Owners Association of Alberta.

Alcohol and Drug Policy Model: Program Development Guideline, (ed. 2.1), Enform, Revised January 2011.

U.S. Department of Transportation (DOT) rule, Title 49: CFR Transportation Part 40 – Procedures for Transportation Workplace Drug and Alcohol Testing Programs (updated November 13, 2017).

U.S. Department of Transportation (DOT) rule, Title 49: CFR Transportation Part 199 – Drug and Alcohol Testing. (PHMSA)

U.S. Department of Transportation (DOT) rule, Title 49: CFR Transportation Part 382 – Controlled Substances and Alcohol Use and Testing. (FMCSA)

9 Definitions

Alcohol and drugs: Alcohol or drugs or both.

Company workplace: Includes all real or personal property, facilities, land, buildings, equipment, containers, vehicles, vessels, boats, and aircraft whether owned, leased, or used by the Company and wherever it may be located.

Contractor: A person, business or corporation which provides goods or services to the Company under terms specified in a contract.

Drug Paraphernalia: Includes any personal property which is associated with the use of any drug, substance, chemical or agent, the possession of which is unlawful.

Drug: Means any substance, including but not limited to: alcohol, legal or illegal drugs, medications, cannabis and cannabis related products, or other substances, the use of which has the potential to change or adversely affect the way a person thinks, feels or acts. For the purposes of this practice, drugs are those substances that may or do inhibit an employee's ability to perform his or her job safely and productively. Specifically, the following apply:

- **Alcohol** – refers to beer, wine and distilled spirits, and the intoxicating agent found in some medicines or other products, that may be consumed and has an alcoholic content in excess of 0.5 percent by volume.
- **Illegal Drug** – means any drug or substance which is not legally obtainable and whose use, sale, possession, purchase or transfer is restricted or prohibited by law (e.g., street drugs such as cocaine).
- **Medication** – refers to a drug intended for therapeutic use and obtained legally, either over-the-counter or through a licensed health care practitioner's prescription, and includes medically prescribed, legally obtained cannabis or cannabis related products.
- **Cannabis and Cannabis related products** – Includes those cannabis and cannabis related products that are legally obtained recreational substances, legally obtained medical substances or medications, and illegally possessed substances under local laws.

Alcohol and Drug Test: A test administered in accordance with this practice.

Designated Company Representative (DCR): Is a key contact for alcohol and drug program functions and information. A DCR receives test results from the Medical Review Officer (MRO) and Breath Alcohol Technician (BAT) and takes immediate action to remove employees from their safety-sensitive duties when there is a violation of the alcohol and drug practice. A DCR will have knowledge of the testing process and be able to answer questions and concerns. A list of Stantec's DCRs can be found on The Lens here (link).

Employee: Any person engaged in Company work or on a work site where this Practice applies.

Employee and Family Assistance Program (EFAP): Services that are designed to help employees who are experiencing personal problems such as drug and alcohol abuse.

Incident: Any unplanned event that adversely affects our employees, our business, its physical assets, the clients we serve, or the environment.

Laboratory: A laboratory providing urine-based drug testing services, certified by the United States Department of Health and Human Services (US DHHS) under the National Laboratory Certification Program, and accepted in Canada.

Manager: Includes team leaders and others in positions of authority.

Medical Review Officer (MRO): A licensed physician with knowledge of substance abuse disorders and the ability to evaluate an employee's positive test results who is responsible for receiving and reviewing laboratory results generated by an employer's drug testing program and evaluating medical explanations for certain drug test results.

Near Miss: Any unplanned event or action that, under slightly different circumstances, could have resulted in an incident adversely affecting our employees, our business, its physical assets, the clients we serve, or the environment. The severity of potential loss must be identified and taken into consideration.

Negative Test Result: A report from the medical review officer that the employee who provided a specimen for alcohol and drug testing did not have an alcohol and drug concentration level equal to or in excess of that set out in in this practice (Standard 4.1).

Positive Test Result: A report from the medical review officer that the employee who provided a specimen for drug and alcohol testing did have a drug or alcohol concentration level equal to or in excess of that set out in Appendix A.

Reasonable Grounds: Fair and sensible factors leading to a conclusion that an employee may be unable to work safely because of substance use. This includes information established by the direct observation of the employee's conduct or other indicators, such as the physical appearance of the employee, the smell associated with the use of alcohol or drugs on his or her person or in the vicinity of his or her person, his or her attendance record, circumstances surrounding an incident or near miss, and the presence of alcohol, drugs, drug paraphernalia in the vicinity of the employee or the area where the employee worked.

Rehabilitation Program: A program tailored to the needs of an individual which may include education, counseling and residential care offered to assist a person to comply with the alcohol and drug practice standards.

Safety Sensitive Work (SSW): A position or task in which the individual has a key and direct role in an operation where performance limitations due to substance use could result in a serious incident or near miss. The potential consequences of such an incident or near miss may include fatalities, serious injury to workers or the public, significant property damage, significant environmental damage or detrimental impact to reputation. The designation SSW may be determined by the client (for a specific project, location, or type of work), by regulation, or by Stantec.

Serious Incident: Any incident that is Severity Level 4; see Incident Severity table (HSSE Program Manual, s. 14.2 and s. 14.3).

High Potential Incident (HPI): An incident for which potential severity of loss is assessed to be a severity level of 4. That is, the severity had the potential to be a 4 given slightly different circumstances. HPIs can be incidents that result in injuries, illnesses, or damage to assets, the environment or company reputation, or they can be near misses. (HSSE Program Manual, s. 14.2 and s. 14.3).

Substance Abuse Expert (SAE): A licensed physician; a licensed or certified social worker; a licensed or certified psychologist; a licensed or certified employee assistance expert; or a drug and alcohol abuse counselor. He or she has received training specific to the SAE roles and responsibilities, has knowledge of and clinical experience in the diagnosis and treatment of substance abuse-related disorders, and has an understanding of the safety implications of substance use and abuse. May also be referred to as a Substance Abuse Professional (SAP).

Supervisor: The person who directs the work of others. This includes project managers.

Tamper: To alter, meddle, interfere or change.

Work: Includes all work performed by employees on behalf of the Company and includes training and any other breaks while at a Company workplace/site.

10 Documentation Summary

- DCR will maintain confidential files on testing requests and results.
- Service providers may maintain electronic files for an approved duration.

11 Revision History

Date	Change	Acknowledgments
October 24, 2025	Revision to DOT testing rate in 5.6 – removal of specific testing rates and addition of wording to use current published DOT rates; 5.9 revised dilute-negative language to remove urine recollection unless required by regulation or client. All caps text revised for ADA compliance. Added links for internal document references and updated existing hyperlinks. StanNet references updated.	P. Fox, AL. Albert, G. Burnett, J. Parker
April 4, 2019	Addition in 4.1.6 Searches to clarify process.	J. Lessard
May 21, 2018	1(b) add public; 2 removed "North America" and "version 5"; 4.1 addition for authorized medications and stipulation for disclosure prior to commencing work; 4.1.1 specific prohibition on cannabis or cannabis related products at social or hosted situations; 4.1.2 addition of cannabis for medical purposes; 4.1.4 addition of Administrative Suspensions to section heading, and potential for oral fluid or blood sampling; 4.1.5 addition of High Potential; 5.5 addition of High Potential; 5.7 removed one year period for Return to Duty and added that frequency and duration will be determined; 9.0 addition to definitions of drug, update of serious incident, and addition of High Potential incident.	J. Stone, J. Buckwold, C. Ferguson-Scott
February 1, 2018	Revisions to DOT 5-Panel per new final rule, effective January 1, 2018; updated DOT agency random testing rates.	C. Ferguson-Scott
November 7, 2014	Edit to section 4.1 for clarity.	C. Ferguson-Scott
April 1, 2014	New HSSE Practice.	C. Ferguson-Scott

1 Purpose

Stantec strives to provide a safe work environment for our employees, clients, and visitors. To ensure a safe workplace and to reduce the risk and/or threats of violence, harassment, intimidation and other disruptive behavior, all employees must review and understand all provisions of Stantec's Workplace Violence Policy.

This Workplace Violence Prevention Program has been developed to support Stantec's Workplace Violence Policy, HSSE Policy, and in accordance with appropriate occupational health and safety legislation.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 Scope

All Stantec employees are entitled to a workplace free from violence and harassment. In some areas, participation in a structured Workplace Violence Prevention Program is mandated by legislation. Please contact your regional HSSE Manager or regional Human Resources representative if you have questions or concerns.

3 Responsibilities

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this SWP by reviewing it on an annual basis or as conditions change
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements within this practice are being met
- Provide guidance regarding office security

3.2 Human Resources

- Provide input and expertise for program components; local support for Joint Health and Safety Committee (JHSC) members; facilitators for reporting and investigation processes
- Will familiarize themselves with the Workplace Violence Prevention Program, including:
  - Their roles (see Appendix A Workplace Violence Intervention and Follow-Up Procedures)
  - Background information (review applicable regulatory requirements)
  - Use of relevant tools (SWP-102b – Workplace Violence Hazard Assessment Questionnaire and HSSE Incident Report (RMS3))
  - Important resources (see section 8 Resources)

3.3 HSSE Manager and Advisors

- May, depending on the location, participate in hazard assessment and risk assessment activities
- Will familiarize themselves with the Workplace Violence Prevention Program, including:

- Their roles (see Appendix A Workplace Violence Intervention and Follow-Up Procedures)
- Background information (review applicable regulatory requirements)
- Use of relevant tools (SWP-102b – Workplace Violence Hazard Assessment Questionnaire and HSSE Incident Report (RMS3))
- Important resources (see section 8 - Resources)

3.4 Office Safety and Environment Coordinator (OSEC)

- May, depending on the location, participate in hazard assessment and risk assessment activities

3.5 Joint Health and Safety Committee (JHSC) or Equivalent

- Participate in hazard assessment and risk assessment activities; support program execution; report and monitor action items as submitted for management consideration
- Will familiarize themselves with the Workplace Violence Prevention Program, including:
  - Their roles (see Appendix A Workplace Violence Intervention and Follow-Up Procedures)
  - Background information (review applicable regulatory requirements)
  - Use of relevant tools (SWP-102b – Workplace Violence Hazard Assessment Questionnaire and HSSE Incident Report (RMS3))
  - Important resources (see section 8 Resources)

3.6 Office Leader/Regional Leader Designate

- Support program execution and provide consideration and feedback on recommended actions items
- Confirm yearly completion of Workplace Violence Prevention Program Assessment, using SWP-102a – Workplace Violence Inspection Form

3.7 Project Managers

- Consider potential for workplace violence as part of a project's Risk Management Strategy (RMS1), or Health and Safety Plan [HASP] (where applicable)

4 Hazards

Certain work processes, situations, and interactions can put people at risk from workplace violence:

- Work with the public
- Handle money or valuables
- Carry out inspection or enforcement duties
- Provide service, advice, or education
- Work with unstable or violent persons
- Work alone or in small numbers
- Work in community-based settings
- Drive a vehicle as part of the job
- Work during the late evening or early morning hours
- Use public transit during the workday
- Travel to other cities/countries
- Stay in hotels

5 Controls

5.1 Workplace Violence & Harassment and Discrimination Policies

Stantec has corporate policies for both Workplace Violence and Harassment and Discrimination. Both documents are readily available to all employees; please refer to The Lens for the most current versions.

5.2 Workplace Violence Hazard Assessment

To effectively prevent workplace violence, potential hazards associated with Stantec work and locations need to be identified.

SWP-102a – Workplace Violence Inspection Form: a tool to be used by JHSC members and/or local HSSE representatives on a yearly basis to guide a visual inspection of a workplace and the work carried out locally. Findings and recommendations from inspections will be submitted to the JHSC and/or local management and entered into Pro-Sapien.

SWP-102b – Workplace Violence Hazard Assessment Questionnaire: can be used in-person or for anonymous submission to identify any personal or historical issues in the workplace or general practice area. To be used by local HSSE representatives, or regional HR to obtain background information to consider for inclusion in action plans. Care must be taken as some information obtained by this tool could be considered personal in nature.

For field and project applications, the potential for workplace violence can be identified on the RMS1, prompting review and discussion of this SWP and its associated tools and materials. Appropriate control measures would then be communicated to the project team, included in the site-specific emergency response plan, and documented in the Field Level Risk Assessment (RMS2).

Findings of the hazard assessment and prevention measures will be communicated to employees and to project teams, as appropriate.

5.3 Development of Preventive Measures

The hazard assessment will identify most significant concerns for a location or project site. The next step is to develop specific control measures to eliminate or minimize these hazards. Controls can include training as well as improvements to workplace design, administrative practices, and work practices.

Stantec has a working library of Safe Work Practices (SWPs) which may be used at a local level to address hazards and risk. Topics related to workplace violence may include Working Alone and Working in Remote Locations. Please refer to The Lens for a complete listing of topics and documentation. Local documentation which may be used to outline control measures would include an office/site Emergency Response Plan (ERP).

Findings of the hazard assessment and prevention measures will be communicated to employees and to project teams, as appropriate.

5.4 Establishing an Emergency Response Plan

Issues of workplace violence must be taken into consideration when developing an emergency response plan for a project site or office.

Offices will document their procedures in their local Emergency Response Plan.

Project Managers who have identified potential risk for workplace violence on their RMS1 or HASP will document and discuss potential situations and controls with the on-site team and include any identified measures in their site-specific emergency response plan, as well as the Field Level Risk Assessment (RMS2).

5.5 Reporting and Investigation of Workplace Violence

Stantec does not tolerate any type of workplace violence committed by or against employees. The term "workplace" includes both Stantec premises and off-site locations. Employees, clients, or visitors of Stantec are prohibited from making threats or engaging in violent activities or other forms of abusive behavior such as bullying, shouting, belittling others, etc.

For a complete outline of the Workplace Violence Intervention and Follow-up Procedures, please refer to Appendix A (includes reporting, investigation, victim support and incident follow-up) and Appendix B Workplace Violence Reporting Form.

Issues of workplace violence which arise on a project site can be documented and reported using the Field Level Risk Assessment (RMS2). Reporting and investigation of these incidents should begin immediately as outlined in Appendix A.

Stop Work Authority – all Stantec employees are responsible and authorized to STOP work immediately if they become aware of an unsafe act or condition that could place anyone in danger, or if they are not confident in the work plan.

5.6 Providing Workplace Violence Training and Education

All employees must be provided information and instruction on:

- How to recognize violence and harassment
- Nature and extent of risks
- Controls in place to mitigate the risks
- How to summon help
- How to report incidents
- How the employer will investigate
- Acceptable vs. unacceptable behavior

Information on Workplace Violence, including Harassment and Discrimination, is contained within Stantec's Ethics and Code of Conduct online training, which is completed during new hire orientation and reviewed at designated intervals. This training includes review of Stantec's corporate policies for both Workplace Violence and Harassment and Discrimination. Additionally, there is a general policy and practice review incorporated into new hire orientation, and the Performance Review and Performance Management processes.

This SWP, the Workplace Violence Policy, and the Harassment and Discrimination Policy will provide resource material on an on-going basis. Please refer to The Lens for the most current version.

5.7 Conducting Program Review

The Workplace Violence Prevention Program will be reviewed by corporate HSSE on a yearly basis to assess whether it is functioning as intended and to share appropriate information across the company.

At a local level, the hazard and risk assessment process will be repeated on a yearly basis, or as conditions change.

Document the review utilizing SWP-102a – Workplace Violence Inspection Form and, if necessary, SWP-102b – Workplace Violence Hazard Assessment Questionnaire.

The purpose of this action is to review a physical location (office, field site) to identify hazards and risks which have the potential to be associated with workplace violence. The inspection is usually conducted by members of the Joint Health and Safety Committee (JHSC) but may also be performed by a local HSSE representative (Office Safety and Environment Coordinator/Regional HSSE Advisor).

Results and recommendations of this inspection will be submitted to local management through the JHSC and entered into Pro-Sapien. If no JHSC for a location exists, submission directly to local management is appropriate.

Please note: Contact your regional HR representative for guidance if/when any sensitive issues or feedback are reported.

6 Training or Qualifications

As outlined in section 5.6.

7 Outside Authorities to be Contacted

Be aware that in certain situations, it may become necessary to contact local law enforcement.

8 Resources

8.1 Internal

- Stantec - Office Security Guide
- SWP-102a – Workplace Violence Inspection Form
- SWP-102b – Workplace Violence Hazard Assessment Questionnaire
- Workplace Violence Policy
- Harassment and Discrimination Policy

8.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library
- Violence in the Workplace – Prevention Guide, 3rd ed., Canadian Centre for Occupational Health and Safety (2008)
- Enforcement Procedures for and Scheduling for Occupational Exposure to Workplace Violence, US Department of Labor, Directive Number: CPL 02-01-058, effective January 10, 2017
- Health and Safety Executive (UK): Resources including the guidance document Preventing Workplace Harassment and Violence can be found here www.hse.gov.uk/violence/

- Safe Work Australia: State and territory links and resources found here: https://www.safeworkaustralia.gov.au/safety-topic/hazards/workplace-violence-and-aggression
- Worksafe – Government of New Zealand – links and resources found here: worksafe.govt.nz/topic-and-industry/work-related-health/violence-at-work/

9 Definitions

N/A

10 Documentation Summary

- SWP-102a – Workplace Violence Inspection Form
- SWP-102b – Workplace Violence Hazard Assessment Questionnaire
- Workplace Violence Policy
- Harassment and Discrimination Policy
- Workplace Violence Intervention and Follow-up Procedures
- Workplace Violence Reporting Form
- Risk Management Strategy (RMS1) or Health and Safety Plan (HASP)
- Field Level Risk Assessment (RMS2)

11 REVISION HISTORY

Date	Change	Acknowledgments	Approval
July 30, 2025	Update to Sections 5.2 and 5.7 to reflect entering in Pro-Sapien. All caps text revised for ADA compliance. Updated HSSE Event Report to HSSE Incident Report.	D. Leifeld G. Burnett	K. Hancock
February 1, 2023	Administrative Update: Edits to 1 Purpose, 3.1 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Ferguson-Scott	P. Poelzer
December 17, 2020	Updates to links and references for migration from StanNet to The Lens; minor changes to formatting.	K. Bayer	C. Ferguson-Scott
January 29, 2020	Updates to branding and form naming throughout. Update to Responsibilities s. 3.0. Changed reference to CDPR process to Performance Review and Performance Management in s. 5.6. Updates to resources in s. 8.0. Terminology added to include regional equivalents of the Employee and Family Assistance Program (EFAP) and Workers' Compensation agencies in s. 12 (Appendices).	C. Ferguson-Scott	J. Lessard

Date	Change	Acknowledgments	Approval
December 15, 2016	Clarification in s. 5.7. Update 3.4 to clarify leadership role.	C. Ferguson-Scott	J. Lessard
June 15, 2016	Minor changes to wording and flow.	J. Buckwold, R. Roy, K. Bayer, C. Ferguson-Scott.	J. Lessard
June 13, 2012	Approved for posting.	C. Ferguson-Scott, G. Doran	P. Salusbury

Appendix A: Workplace Violence Intervention and Follow-up Procedures

Stantec strives to provide a safe work environment for our employees, clients, and visitors. To ensure a safe workplace and to reduce the risk and/or threats of violence, harassment, intimidation and other disruptive behavior, all employees must review and understand all provisions of Stantec's Workplace Violence policy.

Stantec does not tolerate any type of workplace violence committed by or against employees. The term "workplace" includes both Stantec premises and off-site locations. Employees, clients, or visitors of Stantec are prohibited from making threats or engaging in violent activities or other forms of abusive behavior such as bullying, shouting, belittling others, etc.

If you feel you are being subjected to violence in the workplace, please follow the steps as outlined below.

Step 1 (Employee)

Where possible, an employee who believes they have been subjected to an act of violence or harassment is encouraged to first clearly and firmly make known to the alleged offender (directly or with the assistance of a third party) that the harassment is objectionable and must stop.

The employee should then immediately report the alleged incident to their supervisor and/or to their regional Human Resources representative. If the employee does not feel safe to interact directly with the alleged harasser, they can go directly to their supervisor and or regional Human Resources representative.

Details of the incident should be recorded including the date and time, nature of the violence, and names of any person(s) who may have witnessed the violence. This document is the victim's personal record and property. A form for this purpose can be found at the end of this procedure.

To enlist assistance in taking further action, the employee must notify their regional Human Resources representative.

Step 2 (Regional Human Resources Representative)

When an incident occurs, the regional Human Resources representative debriefs the employee. This includes reviewing critical incident facts and a review of the employee's needs.

The regional Human Resources representative provides immediate assistance. This may include sending the employee to hospital or advising the employee to consult a health professional or support services of their choice for treatment.

If the employee refuses medical attention, HR documents the fact that the employee has been notified and understands this right and potential consequence of refusal.

Step 3 (Regional Human Resources Representative / HSSE / Legal)

The Human Resources representative and employee (together with the employee's supervisor where possible) complete an HSSE Incident Report (RMS3) in confidence that may be shared with HSSE and Legal representatives.

Step 4 (Regional Human Resources Representative)

Following an incident, any or all of the following may be provided:

- Physical support to the victim, such as immediate medical care

- Environmental support, which may include removing either the victim(s) or the offender(s) from the environment or adjusting the environment in order to reduce the potential for continued abuse
- Psychological support for the affected individuals (the victim, other workers, and the offender, if appropriate) through Stantec's EFAP (Employee and Family Assistance Program) or regional equivalent, other debriefing programs, counseling, or removal from the work environment
- Social support from co-workers, peers, supervisors
- Assistance to the employee in liaising with appropriate personnel or services, such as Workers' Compensation Claims Coordinator, law enforcement and legal assistance. Support in accessing these options, may include filing documentation with the agency that oversees Occupational Health and Safety and/or the Human Rights Commission

Step 5 (Employee / Regional Human Resources Representative/ Workers' Compensation Claims Coordinator)

If the employee consults a physician (or misses work) because of an incident, both the employer and the employee are required to make a report of the injury to the agency that administers the Workers' Compensation program, or regional equivalent.

Step 6 (Regional Human Resources Representative)

The regional Human Resources representative leads the investigation.

The regional Human Resources representative notifies all parties involved in the complaint and provides general information concerning the nature of the complaint.

Step 7 (Regional Human Resources Representative / Risk Management / HSSE)

Investigating parties are identified. Parties are viewed as impartial, non-biased, familiar, and knowledgeable with procedures relating to the subject of human rights. Please note the following:

- Incidents must be investigated promptly
- Written complaints are more reliable than verbal complaints, and whenever possible, a complainant is encouraged to sign their complaint
- Maintain confidentiality throughout
- Interview only those individuals absolutely necessary to maintain confidentiality
- The complainant and the alleged offender will have to be interviewed in every case
- Encourage those with knowledge of the case to not discuss the details with others
- Consider the safety of the complainant throughout the investigation

At the conclusion of the investigation, the regional Human Resources representative informs the employee and the involved parties of the results of the investigation.

Where an incident has been substantiated, appropriate action is taken. Where an incident has not been substantiated, no action will be taken against an employee who has made a complaint in good faith.

Step 8 (Corrective Actions)

In addressing the corrective actions, the team should consider:

- Impact of the abuse on the victim
- Nature of the abuse
- Degree of aggressiveness and physical contact in the abuse

- Period of time over which the abuse took place
- Frequency of the abuse
- Vulnerability of the victim

Referral of the offender to appropriate professional resources for assistance should be considered. The following are possible options which could be considered when taking corrective action:

- Apology
- Training
- Referral to EFAP or regional equivalent
- Reassignment or relocation
- Limiting access to certain areas of the organization
- Report to professional body
- Discipline (e.g., discharge)
- Filing a formal complaint or criminal charges

The investigating parties determine what further steps are needed to prevent a recurrence and take appropriate corrective action. Once the corrective actions have been implemented, the Investigation Report is completed and signed off by the assigned team for the incident: the Regional Human Resources representative, the Regional HSSE Manager, and/or Legal Counsel.

Appendix B: Workplace Violence Reporting Form

To be completed as supporting documentation in reporting any act of violence

Reporting Employee's Name: _____

Location: _____

Date of Incident(s): _____

Time and Location of Incident(s): _____

Name of Respondent(s): _____

Detailed Description of Alleged Offense(s): Please provide as much detail as possible regarding your incident. Include specific language, conversation, gestures, and actions. You may choose to submit this form to your regional Human Resources representative.

Name(s) of Witness(es) if any: _____

Incident(s) Reported to: _____

Time and Date Incident Reported: _____

Print (Reporting Employee)	Signature (Reporting Employee)	Date

Print (HR Representative)	Signature (HR Representative)	Date

□ Confidential - Copy to HR

HEALTH, SAFETY, SECURITY, AND ENVIRONMENT
SAFE WORK PRACTICE - SWP 104 - HAZARD COMMUNICATION - UNITED STATES
SWP-104

1 PURPOSE

This Safe Work Practice (SWP) provides a framework under which employees of Stantec working in the United States are adequately protected from hazardous chemicals. This program is written to meet the requirements of the Occupational Safety and Health Administration's (OSHA's) Hazard Communication (HazCom) regulations, Title 29 of the Code of Federal Regulations (CFR), § 1910.1200.

2 SCOPE

This SWP applies to all Stantec employees in offices and field operations in the United States who will or may be exposed to hazardous chemicals in the workplace. The HazCom Program will be made available to all employees and their designated representatives, as well as state or federal agency personnel as required by regulation (e.g., OSHA, the Chief of the California Division of Occupational Safety and Health (Cal/OSHA) and the National Institute for Occupational Safety and Health [NIOSH].)

Note: For the purposes of this SWP, the term "hazardous chemicals" does not apply to consumer products that are used in the workplace in the same way they would be by a consumer. Examples include dish soap used to wash dishes in a workplace break room; cleaning products used for cleaning workstations; and general office supplies like Wite-Out™ correction fluid and printer/copier supplies. Consumer products are only considered to be hazardous chemicals when the duration and/or frequency of use exceeds that of a normal consumer.

3 RESPONSIBILITIES

3.1 Manufacturers, Importers, or Distributors

- Evaluate and classify the hazards of the chemicals they produce or import
- Ensure that all containers of hazardous chemicals that leave their facilities are properly labeled with HazCom-compliant labels
- Obtain or develop a Safety Data Sheet (SDS) for each hazardous chemical they produce or import and ensure that employers are provided an appropriate SDS with their initial shipment and the first shipment after an SDS is updated

3.2 Health, Safety, Security, and Environment (HSSE)

- Maintain this SWP
- Assist with interpretation and methods of compliance with this SWP
- Perform periodic formal and informal audits to verify whether the requirements within this SWP are being met

3.3 Office Leader or Regional Delegate

- Verify that an inventory of hazardous chemicals stored or used in the office is developed and maintained using the product name or identifier that is referenced on the appropriate Safety Data Sheet (SDS)
- Confirm that current SDSs for all hazardous chemicals be maintained and readily available to employees

3.4 Supervisor

- Provide access to HazCom training for employees who will or may be exposed to hazardous chemicals in the workplace
- Verify that affected employees have completed the HazCom training as well as the periodic review of this SWP as specified in the Safe Work Practices Checklist and process

3.5 Project Managers (PMs)

- Communicate with clients regarding potential exposure to hazardous chemicals on the worksite
  - Stantec PMs will document chemicals Stantec is bringing on site, including those brought on site by subcontractors, if applicable.
  - Clients will document chemicals that Stantec teams may be exposed to during the execution of work, including those used by other contractors, if applicable.
- Inform employees regarding hazardous chemicals specific to their projects and/or work areas and provide access to SDSs for products to which they may be exposed
- Document hazardous chemicals and appropriate controls on the Risk Management Strategy (RMS1) or the project-specific Health and Safety Plan (HASP)
- Verify that employees performing project work have completed HazCom training as necessary
- Replace supplier labels that are damaged, worn, or illegible with HazCom-compliant workplace labels
- Verify that an SDS has been provided for each hazardous chemical received; if an SDS is not provided, request it from the vendor or supplier as soon as possible

3.6 Lab Managers

- Inform employees regarding hazardous chemicals specific to their projects and/or work areas and provide access to SDSs for products to which they may be exposed
- Replace supplier labels that are damaged, worn, or illegible with HazCom-compliant workplace labels
- Verify that an SDS has been provided for each hazardous chemical; if an SDS is not provided, request it from the vendor or supplier as soon as possible

3.7 Office Safety and Environment Coordinator (OSEC)

- Maintain an inventory of all hazardous chemicals stored or used within the office and/or lab
  - Review the inventory for accuracy on a yearly basis; less-hazardous replacement products may be recommended
- Establish and maintain an SDS collection within the office that is complete, up-to-date, and readily available. (Stantec subscribes to a service called MSDSonline to assist in this task. Please contact your regional HSSE Manager or Advisor for details.)
- Make workplace label templates available
- Replace supplier labels that have become worn or illegible with HazCom-compliant workplace labels

3.8 Employees

- Review this SWP, as required per the Safe Work Practice Review checklist and process
- Complete the initial HazCom training as well as any additional training required when new hazards or chemicals are introduced in the workplace
- Review the SDS prior to handling or using a new hazardous chemical
- Wear PPE as required in the SDS and/or the Risk Management Strategy (RMS1)/ Health and Safety Plan (HASP)
- Notify the PM, Lab Manager, and/or OSEC (as appropriate for the worksite) when a supplier label has become worn or illegible, an SDS is missing, or if there are any other health and safety concerns
- Discontinue use of a hazardous chemical if it is not labeled properly and notify the PM or Lab Manager
- Affix HazCom-compliant workplace labels for products transferred to containers other than the original container

3.9 Vendors and Subcontractors

- Check in with the appropriate Stantec representative and provide them with a chemical inventory consisting of all hazardous chemicals being brought into the office or on-site and the corresponding SDS
- Ensure that all containers of hazardous chemicals being brought into an office or on-site are affixed with the appropriate warning labels

4 HAZARDS

Hazards arising from hazardous chemicals are described in detail in the SDS and are shown on supplier labels and/or workplace labels.

Exposure to hazardous chemicals can cause or contribute to a variety of health effects such as irritation, burns, sensitization, heart ailments, kidney and lung damage and cancer. Some chemicals may also be a safety hazard and can contribute to fires, explosions and other incidents if not properly stored or handled.

4.1 Hazardous Chemicals On-site

Stantec does not typically store large amounts of hazardous chemicals in its offices and labs, nor does Stantec transport bulk chemicals. Periodically, small quantities of hazardous chemicals are used to calibrate or fuel field instrumentation (e.g., photo ionization detectors, flame ionization detectors, field gas chromatographs, etc.) These chemicals may include:

compressed isobutylene	compressed methane	tetrahydrofuran
compressed hydrogen	compressed nitrogen	trichloroethylene
compressed ultra-pure air	acetone	vinyl chloride
benzene	2-butanone	cleaning products
1,1-dichloroethane	1,2-dichlorethane	toluene
ethylbenzene	hexane	1,1,1-trichloroethane
hydrochloric acid	hydrogen peroxide	xylene
isopropyl alcohol	methanol	tetrachloroethene
methylene chloride	methyl ethyl ketone	1,1,2,2-tetrachloroethane
methyl isobutyl ketone	4-methyl-2-pentanone	sodium hydroxide
methyl tert-butyl ether	nitric acid	sulfuric acid
pentane	propane	

Each employee working with the chemicals listed above will be given instruction that will allow safe use, handling, storage, and disposal of the products. These chemicals are used in very small quantities, often less than 1 ounce (50 mL) each, and at any one time there may only be a few chemicals present in the workplace.

Stantec personnel may also be exposed to chemicals in the soil, water, and air while working at Hazardous Waste Operations and Emergency Response (HAZWOPER) sites. The HAZWOPER standard, 29 CFR 1910.120, includes requirements for employees to work safely in those environments.

Chemicals destined for disposal will be treated as hazardous waste. Appropriate labels must be maintained on the containers. US Department of Transportation (DOT) Hazardous Materials Transportation requirements must be reviewed and implemented prior to shipment.

Always consult the SDS for potential health hazard exposures and follow the precautions noted on the SDS. Where more detailed procedures or controls are required by the client or the contractor responsible for the work site, the PM will coordinate with them and provide the necessary information and any required training to employees required to work there. This information will be used by the PM when the Risk Management Strategy (RMS1) is completed.

5 CONTROLS

5.1 HazCom Program Requirements

State and federal regulations require all employers with hazardous chemicals in their workplaces to develop, implement, and maintain a written HazCom program. At a minimum, those programs must include three elements: labels, SDS, and employee training.

5.1.1 Labels

Labels are placed on hazardous chemical containers to alert employees to the dangers of the products and to the basic safety precautions to be taken while using them.

5.1.1.1 Supplier Labels

Chemical manufacturer, importers, or distributors are required to ensure that each container of hazardous chemicals leaving their workplace carries a label. These supplier labels must be in

English (although other languages may be included if appropriate) and must have the following sections:

- Product identifier
- Hazard pictograms
- Signal word
- Hazard statements
- Precautionary statements
- Name, address, and telephone number of the manufacturer, importer, or other responsible party

Supplier labels must not be removed or defaced unless the container is immediately marked with the missing information, such as through the use of a workplace label.

5.1.1.2 Workplace Labels

Workplace labels are created and used when the original supplier label is damaged, worn, or illegible, or when a hazardous chemical is transferred to another container. Workplace labels may contain all of the information required for the supplier label. If they do not, they must include the product identifier and provide general information regarding the hazards of the chemical. These labels must be sufficient, when used with training, the SDS, and other readily available information, to provide employees with specific information about the chemical's physical and health hazards.

Note: if the product is being transferred to a portable container for immediate use by the employee who performs the transfer, a label is not required.

5.1.2 Safety Data Sheets (SDS)

SDSs are technical bulletins that provide detailed hazard and precautionary information about a product. They have sixteen sections:

1. Identification	9. Physical and Chemical Properties
2. Hazard Identification	10. Stability and Reactivity
3. Composition/Information on ingredients	11. Toxicological Information
4. First Aid Measures	12. Ecological Information
5. Fire-fighting Measures	13. Disposal Considerations
6. Accidental Release Measures	14. Transport Information
7. Handling and Storage	15. Regulatory Information
8. Exposure Controls/Personal Protection	16. Other Information (including revision date)

SDSs are created and maintained by the manufacturer or importer, who must ensure they are distributed to the employer. In turn, the employer must provide employees with ready access to SDSs for hazardous chemicals to which they may be exposed.

If an SDS is not provided with a hazardous chemical, employees cannot use the product until an SDS has been obtained from the supplier (or MSDSonline) and reviewed.

5.1.3 Employee Training

See section 6.

5.2 Hierarchy of Controls

Stantec uses the hierarchy of controls to eliminate or minimize exposure to hazards. The hierarchy is based on the effectiveness of each type of control, which are listed below in order of decreasing effectiveness:

- Elimination/Substitution:
  - If a hazardous chemical's use or presence can be eliminated, then it should be.
  - If a chemical that is less hazardous can be utilized to perform the same function, and it is reasonable to do so, use the less-hazardous chemical instead.
- Engineering Control: When the use or presence of a hazardous chemical cannot be eliminated, implement appropriate engineering controls, such as ventilation, enclosures or other barriers, fume hoods, etc.
- Warnings: Where appropriate, storage areas should be labeled or placarded to indicate contents, and areas of use should have precautionary information posted.
  - Incompatible chemicals must be segregated in accordance with legislation (e.g., flammable materials and oxidizers must be kept separate).
  - Label and decanted product requirements do not apply to hazardous chemicals contained in or transferred through piping or vessels (such as process vessels, reaction vessels, tank cars, or ore cars). Stantec employees should be aware that identification conventions can vary between worksites.
- Administrative Controls: Limiting the amount of time a person is exposed to a hazardous chemical or rotating job assignments are examples of administrative controls.
- Personal Protective Equipment (PPE): PPE is the lowest level in the hierarchy of controls since PPE only places a barrier between the employee and the hazard.
  - PPE requirements are identified in the SDS. Other reference materials can also be used, such as the NIOSH Pocket Guide to Chemical Hazards and PPE compatibility charts.
  - For more information on the selection and use of PPE, refer to SWP-105 – Personal Protective Equipment (PPE).

5.3 Client Sites

On sites where there is the potential for exposure to hazardous chemicals, the PM will coordinate with the client (or other responsible party) on the required controls and procedures.

The SDS will be consulted prior to any potential exposure, with precautions noted on the SDS implemented to limit exposure. Where more detailed procedures or controls may be required by client or contractor, the PM will coordinate and provide the necessary information and, if required, training, to the employees.

A client (or subcontractor) may also use signs, placards, process sheets, batch tickets, operating procedures, or other such written documentation instead of applying labels to "fixed in place" process containers, as long as the documentation identifies the stationary containers, and provides the required information on a label. On construction sites, the same type of documentation may be used in lieu of labels on individual containers as long as it meets the requirement for information on a label.

5.4 Office and Lab Locations

Each office and lab will develop and maintain an inventory of all hazardous chemicals that are stored or used in that location. The product identifiers listed will match those on the corresponding container labels and SDSs. The inventory will be readily available for reference.

5.5 Storage of Hazardous Chemicals

- Hazardous chemicals will be stored in a clean and organized manner, with attention to their characteristics (flammable, combustible, etc.) and relative compatibilities. Consult Section 7 of the SDS, Handling and Storage. If hazardous chemicals are required proper storage and good housekeeping will assist in the prevention of spills.
- Hazardous chemicals will be stored in proper containers and in proper storage locations including the use of secondary containment to minimize the potential for spills, when appropriate.
- All hazardous chemicals used or stored at a worksite must be clearly identified with proper HazCom-compliant labels. They must be used and stored in such a way that they do not pose a hazard to workers.
    - Periodically inspect containers for proper labels and warnings.

5.6 Spill Prevention and Response

- In the event of an uncontrolled release, Stantec personnel and their subcontractors will follow the site-specific (office, facility, field location) emergency response plan, including communication with the appropriate Stantec and/or client personnel.
- An adequate number of spill kits must be available to handle the quantity of hazardous substances/materials/wastes that could potentially spill.
- The spill kits should be staged for immediate access without exposing the responder(s) to any hazards.
- The supplies, equipment, and materials in the spill kit need to be compatible for the materials involved.
- Only those personnel who are trained in emergency spill response should attempt to contain or arrest the release.

6 TRAINING OR QUALIFICATIONS

All Stantec employees in the United States who work with or may be exposed to hazardous chemicals will receive HazCom training. Training will be completed upon hire or prior to their initial assignment to areas or tasks where exposure may occur. Training may not be transferred from a previous employer.

Initial training will be provided electronically via Stantec's Learning Management System (LMS). HSE 1220: HazCom/GHS Online covers:

- Program overview and legal requirements
- Responsibilities and rights
- Labels and warnings
- SDSs and how to read and understand them
- Hazards and safe work procedures for controlled products
- Spill prevention, first aid, and emergency response procedures

Office, lab, and site-specific instruction will be given, where required, covering site-specific labeling systems, SDS location, PPE requirements, etc. Hazardous chemicals are not to be used until an SDS is provided by the supplier and precautions have been reviewed.

HazCom training will be refreshed if exposure to hazardous chemicals is impacted when:

- Work conditions or locations change
- Work procedures change
- There is a change to a controlled product
- Updated hazard information becomes available
- There is a client-specific requirement

The extent of the refresher may vary by duties and/or need.

Employees required to work on or around hazardous waste sites will also refer to SWP-314 – Working around Hazardous Waste and Wastewater.

Training documentation will include the trainees name, training dates, the training title (brief description of the training), and the training provider's name. Documentation will be retained in the employee's training record.

7 OUTSIDE AUTHORITIES TO BE CONTACTED

Not applicable.

8 RESOURCES

8.1 Internal

- SWP-105 – Personal Protective Equipment (PPE)
- SWP-314 – Working around Hazardous Waste and Wastewater

8.2 External

- OSHA HazCom Standard: 29 CFR §1910.1200
- US DOT Hazardous Materials Transportation Regulations
  - 49 CFR Parts 100-185
  - *How to Comply with Federal Hazardous Materials Regulations*
- California: Title 8 of the California Code of Regulations, §5194 Hazard Communication
- *NIOSH Pocket Guide to Chemical Hazards*

9 DEFINITIONS

Chemical: Any element, chemical compound, or mixture of elements and/or chemical compounds

10 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- HazCom training records
- Site chemical inventory
- SDS for all materials maintained in the office

File these records in the Project Health & Safety File:

- Project chemical inventory

- SDS for all materials required on the project site

11 REVISION HISTORY

Date	Changes	Acknowledgments	Approval
December 15, 2021	Scope updated to exclude consumer products; Responsibilities, Controls, and Training sections updated for clarity and consistency with current processes and practices, as well as GHS and regulatory standards. Minor edits throughout for terminology and formatting.	K. Bayer	J. Treen
February 27, 2015	Minor wording edits to meet Cal/OSHA requirements.	C. Ferguson-Scott	C. Ferguson-Scott
July 4, 2014	Edit to scope and requirements for refresher training.	K. Robinson	K. Robinson
December 18, 2013	Revision for GHS content and addition of training information.	K. Robinson	K. Robinson
July 24, 2013	Revision for minor content and format.	C. Ferguson-Scott	C. Ferguson-Scott
August 26, 2010	Initial submission to StanNet.	K. Robinson	K. Robinson

1 Purpose

Stantec employees work on a variety of sites, with many different specific hazards. To protect employees working in these environments, hazards must be assessed, and all employees must use the proper Personal Protective Equipment (PPE) identified by that assessment. PPE used by Stantec employees will conform to applicable regulatory requirements.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to Section 8.0 Resources > External.

2 Scope

This practice is to be followed by all Stantec employees and subcontractors while performing their work tasks after a hazard assessment has been carried out to determine the required PPE. Specific requirements may be found within local regulations. This SWP will be reviewed on an annual basis to verify it is meeting the appropriate standards and legislation as they are revised.

PPE is to be considered an employee's last line of defense. Other avenues should be pursued first (where reasonably practicable) to mitigate the employee's exposure to a site's identified hazards. These include elimination of the hazard, substitution of safer materials or processes, engineering controls, and administrative controls. Only after these are considered should PPE requirements be assessed.

Reimbursement policies for personal PPE (prescription safety glasses and safety footwear) will be determined by each Business Center Operations Leader (BCOL) (refer to Section 5.3).

3 Responsibilities

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this Safe Work Practice
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements within this practice are being met

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP
- Determine the practice for prescription safety glasses and safety footwear within your BC

3.3 Project Manager

The PM has the primary responsibility for implementing this practice. This responsibility includes:

- Evaluate the chemical, biological, environmental, mechanical, radiation and/or noise hazards associated with every project to determine what PPE is required. This evaluation will be documented using the Risk Management Strategy (RMS1) form, Health and Safety Plan (HASP), or SWP-105a – PPE Hazard Assessment form

- Use only employees trained as required in this practice so that employees will be able to select, use and properly maintain their PPE
- Provide the required protective equipment to employees and reimburse as described in this practice
- Require employees to use the PPE that is required for their tasks. This can be addressed in the site inspections that are required by Project Managers
- Maintain and use applicable equipment in accordance with this practice

3.4 Field Employees

- Take every reasonable precaution to protect their personal health and safety, and that of their coworkers
- For situations where a Risk Management Strategy (RMS1) or Health and Safety Plan (HASP) is not required, SWP-105a – PPE Hazard Assessment will be completed
- Be aware of and comply with requirements outlined in this SWP
- Be responsible for obtaining the prescribed safety equipment through their Project Managers or other approved sources
- Select and use appropriate PPE, together with the tools and equipment required to conduct the work safely
- When handling chemicals such as acids, caustics, hydrocarbons or any other harmful substances, use appropriate PPE or other means to provide adequate protection against these hazards
- Follow manufacturer instructions, inspect PPE for cleanliness and defects prior to each use. Worn or deteriorated parts must be immediately reported to a supervisor and either repaired or replaced immediately. Any maintenance or repair on PPE must be done in accordance with the training and instruction provided. PPE that is no longer fit for use must be disposed of responsibly
- Know the proper use and limitations of the assigned PPE
- Use the required PPE in accordance with the training provided
- Inform other individuals when safety devices are not being (properly) used
- Will not wear PPE outside of the work area where it is required if doing so could create a hazard to the employee or to others
- Any protective clothing or other safety device that is worn next to the skin must be cleaned and disinfected prior to use by another employee
- As a minimum, when visiting a project site, have the following equipment on-hand:
- Hard hat/safety helmet
    - Safety glasses
    - High visibility apparel
    - Safety footwear
    - Gloves appropriate for anticipated hazards
    - Appropriate hearing protection

Note: The PPE used must satisfy the standard cited in the local regulations and/or client requirements, whichever is most stringent. Employees have the option of exceeding minimum PPE requirements

4 Hazards

- Bodily injury

- Occupational illness or disease
- Death

5 Controls

5.1 Hazard Assessment

The Stantec Project Manager, or their designee, will perform the site hazard assessment to determine potential hazards, and to identify the required PPE for employees assigned to perform operations in the identified location. Where applicable, the site owner/operator will be consulted by the Project Manager to obtain the minimum requirements for PPE to be worn by Stantec employees.

Each workplace hazard assessment will include a written confirmation that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment. The hazard assessment phase is carried out using the Risk Management Strategy (RMS1) or if required, the site-specific HASP. An RMS1 Form or a HASP will be completed for all projects prior to beginning field work.

For situations where a Risk Management Strategy (RMS1) or Health and Safety Plan (HASP) is not required SWP-105a – PPE Hazard Assessment will be completed.

Personal protective equipment will:

- Be selected and used in accordance with recognized standards, and provide effective protection
- Not in itself create a hazard to the wearer
- Be compatible, so that one item of personal protective equipment does not make another item ineffective
- Be maintained in good working order and in a sanitary condition
- Fit the intended user appropriately; allow time for delivery and for verification from employee.

5.2 Selection

Note: Jurisdictions may make reference in their OHS legislation to different revisions of the same standards (e.g., CSA or ANSI); references made in this SWP to particular standards should be taken as examples only.

5.2.1 Head Protection

Every employee working on or visiting a project site with identified head-strike hazards will possess a hard hat/safety helmet approved by the applicable local standards.

For North America, types and definitions are listed below. Outside of North America, please consult your local legislation and standards where applicable. All head protection must be appropriate for the conditions and the tasks for which they are being used.

- Type I hard hats/safety helmets are designed to reduce the force of impact resulting from a blow to the top of the head.
- Type II hard hats/safety helmets are designed to provide protection against both side impact and blows to the top of the head.

Electrical protection classes are as follows:

- General (G) – up to 2,200 volts

- Electrical (E) – up to 20,000 volts
- Conductive (C) – no electrical protection

Approved hard hats/safety helmets must be worn when working under any of the following conditions:

- At all construction, excavation, or road building sites
- When working as a flag person
- When working with or near any mobile equipment such as backhoes, bulldozers, drills, or cranes
- In heavily wooded areas with the potential of overhead limbs falling
- In all posted, designated areas
- In all other areas where a potential hazard to the head exists from falling, flying or thrown objects, or from other harmful contacts
- Employees riding on off-road vehicles such as quads, ARGOs, Rhinos, or snowmobiles must wear DOT or Snell-approved helmets with chin and face protection. See SWP-505 – Off-Road Vehicles for more information.
- When specifically directed by a client

Hard hats/safety helmets must be inspected before each use by the user, be kept in good clean condition and if found defective, be replaced immediately. Employees are not permitted to wear head protection that has been damaged, structurally modified, subjected to severe impact, painted, or cleaned with solvents.

Even with careful use, a hard hat/safety helmet has a limited lifespan. Frequent use and exposure to chemicals, or UV radiation can cause damage that will reduce its ability to protect the wearer from impact. Follow the manufacturer's recommended replacement schedule . Personal usage pattern may warrant more frequent replacement. For reference, the date of manufacture is typically stamped on the underside of the brim.

If hard hats/safety helmets are not required as part of the work, employees must ensure that appropriate head protection is worn to protect the employee from environmental hazards such as sunburn, heat stroke, or frost bite.

5.2.2 Hearing Protection

Stantec employees will be required to wear appropriate hearing protection while working in areas with noise exposures at or above hazardous noise levels as determined by regional requirements.

Please refer to SWP-106 – Noise Control and Hearing Conservation for additional details on noise exposure limits and the use of hearing protection devices.

5.2.3 Eye and Face Protection

Every person working on or visiting a project site must carry approved protective eye and/or face protection. Eye protection must be fitted with side shields. The appropriate eye protection must be worn when the potential for eye injury exists.

- Clean eye and face protection regularly and replace when it becomes pitted or scratched.
- Tinted or shaded glasses will not be worn at night, indoors or in poor light conditions.

- To help prevent eye and face injuries, employees who work in areas where there is a possibility of flying particles or splash will wear protective eye and/or face wear that conforms with local standards.
- The appropriate reference depends on the type of protection and/or local regulatory requirements. Approved eye and/or face protection (including glasses, goggles and/or face shield) will be worn while:
  - Working in any Stantec laboratory
  - Performing work which might cause foreign particles, dusts, chemicals, or vapors to enter the eyes
  - Working on any construction site
  - Exposed to arc flash from welding operations
  - Working in bright sunlight or exposed to other extremely bright light services
  - Anytime specifically directed by a client

Secondary eye protection in the form of a full-face shield will be worn at all times when job tasks present the potential for chemical facial-splash (e.g., performing contaminated ground water sampling, tank cleaning, and examination of drill cuttings, using hazardous cleaning compounds, or high-pressure sprayers, or performing tasks associated with buffing or grinding).

Note: Many face shields by themselves do not provide adequate eye protection, and must be worn with safety glasses, or where chemicals or high pressure are present, goggles. Contact your HSSE representative for clarification.

Employees that require corrective lenses and who regularly wear safety glasses will be provided, in accordance with Section 5.3, prescription safety glasses that meet the regulatory requirements for impact resistance and will have permanently attached side shields that conform to the applicable local standard. The following requirements apply to prescription safety glasses:

- Eye examinations are at the initial expense of the employee – reimbursement programs will vary by region.
- As indicated in the table in Section 5.3, the reimbursement policy for prescription safety glasses is determined by each BCOL.
- Prescription safety glasses must meet the following guidelines to be acceptable as approved safety eye wear:
  - Frames and plastic lenses must meet or exceed the applicable local standards.
  - The eyewear must be equipped with clear plastic top/side protection shields. Stantec requires permanently attached side-shields.
  - The glasses must be marked as required to indicate that they meet the applicable local standards for protective eyewear.
- Where BCOL approves of reimbursement, lost or misplaced prescription safety glasses must be replaced at the employee's expense.
- Employees that require corrective lenses and who only on occasion need eye protection can wear safety glasses specifically designed to be worn over prescription glasses.

Employees who intend to wear contact lenses must inform their PM or their Office Safety and Environment Coordinators (OSEC) and their first aid attendants so that proper first aid may be promptly administered if necessary. No worker will wear contact lenses where:

- Gases, vapors, or other materials are present which, when absorbed by contact lenses, may harm the eye
- Dusts or other materials are present which may harm the eyes or cause distraction which may expose the worker to other injury
- Prohibited by the client due to the work environment

5.2.4 Hand Protection

- Stantec will select, provide, and require its employees to use appropriate hand protection when hands may be exposed to biological, chemical, extreme temperature or environmental hazards, or to physical hazards that may lead to cuts, lacerations, abrasions, punctures, or burns.
- One type of glove will not work in all situations. Glove selection will be based on the tasks to be performed, the perceived hazards, the gloves' performance requirements, the working conditions, and the duration of use. Additionally, glove selection will take into account manufacturers' guidelines, host-facility hand protection requirements, and/or the Stantec Project Manager's evaluation.
- Disposable gloves are designed for one-time-use, while re-usable gloves may be decontaminated by neutralizing/cleaning methods suggested by the glove manufacturer. Note that gloves that afford protection from electrical hazards have inspection and (re)certification requirements that must be followed.
- A thorough inspection is required before use or during use if leakage is suspected, or after any decontamination occurs. If reusable gloves become worn and no longer provide protection, they must be discarded, and new ones obtained.
- Where possible, gloves should be inspected by inflating them with air to check for pinholes, cracks, or excessive wear. Defects will prohibit their use and replacements must be obtained before work can begin.
- Gloves should not be worn when there is a risk of catching in operating mechanized devices. If there is a possibility of frostbite, gloves must allow for proper manipulation of the apparatus and be easily removable.
- If an employee is working with a chain saw, gloves with cut resistant back of the hand should be used.

5.2.5 High Visibility Clothing

- Employees in work zones where vehicles are traveling in excess of 30 km/hr (20 mph) will wear high visibility apparel. Different jurisdictions may have specific requirements for the type of apparel that will be required; please contact your HSSE representative.
- Various job sites require the employee to wear a high-visibility safety vest. They must be kept in good clean condition and replaced immediately if found to be defective or faded. If the vest is to be worn over fire retardant clothing, the vest, striping, and thread must also be fire retardant.
- Where an entanglement hazard exists, the high-visibility safety apparel will be the break-away type and will be used as designed. It will be designed to separate in such a way that no section encircles any part of the body. Entanglement hazards include rotating equipment as well as projections or snagging points on a moving vehicle, machine, or object.
- Approved high-visibility safety vests will be worn under the following conditions:
  - On all excavation or drilling sites

- On all construction or road building sites where there is vehicular activity
- On or near roads or highways, including work done by flag persons
- Work in remote or forested locations
- On client properties requiring them and
- During hours of darkness

5.2.6 Clothing and Attire

- Shirts will be worn in all instances at all work sites. Short-sleeved shirts are acceptable if a long-sleeved shirt results in an unacceptable risk of heat exposure. The wearing of short-sleeved shirts must be evaluated versus the risk of burns or skin exposure, with justification and approval documented on the assessment form utilized. Tank tops and sleeveless shirts are not permitted on any work sites. When long sleeve shirts are required, they will be rolled all the way down and buttoned.
  - On all HAZWOPER (US) sites, 100% cotton long sleeve shirts are required.
- Shorts or cut-off pants will not be worn at any work site.
- If there is a risk of exposure to molten metal, infectious substances or dangerous tools, employees must wear appropriate protective attire (e.g., protective apron, hood, or arm/leg pads).
- Loose clothing, long hair, dangling accessories, jewelry or other similar items that are likely to be a hazard will not be worn around machinery or electrical equipment unless they are tied, covered, or otherwise secured so they prevent the hazard. (See also Section 5.2.7.)
- In all cases, body attire must comply with or exceed client/owner site requirements.

5.2.7 Jewelry

Typically, jewelry related incidents and injuries happen to workers wearing dangling neckwear, rings, bracelets, wristwatches, body piercings or similar items. These items can come into contact with, get caught in or struck against objects, energized equipment, and moving parts of machinery. When working in a field or lab setting or in locations where staff work on or near equipment these industry best practices must be considered:

- Hair: Must be suitably covered or contained to prevent entanglement.
- Neckwear: Must be worn inside the shirt at all times and must not be permitted to fall out.
- Bracelets: Must not be worn except for Medic Alert. It is recommended that employees purchase the type of medical alert bracelets with a break away clasp.
- Rings: Must not be worn when there is a risk of entanglement, catching on objects, or exposure to chemicals that can cause injury to the skin.
- Earrings: Must be small, stud or sleeper type. Lobe gauging must be solid style.
- Piercings: Body piercings that risk entanglement or injury must be removed.
- Watches: Must be removed or completely covered by clothing cuffs and remain covered for the duration of the work activity. Watchstraps should be fitted with a quick release catch.

5.2.8 Fire Retardant and Arc Flash Clothing

- Employees must wear properly fitted fire retardant clothing as an outer layer if the hazards of the work may subject the employee to the threat of flash fires, molten metal, welding, gouging, or burning.
- Fire retardant clothing must meet the requirements of the authority having jurisdiction for fire resistance and should only be laundered according to manufacturers' guidelines. Failure to adhere to these guidelines may diminish the protection of the garment.
- On project sites where personnel could be exposed to energized or potentially energized conductors, the need for arc protection clothing should be assessed. See SWP-406 - Electrical Safety Program for additional guidance.
- It is strongly recommended that 100% natural fiber clothing (cotton, wool) should be worn underneath fire retardant clothing. The use of fusible synthetic materials (e.g., polyester/nylon blends) is strongly discouraged. An incidental amount of elastic used on non-melting fabric underwear or socks is permitted. Polyester blends will melt to the skin if an employee is subjected to a flash fire.
- If warm temperatures are expected while wearing fire retardant coveralls, a minimum layer of clothing worn under the coveralls should be a short-sleeved T-shirt and shorts. The more clothing worn under the coveralls, the higher the level of protection in the case of a flash fire.
- Any disposable coveralls, rain wear, or chemical gear used as an outer layer must be of flame-resistant material with regular FRC clothing worn as the primary layer.

5.2.9 Skin Protection

- Every precaution must be taken to protect the skin through the proper use of clothing, shields, or cream (e.g., sun block or barrier cream) when there is a hazard of injury or disease to or through the skin. It is important to ensure that PPE such as safety glasses and hard hats/safety helmets are not worn when applying sunscreen or insect repellent as these compounds can permanently damage the PPE.
- Evaluations to determine appropriate skin protection must include a review of potential hazards from biological hazards, such as poison ivy and/or insects (e.g., ticks, black flies, wasps, etc.). In cases of extreme exposure to insects (e.g., heavily forested areas), the use of insect netting around the face and neck should be evaluated, including the size of mesh used.
- See Section 5.2.6 on Clothing and Attire for additional information.

5.2.10 Leg Protection

- Leg protective devices (e.g., ballistic pants and chaps) will be worn by employees using chain saws or other potentially hazardous equipment, and where risk of snake bite or other hazard of leg injury exists.
- Refer to SWP-518 – Using a Chainsaw and SWP-508 – Preparing for Animal Encounters.

5.2.11 Foot Protection

- Depending on the national jurisdiction in which the work occurs, where there is potential hazard of impact to the toes or metatarsal area, or a risk of injury to the soles of the feet, employees must wear safety footwear designed to comply with local regulation. Employees must wear safety footwear under any of the following conditions:
  - In all excavations

- In all pipe laying work
- At all construction sites or road works
- While conducting traffic control (i.e., all flag persons)
- At all environmental and geotechnical investigation or remediation sites
- When loading or unloading heavy material or equipment
- When working in Stantec materials laboratories
- Where risk of foot injury exists in Stantec environmental laboratories
- In Stantec warehouses
- Where required by clients

- In all areas outside of an office environment, it is mandatory to wear an appropriate work boot or work shoe that is appropriate for the hazards identified. In no case will athletic, open-toed, cowboy boot, or light cloth shoes be acceptable. Chemical and oil resistance is required where such hazards are present.
- Boots will have a minimum of six inches (15 cm) of ankle support and will be tied up to the top of the boot to ensure the ankle is properly protected from slips and trips. All boots must have good tread and should be replaced if cracked, torn or the toe caps are exposed.

5.2.12 Fall Protection

- Fall protection systems will conform with applicable regulatory and/or client requirements, whichever is the more stringent.
- Refer to SWP-201 – Fall Protection/Working from Heights.

5.2.13 Buoyancy Devices

- When exposed to a risk of drowning, each employee will be supplied with and will wear an approved personal flotation device having sufficient buoyancy to keep the worker's head above water. The device will not require manual manipulation to produce the buoyancy effect.
- Refer to SWP-513 – Water and Boat Safety and SWP-514 – Working on Ice-Covered Bodies of Water.

5.2.14 Respiratory Protection

- Some work tasks require the use of an approved respirator to mitigate respiratory hazards (NIOSH, or standard appropriate to the local legislation). Examples include entering into work areas designated as "benzene-regulated," considered "hazardous" by the nature of other components (e.g., solids, liquids, or mixtures) identified on specific job sites, or those above exposure levels (OELs/PELs/TLVs) as outlined in legislation, the ACGIH, or local equivalent. Respirators are often used to protect employees when engineering controls are not feasible or when engineering controls are being installed. The Project Manager will identify this requirement in the Risk Management Strategy (RMS1) or the Health and Safety Plan for each project.
- Air purifying respirators (APRs) will be provided when the contaminant is known, and when an oxygen-deficient atmosphere is not a possibility. The choice between half-face and full-face APRs will be determined by the hazard assessment or client requirements. Use of this equipment requires additional training as specified in SWP-409 – Respiratory Protection Program.
- Where not reasonably practicable to prevent or eliminate an oxygen deficient atmosphere or a harmful concentration of air contaminants, or where the exposure to the hazard results

from temporary or emergency conditions only, supplied air respirators (SARs), such as SCBA or Air-Line/Egress (ALE) will be provided. Use of this equipment requires additional training as specified in SWP-409 – Respiratory Protection Program.

- Employees requiring respiratory protection must be medically fit and be face fit-tested by a competent person according to the provisions of SWP-409 – Respiratory Protection Program.

5.3 Reimbursement

Stantec will reimburse employees for employee-purchased PPE as outlined in the following table. All purchases are to be pre-approved by the BCOL.

Stantec expenditures for PPE are to be coded against Safety Supplies. Depending on the situation and type of PPE being purchased, the associated costs may be direct or indirect.

Reimbursement for all PPE items whether identified in this SWP or not is at the BCOL's discretion and approval. This includes early replacement of worn/damaged items due to valid work activities. This practice is to serve as a guideline to verify that employees have the necessary PPE to safely perform required duties.

PPE	Reimbursement Amount	Frequency	Comment
Hard Hats/Safety Helmets	Company supplied	Per manufacturer's expiry date	Provided by company on initial hiring. Replaced upon hard hat/safety helmet expiry date (follow the manufacturer's recommended replacement schedule). Hard hats/safety helmets provided to contract/term employees remain company property and are to be returned at end of contract/term
Non-Prescription Safety Glasses	Company supplied	As needed based on wear	Provided by company on initial hiring. Safety glasses provided to contract/term employees remain company property and are to be returned at end of contract/term
Prescription Safety Glasses	Policy determined by BCOL	Every three calendar years or when prescription changes	Certified to local standards. Must have permanent side-shields.
Safety Vest	Company supplied	N/A	Provided by company on initial hiring. Assumption is light-weight tear-away vests. Vests provided to contract/term employees remain company property and are to be returned at end of contract/term
Safety Footwear:			Refer to OSH Answers: Safety Footwear for descriptions of appropriate footwear for various situations
Field Staff	Policy determined by BCOL	Based on wear and tear	Minimum – steel toe/steel plate, electrical resistant, chemical resistant.
Concrete Technicians	Policy determined by BCOL	Based on wear and tear	Minimum – steel toe/steel plate, electrical/chemical resistant rubber boots and these may be replaced due to concrete damage.
Lab Staff	Policy determined by BCOL	Based on wear and tear	Minimum – steel toe/steel plate, electrical resistant, chemical resistant.
Seasonal Field/Lab Staff	Policy determined by BCOL	N/A	Minimum – steel toe/steel plate, electrical resistant, chemical resistant.

PPE	Reimbursement Amount	Frequency	Comment
All other full-time technical staff	Policy determined by BCOL	Based on wear and tear	Minimum – steel toe/steel plate, electrical resistant, chemical resistant.
Hearing Protection	Company supplied	N/A	Company supplies disposable earplugs. With supervisor approval, employee will be supplied with a set of earmuffs.
Leg Protection	Company supplied	N/A	Part of company-owned equipment inventory.
Gloves – Chemical Resistant	Company supplied	As needed based on wear	Specific glove material determined during hazard assessment – specific to protect against identified chemical hazards
Gloves – Leather	Company supplied	As needed based on wear	BCOL to decide re bulk purchase
Coveralls – Field or Lab staff	Company supplied	Every two calendar years	Specific materials as determined by hazard assessment, including Flame Resistant (FR).
Lab coat – Lab Staff (>25% of time in lab)	Company supplied	Every two calendar years	Specific materials as determined by hazard assessment, including Flame Resistant (FR).
Rain Gear – Field Staff	Policy determined by BCOL	Yearly, if required	Can be company supplied on an as-needed basis, and returned when no longer needed
Cold weather gear – Field Staff	100% if chargeable to project, otherwise at BCOL discretion	Based on wear and tear	For fields staff who regularly work full days outside during winter months. BCML discretion if not chargeable to the project.
Buoyancy Devices	Company supplied	N/A	Part of company-owned equipment inventory.
Respirators	Company supplied	N/A	Provided in conjunction with approved respiratory protection training
Fall Protection	Company supplied	N/A	Part of company-owned equipment inventory/hired. Provided in conjunction with approved fall protection training and inspection program
Offshore Safety Gear	100%	Once	For staff who require for offshore project work. Assume chargeable to project; BCOL discretion if not chargeable to the project.

6 Training or Qualifications

Each employee who receives PPE must be properly trained by a supervisor or Office Safety and Environment Coordinator (OSEC) on:

- Selection of PPE
- When PPE is required
- What PPE is required
- How to properly put on, remove, adjust, and wear PPE
- The limitations of PPE
- The proper care, maintenance, useful life, and disposal of the PPE

Each employee will demonstrate an understanding of the training, and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.

When there is reason to believe that any employee who has already been trained does not have the understanding and skill required by this SWP, they will be retrained. Circumstances where retraining is required include, but are not limited to, situations where:

- Changes in the workplace render previous training obsolete, or
- Changes in the types of PPE to be used render previous training obsolete, or
- Inadequacies in an employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill

Verification that each employee has received and understood the required training is required. This verification will be through written documentation that contains the name of each employee trained, the date(s) of training, and that identifies the subject of the training.

7 Outside Authorities to be Contacted

Not applicable.

8 Resources

8.1 Internal

- SWP-105a – PPE Hazard Assessment (to be used when RMS1 or HASP is not required)
- SWP-106 – Noise Control and Hearing Conservation Program
- SWP-201 – Fall Protection/Working from Heights
- SWP-406 – Electrical Safety Program
- SWP-409 – Respiratory Protection Program
- SWP-505 – Off-Road Vehicles
- SWP-508 – Preparing for Animal Encounters
- SWP-513 – Water and Boat Safety
- SWP-514 – Working on Ice-Covered Bodies of Water
- SWP-518 – Using a Chainsaw

8.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library

If your jurisdictional standard is not listed, please contact your HSSE representative for guidance.

- 29 CFR 1910, Subpart I: Personal Protective Equipment
- 29 CFR 1910.120: Hazardous Waste Operations and Emergency Response
- ANSI Z41.1-1999/1991: American National Standard for Personal Protection - Protective Footwear
- ASTM F-2412-2005: Standard Test Methods for Foot Protection
- ASTM F-2413-2005: Standard Specification for Performance Requirements for Protective Footwear
- ANSI Z87.1: Practice for Occupational/Educational Eye and Face Protection

- ANSI Z89.1: American National Standard for Personal Protection -- Protective Headwear for Industrial Workers--Requirements
- ANSI Z359.1: Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
- British Columbia WCB Standard: PPE 2 High Visibility Garment - PPE Standard 2
- CAN/CSA Z94.1: Industrial Protective Headwear
- CAN/CSA Z94.1: Industrial Protective Headwear - Performance, Selection, Care, and Use
- CAN/CSA Z94.2: Hearing Protection Devices - Performance, Selection, Care, and Use
- CAN/CSA Z94.3: Industrial Eye and Face Protectors
- CAN/CSA Z94.3: Industrial Eye and Face Protectors
- CAN/CSA Z94.3: Eye and Face Protectors
- CAN/CSA Z96: High-Visibility Safety Apparel
- CAN/CSA Z195: Protective Footwear
- CSA Z259: Fall-Arresting Devices, Personnel Lowering Devices, and Lifelines
- CSA Z259.10: Full Body Harnesses
- CSA Z259.111: Shock Absorbers for Personal Fall Arrest Systems
- NFPA 2112 - Standard on Flame-Resistant Garments for Protection of Industrial Personnel against Flash Fire
- UK – The Personal Protective Equipment at Work Regulations 1992
- UK – INDG 174 Personal Protective Equipment (PPE) at Work

9 Definitions

- **ANSI** – American National Standards Institute
- **ASTM** – American Society for Testing and Materials
- **CFR** – United States Code of Federal Regulations
- **CSA** – Canadian Standards Association
- **HASP** – Health and Safety Plan
- **NFPA** – National Fire Protection Association (US)
- **OSEC – Office Safety and Environment Coordinator**
- **OSHA** – US Occupational Safety and Health Administration
- **RMS1** – Risk Management Strategy (tool for hazard assessment)

10 Documenation Summary

File these records in the Office Safety File:

- Employee Training Records
- SWP-105a – PPE Hazard Assessment

File these records in the Project Health & Safety File:

- SWP-105a – PPE Hazard Assessment
- Risk Management Strategy (RMS1) or Health and Safety Plan (HASP)

11 Revision History

Date	Changes	Acknowledgments	Approval
August XX, 2025	Removed 5-year expiration date for hard hats and added safety helmets – referring to manufacturer's recommended replacement schedule. Updated Section 5.2.2 Noise Limits to remove noise action level. All caps text revised for ADA compliance.	T. Blair, G. Burnett	K. Hancock
February 1, 2023	Administrative Update: Edits to 1 Purpose, 3.1 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Ferguson-Scott	P. Poelzer
February 24, 2022	Updates to leadership terminology throughout. Review for global applicability.	C. Ferguson-Scott	J. Treen
July 31, 2020	Updates to links and references for migration from StanNet to The Lens; minor changes to formatting	K. Bayer	C. Ferguson-Scott
May 14, 2019	Adjustment to vest description in 5.2.5, added section 5.2.7 on Jewelry. Clarification to 5.3 on Reimbursement; removed references to specific regional standards in text.	K. Bayer, C. Ferguson-Scott, R. Roy	J. Lessard
November 5, 2018	Formatting; added clarification to hard hat electrical protection classes.	K. Bayer, R. Roy	C. Ferguson-Scott
May 10, 2012	Formatting; content review.	C. Ferguson-Scott	C. Ferguson-Scott
April 12, 2011	Update of content	K. Robinson	K. Robinson
March 30, 2011	Review and approval by CGC. Initial posting to StanNet	K. Robinson	K. Robinson

Certification of Hazard Assessment
Personal Protective Equipment (PPE) Assessment Form

BC: _____ Location/Process/Job: _____

Check the block by the hazards to which the employees performing the job are exposed, then in the section below, use the equipment specification # to list the required personal protective equipment:

EYE & FACE HAZARDS

[ ] Flying Solids/Particulates

[ ] Liquid Splash

[ ] Radiant Energy/Welding

FOOT HAZARDS

[ ] Sharp, Piercing Objects

[ ] Chemical Exposure

[ ] Falling Objects

[ ] Rolling/Pinching

[ ] Vehicle Movement

HEARING HAZARDS

[ ] Excessive Noise (>80 dBA, or local restriction)

[ ] Impact Noises

HEAD HAZARDS

[ ] Falling Objects

[ ] Head Strike Potential

RESPIRATORY HAZARDS

[ ] Harmful Concentrations of Dust

[ ] Mists, Fumes, or Vapors

[ ] Dangerous Levels of Air Contaminants

HAND HAZARDS

[ ] Puncturing Objects

[ ] Sharp Edges

[ ] Pinch Points, Moving Parts

[ ] Chemical Exposure

[ ] Excessive Heat/Cold

GENERAL HAZARDS

[ ] Unprotected Heights, >6 ft/2 m or local restriction

[ ] Electrical Energy

[ ] Chemical Exposure

[ ] Slips, Trips and Falls

[ ] Pinch Points

[ ] Temperature Extremes

In order to adequately protect employees involved with the above referenced job from the hazards listed, they must wear the below listed personal protective equipment. Prior to using the required equipment, each employee will receive training on the correct use, care, and maintenance of the required equipment.

_____

_____

_____

_____

By signing below, I am verifying to the best of my knowledge that the hazards described above are accurate and complete, and that I acknowledge the requirement for employees to wear the above-described personal protective equipment.

_____
Print Name of Evaluator

_____ _____
Signature of Evaluator Date

Personal Protective Equipment Specification

Equip Spec #	Equipment Description	Example Standard
1	Eye Glasses	ANSI Z87.1/CSA Z94.3: Attached side shields required (or regional equivalent) Supplier certifies compliance with standard through corporate purchase program.
2	Eye Goggles	ANSI Z87.1/CSA Z94.3 : Safety Goggles (or regional equivalent). Supplier certifies compliance with standard through corporate purchase program.
	Face/Eye Shield	
3a		full face, clear lens splash shield
3b		filter lens, radiant energy welding glasses/shield
	Hard Hat	ANSI Z89.1/CSA Z94.1 Headwear (or regional equivalent) Supplier certifies compliance
4a	Type I	vertical impact hazard
4b	Type II	Vertical and side impact hazards – consider need for electrical performance
4c	bump cap	Specialized situations only; consult with HSSE representative
	Gloves	Hazard Assessor, in conjunction with supplier, determines the appropriate hand protection based on the hazards identified;
5a		Leather
5b		Cloth
5c		cut-resistant
5d		chemical resistant – specify
	Shoes/Footwear	ANSI Z41/CSA Z195 safety shoes or regional equivalent. Safety toe required. Supplier certifies compliance through corporate purchase program.
6a		chemical resistant – specify
6b		non-conductive (maintenance)
6c		electro-static dissipative
6d		metatarsal guard
	Respirators	Certified respirators. Supplier certifies compliance;
7a		half-face, air purifying – specify cartridge type
7b		full-face, air supplied
7c		full-face, air purifying – specify cartridge type
	Body Protection	Hazard assessor, in conjunction with supplier, determines appropriate PPE based on hazards identified;
8a		Apron
8b		splash suit
8c		knee pad
8d		flame retardant uniform / lab coat
8e		Other

Equip Spec #	Equipment Description	Example Standard
	Hearing Protection	ANSI S3.19/CSA Z94.2 or regional equivalent
9a	Ear plugs	Noise reduction rating (NRR) selected based on desired noise reduction goals
9b	Earmuffs	Noise reduction rating (NRR) selected based on desired noise reduction goals
	Fall Protection	ANSI Z359/CSA Z259 or regional equivalent
10a		Various equipment as designated by situation and task.

1 Purpose

This safe work practice (SWP) establishes requirements for a noise control and hearing conservation program to protect employees' hearing while performing job tasks where elevated noise intensity may be present. This document is written to comply with or exceed local regulatory requirements and/or standards.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 9.0 Resources > External.

2 Scope

This SWP applies to all Stantec employees who may be exposed to noise equal to or greater to noise levels applicable to the region.

Where exposures are documented at or above regional limits, the requirements below will be implemented accordingly.

3 Responsibilities

3.1 Health, Safety, Security, and Environment (HSSE)

- Assist with development and maintenance of this SWP
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform noise dosimetry and spot checks/measurements to determine when the implementation of this SWP is required
- Perform periodic formal and informal program audits to determine if implementation of this SWP is effective

3.2 Business Center (BC) Leader

- Require that applicable SWPs are implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWPs

3.3 Project Manager (PM) or Supervisor

Has the primary responsibility for implementing this SWP, which includes:

- Verify implementation and compliance for all applicable operations
- Where applicable, use only employees that are trained in the requirements of this SWP, and who understand the potential hazards associated with workplace noise and the required controls and precautions
- If work conditions (i.e., operations, equipment, etc.) change, consult with the Joint Health and Safety Committee, where one exists, or the Regional HSSE Manager, to determine if re-training or additional noise monitoring is necessary
- Identify the potential noise hazards employees could be exposed to and select appropriate hazard controls (using the Risk Management Strategy Form (RMS1), Health and Safety Plan (HASP), Project Safety Plan (PSP), etc.)
- Review the tasks and procedures prior to commencing work

- Monitor and verify the use of hearing protection where required
- Be responsible for the recognition and evaluation of workplace noise hazards, and for the implementation of controls to reduce TWAs to levels consistently below the applicable exposure limits

3.4 Employees

- Be aware of potential noise hazards that may be encountered
- Know how to properly select, inspect, use, and maintain the hearing protection equipment provided
- Understand the limitations of hearing protection equipment
- Be aware of and comply with requirements outlined in this SWP
- Assess equipment and work areas regularly for noise hazards
- Use training, knowledge, and experience to protect their health and safety and that of their coworkers
- Report to their Project Manager or Supervisor any concerns with the equipment or procedures they have been provided, or any issues that may limit their ability to comply with this SWP

4 Hazards

Exposure to high noise levels is hazardous to a person's hearing and can cause hearing damage and loss. Hearing loss is seldom noticed because the injury or damage is not usually painful, and hearing loss occurs slowly over time (generally over many years). A false sense of security is experienced, and the employee thinks that they may have escaped damage, or that they are "getting accustomed to" noise. Once hearing is lost, it is likely irrecoverable.

A number of factors contribute to hearing loss or damage, including:

- Intensity of the sound (i.e., decibels)
- Duration of exposure (i.e., time)
- Distance from the noise source

In the workplace, hazardous noise may be generated by a number of sources, including operations, processes, machinery, and equipment.

High noise levels can also create a safety hazard by preventing employees from hearing warnings of other hazards in their vicinity.

4.1 Non-Occupational Noise Exposure

All noise (i.e., work and non-work) has the potential to damage hearing. Noise exposure outside work can be as intense or more intense than in the workplace. Recreational activities, hobbies, and home improvement equipment can pose significant noise hazards, including:

- Power tools, including woodworking equipment and chain saws
- Lawn mowers and weed trimming devices
- Motorcycles and motor sports events (e.g., car racing)
- Powered recreational vehicles (e.g., all-terrain vehicles, wet bikes, jet skis, snowmobiles, etc.)
- Shooting sports
- Loud stereos or headphones - home/car
- Concerts

Exposure to hazardous noise levels at work, coupled with noise at home, may accelerate hearing loss. The sensory hair cells located in the cochlea of the inner ear need a significant period of "quiet" to recover.

4.2 Signs of Hearing Loss

If any of the following conditions are experienced, it may be an indication of potential hearing loss:

- Difficulty hearing consonants like "s" and "t" in conversation
- People around you say you shout or talk too loudly
- The need to turn up volume controls on the TV or radio
- High frequency sounds like whistles, telephone rings are faint
- Soft sounds like a baby's voice are not heard
- A constant ringing in your ears (tinnitus)

If an employee experiences symptoms of potential hearing loss, they should seek medical advice from their personal or family health care provider. If they are exposed to or may be exposed to high levels of noise in the workplace, they should also report the symptoms to their supervisor immediately and submit an HSSE Incident Report (RMS3).

5 Hazard Identification & Monitoring

5.1 Initial Assessment

When a work site is suspected to have hazardous noise levels, an initial noise assessment must be performed. SWP-106a – Noise Level Assessment Tool provides guidance on the approximate noise level for a number of tools, machinery, and equipment. It allows users to estimate the exposure level based on the distance from the source of the noise and the duration of exposure. A general guideline is that if someone is standing 3 feet (1 meter) away and they must raise their voice above normal volume to be heard clearly, the noise level is likely high enough to require an assessment.

5.2 Noise Limits

Noise limits vary by country or region but for the purposes of this SWP, the Action Level will be noted as 85 dBA-TWA (North America only – see Section 5.2.1 for global noise limits). Additionally, the peak noise level is 140 decibels, C-scale (dBC).

Stantec employees with potential exposure at or above 85 dBA-TWA, an adjusted Action Level for extended shift, or with the potential exposure to instantaneous noise levels at or above 140 dBA, will be included in a Hearing Conservation Program. Hearing protection will be provided and the use of it required. Requirements of a hearing conservation program may vary by country or region. Consult with your local HSSE representative for guidance.

5.2.1 Global Noise Limits

Australia/New Zealand & Latin America

- Permissible Exposure Limit: 85 dBA
- Peak: 140 dBC

Middle East

- Permissible Exposure Limit: 85 dBA

- Peak:137 dBC

United Kingdom/Republic of Ireland

- Lower Exposure Action Values: 80 dBA daily/weekly average and 135 dBC peak. Information and training must be provided
- Upper Exposure Action Values: 85 dBA daily/weekly average and 137 dBC peak. The level at which employers must provide hearing protection and hearing protection zones
- Exposure Limit Values: 87 dBA) daily/weekly average and 140 dBC peak. Taking account of any reduction in exposure provided by hearing protection, above which workers must not be exposed.

5.3 Initial Noise Monitoring

If the initial assessment shows that noise levels may be equal to or exceed the Action Level of 85 dBA-TWA, noise monitoring must be performed. Noise monitoring uses calibrated equipment to measure noise in a work area to determine the employees' noise exposure level.

Initial noise monitoring can be performed for one or more representative employees from a particular group of employees performing the same work or from the same workplace.

5.4 Types of Noise Monitoring

There are two types of noise monitoring: noise surveys and personal noise exposure monitoring.

5.4.1 Noise Surveys

Noise surveys identify sources of hazardous noise throughout a work area, such as a geotechnical lab, and also provide information regarding where personal dosimetry may be needed and where potential control options to reduce noise exposure should be considered.

Noise surveys begin with a sketch or map of the work area that identifies the location of workers, equipment, and operations. Noise intensity measurements are taken at a number of positions around the area, using a sound level meter (SLM) or an integrating sound level meter (ISLM). (A description of both instruments is provided below.) The results are marked on the sketch or map, and from that, a noise contour map can be produced by drawing lines on the sketch between points of equal sound level.

5.4.1.1 Sound Level Meter (SLM)

A sound level meter (SLM) consists of a microphone, electronic circuits, and a readout display. It measures sound pressure levels (in decibels) and provides a digital or analog readout.

There are two types of SLMs. A Type 2 SLM is sufficiently accurate for industrial field evaluations. The more accurate and much more expensive Type 1 SLMs are primarily used in engineering, laboratory, worker's compensation, and research work.

SLMs only capture instantaneous noise measurements; they do not provide a TWA. As such, they are good for workplaces with continuous noise levels. But in workplaces with impulse, intermittent or variable noise levels, the SLM makes it difficult to determine a person's average exposure to noise over a work shift. One solution in such workplaces is noise dosimetry.

5.4.1.2 Integrating Sound Level Meter (ISLM)

The integrating sound level meter (ISLM) determines equivalent sound intensity at a particular location over a period of time and yields a single reading of a given noise, even if the actual sound level of the noise changes continually. It determines equivalent sound pressure levels over a measurement period. The ISLM can also measure impulse noises at the peak of each impulse.

The ISLM is similar to a dosimeter. The major difference between a dosimeter and the ISLM is that an ISLM does not provide personal exposures because it is hand-held like the SLM, and not worn.

5.4.2 Personal Noise Exposure Monitoring

Personal noise exposure monitoring is performed with the use of a noise dosimeter to determine an individual's personal noise dose or equivalent TWA.

The noise dosimeter is a small, light device with a small microphone that is placed on the employee, usually on the collar or shoulder, close to an ear. Wearing the dosimeter over a complete work shift gives the average noise exposure or noise dose for that person. The dosimeter integrates and logs the noise intensity and time data to provide a TWA. It is most applicable in settings where noise is commonly variable in duration and intensity, and when operations, equipment and work locations can also be variable.

A noise dosimeter requires the following settings:

- Criterion Level: The maximum allowable exposure to noise, accumulated over an 8-hour work period, and that corresponds to a 100% dose. The Stantec criterion level will be 85 dBA, as this is the most conservative/stringent value for all jurisdictions.
- Exchange rate: 3 dB or 5 dB (US) as specified in the noise regulation. As best practice, Stantec will use an exchange rate of 3 dBA.
- Threshold: noise level limit below which the dosimeter does not accumulate noise dose data. NIOSH recommends a lower limit of 80 dBA.

The noise dosimeters used must be capable of integrating all continuous, intermittent, and impulsive sound levels from 80 to 140 decibels.

5.5 Monitoring Equipment Calibration

All noise monitoring equipment will be calibrated per the manufacturer's instructions to ensure measurement accuracy, prior to and after each use.

5.6 Monitoring Results

When results show that the potential exposure exceeds the Action Level (i.e., 85 dBA-TWA), controls must be implemented to reduce exposure per Section 6.

- All employees who are found to be exposed to TWAs at or above the Action Level (i.e., 85 dBA-TWA) must be informed of the results.
- Affected employees will have the opportunity to observe any monitoring studies that are performed.

5.7 Exposure Records

Record of the monitoring will be maintained in an exposure record that identifies for each employee in the monitored work area. See the form provided in Appendix A.

5.8 Repeat Monitoring

Monitoring will be repeated whenever changes to a processes, operations, machines, equipment, or controls could lead to increased potential exposure to the extent that:

- Additional employees may be exposed at or above the action level; or
- The attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the requirements of section 6.6 Hearing Protection below

6 Controls

6.1 Elimination/Substitution

Sources of high intensity noise will be switched off, or work will be performed outside the area affected by the noise when practicable.

6.2 Engineering Controls

High intensity noise will be effectively reduced whenever practicable by implementing engineering controls such as:

- Proper design of new machines and equipment
- Modification of existing machines and equipment to reduce noise output
- Performance of routine maintenance and upkeep of machines and equipment
- Installation of noise suppression devices such as baffles or mufflers
- Erection or installation of sound barrier structures, equipment, or materials

6.3 Warnings

Machines, equipment, operations, and processes related directly to noise at or above 85 dBA will be identified with signs or labels stating that hearing protection is required.

- Signs should be placed at access points to these areas to notify all personnel entering the area that hearing protection is required.
- Portable tools and equipment with instantaneous noise intensity measured at or above 85 dBA will have labels affixed to them stating that hearing protection is required when using them.

6.4 Administrative Controls

Where engineering controls are considered impracticable, the following administrative controls can be considered:

- Limit duration of potential exposure
- Job schedule changes or shift rotation
- Increase working distance between noise sources and employees

6.5 Audiometric Testing

Audiometric testing is a medical test performed to evaluate a person's hearing. The results of audiometric testing are called an audiogram. When engineering or administrative controls are either impracticable or ineffective in reducing exposure to below the Action Level of 85 dBA-TWA, or when there is regular exposure potential to instantaneous noise at or above 140 dBA, an audiometric testing program will be established, at no charge, for all affected employees.

Before an employee's first identified potential exposure to noise at or above the Action Level, Stantec will establish a valid baseline audiogram against which subsequent audiograms can be compared.

- The testing may be performed by a mobile testing service or a local clinic that is certified to conduct audiometric testing. See SWP-111 – Medical Surveillance for more information.
- To assure validity and accuracy of this test, employees should have no exposure to high intensity (above 85 dBA) workplace or home noise for at least 14 hours prior to taking the test. Hearing protection devices may be used to meet this requirement.

At least annually after a baseline audiogram is obtained, each employee in the audiometric testing program will undergo follow-up audiometric testing. The annual audiogram will be compared to the baseline, making an allowance for hearing loss due to aging (presbycusis), to determine if a standard threshold shift (STS) has occurred. An STS is defined as a change in hearing threshold relative to the baseline of 10 dB or more averaged over 2000, 3000, and 4000 Hertz (Hz), in either ear.

- If the annual audiogram shows an STS, a re-test will be performed within 30 days.
- Results indicating an STS will be reviewed by an audiologist, otolaryngologist, or other physician to determine the need for further evaluation. The professional performing this evaluation will be provided with a copy of the standard, results from both the baseline and most recent audiogram, measurements of the background sound pressure levels in the audiometric test room, and records of the audiometric calibrations.

If the follow-up evaluation confirms that an STS has occurred, the affected employee will be informed of this fact within 21 days of the determination. Unless a licensed health care professional determines that the STS is not work related or aggravated by occupational noise exposure, the following steps will be taken:

- Employees who will be provided or issued a new form of hearing protection will be trained in its use, proper fitting, maintenance, storage, and limitations.
- The employee will be referred for a clinical examination for further testing, and to determine if the wearing of hearing protection has caused or aggravated a medical pathology of the ear.

If an STS is judged to be persistent by the health care professional, the employee and their supervisor are responsible to complete and submit an HSSE Incident Report (RMS3). The most recent audiogram may be now labeled as the revised baseline.

Additionally, if the most recent audiogram shows a significant improvement over the baseline, the health care professional may choose to label it as a revised baseline.

All audiometric testing records will be retained for the term of employment, plus 30 years.

6.6 Hearing Protection

Hearing protection will be provided and worn by employees with noise exposure at or above 85 dBA-TWA, or when potentially exposed to instantaneous/peak noise at or above 140 dBA.

The use of hearing protection will be mandatory for when noise exposure meets or exceeds the Action Level. Covered employees will be given a choice of suitable hearing protection (at no

cost to the employee) from which to choose. They will receive training on obtaining a proper fit and on the care and use of the hearing protection.

The hearing protection used will be assessed, using the formula below, to verify that it is sufficient to reduce noise exposure to below 85 dBA-TWA.

The results of noise monitoring will be used to help determine which hearing protection devices will be provided, based on the appropriate noise reduction rating (NRR) assigned to each piece of hearing protection.

- Note that the NRR should be reduced by 7 dB, and then divided by two (or multiplied by 50%). The resulting figure is subtracted from the TWA exposure (dBA) to determine the actual effective noise reduction of the hearing protection device. For example, if the NRR on the package of ear plugs is 33 dB, then the effective noise reduction is:

  (33 – 7) x 50% = 13 dBA

  Subtract this figure from the noise level in the workspace: for instance, if the noise intensity in the work area is 97 dBA, subtract 13 and you have an effective level of 84 dBA (97 -13 = 84).

  In some cases, such as a loud drill rig, this may not be adequate and ear plugs should be combined with earmuffs for better protection (i.e., double hearing protection). When wearing two forms of hearing protection, you can add 5 dBA to the protection level. In the example above then, the combined hearing protection would be 18 dBA.

The adequacy of the hearing protection used will be re-evaluated whenever either noise intensities change significantly, or the duration of exposure time per shift increases, to ensure the proper attenuation is still provided.

7 Training or Qualifications

7.1 Initial Training

All Stantec employees who may be exposed to noise intensities exceeding the Action Level (i.e., 85 dBA-TWA) will receive training prior to initial assignment and annually thereafter, and as a minimum, will cover the following:

- What is noise
- How the ear works
- The effects of noise on hearing
- The purpose and procedures for hearing (audiometric) tests
- How noise is measured
- The purpose of hearing protection, its advantages and disadvantages, the degree to which it reduces noise, and the selection, inspection, use, and maintenance of hearing protection most suitable for the work environment

7.2 Documentation

This training will be documented, and the information provided to and maintained within the Stantec Learning Management System. Copies will also be retained in the Office Safety file. Training records will indicate the following:

- Name and signature of trainee
- Date of training

- Training provider

8 Outside Authorities to be Contacted

Not applicable

9 Resources

9.1 Internal

- Risk Management Strategy (RMS1)
- HSSE Incident Report (RMS3)
- SWP-106a – Noise Level Assessment Tool
- SWP-111 – Medical Surveillance

9.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library

If your jurisdictional standard is not listed, please contact your HSSE representative for guidance.

9.2.1 Canada

- CAN/CSA Z107.56-2013(R2018): Measurement of noise exposure
- CSA/Z94.2-14: Hearing Protection Devices - Performance, Selection, Care, and Use

9.2.2 United States

- 29 CFR 1910.95 – Occupational Noise Exposure
- ANSI S1.4-1983 (R2006): Specification for sound level meters
- ASA S12.13 TR-2002(R2016): Evaluating the Effectiveness of Hearing Conservation Programs through Audiometric Data
- ANSI/ASSE A10.46-2013: Hearing Loss Prevention for Construction and Demolition Workers
- ANSI/ASA S12.6-2016: Methods for Measuring the Real-Ear Attenuation of Hearing Protectors

9.2.3 Australia and New Zealand

- AS/NZS 1269.0:2005(R2016) - Occupational noise management, Part 0: Overview and general requirements
- AS/NZS 1269.1:2005(R2016) - Occupational noise management, Part 1: Measurement and assessment of noise immission and exposure
- AS/NZS 1269.2:2005(R2016) - Occupational noise management, Noise control management
- AS/NZS 1269.3:2005(R2016) - Occupational noise management, Hearing protector program
- AS 2436-2010(2016): Guide to noise and vibration control on construction, demolition and maintenance sites

9.2.4 British (International)

- ISO 9612:2009 Acoustics — Determination of occupational noise exposure — Engineering method

- ISO 13474:2009 Acoustics -- Framework for calculating a distribution of sound exposure levels for impulsive sound events for the purposes of environmental noise assessment

10 Definitions

Action Level: An 8-hour time-weighted average of 85 decibels as measured on the A-scale, slow response, or equivalently, a noise dose of fifty percent (i.e., 85 dBA over an 8-hour shift, 83.4 dBA over a 10-hour shift or 82.1 dBA over a 12-hour shift, as measured by noise monitoring).

A-scale (A-weighting): A filter that simulates and concentrates on the frequencies that the human ear is the most sensitive to with respect to noise damage.

Audiogram: A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

Audiometric testing: A medical test performed to evaluate a person's hearing.

Audiologist: A medical professional, specializing in the study and rehabilitation of hearing, who is certified or licensed in their jurisdiction.

Baseline audiogram: The first/initial audiogram against which future audiograms are compared.

Criterion level: The maximum allowable exposure to noise, accumulated over an 8-hour work period, and that corresponds to a 100% dose. The criterion used by Stantec will be 85 dBA.

Decibel (dB): Unit of sound intensity.

Exchange rate: a factor of 3 or 5 dB which results in doubling of the noise intensity, and halving of the allowable exposure time. Stantec will use 3 dB as best practice.

Hertz (Hz): Unit of measurement of frequency, numerically equal to cycles per second.

Instantaneous Noise: A noise of short or momentary duration. Examples of instantaneous noises include impact noise, such as the sound of a hammer striking a nail, and impulse noise, such as the sound made by a single firework or gunshot. Instantaneous noises are frequently categorized as a burst or "bang." They may be sudden and unexpected or unpredictable.

Medical pathology: A disorder or disease, for purposes of this program; a condition or disease affecting the ear, which should be treated by a physician specialist.

Noise dose: The total sound exposure normalized to an 8-hour period. For Stantec, 90 dBA-TWA is a 100% dose. A 50% dose is 85 dBA-TWA.

Noise dosimeter: An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose to evaluate workers' exposure to noise levels over an entire shift. Wearing the dosimeter over a complete work shift provides an integrated average noise exposure (i.e., TWA) or noise dose for that worker.

Noise Monitoring: The measurement of noise in a work area using calibrated equipment in order to determine employee noise exposure levels.

Noise Reduction Rating (NRR): The measurement, in decibels, of how much a hearing protector reduces noise as specified by the Environmental Protection Agency. The higher the NRR number the greater the noise reduction.

Otolaryngologist: A physician specializing in diagnosis and treatment of disorders of the ear, nose, and throat.

Presbycusis: A lessening of hearing acuteness resulting from degenerative changes in the ear that occur especially in old age.

Sound level: Ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals. Unit: decibels(dB). For use with this SWP, SLOW time response, in accordance with ANSI S1.4-1971 (R1976), is required.

Time-weighted average (TWA) sound level: Noise intensity averaged over a specific time period. In most occupational scenarios, the time frame is 8 hours.

11 Documentation Summary

File these records in the Office Safety File:

- Employee training records
- Noise dosimetry results
- Noise monitoring results (area spot or instantaneous measurements)
  - All noise dosimetry and monitoring records will be retained for at least two years
- Copies of any HSSE Incident Report (RMS 3) submitted as a result of an STS
- Copies of any clearance documents issued to Stantec as a result of audiometric testing

File these records in the Project Health & Safety File:

- Employee training records
- Risk Management Strategy (RMS1)
- Copies of any HSSE Incident Report (RMS3) submitted as a result of an STS

Medical Records:

- When an MSP is utilized, medical records are maintained and preserved in confidential, secure files in the MSP's custody. Other medical records will be maintained and preserved in the custody of the examining physician in compliance with local regulations.
- Medical records will be maintained for at least the duration of employment plus 30 years, or as otherwise required by jurisdictional regulations.

12 Revision History

Date	Changes	Acknowledgments	Approval
January 30, 2026	Replaced all "Ireland" references with "Republic of Ireland"	G. Burnett	K. Hancock, J. Parker
July 31, 2025	Updated noise action level. Added global noise action level standards. Updated "HSSE Event Report" to "HSSE Incident Report" throughout. All caps text revised for ADA compliance.	M. Doherty, J. Elkins, G. Burnett	K. Hancock

Date	Changes	Acknowledgments	Approval
February 1, 2023	Administrative Update: Edits to 1 Purpose, 3.1 Responsibilities, and 9.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Ferguson-Scott	P. Poelzer
August 18, 2020	Posting to The Lens	K. Bayer, D. Feldt, R. Roy, S. Wilde.	J. Lessard

Appendix A: Noise Exposure Monitoring Results

Project Number: _____ Date: _____

Location Name: _____

Location Address: _____

_____

Employee Name	Area/Activity Monitored	Exposure (in dBA on an 8-hr TWA)

1 Purpose

This safe work practice (SWP) provides guidance for the provision of first aid supplies and first aid providers in Stantec offices and at Stantec work sites. Although prevention is the primary goal, when injuries do occur, appropriate first aid is an integral part of care and recovery.

Provisions outlined in this SWP may differ from local regulations. Based on individual circumstances, it is expected that the more stringent requirement will be applied. Information on local regulations is found under Resources and in Appendix A of this document.

As Stantec has operations around the globe, SWP's are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to Section 8.0 Resources > External.

2 Scope

This SWP applies to all operations - field and office. For information related to bloodborne pathogens, please refer to SWP-108 – Bloodborne Pathogens.

3 Responsibilities

3.1 Health, Safety, Security, and Environment (HSSE)

- Maintain this SWP
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform an annual program review of this SWP and associated processes

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations.
- Hold designated employees accountable for properly implementing this SWP.

3.3 Project Manager (PM) – Projects/Field Operations

- Resource projects with trained and designated first aid providers as required by this SWP and local requirements
- Provide first aid supplies and equipment appropriate to the hazards identified for the different working environments that employees will encounter and as required by this SWP and local requirements
- Communicate emergency response and transportation procedures to employees if external medical assistance is necessary. Reference should always be made to local requirements.
- Hold designated employees accountable for properly implementing this SWP
- Implement this SWP for all applicable operations

3.4 Office Leader/Regional Leader Designate

- Provide office with trained and designated first aid providers as required by this practice and local requirements
- Confirm that emergency response and transportation procedures are established and communicated according to this SWP, SWP-116 – Office Safety, and local requirements

- Coordinate with OSEC and/or Stantec Learning and Development for the supply and/or purchase of the required training and supplies as required
- Establish a designated individual to maintain the first aid supplies that may be required under regulations

3.5 Office Safety and Environment Coordinator (OSEC)

- Maintain a current list of all trained first aid providers for each office, and post in appropriate locations in the office (e.g., HSSE Bulletin Board, break rooms, etc.)

3.6 First Aid Providers

- Review, understand, and apply the requirements of this SWP. The review cycle will be in accordance with the Safe Work Practice Checklist.
- Use their training, knowledge, and experience to protect their personal health and safety and that of their coworkers
- Know how to respond to emergencies, and where required, know how to use emergency equipment necessary to gain access to injured parties, where competent to do so (e.g., rope access)
- Select and use appropriate Personal Protective Equipment (PPE), together with the tools and equipment required to provide first aid safely, without incurring personal harm or exposure
- Report to the Office Leader/Regional Leader Designate any concerns they may have with the equipment or procedures they have been provided, or any issues that may limit their ability to comply with the safe work requirements of this practice
- Promptly provide injured employees with a level of care within the scope of their training, objectively record observed or reported signs and symptoms of injuries and exposures and refer for medical assistance for injuries considered by the first aid provider as being serious or beyond the scope of their training

3.7 Employees

- Report any incident related to illness or injury, per the HSSE Program Manual, Section 14.0 – Incident Notification, HSSE Reporting, and Investigation

4 Hazards

4.1 Energy Wheel



The energy wheel is a visual tool used by Stantec to identify 10 sources of energy and to assess and control the hazards associated with each source. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. Before beginning any activity, review the potential hazards and controls associated with the task. For project work, these sources, hazards, and controls will be documented on the Project HSSE Plan/Risk Management Strategy (RMS1) and in a Field Level Risk Assessment (RMS2/field app). Below are the energy

sources and hazards most commonly associated with providing first aid.

Energy	Hazard / Condition
Gravity	• Falling object risk to self or others due to dropping tools and/or materials • Exposure to working at height risk dependent on location and nature of related incident
Mechanical	• Exposure to mechanical risk dependent on location and nature of related incident – machinery involved or nearby
Motion	• Bring struck by moving equipment when responding to an incident.
Noise	• Noise exposure exceeding Stantec's Action Level for an eight-hour time-weighted average dependent on nature of nearby activities, environment, and related incident
Pressure	• Exposure to pressure risk dependent on location and related incident – pressure systems, pipeline, vessels etc. involved or nearby
Radiation	• Exposure to radiation risk dependent on location and related incident – use of radioactive equipment, proximity to radioactive assets or naturally occurring radioactive substances involved or nearby
Thermal	• Poor performance due to extreme hot or cold weather, especially during a prolonged emergency response • Contact with hot or cold surfaces (e.g., guardrails) dependent on weather, location, activities being undertaken and related incident
Biological	• Exposure to biohazards relating to the activity being undertaken or the casualty's blood borne pathogens
Chemical	• Exposure to hazardous materials or atmospheres dependent on nature of activities being undertaken and related incident
Electrical	• Exposure to electrical risk dependent on location and related incident – electrical equipment involved or nearby

5 Controls

Every Stantec office and worksite is required to have equipment, supplies, facilities, first aid providers, and services that meet the minimum first aid requirements of the worksite's jurisdiction (see Appendix A). If your jurisdiction is not listed, please see Section 8.2, and contact your HSSE representative for guidance.

Providing ready access to appropriate first aid equipment and providers requires consideration of the following factors:

- Nature of the work and workplace hazards and risks
- Types of injuries likely to occur
- Organization's history of incidents
- Size of the organization
- Needs of travelling, remote, and lone workers
- Work patterns including frequency of the task
- Distribution of the workforce
- Remoteness of the site from emergency medical services including response and travel times
- Employees working on shared or multi-occupied sites

- Annual leave and other absences of first aiders and appointed persons
- First aid provision for non-employees
- An effective means of communication between the first aid providers and the employees being attended to, and, when required, with the emergency medical services
- Any barriers to first aid being provided to an injured worker

The result of this assessment is incorporated into an office location's Emergency Response Plan (ERP) and communicated to the employees. Office ERPs will be reviewed yearly or whenever a change occurs which affects the operations at the location.

For project sites, the hazards and appropriate controls identified through this assessment process will be recorded using the Project HSSE Plan/Risk Management Strategy (RMS1) or in the project Health and Safety Plan (HASP) and will be communicated directly to the employees involved in the work.

All employees required to work alone must have valid first aid training. Where two or more Stantec employees are present at a worksite, a minimum of one first aid provider should be present. The first aider can be provided by the client or contractor, but confirmation of arrangements must be agreed in advance. (A worksite is any location where a Stantec employee is engaged in Stantec work activities, other than a permanent Stantec office or another office setting.) To facilitate scheduling and deployment of field crews that comply with legislative requirements for first aid training, there are Stantec operations that train all field staff in first aid.

Regardless of the number of Stantec employees on a worksite, a reliable means of communication must be available as well as a plan for safely transporting injured workers to medical treatment.

5.1 First Aid Reports

When First Aid is required as a result of workplace activities, it must be documented. The name of first aid provider, nature and location of injury, and the first aid provided must be included in the fields provided. For more information on incident reporting and investigation, see Section 14.0 of the HSSE Program Manual. Records of all first aid incidents will be kept in accordance with the Stantec Records Retention Schedule.

5.2 First Aid Providers

First aid providers will be available in each office or worksite as dictated by local requirements. Employees designated as first aid providers will be trained and certified as specified in Section 6.

First aid providers will follow recognized procedures and protocols as provided by approved training organizations, as defined by local jurisdiction. At no time will an employee attempt to provide first aid beyond their level of training or that is in any way different from the standard protocols provided by their approved training organization. First aid providers can install a first aid application (app) on their mobile device, to be used as a reference or a training aid.

Employees on worksites are to be trained in the requirements for emergency communication and transportation in the event of serious injury. The situation, the injury, and/or regulations may dictate that the first aid provider accompany an injured employee to a medical facility.

In offices, the names and contact information of designated first aid providers will be included in the office's Emergency Response Plan and posted on the HSSE bulletin board(s), together with emergency medical service contact information and any other documents required to be posted by local first aid regulations.

For field projects, the emergency planning section of the Project HSSE Plan/Risk Management Strategy (RMS1) or Health and Safety Plan (HASP) must address the provision of first aid services, including the names of first aid providers, prior to the start of fieldwork. The RMS1/HASP must also provide contact information for emergency medical services, protocols for contacting them, and the location of hospitals, including maps. Reviewing and confirming this information with the site personnel will facilitate transport to a medical facility should the need arise. In addition, any information required to be posted by local authorities must be posted on worksites or made part of the RMS1/HASP, so that it is readily available to employees.

If a client or contractor's site already provides first aid services that satisfy local requirements, documentation of access and agreement must be recorded in the RMS1/HASP.

5.3 First Aid Kits & Supplies

The required contents of a first aid kit or station varies by location; refer to Appendix A for more information.

First aid kits and stations will be properly maintained and stored in a clean, dry environment that keeps the contents in good condition. Kits must be large enough that each item is in plain view and is easily accessible.

Each first aid kit or station must be available to all employees. Locations of first aid kits should be clearly and conspicuously marked (e.g., decals on vehicles, posted notices in office locations). All office first aid kits and stations will be equipped with a first aid guide. Field first aid kits will be equipped with a first aid pocket guide; if a pocket guide is not available, employees can install a first aid app (developed by a locally recognized organization, e.g., Red Cross) on their mobile device. Employees working in the field or at remote locations will ensure they have the protocols and equipment fit for purpose based on the number of employees, proximity to advanced medical support, and the types of injury/illness that are reasonably foreseeable.

Office first aid supplies are to be inspected monthly as part of the office safety inspection and any missing, damaged, or expired supplies must be replaced. Signs will be posted indicating where first aid kits are located.

Employees in the field will be provided with a first aid kit that meets the local requirements and is adequate for the number of employees and the nature of the hazards. Field first aid kits should be restocked upon returning to the office and must be inspected at an interval set by local requirements, or quarterly, whichever is more frequent. Missing, damaged, or expired supplies must be replaced.

A list of the names of those employees who have first aid training must be posted in the office, site trailer, or provided on the Project HSSE Plan/Risk Management Strategy (RMS1) or HASP. Any supplies removed from the kits to provide first aid assistance must be recorded in the first aid log kept with each kit (refer to Appendix B), along with notations on the service provided and any referral for medical treatment.

5.4 Universal Precautions

When performing first aid, employees must do so in accordance with Universal Precautions against exposure to bloodborne pathogens and treat all blood and other bodily fluids as if they were infected. Universal Precautions include the use of gloves, CPR masks, and other barriers (such as face shields or eye protection) to prevent potential exposure to bloodborne pathogens. Employees must also wash their hands for at least 30 seconds with soap and water after removing their gloves. If soap and water are not available, employees should use hand sanitizers or waterless hand scrubs, rubbing the product over the hands and fingers until they are dry.

To facilitate the use of Universal Precautions, all first aid kits should include at a minimum:

- Vinyl or nitrile gloves
- A CPR mask with oxygen port (sealed packet)
- Supplies for washing hands and cleaning any reusable equipment

CPR masks and other equipment must be replaced or cleaned and sterilized in accordance with the manufacturer's recommendations.

Please refer to SWP-108 – Bloodborne Pathogens for more detail, including post-incident housekeeping and cleaning requirements.

5.5 Eyewash Stations and Showers

At locations where employee may be exposed to corrosive materials, suitable facilities, such as eyewash stations (or kits) and showers will be provided for quick drenching or flushing of the eyes or body.

5.6 Over-the-Counter Medication

Where permitted, Stantec offices may choose to provide over the counter (OTC) medication in sealed single-use packets. However, while generally helpful, OTC medications can have unintended side effects, such as:

- Reduced effectiveness of prescription and other OTC medications
- Increases in otherwise "normal" side effects (e.g., drowsiness or alertness)
- Harmful interactions with medications, some foods or beverages, or health conditions, such as diabetes, kidney disease, and high blood pressure

For that reason, OTC medications must not be administered to other employees at the direction of first aid providers.

If an office chooses to provide OTC medication for use by staff, the following guidance must be followed.

- Verify the providing OTC medication is allowed by the local occupational health and safety regulatory authority. Contact your Regional HSSE Manager for information.
- OTC medication must not be stored in first-aid kits.
- OTC medication is provided in sealed, single-use format only and is monitored to verify expiration dates.

Please note, items such as antiseptic washes, antibiotic creams, alcohol wipes, etc. are not considered OTC medications.

6 Training

First aid training requirements vary by geography. First aid training needs to address the local requirements for minimum standard for first aid training and cardiopulmonary resuscitation (CPR). Additional training, such as Wilderness First Aid, may be identified through the project risk assessment and captured on the Project HSSE Plan/Risk Management Strategy (RMS1) as required for staff working in remote or wilderness areas. Employees must be recertified per the expiry period provided by the training organization.

7 Outside Authorities to be Contacted

N/A

8 Resources

8.1 Internal

- Stantec Records Retention Schedule
- HSSE Program Manual
- Project/HSSE Plan/Risk Management Strategy (RMS1)
- SWP-108 – Bloodborne Pathogens
- SWP-116 – Office Safety

8.2 External

Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:

- Stantec's Critical Task Inventory
- HSSE Regulations Library

8.2.1 Canada

- Provincial Legislation and Regulations (See Appendix A)
- Canadian Red Cross
  - Comprehensive Guide for First Aid & CPR
  - First Aid App (download via your mobile device's app store)

8.2.2 United States

- US OSHA: 29 CFR 1910.151
- California OSHA:
  - Title 8, General Industry Orders, § 3400
  - Title 8, Construction Safety Orders, § 1512
- American Red Cross
  - First Aid App (download via your mobile device's app store)

8.2.3 Australia

- Queensland: Work Health and Safety Regulations 2011, Part 3.2, Division 3 First Aid
- New South Wales: Work Health and Safety Regulation 2017, Part 3.2, Division 3 First Aid
- South Australia: Work Health and Safety Regulations 2012, Chapter 3, Part 2, Division 3—First Aid
- Victoria: Compliance Code: First aid in the workplace
- Western Australia: Occupational Health and Safety Regulations 1996, Regulation 3.12

8.2.4 New Zealand

- Health and Safety at Work (General Risk and Workplace Management Regulations 2016: Regulation 13 – Duty to provide first aid)

8.2.5 United Kingdom & Republic of Ireland

- England, Scotland, and Wales: The Health and Safety (First Aid) Regulations 1981 (SI 1981/917)
- The Health and Safety (First Aid) Regulations (Northern Ireland) 1982 (SR 1982/429)
- Safety, Health and Welfare at Work (General Application) Regulations 2007 (SI 299/2007) - First Aid (Republic of Ireland)
- HSE Guidance First Aid at Work L34

9 Definitions

Bloodborne Pathogens: Pathogenic microorganisms that are present in human blood that can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

First Aid Provider: A person who has satisfied the training requirements in their jurisdiction to provide immediate, temporary care for an injured or ill person. Also known as a First Aid Attendant or First Aider. For purposes of this SWP, may also apply to employees who are trained in a more advanced level, such as an Advanced First Aid Provider or Certified First Responder in jurisdictions where such a designation exists.

Over the Counter (OTC) Medication: A medicine that may be sold without a doctor's prescription.

Universal Precautions: Infection control guidelines designed to protect workers from exposure to diseases spread by blood and other bodily fluids. Universal precautions include the use of physical barriers to prevent contact with fluids (such as gloves and CPR masks) and washing hands thoroughly after removing gloves.

Worksite: A location, other than a permanent Stantec office or other office setting, where a Stantec employee is engaged in Stantec work activities. An employee driving a vehicle is not considered to be at a worksite unless that employee is employed exclusively for the purpose of driving a vehicle for Stantec business.

10 Documentation Summary

File these records in the Office Safety File:

- Records of training

File these records in the Project Health & Safety File:

- Project HSSE Plan/Risk Management Strategy (RMS1) or HASP
- Field Level Risk Assessment (RMS2)
- Emergency Response Plan (if applicable)

11 Revision History

Date	Change	Acknowledgments	Approval
January 30, 2026	Replaced all "Ireland" references with "Republic of Ireland)	G. Burnett	K. Hancock/J. Parker
August 7, 2025	Section 3.6 - minor update to SWP Checklist link. Section 5 Controls updated to include working alone training requirement. Section 8.2 – updated regulations library links. Added British Columbia section to Appendix A. Project HSSE Plan language added to RMS1 references. All caps text revised for ADA compliance.	S. Robichaud, G. Burnett	K. Hancock/J. Parker
November 22, 2022	Reinforced references throughout to local requirements, added alignment with energy wheel (4.1), clarification and restructuring of controls (5.0). Edits to 1. Purpose, 3.2 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Hyde, L. Appleby	P. Poelzer
July 31, 2020	Updates to links and references for migration from StanNet to The Lens; minor changes to formatting	K. Bayer	C. Ferguson-Scott
February 28, 2019	Addressed conflict between Stantec requirements for First Aid Providers and local regulatory requirements, S. 1 and S. 5. Modified requirement for hepatitis B vaccination to post exposure, S. 3.3 and S. 3.4. Clarified "over the counter medication" in S. 5.6. Minor changes throughout for format, and clarity and intent of language.	K. Bayer, R. Roy	J. Lessard
December 15, 2016	Addition of s. 5.5 regarding OTC medication in offices.	C. Ferguson-Scott	J. Lessard
July 24, 2013	Minor edits for format and clarity of language.	C. Ferguson-Scott	P. Salusbury
August 2, 2011	Update for submission to Corporate Governance Committee (CGC) for approval	K. Robinson	CGC

Date	Change	Acknowledgments	Approval
July 29, 2010	Reformatted 'Purpose' moving much of the wording to S. 6; broadened scope of 'Responsibilities'; removed references to Area Manager; added references to SWP 108 to S. 5.4; added provision for HBV vaccination in S.5.4; removed provision for HCV vaccination in S. 5.4; clarified requirements for training and required number of Providers throughout S. 6; added definitions to 'Definitions'.	G. Doran	
April 1, 2010	Corrections to SWP references in body; addition of SWP and Form references in 'Resources'	G. Doran	
April 1, 2010	Initial Posting to StanNet	K. Robinson	

Appendix A: First Aid Requirements by Geography

If your jurisdiction is not listed, please see Section 8.2, and contact your HSSE representative for guidance.

Canada

In Canada, each province and territory has its own occupational health and safety regulations that specify requirements for workplace first aid, including, but not limited to, kits/supplies and the number and type of providers. The regulations for each province and territory are listed below. Check online for the most current version of the requirements and incorporate them into safety planning, as necessary. *Please note that because links and regulations are subject to change, the links provided may not link directly to the current regulation, but instead to a site that should allow easy access to the current legislation, code, or regulation.*

Province	Legislation/Regulation	Link
AB	Occupational Health & Safety Code, Part 11	work.Alberta.ca
BC	OHS Regulation Sections 3.14-3.21 and Schedule 3-A	WorkSafe BC
MB	Workplace Safety & Health Regulation, Part 5	SAFE Work MB
NB	Regulation 2004-130 under the Occupational Health & Safety Act	WorkSafe NB
NL	Consolidated Newfoundland and Labrador Regulation 1148/96	House of Assembly
NT/NU	Occupational Health and Safety Regulations, Part 5	WSCC
NS	Occupational Health and Safety Act, Section 82	Novascotia.ca
ON	Workplace Safety and Insurance Act, Regulation 1101	Ontario.ca
PE	Occupational Health and Safety Act, General Regulations, Part 9	WCB of PEI
QC	First-aid Minimum Standards Regulation, chapter A-3.001, r.10	Légis Québec
SK	Occupational Safety and Health Regulations, Part V	qp.gov.sk.ca
YT	Occupational Health and Safety Regulations, Part 18	Yukon WCB

British Columbia

Annual Workplace Assessments: An annual workplace assessment must be completed for Stantec's various scope(s) of work. This must consider the number of workers, type of work, and site-specific factors including the provision of transportation at the various worksites. For projects, this can be completed using the Project HSSE Plan (RMS1) or Health and Safety Plan if appropriate. For offices, labs and warehouses, document this using the WorkSafe BC First Aid Assessment Worksheet and submit it in ProSapien as a Report Only – Stantec.

Written Procedures: Written procedures must be documented and include communication between the first aid attendant and workers served, transportation procedures, and the procedure to request additional assistance when needed. For projects, document this using the Project HSSE Plan (RMS1), or Health and Safety Plan if appropriate. Any onsite changes can be documented on the Field Level Risk Assessment (RMS2) if needed. For offices, labs and warehouses, document this in the Emergency Response Plan for that facility.

First Aid Drills: For offices, labs and warehouses, along with fixed project locations, first aid drills will be completed annually at a minimum, and when conditions change. For temporary working locations, which include project sites where workers are located for less than a year, a drill will be completed as outlined in legislation. When working at various temporary locations, this drill can be completed at one location annually, providing procedures remain substantively the same. Please document First Aid Drills

using SWP 116A: Emergency Response Plan Drill Review and submit it in ProSapien as a Report Only – Stantec.

Newfoundland

Newfoundland and Labrador requires that offices with less than 15 people must have a # 1 kit with supplies outlined in Schedule B, while offices with more than 15 people must have a # 2 kit with supplies outlined in Schedule C of the regulations.

Nunavut and the Northwest Territories

If the office is within 20 minutes of a fixed medical facility, at least one person must hold a Standard First Aid certificate and if there is between 19 and 50 employees, there must be two people with a Standard First Aid Certificate. If the office is more than 20 minutes from a fixed medical facility, two people must have Standard First Aid Certificates. If there are between 20 and 75 employees, there must be an additional person with Standard First Aid for every 15 people over 19 and a dressing room. Should an office have staff above these two limits, please refer to the regulations for specific requirements.

Saskatchewan

Offices in Saskatchewan must have supplies as outlined in Table 9 of the Appendix of the legislation for the type of work carried out at the place of employment, the distance of the place of employment from the nearest medical facility and the number of workers at the place of employment at any one time and ensure that the personnel are readily available during working hours. The office must also have a readily accessible first aid station that contains; a first aid box containing the supplies and equipment set out in Table 10 of the Appendix, a suitable first aid manual and any other supplies and equipment required by the regulations. If a first aid attendant is required, additional first aid supplies and equipment set out in Table 11 and Table 12 in the Appendix of the regulations will be provided.

United States

In the United States, where there is no infirmary, clinic, or hospital in "near proximity" (3-4 minutes) to the workplace, a person or persons will be adequately trained to provide first aid. There is no federal requirement for first aid kit contents. Where local legislation does not specify first aid requirements, ANSI Z308.1 Minimum Requirements for Workplace First Aid Kits will be used as guidance.

#	Item	#	Item
16	Adhesive bandages, 1" x 3"	1	Eye/skin wash, 1 fl oz
1	Adhesive tape, 2.5 yards	1	First aid guide
10	Antibiotic ointment single use packets	6	Hand sanitizer single use packets
10	Antiseptic single use packets	2	Medical exam gloves (pairs)
1	CPR breathing barrier	1	Roller bandage, 2" x 4 yd (used to hold other bandages or dressings in place)
1	Burn dressing (gel soaked) 4" x 4"	1	Scissors
10	Burn treatment single use packets	2	Sterile pad 3" x 3"
1	Cold pack – 4" x 5"	2	Trauma pad 5" x 9"
2	Eye dressings/pads with means of attachment (such as adhesive)	1	Triangular bandage 40" x 40" x 56"

United Kingdom & Republic of Ireland

First aid risk assessments are to be undertaken for Stantec office and field work in line with HSE First Aid at Work Guidance. Consideration is also to be given to the need for Mental Health First Aiders.

Stantec will align with the HSE's optional four-layer framework for first aid provision that has been in place, comprising:

- Appointed person (AP)
- Emergency first aid at work (EFAW)
- First aid at work (FAW)
- Additional training

Project/task specific planning will include first aid risk assessment. First aid provisions, names of first aiders and contact details will be confirmed in the Risk Management Strategy (RMS1) or HASP. It is recommended that Stantec UK employees who frequently carry out lone work on a site/field environment, particularly if they are involved in higher hazard activities, carry a personal first aid kit, have means of communication (e.g., mobile phone), and complete the emergency first aid at work course (EFAW).

When Stantec UK employees are working as a team on a site/field environment, not covered by a client or contractor's first aid arrangements, at least one member of the team should be trained in emergency first aid at work (EFAW).

There is no mandatory list of items to be included in a first aid kit. The decision on what to provide will be influenced by the findings of the first aid needs assessment. Refer to the HSE Guidance for the minimum recommended contents for low-risk environments or travelling kits.

Good Samaritan Laws

Good Samaritan laws exist in the United States and in a few provinces in Canada (AB, ON, BC and NS), with most of the balance of the provinces covered by a Good Samaritan doctrine (or legal principle). Whether it is a law or doctrine, it is there to protect from liability those who choose to aid others who are injured or ill.

Laws vary somewhat from jurisdiction to jurisdiction, but generally speaking, if aid is given in good faith, the aid provider is unlikely to be held liable in the event that the aid itself causes harm or is ineffective. In some jurisdictions in the United States, Good Samaritan laws only protect those who have completed first aid training and provided they have acted within the scope of their training. In these jurisdictions, a person that is untrained in first aid and who performs first aid incorrectly can still be held liable. In the balance of the United States, any rescuer is protected from liability as long as the responder acted rationally.

Quebec, with its foundation in civil law is unique in Canada in that it imposes a duty on everyone to help a person in peril (i.e., a duty to rescue) if it can be accomplished without serious risk to the Good Samaritan or a third person. Failure to do so would amount to fault and lead to legal wrong.

Appendix B: First Aid Kit Supplies

Please enter the appropriate information in the following table every time supplies are used from this First Aid Kit. Please note that tracking of first aid supplies is a company-wide practice.

Date	Name of Ill/Injured Worker	Name of First Aid Provider	Supplies Used	Reason	RMS3 Filled Out (Y/N)

1 PURPOSE

This Safe Work Practice (SWP) has been established to control and reduce employee exposure to bloodborne pathogens. Bloodborne pathogens are infectious microorganisms present in human blood and some other bodily fluids that can cause disease in humans. Bloodborne pathogens include, but are not limited to, human immunodeficiency virus, hepatitis B, and hepatitis C.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 SCOPE

This practice applies to Stantec employees who are reasonably anticipated to be exposed to blood or other potentially infectious materials (OPIM) in the course of their job duties. OPIM include some bodily fluids and other types of human tissue. (See Section 9 for the full definition.)

Stantec employees who are trained and designated to provide first aid in an office or on a worksite have the potential for occupational exposure to bloodborne pathogens. Other work activities are not subject to this SWP. For work around hazardous waste and/or wastewater, see SWP-314 – Working around Hazardous Waste and Wastewater.

3 RESPONSIBILITIES

3.1 Health, Safety, Security, and Environment (HSSE)

- Maintain this SWP
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform an annual program review and update as required

3.2 Office Leader

- Identify employees who are trained and designated to provide first aid in an office
- Offer those employees hepatitis B vaccinations as required by this SWP
- Provides resources for compliance with this SWP

3.3 Supervisor

- Identify employees who are trained and designated to provide first aid at a Stantec project or field site
- Offer those employees hepatitis B vaccinations as required by this SWP

3.4 Office Safety and Environment Coordinator (OSEC)

- Assist employees in scheduling pre-exposure Hepatitis B vaccinations
- Maintain office records related to this SWP

3.5 Employees

Employees who are trained and designated to provide first aid in an office or on a worksite are responsible for the following:

- Review, understand, and apply the requirements of this SWP and SWP-107 – First Aid. The frequency of review will be in accordance with the Safe Work Practices Checklist.
- Select and use appropriate Personal Protective Equipment (PPE), together with the tools and equipment required to provide first aid safely, without incurring personal harm or exposure
- Report any exposure incidents to BBP per the Incident Reporting Protocol for their location

4 HAZARDS

Blood and some other human tissues and bodily fluids have the potential to carry pathogens that cause certain transmittable diseases. Of greatest concern are hepatitis B, hepatitis C, and human immunodeficiency virus (HIV).

4.1 Hepatitis

Hepatitis is an inflammation of the liver, usually caused by a virus. There are several types of viral hepatitis, but the primary risk of occupational exposure is associated with hepatitis B and hepatitis C.

Both hepatitis B and C can cause acute and/or chronic infection and carry the risk of permanent organ damage and death. There is no vaccination for hepatitis C, but there are highly effective treatments that can cure most infections.

There is a vaccination for hepatitis B, which is 95% effective in preventing infection. Hepatitis B vaccinations may come in a 2-, 3, or 4-dose series or in a single dose. Once an individual has received all the required doses for their particular vaccine, they are considered fully immunized. There are no requirements for boosters or immunity checks to ensure ongoing immunity.

4.2 Human Immunodeficiency Virus (HIV)

Human immunodeficiency virus (HIV) attacks specific cells in the body's immune system, which reduces the immune system's ability to fight off other infections or infection-related cancers. While there is currently no effective cure for HIV, it can be controlled with proper medical care.

5 CONTROLS

5.1 Pre-Exposure Hepatitis B Vaccinations

Employees who have been designated as first aid providers for offices or worksites will be offered pre-exposure hepatitis B vaccinations. In the US, pre-exposure vaccinations will be offered following the employee's initial training and within 10 days of being designated as a first aid provider at an office or worksite.

- Employees who have already been fully vaccinated against hepatitis B should not receive further vaccinations unless directed to do so by a medical professional.

Hepatitis B vaccinations will be administered according to the current recommendations issued by the jurisdictional public health authorities (e.g., Health Canada or the US Public Health Service). The vaccinations will be provided at no cost to the employee.

5.1.1 Declining Vaccination

Should an employee decline pre-exposure vaccination, because they are already vaccinated or for any other reason, that declination should be made in writing. US employees must complete the Hepatitis B Vaccine Declination Form (Attachment A). Employees in other jurisdictions may also use that form, but they are not required to do so. The written declination or completed form will be provided to the OSEC, so it can be maintained in the Office Safety File.

If an employee initially declines the vaccination, but later decides to accept, the vaccination will be made available to them at that time.

5.2 Universal Precautions

Employees should treat any blood or OPIM as if it is known to be infectious for bloodborne pathogens and avoid contact. Body fluids that are visibly contaminated with blood will also be considered potentially infectious materials. When differentiation between body fluid types is difficult or impossible, all body fluids will be considered potentially infectious materials.

5.3 Handwashing

Employees will wash their hands immediately or as soon as feasible after removing PPE. When feasible, handwashing facilities (including running potable water, soap, and single use towels or air-drying machines) will be readily accessible to employees. When it is not feasible to provide handwashing facilities, employees will be provided an appropriate antiseptic hand cleanser and clean paper or cloth towels, or antiseptic towelettes. If hand cleansers or towelettes are used, employees should wash their hands with soap and running water as soon as feasible.

5.4 Personal Protective Equipment (PPE)

PPE will be used to reduce the risk of exposure to BBPs, both while providing first aid and while performing clean-up and decontamination activities.

Gloves will be worn when there is a chance of hand contact with blood, OPIM, non-intact skin, or mucous membranes. Disposable gloves, such as those made of nitrile, are generally preferrable to reusable gloves, which would require decontamination after each use. Additional PPE, such as eye protection, face masks or shields, or gowns, may also be used when needed, such as when there are concerns about splatter from blood or OPIM and when using chemical cleaners that may cause irritation to the eyes or respiratory system.

PPE will be provided at no cost to the employees. It may be included in a first aid kit or stored in a location near the first aid kit that is readily available to first aid providers.

5.5 Housekeeping

Appropriate cleaning and decontamination supplies will be readily available. They may be part of the first aid kit or stored in an accessible location near the first aid kit. At a minimum, the supplies will include a suitable surface cleaning agent, PPE, and the means to safely contain and dispose of contaminated materials.

Any object or surface that is potentially contaminated will be decontaminated and sanitized using a 10 % bleach solution (1 part bleach to 9 parts water) or a cleaning product that has been registered or approved for this purpose by Health Canada, the US Environmental Protection Agency (EPA), or other jurisdictional regulatory authority. Employees will utilize appropriate PPE while performing this task.

Broken glassware and other potentially contaminated sharp objects will not be picked up directly with the hands. When present, they will be cleaned up using mechanical means, such as a brush and dustpan or tongs.

5.6 Exposure Incidents

An exposure incident occurs when, in the course of performing their job duties (i.e., providing first aid), an employee has contact with blood or OPIM that could result in the transmission of BBPs. BBPs can be transmitted through:

- Contact with broken skin (e.g., cuts, scrapes, open sores, or chapped skin)
- Contact with mucous membranes (e.g., eyes, lips, and the inside of the nose and mouth)
- Ingestion of contaminated materials
- Cuts or punctures from contaminated sharps (e.g., needle sticks or broken glass)

Most exposure incidents can be prevented through the use of controls. At Stantec, the primary controls used to prevent exposure are administrative controls and PPE.

5.6.1 Post-Exposure Vaccination and Evaluation

In the case of an exposure incident, Stantec will post-exposure evaluation, the hepatitis B vaccination series, and follow-up at no cost to the employee.

Following an exposure incident, employees should follow the Incident Reporting Protocol in place for that jurisdiction. Through that process, they will be directed to an appropriate medical provider for post-exposure vaccination and evaluation.

In the US, services will be performed at a facility within the workers compensation insurer's provider network. The healthcare official evaluating an employee who has had an exposure to a potentially infectious fluid will be provided with the following:

- A copy of the OSHA Bloodborne Pathogens Standard (where applicable) if they do not have it
- Attachment B, Exposure Description Form (completed), and
- Attachment C, Healthcare Official's Written Opinion

In Canada, employees may receive the vaccination series through their family physicians.

If an employee wishes to decline post-exposure hepatitis B vaccination, they will follow the process outlined in section 5.1.1 Declining Vaccination.

5.6.2 Reporting

Exposure incidents will be reported as separate, distinct incidents from the injury or other event causing the exposure according to the Incident Reporting Protocol for the jurisdiction. They will not be reported as part of the incident for which they were providing first aid.

Exposure incident reports and associated documents will be stored securely by HSSE. Those records, as well as the related medical records, will be maintained for thirty years after the employee's last day of employment, unless otherwise required.

6 TRAINING

6.1 Initial Training

Each employee covered by this SWP will be trained in its requirements prior to being assigned an associated task where exposure is possible. Ideally, this training will be combined with the First Aid/CPR training.

6.2 Re-training

Re-training will be provided when workplace changes result in changes to risk exposure.

6.3 US Employee Training

Under the OSHA BBP standard, US employees covered under this SWP must complete annual BBP training that addresses this Exposure Control Plan. This training will be available through the Learning Management System. Records related to this training will be detailed and maintained in accordance with 29 CFR 1910.1030(h)(2).

7 OUTSIDE AUTHORITIES TO BE CONTACTED

Not applicable

8 RESOURCES

8.1 Internal

- SWP-107 – First Aid
- Incident Reporting Protocols

8.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library
- OSHA Safety & Health Topic: Bloodborne Pathogens https://www.osha.gov/SLTC/bloodbornepathogens/index.html
- US Centers for Disease Control and Prevention (CDC)
  - Hepatitis B: https://www.cdc.gov/hepatitis/hbv/index.htm
  - Hepatitis C: https://www.cdc.gov/hepatitis/hcv/index.htm
  - HIV Basics: https://www.cdc.gov/hiv/basics/whatishiv.html
- 29 CFR 1910.1030: https://www.ecfr.gov/current/title-29/subtitle-B/chapter-XVII/part-1910/subpart-Z/section-1910.1030

9 DEFINITIONS

- **Blood:** Human blood, human blood components, and products made from human blood
- **Bloodborne Pathogens:** Pathogenic micro-organisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B, hepatitis C, and human immunodeficiency virus (HIV).

- **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.
- **Exposure Incident:** A specific contact with eye, mouth, other mucous membrane, non-intact skin, puncture by a potentially contaminated object or other contact with blood or other potentially infectious materials that results from the performance of an employee's duties.
- **Handwashing Facilities:** A facility providing an adequate supply of running potable water, soap and single use towels or hot-air drying machine.
- **HIV**: Human immunodeficiency virus
- **Occupational Exposure:** Reasonably anticipated skin, eye, mucous membrane, or parenteral (puncture wounds) contact with blood or other potentially infectious materials that may results from the performance of an employee's job duties.
- **Other Potentially Infectious Materials (OPIM)**:
  - 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 bodily 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), and
  - HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV
- **Personal Protective Equipment** is 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 is not considered to be personal protective equipment.
- **Universal Precautions:** An approach to infection control in which all human blood and certain human body fluids are treated as if they are known to be infected with a bloodborne pathogen and appropriate controls are implemented to reduce or eliminate transmission of bloodborne pathogens during first aid activities.

10 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- Declination forms (maintained until such time as the employee is no longer a designated first aid provider)

11 REVISION HISTORY

Date	Change	Acknowledgments	Approvals
September 28, 2022	Major revisions throughout to improvement alignment with Stantec operations and relevant regulations	K. Bayer, R. Roy	P. Poelzer
July 25, 2013	Minor revisions for wording as requested by prequalification service.	C. Ferguson-Scott	C. Ferguson-Scott
October 15, 2012	Updated for review.	K. Robinson	K. Robinson
July 8, 2010	Finalized and posted	K. Robinson	K. Robinson

ATTACHMENT A

HEPATITIS B VACCINE DECLINATION

Name: _____ Employee ID#: _____

Office: _____ BC: _____

I understand that due to my potential occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time.

☐ I am declining vaccination because I have previously been vaccinated against Hepatitis B.

☐ I am declining vaccination for another reason. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, 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 hepatitis B vaccine, I can receive the vaccination series at no charge to me.

_____ _____

Signature Date

☐ Received by OSEC and placed in Office Safety File on _____

ATTACHMENT B

EXPOSURE DESCRIPTION FORM

To be filled out by employee's supervisor

Employee's Name: _____ Date of Exposure: _____

Description of exposed employee's duties as they relate to the exposure incident:

_____

_____

_____

_____

_____

Routes of exposure and circumstances under which exposure occurred:

_____

_____

_____

_____

_____

_____ _____

Signature of Supervisor Date

APPENDIX A: UNITED STATES

SCHEDULING MEDICAL SURVEILLANCE SERVICES

When the supervisor and employee have completed the RMS9 and determined that medical surveillance services are required, they should provide the completed RMS9 to the OSEC and request that services be scheduled, as applicable. The OSEC is responsible for coordinating the scheduling of services with the MSP.

OSECs will be instructed in the processes for coordinating scheduling with the MSP, including how to identify the required services based on the employee's RMS9.

Exception for Pre-Employment Medical Surveillance Services

Pre-employment medical surveillance services are not coordinated by the OSEC. When requested by the hiring manager, Human Resources (HR) will coordinate scheduling with the applicant and the MSP during the hiring process. The MSP, in turn, will provide the medical clearance documentation to HR. If the prospective employee is hired, the supervisor is responsible to request from HR a copy of the medical clearance documentation, to be provided to the OSEC for the Office Safety File.

Table 1: Triggers for Medical Surveillance

Table 2: Medical Surveillance Exam Protocols

Table 3: References

Abbreviations and Acronyms:

µg: Micrograms
AAUS: American Association of Underwater Sciences
ADCI: Association of Diving Contractors International
BUN: Blood urea nitrogen
CBC: Complete blood count
CFR: Code of Federal Regulations
dBA: Decibels on the A-scale
EKG: Electrocardiogram
GCW: Gross combined weight
GCWR: Gross combined weight rating
GVW: Gross value weight
GVWR: Gross value weight rating
PEL: Permissible exposure limit
PFT: Pulmonary function test
ppm: Parts per million
STEL: Short-term exposure limit
TWA: Time-weighted average
TSD: Treatment, storage, and disposal
RCRA: Resource Conservation and Recovery Act
ZPP: Zinc protoporphyrin

TABLE 1: TRIGGERS FOR MEDICAL SURVEILLANCE

Screening Category	Trigger(s)	References
HAZWOPER	Employees who perform work on a site whose operations are subject to the US OSHA HAZWOPER standard - Clean-up of hazardous substances required by a governmental body at an uncontrolled hazardous waste site - Corrective actions involving clean-up operations at a site covered by RCRA - Voluntary clean-up operations at sites recognized by a governmental body as uncontrolled hazardous waste sites - Hazardous waste operations at a TSD facility regulated by RCRA - Emergency response operations for releases of, or substantial threats of releases of, hazardous substances at any location in the US **AND** Said work meets one or more of the following criteria: - Employee is or may be exposed to hazardous substances or health hazards at or above the PEL or published exposure level for 30+ days per year - Employee wears a respirator 30+ days per year - Employee is designated as a member of a hazardous materials response team that satisfies the requirements defined by OSHA in 29 CFR 1910.120: "An organized group of employees, designated by the employer, who are expected to perform work to handle and control actual or potential leaks/spills of hazardous substances requiring possible close approach to the substance . . . for the purpose of control or stabilization of the incident."	29 CFR 1910.120(f)
DOT	Employees who operate a motor vehicle on a public roadway when the vehicle: - Has a GVWR, GCWR, GVW, or GCW of 4,536 kg (10,001 pounds) or more, whichever is greater - Is designed or used to transport more than 15 passengers, including the driver, or - Is used to transport hazardous materials in quantities requiring placarding under 49 CFR 171	49 CFR 391.43
Respirator	Employees who are required to wear a respirator	SWP-409 – Respiratory Protection 29 CFR 1910.134(e)
Noise	Employees with potential exposure to noise at or above: - 82 decibels on the A-Scale (dBA) on an 8-hr TWA, or equivalent for shifts longer than 8 hours (see adjusted Action Levels in SWP-106 – Hearing Conservation), or - Instantaneous (peak) intensities at or above 140 dBA	SWP-106 – Noise Control and Hearing Conservation Program 29 CFR 1910.95(g)

Screening Category	Trigger(s)	References
Asbestos	Employee is or may be exposed to an airborne concentration of asbestos fibers (even if they are wearing a respirator) at or above: - 0.1 fibers/cm^3 of air on an 8-hour time-weighted average (TWA), or - 1.0 fibers/ cm^3 of air as averaged over a sampling period of 30 minutes (Excursion Limit) **OR** Employee is engaged in Class I, II, or III asbestos work 30+ days per year; see SWP-304 – Asbestos Safety for definitions.	SWP-304 – Asbestos Safety 29 CFR 1910.1001(l) 29 CFR 1926.1101
Arsenic (Inorganic)	Employee is or may be exposed to airborne concentrations at or above 5 µg/m^3 on an 8-hr TWA (Action Level), 30+ days per year	SWP-315 – Arsenic Safety 29 CFR 1910.1018
Benzene	Employee is or may be exposed to airborne concentrations at or above: - 0.5 ppm on an 8-hr TWA, 30+ days per year (Action Level) - 1 ppm on an 8-hr TWA, 10+ days per year (TWA) - 5 ppm as averaged over any 15-minute period, 10+ days per year (STEL)	SWP-305 – Benzene 29 CFR 1910.1028(i)
Crystalline Silica	Employee is or may be exposed to airborne concentrations at or above 25 µg/m^3 as an 8-hr TWA, 30+ days per year	SWP-309 – Silica Awareness 29 CFR 1910.1053(i)
Lead	Employee is or may be exposed to an airborne concentration at or above 30 µg/m^3 as an 8-hr TWA, 30+ days per year	29 CFR 1910.1025(j)
Diving – Commercial or Scientific	Employee performs work underwater using a supplied-air breathing apparatus for either commercial or scientific purposes. - Commercial diving: Performed to complete tasks other than scientific research, such as placing or removing heavy objects underwater; inspection of pipelines, bridges, and similar objects or structures; construction; or cutting or welding. - Scientific diving: Performed solely as a necessary part of a scientific, research, or educational activity by employees whose sole purpose for diving is to perform scientific research tasks.	29 CFR 1910.421(f)(2) AAUS Standards for Scientific Diving ADCI International Consensus Standards for Commercial Diving and Underwater Operations

TABLE 2: MEDICAL SURVEILLANCE EXAM PROTOCOLS

Screening Category	Frequency/Interval	Required Elements	MSP/Physician's Discretion[1,2]
HAZWOPER	Pre-placement	• Medical and Work History • Physical Exam	• Vision test[3] • Audiogram[3] • Pulmonary function test (PFT)[3] • Chest x-ray[3] • Electrocardiogram (EKG)[3] • Respirator questionnaire & evaluation • Laboratory blood tests • Urinalysis
	Periodic (generally on an annual basis, but can be biennial if recommended by physician)	• Medical and Work History • Physical Exam	• Vision test[3] • Audiogram[3] • PFT[3] • Chest x-ray[3] • EKG[3] • Respirator questionnaire & evaluation • Laboratory blood tests • Urinalysis
	Exit[4]	• Medical and Work History • Physical Exam	• Vision test[3] • Audiogram[3] • PFT[3] • Chest x-ray[3] • EKG[3] • Respirator questionnaire & evaluation • Laboratory blood tests • Urinalysis
DOT	Pre-placement	• DOT Exam Form • Physical Exam • Vision Test • Urinalysis • Whisper Test	• Audiogram
	Recertification (biennially)	• DOT Exam Form • Physical Exam • Vision Test • Urinalysis • Whisper Test	• Audiogram
Respirator	Pre-placement	• Respirator questionnaire & evaluation	• PFT
	Additional Evaluations	• Respirator questionnaire & evaluation	• PFT
Noise	Pre-placement	• Audiogram	
	Annual	• Audiogram	

Screening Category	Frequency/Interval	Required Elements	MSP/Physician's Discretion[1,2]
Asbestos	Pre-placement	• Medical and Work History • Asbestos Questionnaire • Physical Exam • PFT • Chest x-ray	
	Periodic (to be performed annually, with exceptions for chest x-ray)	• Medical and Work History • Asbestos Questionnaire • Physical Exam • PFT • Chest x-ray[5]	
	Exit[6]	• Medical and Work History • Asbestos Questionnaire • Physical Exam • PFT • Chest x-ray	
Arsenic (inorganic)	Pre-placement	• Medical and work history • Physical exam • Chest x-ray • Nasal and skin exam	
	Periodic (at least annually)	• Medical and work history • Physical exam • Chest x-ray • Nasal and skin exam	
	Exit	• Medical and work history • Physical exam • Chest x-ray • Nasal and skin exam	
Benzene	Pre-placement	• Medical and work history • Physical exam • Complete blood count (CBC) • PFT[7]	
	Periodic (annually)	• Medical and work history • Physical exam • CBC • PFT[7]	

Screening Category	Frequency/Interval	Required Elements	MSP/Physician's Discretion[1,2]
Crystalline Silica	Pre-placement	• Medical and work history • Physical exam • Chest x-Ray with b-reader • PFT • Tuberculosis test	
	Periodic (every three years)	• Medical and work history • Physical exam • Chest x-Ray with b-reader • PFT • Tuberculosis test	
Lead	Pre-placement	• Medical and Work History • Physical Exam • Blood tests: Lead, Zinc protoporphyrin (ZPP), Blood urea nitrogen (BUN), and Creatinine • Urinalysis	
	Periodic (every six months)	• Blood tests: Lead and ZPP	
Commercial Diving	Pre-placement	Medical examination per current ADCI International Consensus Standards for Commercial Diving and Underwater Operations, documented on ADCI Physical Examination Form or equivalent	
	Periodic (annually)	Medical examination per current Association of Diving Contractors International's (ADCI's) International Consensus Standards for Commercial Diving and Underwater Operations, documented on ADCI Physical Examination Form or equivalent	
Scientific Diving	Pre-placement	Medical examination per current American Academy of Underwater Sciences' Standards for Scientific Diving Manual, documented on Medical Evaluation of Fitness for Scuba Diving Report or equivalent	
	Periodic	Medical examination per current American Academy of Underwater Sciences' Standards for Scientific Diving Manual, documented on Medical Evaluation of Fitness for Scuba Diving Report or equivalent	

Notes:
1. MSP or examining physician can add other exam elements at their own discretion even if they are not listed here, based on the employee's individual history and exposures. Some examples include laboratory blood tests and urinalysis.
2. MSP may include other elements as a standard component of an exam, based on the recommendations of their in-house medical professionals and established standards for medical practice.
3. These elements are specifically suggested by OSHA, but whether they are performed is left to the physician's discretion.
4. Exit exam is not required if it has been less than six months since last exam.
5. For asbestos periodic exams, chest x-rays are not required every year; instead, they are performed according to Table 1 of the OSHA Asbestos standard, 29 CFR 1910.1001, which is based on employee's age and length of time since first exposure.
6. Asbestos exit exams are not required if it has been less than one years since the last exam.
7. Benzene exams: A PFT is required during the pre-placement exam if, in addition to exposure to benzene action level, the employee wears a respirator 30+ days per year. Following the pre-placement exam, a PFT is only required during the periodic exam every three years.

TABLE 3: REFERENCES

Screening Category	Relevant Internal and External References
HAZWOPER	• 29 CFR 1910.120
DOT	• 49 CFR 391, Subpart E
Respirator	• 29 CFR 1910.134 • SWP-409 – Respiratory Protection Program
Noise	• 29 CFR 1910.95 • SWP-106 – Noise Control and Hearing Conservation Program
Asbestos	• 29 CFR 1910.1001 (General Industry) • 29 CFR 1926.1101 (Construction) • SWP-304 – Asbestos Safety
Arsenic (inorganic)	• 29 CFR 1910.1018 • SWP-315 – Arsenic Safety
Benzene	• 29 CFR 1910.1028 • SWP-305 – Benzene Safety
Crystalline Silica	• 29 CFR 1910.1053 • SWP-309 – Silica Awareness
Lead	• 29 CFR 1910.1025
Diving	• 29 CFR 1910, Subpart T • Standards for Scientific Diving Manual (American Academy of Underwater Sciences, 2018 version with March 2019 corrections) • International Consensus Standards for Commercial Diving and Underwater Operations (Association of Diving Contractors International, 6.2 Edition, 2016)
Additional References and Resources	• 29 CFR 1910.1020: Access to Medical Records • OSHA Safety and Health Topic: Medical Screening and Surveillance • Medical Screening and Surveillance Requirements in OSHA Standards: A Guide (OSHA Publication 3162-01R, 2014) • Specific Medical Tests or Examinations Published in the Literature for OSHA-Regulated Substances (US National Institute of Occupational Safety and Health (NIOSH), Publication Number 2005-110, December 2004)

REVISION HISTORY

Date	Changes	Acknowledgments	Approval
August 18, 2020	Initial posting to The Lens	K. Bayer, P. Fox, R. Roy	J. Lessard

1 Purpose

The medical surveillance program is designed to protect the general health and fitness of employees with the potential to be exposed to certain chemical and physical hazards. The program aims to:

- Assess the physical capability of employees to safely perform certain assigned tasks or utilize certain types of personal protective equipment (PPE)
- Prevent occupational illness and injury through early identification of occupational exposure-related health effects before they result in disease, and
- Provide data to help verify that hazard controls are effective

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 Scope

Medical surveillance is required for employees who:

- Are or may be exposed above the level or limit of any carcinogen or hazardous chemical that has medical surveillance requirements under local regulation or other SWPs
- Perform work in environments where noise levels exceed 85 dBA on an 8-hour time-weighted average
- Are required to wear a respirator
- Perform underwater diving operations
- Perform work that is subject to the US Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) standard
- Operate motor vehicles that are subject to US Department of Transportation Federal Motor Carrier Safety Administration (DOT FMCSA) driver qualification regulations

The appendices to this SWP provide jurisdiction-specific information about medical surveillance requirements. Employees should refer to the appendix for the jurisdiction(s) in which they perform work to see the specific requirements. (Non-applicable regulatory requirements will not be included in the appendices; see the note under Section 5.1.)

Medical surveillance will be provided at no cost to the selected employee, without loss of pay, and at a reasonable time and place. In jurisdictions where the employee may be required to provide payment at the time of service, they will be reimbursed.

3 Responsibilities

3.1 Health, Safety, Security, & Environmental (HSSE)

- Maintain this Safe Work Practice (SWP)
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Identify the vendor(s) who act as the Medical Services Providers (MSPs)
- Perform periodic formal and informal audits that verify whether the requirements within this practice are being met

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP

3.3 Supervisor

- Identify employees who may be required to participate in the medical surveillance program in accordance with this SWP:
  - Within the first 10 days of employment (per the Employee HSSE Orientation checklist) or
  - When employee job duties or hazard exposures change
- Complete the Medical Surveillance Assessment Form (RMS9) with identified employees to determine whether each employee requires medical surveillance and what medical surveillance services are required based on the appendix for the jurisdiction
- Provide a copy of the completed RMS9 to the OSEC and advise the OSEC when medical surveillance is required
- Where employees were required to undergo pre-employment medical screening, request the medical clearance documentation from HR
- Verify that medical surveillance is completed as required at the frequency noted in the Appendix for the jurisdiction, including exit exams (if required per the Appendix) when dictated by a change in job duties or the employee's departure from Stantec
- When informed of an employee who has not been cleared or cleared with restrictions, alter the employee's job duties to comply with the limitations of the medical clearance document issued by the MSP
- Confirm that affected employees have reviewed this SWP in accordance with the Safe Work Practice Checklist

3.4 Project Manager (PM)

- Identify hazards and tasks associated with their projects that can trigger medical surveillance requirements
- Relay medical surveillance triggers to affected employees and the employees' supervisors

3.5 Medical Service Provider (MSP)

An MSP is an external service that provides qualified occupational medicine oversight for medical surveillance program. When an MSP is retained, their responsibilities may include the following:

- Establish medical surveillance protocols that comply with regulatory requirements and standards for medical practice
- Utilize duly certified physicians to review the results of medical surveillance exams and associated testing
- Notify employees of the results of any medical tests
- Advise and refer employees for further testing and/or treatment based on medical findings
- Provide Stantec with a clearance document that indicates a physician's written opinion based on their review, including any limitations or restrictions on the employee's exposures or the use of PPE
- Maintain and preserve related medical records confidentially and securely

3.6 Office Safety & Environment Coordinator (OSEC)

3.6.1 United States

- Coordinate scheduling of medical surveillance services with the employee and the MSP
- Receive and distribute medical surveillance clearance documents to employees, supervisors, and other personnel as appropriate
- Maintain a list of employees assigned to their office who are currently participating in the medical surveillance program that identifies the type of medical surveillance, the date on which the current clearance was issued, and when that clearance expires
- Retain completed forms and other documents in the Office Safety File as required by this SWP

3.6.2 Canada

- Provide completed RMS9 forms to the Designated Company Representatives to initiate scheduling of medical surveillance services
- Retain completed forms and other documents in the Office Safety File as required by this SWP

3.7 Designated Company Representatives (Canada only)

- Coordinate scheduling of medical surveillance services with the employee, the MSP, and other medical providers as necessary
- Receive and distribute medical surveillance clearance documents to employees, supervisors, and OSECs

3.8 Employees

- Complete the RMS9 with their supervisor when required by this SWP
- Participate as necessary in the process to set up required medical surveillance services in their jurisdiction
- Attend exams as scheduled
- Notify their supervisor if they identify new or existing hazard exposures that were not captured in their most recently completed RMS9

4 Hazards

Exposure to chemical, and physical hazards can have negative, sometimes serious, effects on an individual's health. Those negative effects can vary based on the hazard's specific properties, the individual's unique physiological characteristics and medical conditions, and the level and/or frequency of exposure.

5 Controls

5.1 Triggers for Medical Surveillance

Each medical surveillance screening category (respirator use, asbestos, noise, etc.) has specific criteria that trigger the need for medical surveillance. If an employee's exposures or job duties do not satisfy the criteria, medical surveillance is not required. Absent a compelling special circumstance, employees should not be placed into a medical surveillance program if it is not required. Any exceptions should be referred to the Regional HSSE Manager and HSSE Programs & Practice team for guidance prior to initiating medical surveillance services.

The triggers for medical surveillance are listed in Table 1 for each jurisdictional appendix to this SWP.

Note: There are regulatory requirements for medical surveillance in various jurisdictions that are not applicable to Stantec, as they address hazards that Stantec employees are not exposed to. As such, they are not included in the relevant appendix. Examples include compressed air environments (for which there are regulations in multiple provinces in Canada) and certain hazardous substances for which there are regulations under OSHA in the US (including, but not limited to, beryllium, cadmium, hexavalent chromium, and formaldehyde). In the case of a client requirement or any other questions about a hazard not listed in the relevant appendix, send the inquiry to HSSE@stantec.com.

5.2 Identifying Employees Subject to Medical Surveillance

In order to determine whether an employee is subject to medical surveillance requirements, the supervisor and employee will work together to complete the Medical Surveillance Assessment (RMS9) form.

The RMS9 lists questions about each of the screening categories identified in section 2.0 of this SWP. The questions assess whether the employee's exposure or job duties trigger participation in medical surveillance. If the answer to any of the questions is "yes," the employee is subject to medical surveillance. The type of exam and frequency will be determined per section 5.3 of this SWP.

The RMS9 must only be completed for employees who perform work outside of an office on a client or project site or in a laboratory. It must be completed:

- Within 10 days of the start of employment
- When job duties or hazard exposures change, and
- Annually

The completed RMS9 must be provided to the OSEC to be filed in the Office Safety File, regardless of whether medical surveillance services are required.

5.3 Medical Surveillance Exam Protocols and Frequency

5.3.1 Exam Protocols

If it is determined that an employee requires medical surveillance, they will be provided an exam tailored to the screening category. These exam protocols will satisfy local regulatory requirements, as well as standards of medical practice as recommended by an MSP or qualified medical professional. Table 2 in each appendix identifies the minimum required elements for exam protocols and additional discretionary elements for that jurisdiction.

The MSP may include other elements as a standard component of an exam protocol, based on the recommendations of their in-house medical professionals and established standards for medical practice. Further, the MSP or the examining physician may also add other exam elements at their own discretion, based on the employee's individual medical and work history or other factors they deem relevant.

When required, client- or project-specific exam protocols may also be established. Should one of these protocols be required, the PM will send a request to HSSE@stantec.com with the complete documentation of the requirements.

5.3.2 Exam Frequency

Medical surveillance exams are required to occur at a specific frequency or interval. That frequency is specific to the exam protocol and provided in Table 2 of each appendix.

5.3.2.1 Pre-Placement Exams

Pre-placement exams (also known as baseline exams or initial exams) occur before an employee is exposed to a hazard or performs the related task for the first time. Employees are not permitted to engage in applicable activities until they have completed the required exams and been cleared by the MSP. See section 5.7 for information about pre-employment exams.

- An exit exam from a previous employer may be utilized as a pre-placement exam if the exam was performed within 30 days and it includes all the necessary exam components. The MSP will provide a form for the employee to complete requesting the transfer of those exam records, then review the records accordingly. If exam components are missing or the MSP determines that additional testing is required, those components must be completed before a pre-placement exam requirement is considered satisfied.

5.3.2.2 Periodic Exams

Periodic exams generally occur at a fixed interval following the pre-placement exam. That interval varies based on the screening category. See Table 2 in the relevant appendix for specific intervals. The physician may also specify a different interval for periodic exams, if they determine it is necessary.

5.3.2.3 Exit Exams

Some screening categories require exams at the time the employee leaves the medical surveillance program, either when they leave their work assignment or at the end of their employment. These exams establish a record of the employee's health status at the time they leave the medical surveillance program.

- An exit exam may not be required depending on how recently the employee's previous exam was performed. See Table 2 in the relevant appendix for information about when exit exams may not be required.
- When an exit exam is required, it must be offered to the employee. However, the employee has the right to decline the exit exam. If they choose to decline the exam, they must complete and sign the Medical Surveillance Declination form (see Attachment 1). The signed form will be stored in the Office Safety File and where the services of an MSP are used to store employee medical records, a copy of the form will also be sent to be added to the employee's medical records.

5.4 Scheduling Medical Surveillance Services

The processes for scheduling services vary by jurisdiction. Please see the applicable appendix for your jurisdiction.

5.5 Exam Follow Up

Following each exam, the MSP or examining physician will issue a medical clearance document to Stantec that offers the physician's opinion as to whether the employee has any

detected medical conditions that would place them at increased risk to their health from the occupational exposure or task. It may also include:

- Limitations on the employee's use of a respirator or other PPE
- Limitations on their work duties related to specific hazards, and/or
- Recommendations for additional evaluation

Medical clearance documents will not contain any personal health information, including specific medical findings or diagnoses.

The employee will be provided with a copy of their medical clearance document(s). A copy will also be placed in the Office Safety File.

If the medical clearance document indicates that the employee has not been cleared or if it provides any limitations, the supervisor will immediately remove them from any corresponding job duties, until such time as the limitations have been addressed and/or the employee has been medically cleared to resume those duties.

The MSP or examining physician will provide exam results directly to the employee with any recommendations for further evaluation or treatment.

Should an MSP identify, through medical surveillance, an illness or injury that may potentially be related to occupational exposure, they will confidentially notify designated contacts in HSSE, so that the incident reporting and recordkeeping process can be initiated as required. If an employee is notified by an examining physician of a potential work-related illness or injury, they will report it as specified in the Incident Reporting Protocol for their jurisdiction.

5.6 Alcohol & Drug Testing

Alcohol and drug testing are not components of medical surveillance and are beyond the scope of this SWP. Please see the Stantec Alcohol and Drug Practice (HSSE-100).

5.7 Pre-Employment Medical Surveillance

There are circumstances under which medical surveillance may be performed as part of the hiring process for new employees. It may be necessary to confirm that a prospective employee will be able to meet the medical clearance requirements for certain job postings. Pre-employment medical surveillance is only appropriate when employment is conditional upon being medically cleared. Otherwise, pre-placement exams will be performed following the start of employment.

If pre-employment medical screening has been performed, it does not exempt the supervisor and new employee from completing the RMS9 during the first 10 days of employment. Pre-employment medical surveillance services will serve as a pre-placement exam. However, if additional medical surveillance is required and outside of the scope of the pre-employment exam, it must be completed following the start of employment.

5.8 Medical Records

When an MSP is utilized, medical records are maintained and preserved in confidential, secure files in the MSP's custody. Other medical records will be maintained and preserved in the custody of the examining physician in compliance with local regulations. Medical records will be maintained for at least the duration of employment plus 30 years, or as otherwise required

by regulation. Medical clearance documentation supplied to Stantec will not include medical records.

Upon request, each employee will have access to their personal medical record at no cost, and in a reasonable time, place, and manner. Requests to access medical records should be submitted to HSSE@stantec.com.

If an employee wishes to have their medical records released to a designated representative, the employee must submit a specific written consent that contains the following:

- The name and signature of the employee authorizing the release of medical information
- The date of the written authorization
- The name of the individual or organization that is authorized to release the medical information
- The name of the designated representative (individual or organization) that is authorized to receive the released information
- A general description of the medical information that is authorized to be released
- A general description of the purpose for the release of the medical information, and
- A date or condition upon which the written authorization will expire (if less than one year)

Stantec employees working outside of their home country will have their records maintained in their home country.

If Stantec ceases doing business, employee medicals records in the custody of the MSP will either be transferred to another employer or the affected employees will be notified of their right to access their records at least three months prior to cessation of business, in accordance with local legislation.

5.9 Program Analysis

HSSE may use data from medical surveillance exams to analyze program effectiveness and/or the effectiveness of exposure controls. Data may be requested from the MSPs to enable that analysis. If data from medical records is utilized, the MSPs will remove all direct personal identifiers (e.g., name, social security number, employee ID number, address) and any indirect data that would reasonably allow an employee to be identified (age, date of initial employment, job title) before providing the data to Stantec.

6 Training or Qualifications

OSECs, HR, HSSE, and others as appropriate will receive guidance on how to coordinate medical surveillance services with the MSP(s).

7 Outside Authorities to be Contacted

None

8 Resources

8.1 Internal

- Medical Surveillance Assessment Form (RMS9)
- SWP-106 – Noise Control and Hearing Conservation Program
- SWP-304 – Asbestos Safety
- SWP-305 – Benzene Safety
- SWP-309 – Silica Awareness

- SWP-315 – Arsenic Safety
- SWP-409 – Respiratory Protection
- Employee HSSE Orientation Checklist
- Safe Work Practice Checklist

8.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library
- United States: See Appendix A
- Canada: See Appendix B
- For other jurisdictions, please connect with your local HSSE representative.

9 Definitions

Designated Company Representative (DCR): Key contact for Stantec's Alcohol & Drug Program; in Canada and the US, the DCRs also provide support to the medical surveillance program. Outside of North America, these roles are typically connected to Human Resources. For additional information, please contact your local HSSE representative.

Medical Record: A record concerning the health status of an employee which is made or maintained by a physician, nurse, or other health care personnel or technician. [Source: 29 CFR 1910.1020(c)(6)(i)]

HAZWOPER: Hazardous Waste Operations and Emergency Response per the US OSHA standards in 29 CFR 1910.120

10 Documentation Summary

File these documents in the Office Safety File:

- Medical Surveillance Assessment form (RMS9)
- Medical clearance documents
- Medical Surveillance Declination form

File these documents in the Project Health & Safety File:

- None

Records stored by the MSP(s):

- Medical records
- Medical Surveillance Declination form

11 Revision History

Date	Change	Acknowledgments	Approvals
July 25, 2025	Updated noise action level. All caps text revised for ADA compliance.	M. Doherty, J. Elkins, G. Burnett	K. Hancock
February 1, 2023	Administrative Update: Edits to 1 Purpose, 3.1 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Ferguson-Scott	P. Poelzer
August 18, 2020	Substantial updates throughout SWP	K. Bayer, P. Fox, R. Roy	J. Lessard
September 28, 2012	Update to include new contractor/ legislative requirements	K. Robinson	
August 24, 2012	Approved for posting	K. Robinson	P. Salusbury
September 24, 2010	Written for StanNet	K. Robinson	

Appendix A: United States

See link on The Lens.

Appendix B: Canada

See link on The Lens.

Attachment 1: Medical Surveillance Declination Form

I have been a participant in the Stantec Medical Surveillance Program due to exposure to a hazard for which I am entitled an exit exam upon reassignment to a position that does not require medical clearance or upon termination of my employment. I understand that Stantec encourages employees to schedule and complete an exit exam. However, I decline to have an exit exam.

Printed Name: _____ Employee ID #: _____

I have participated in the following Medical Surveillance programs: (Please check all that apply)

☐ HAZWOPER *(US Only)*

☐ Arsenic

☐ Asbestos *(US and Ontario only)*

☐ Benzene *(Ontario only)*

☐ Crystalline Silica *(Newfoundland & Labrador and Ontario only)*

☐ Lead *(Nova Scotia and Ontario only)*

☐ Mercury *(Ontario only)*

Signature: _____ Date: _____

Received by:

Printed Name: _____

☐ Supervisor
☐ OSEC
☐ Other: _____

Signature: _____ Date: _____

1 Purpose

Workers who work in hot environments or are exposed to high temperatures may be at risk of heat stress, which, in turn, can cause heat-related illnesses. When certain types of work activities are undertaken or protective clothing and personal protective equipment (PPE) are used, heat stress can occur at moderate temperatures. In addition, the effects of high heat can increase the risk of incidents, due to sweaty palms, fogged-up safety glasses, or dizziness.

The purpose of this safe work practice (SWP) is to provide employees, project managers (PMs), and supervisors with guidance on, and requirements for, reducing exposure to heat stress where heat has been identified as a hazard.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 Scope

This SWP is applicable to all Stantec employees, subcontractors, and subconsultants who are exposed to a temperature/humidity combination (as identified in Appendix B) that exceeds the applicable threshold temperature. Where employees are wearing protective clothing such as welding leathers, Flame Retardant Coveralls (FRC), or Tyvek or other coveralls, the threshold level will be adjusted as noted in Appendix B.

3 Responsibilities

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this SWP
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether the requirements within this practice are being met

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP

3.3 Project Manager

The PM has the primary responsibility for implementing this practice. This responsibility includes the following:

- Evaluate the potential for heat stress hazards associated with every project to determine what controls are necessary
- Document the evaluation using the Project HSSE Plan/Risk Management Strategy (RMS1) or Health and Safety Plan (HASP)
- For projects where heat stress has been identified as a hazard, use employees trained in the requirements of this practice so that employees will be able to recognize the symptoms of heat-related illness and take appropriate action

- Directly, or through delegation to project supervision, monitor employees for indication of heat-related illness symptoms as identified in this SWP
- Provide cool potable water or fluids that replenish electrolytes for drinking, as well as shade and rest, as required by this practice
- Where work is being performed outdoors or indoors in States reference in Section 5.3.6, where temperatures are at the temperature threshold or higher a Heat Illness Prevention Plan (SWP-113a) meeting the state specific regulatory requirements must be completed.

3.4 Field Employees

- Be aware of the hazards and know how to apply the controls when performing work with the potential for heat illness
- Be aware of and comply with requirements outlined in this SWP
- Monitor themselves for signs and symptoms of heat-related illness and communicate any issues to the Supervisor/Project Manager as soon as identified

4 Hazards

4.1 Energy Wheel



The energy wheel is a visual tool used by Stantec to identify 10 sources of energy and to assess and control the hazards associated with each source. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. Before beginning any activity, review the potential hazards and controls associated with the task. For project work, these sources, hazards, and controls will be documented on the Risk Management Strategy (RMS1), and in a Field Level Risk Assessment (RMS2/field app). Below are examples of energy sources and hazards most commonly associated with the cause of heat-related illnesses

Energy	Hazard / Condition
Thermal	Exposure to hot weather conditions/environments can add heat stress to the body potentially causing heat related illnesses.
Motion	Intensity and duration of physical work activity can create heat stress to the body.
Biological	Individual's fitness level, acclimatization of the working environment, clothing worn, and personal protective equipment worn can contribute to heat stress load.

4.2 Causes of Heat Stress

Heat stress is the net heat burden on the body from the combination of body heat generated while working, environmental factors such as wind and relative humidity, and radiant heat from the sun and other sources. If someone is exposed to too much heat stress, it can overwhelm their body's ability to maintain its normal core temperature, resulting in a heat-related illness.

Heat-related illnesses range from mild to severe and can lead to death if not treated. Appendix A provides information on the four types of heat-related illness, their symptoms, and appropriate first aid.

4.3 Factors Affecting Heat Stress

- **Workload:** The type of work being performed determines how much heat is generated by the body. Light, sedentary work generates little heat, while active, heavy work generates a great deal.
- **Clothing and PPE**: Clothing and PPE worn by the worker has a direct effect on his or her level of heat loss and heat gain. Insulated and non-breathable clothing and PPE (such as Tyvek suits, coveralls, and chemical protection gear) hold heat in, and prevent the circulation of air that would evaporate sweat and cool the body. Dark-colored clothing absorbs more radiant heat than lighter-colored clothing. Light, breathable clothing and PPE (such as vented hard hats, breathable high visibility clothing) allows air circulation that promotes the evaporation of sweat and cools the body.
- **Environmental Factors:** The environment in which work is performed is a key factor to heat stress. In addition to air temperature, relative humidity, shade, and air movement must also be considered. One of the ways the body seeks to cool itself is through the evaporative effect of sweating. Air movement, such as wind or a fan, supports evaporation, while higher levels of relative humidity can inhibit the process.
- **Acclimatization:** Acclimatization is the result of beneficial physiological adaptations that occur after gradual increased exposure to a hot environment, such as an increased sweating efficiency and heat tolerance. It typically takes up to fourteen (14) days for most people to acclimatize. However, it can take as little as four days for workers to become unacclimatized. Once acclimatization has occurred, it can lower an individual's susceptibility to heat stress.
- **General Health, Age, and Physical Characteristics of the Individual:** Health issues can be a significant factor relating to how much heat stress a person can tolerate. Individuals who have experienced heat-related illness in the past are more susceptible to developing it again.
    - Age: Studies have shown that older workers are more susceptible to heat stress.
    - Weight: The same is true for workers who are overweight, as they are less efficient at removing excess heat.
    - Pre-existing medical conditions or treatments: Heart problems and treatments such as low-sodium diets weaken the body's ability to efficiently remove excess heat. Heart disease can also be aggravated by heat. Vulnerability to heat stress may increase with diabetes mellitus, cystic fibrosis, and hyperthyroidism.
    - Short-term disorders and minor illnesses: Feverish illnesses, diarrhea, and vomiting can all cause excess loss of fluids, which may decrease a person's ability to cope with heat. Sleep deprivation can also increase the risk of heat stress.
    - Chronic skin disorders: Rashes, dermatitis, healed burns, and other skin conditions that involve large skin surface areas may limit the body's ability to sweat properly. Skin problems can also worsen when exposed to heat.
    - Alcohol and drugs: Alcohol can cause dehydration while certain drugs increase the internal body heat and decrease the ability to lose heat.

- Use of medication: Some medication that may cause problems when working in hot environments. Workers are encouraged to consult with their physician or pharmacist to determine if the medicine they have been prescribed will increase their susceptibility to heat stress.

5 Controls

5.1 Elimination/Substitution

In some cases, it may be possible to avoid hazardous heat levels entirely. When planning work, consider:

- Performing work during cooler times of the day, such as in the early morning hours or when work areas may be out of direct sunlight
- Having unnecessary heat-generating equipment shut off or powered down when possible
- Completing as much work off site away from hot conditions (e.g., modular construction)

5.2 Engineering Controls

- Air conditioning can be used when working indoors.
- Ventilation, or air movement affects the exchange of heat between the body and the environment. If the air temperature is less than the worker's skin temperature, increasing air speed can help workers stay cooler by increasing both the rate of evaporation and the heat exchange between the skin surface and the surrounding air.
- Shade must be easily accessible (i.e., close to the worksite) and large enough to accommodate all employees who may be resting or recovering at any given time. Shade may be provided by natural or artificial means, including umbrellas, awnings, shade tents, tree branches, or inside vehicles (provided the vehicle is protected from direct sun or has the air conditioning running).
  - At temperatures below 80°F (27°C), PMs should provide all employees at each project site with timely access to shade upon request.
  - For temperatures at or above 80°F (27°C), one or more areas with shade must be provided on the project site at all times while employees are present. These areas must be large enough to accommodate all employees who remain on site during meal periods at any one time.
- The body generates more heat during heavy physical work. Use mechanical devices such as power tools, carts, conveyors, and mechanical lifting devices to reduce the level of physical activity required.

5.3 Administrative Controls

5.3.1 Physical Effort

Reduce the physical effort needed for the task by:

- Lowering the pace of work (how fast) or the intensity (how “hard” the job is)
- Shortening the duration (how long)
- Increasing the number and/or length of rest breaks
- Substituting light tasks for heavy ones
- Increasing the number of employees to share the workload

5.3.2 Hydration

Workers must have easy access to potable drinking water that is suitably cool and available to them free of charge. For project sites where potable water is not plumbed or otherwise

continuously supplied, a sufficient amount of potable water must be provided. "Sufficient" is defined as at least 32 ounces per worker per hour. Provisions should also be made to keep the water suitably cool throughout the workday (e.g., a cooler, storage in a shaded area, etc.). Containers must be kept clean.

Workers are encouraged to frequently consume small quantities of water throughout the workday to help prevent heat stress by replacing fluid lost through perspiration.

When conditions are in the moderate, high, or very high/extreme risk levels identified in the heat stress prevention plan table in Section 5.3.6 – High Heat Procedures, electrolytic replacement drinks (like sports drinks) should be consumed as well.

Many commercially manufactured beverages contain a variety of elements that can cause dehydration when consumed in excess. Knowing which beverages can cause dehydration provides you with vital information that allows you to moderate your consumption. Alcohol and caffeinated drinks including soft drinks, even if consumed the evening before, can increase the potential for dehydration, increasing the potential for heat stress.

5.3.3 Work/Rest Regimens

As the temperature increases, more rest is required. If scheduling around the hottest part of the day is not possible, consider following a modified work/rest regimen [Mandatory in Newfoundland & Labrador, New Brunswick, Prince Edward Island, Quebec, British Columbia, Saskatchewan, and Manitoba, as well as in California].

Selecting the appropriate work/rest regimen can be done in four steps.

1. **First**, estimate the work rate or workload using the table below:

Estimating Work Rates or Loads		
Work Rate Category	**Example Motions**	**Example Tasks**
Light	Sitting with light manual work with hands and arms	Using small bench tools or small power tools
	Driving	Driving vehicle on roads
	Standing with some light arm work and occasional walking	Inspecting and sorting produce
	Casual walking (2 miles per hour)	Sorting light materials
	Lifting 10 pounds fewer than eight times per minute, or 25 pounds less than four times per minute	Assembling small parts
		Nailing
Moderate	Sustained moderate hand and arm work	Picking fruits and vegetables (bending, squatting)
	Moderate arm and leg work	Painting with a brush
	Moderate arm and trunk work	Pushing or pulling lightweight carts or wheelbarrows
	Moderate pushing and pulling	Off road operation of trucks, tractors, or construction equipment
	Walking at a moderate speed	Operating an air hammer
	Lifting 10 pounds 10 times per minute, or 25 pounds six times per minute	Weeding or hoeing

Estimating Work Rates or Loads		
Work Rate Category	**Example Motions**	**Example Tasks**
Heavy	Intense arm and trunk work	Transferring heavy materials, shoveling
	Carrying, shoveling, manual sawing	Sledgehammer work
	Pushing or pulling heavy loads	Hand mowing, digging
	Walking at a fast pace (4 miles per hour)	Concrete block laying
	Lifting 10 pounds 14 times per minute, or 25 pounds 10 times per minute	Pushing or pulling loaded hand carts or wheelbarrows

2. **Second**, based on the guidance provided in Section 4.2 – Factors Affecting Heat Stress, determine if the employees assigned to undertake the work are acclimatized.
3. **Third**, from a trustworthy source, obtain the environmental temperature and relative humidity for the area where the work is being carried out.
4. **Fourth**, using the work/rest regimen tables in Appendix B, determine the appropriate work/rest regimen based on the environmental temperature and relative humidity, then record on the Field Level Risk Assessment (RMS2) form.

Note 1: The tables in Appendix B provide work/rest regimens for both acclimatized and unacclimatized workers, with temperatures provided in both °F and °C. Field staff are encouraged to print Appendix B to use as a reference in the field.

Note 2: For employees wearing coveralls, the apparent temperature will be higher, and the effects of heat stress will be exacerbated.

In all cases, activity, and employee exposure must be discontinued when the following symptoms occur:

- Sustained heart rate greater than 160 beats per minute for those under 35 and 140 for those 35 and over
- Complaints of sudden and severe fatigue, nausea, dizziness, lightheadedness, or fainting
- Periods of inexplicable irritability or flu-like symptoms
- Sweating stops, and the skin becomes hot and dry

5.3.4 Cool-Down Periods

To protect themselves from overheating, employees must be allowed to take a cool-down period when they feel the need to do so.

An employee who takes a cool-down period:

- Must be monitored and asked if they are experiencing symptoms of heat illness
- Must be encouraged to stay in the shade and seek air conditioning where possible
- Must not be ordered back to work before they have had at least five minutes of net resting time
- Must not be ordered back to work "until any signs or symptoms of heat illness have abated," even if this abatement period takes longer than five minutes

When an employee, on cool-down period exhibits or reports symptoms of heat illness, the employer must provide appropriate first aid or implement emergency response procedures. Check State specific regulations on cool down period duration and frequency.

5.3.5 Acclimatization Program

Acclimatization is the human body's natural adaptation to heat. The time required for acclimatization must be considered during work planning.

The time to acclimatize needs to be flexible based on the intensity of the heat (e.g., > 100°F/38°C), the level of humidity, the workers' experience on the job, and the workers' physical fitness.

- New workers on an 8-hour shift should spend only about an hour and a half in the heat on their first day. Their exposure time should increase slowly—no more than a 20% increase per day. Acclimatization depends on each person. It could take 10 days for some and up to 14 days for others.

Acclimation Day	New Worker: Recommended Hours of Work in Heat when Acclimatizing
Day 1	1.5 hours
Day 2	2 hours
Day 3	2.5 hours
Day 4	3 hours
Day 5	3.5 hours
Day 6	4 hours
Day 7	5 hours
Day 8	6 hours
Day 9	7 hours
Day 10	8 hours

- Experienced workers on an 8-hour shift should take about 4 days to acclimatize to the heat. They can spend up to 4 hours in the heat on the first hot day. The second day they can likely manage 5 hours in the heat and about 6.5 hours on the third day. By the fourth day, most healthy workers should be able to tolerate 8 hours in the heat assuming they are well hydrated and have appropriate rest breaks throughout their shift. However, workers should pay attention to how they feel, resting and hydrating as necessary.

Acclimation Day	Experienced Worker: Recommended Hours of Work when Acclimatizing to Heat
Day 1	4 hours
Day 2	5 hours
Day 3	6.5 hours
Day 4	8 hours

Acclimatization periods for new workers and returning workers can vary by State. See the table below for more details.

State (Regulatory Link)	Acclimatization Period (up to x days)	Acclimatization for returning (7-day or greater absence)
California	14	x
Colorado	No specific period	Not specified
Maryland	14	x
Minnesota	No specific period	Not specified
Nevada	14	x
Oregon	14	Not specified
Washington	14	x

- During a "heat wave," a supervisor or trained designee is required to closely monitor all employees at the worksite.
- Any employees who have not been onsite for at least 14 days of acclimatization or returning from an absence of 7-days or greater must be closely monitored by a manager or trained designee anytime temperatures are at or above 95°F (35°C) in States that have high heat requirements.

5.3.6 Heat Illness Prevention Plan Requirements

The table below lists the State specific written heat illness prevention plan requirements.

State	Applicability (Outdoor/Indoor/both)	Temperature Trigger (degrees F)	High Heat Trigger Temperature (degrees F)	Plan Elements (Access to cool water, shade, cool down breaks, emergency response, acclimatization, high heat procedures)	Water Requirements	Additional Comments/Notes
California	Both	80 – outdoors 82 - indoors	95	x	32 ounces/hour/person	
Colorado	Both	80 - both	95	x	Access to sufficient drinking water	Implementation to take effect on April 1,2026
Maryland	Both	80 - both	90	x	32 ounces/hour/person	Symptom recognition
Minnesota	Indoor	Based on work level intensity	NA		Access to sufficient drinking water	77 – heavy 80 – moderate 86 – light No high heat requirements noted Heat Illness prevention program
Nevada	Outdoor	Not specifically mentioned	Not specified	x	Access to sufficient drinking water	JHA is required No High heat requirements noted
Oregon	Outdoor	80 - outdoors	90	x	32 ounces/hour/person	
Washington	Outdoor	80 - outdoors	90	x	32 ounces/hour/person	52 degrees when wearing non-breathable clothing

5.3.7 High Heat Procedures

When environmental temperatures exceed 90 - 95°F (32 - 35°C)(dependent on State), the chances for heat stress occurring become greater, and additional processes need to be added to the work routine. These include, but are not limited to, the following.

- As part of the eField Level Risk Assessment or (RMS2) review, the PM or Supervisor will review the high-heat procedures, encourage employees to drink plenty of water, and remind employees of their right to take cool-down periods when necessary
- Supervisors need to monitor the work crew more frequently and more closely than in milder temperatures.
- Workers should take more frequent and longer breaks in the shade, or air conditioning where possible. Alternative cooling methods, such as cooling jackets and ice vests may be considered.
- Diligently remind personnel to drink adequate amounts of fluids including electrolytic replacement drinks at moderate, high, very high/extreme heat risk levels, as identified in the table below.
- Providing for effective communication is important. If an employee is working alone, a schedule must be established for checking in by telephone with designated person away from the site, (ideally during every break). The employee will be questioned as to when and how many breaks they are taking, fluid consumption, if they are feeling fatigued, etc. Refer also to SWP-118 – Working Alone in the Field.
- New personnel must be closely supervised and monitored during their first fourteen (14) days of employment when required to work in the heat. This is intended to provide adequate time to acclimatize to the local climate, and to evaluate their heat stress prevention skills.
- The following table provides guidance for heat stress prevention, based on the heat stress risk level.

Heat Stress Prevention Guide				
Elements	**Heat Stress Risk Level**			
	Lower (Caution)	**Moderate**	**High**	**Very High Extreme**
Supplies (ensuring adequate water, provisions for rest areas, shade, and other supplies)	✓	✓ Electrolyte Replacement	✓ Electrolyte Replacement	✓ Electrolyte Replacement
Emergency planning and response (preparing supervisors and crews for emergencies)	✓	✓	✓	✓
Worker acclimatization (gradually increasing workloads; allowing more frequent breaks as workers adapt to the heat) Note: See section 5.3.5 above	✓	✓	✓	✓
Modified work schedules (establishing systems to enable adjustments to work schedules)	✓	✓	✓	✓
Training (preparing workers to recognize heat-related illness and preventive measures)	✓	✓	✓	✓
Physiological, visual, and verbal monitoring (using direct observation and physiological monitoring to check for signs of heat-related illness)		✓	✓	✓

5.3.8 Emergency Response Procedures

- All employees at the worksite must be able to contact (through "effective communication") a supervisor or summon emergency medical services.
- When onsite supervisors observe or receive a report of heat illness symptoms, they must take immediate action, including offering the affected employee first aid or emergency medical services if the symptoms are severe.
- If necessary, the onsite supervisor will transport the affected employee to a location where an emergency medical provider can reach them.
- The onsite Supervisor must be able to provide emergency medical providers with clear and precise directions to the worksite, by referring to the routes/map to nearest clinic/hospital provided in the Project HSSE Plan/Risk Management Strategy (RMS1) or HASP.
- Please note that using a cellular phone for calling or texting is considered "effective communication" only if reception in the work area is reliable.

5.3.9 Additional Guidance

- Wear sunscreen with a "Broad Spectrum" SPF factor of at least 30.
- Employees need to read their medication labels and have a conversation with their doctor to determine if the medication can cause the body to react differently to the sun and heat. Make your supervisors aware of any limitations.

5.4 Personal Protective Equipment (PPE)

The selection and use of PPE must be evaluated against local legislative requirements and any negative impact to other equipment.

5.4.1 Hard Hats

- Where hard hats are required, a full (wide) brim hard hat with detachable "sun brim" and neck flap can be used to further reduce sun exposure.
- Detachable "sun brim" and neck flap are also available for regular hard hats.
- Vented hard hats can also be used to reduce the impact from hot conditions.

Note: Vented hard hats cannot be used when working in proximity of electrical installations.

5.4.2 Hearing Protection

- In high temperature, high humidity conditions, ear plugs are preferred to earmuffs.
- Where earmuffs are required due to the level of attenuation required, the ear cushion inside the muff should be taken out, washed, and dried on a regular basis.

5.4.3 Eye Protection

As temperature and humidity increase, the probability of safety glasses fogging up increase. Anti-fog wipes or spray can be used to mitigate this hazard.

5.4.4 Clothing

- Light-weight, loose-fitting clothing in light colors is the best option for working in high heat conditions.
- Cotton is a common suggestion; however, workers need to remember that it readily absorbs moisture and holds it next to the skin. That can reduce the effectiveness of sweating as a cooling mechanism, particularly in more humid conditions. Clothing made from breathable fabrics that wick moisture away from the skin (such as the materials used

in athletic and outdoor recreation apparel) is less likely to inhibit the body's natural evaporative cooling processes.
- Long sleeves are recommended.
- Hats can also reduce sun exposure if hard hats are not being worn.
- Cooling vests can be used to reduce the impact from hot conditions. These vests require cooling facilities to "refreeze" or "recharge."

6 Training

Training is important because it provides employees with the knowledge to recognize the signs and symptoms of heat-related illness in themselves and others, how to avoid it, and how to treat it.

The following table lists the States that require heat illness prevention training, the frequency of training and intended audiences. Staff that work in these states will need to complete the appropriate internal training at the frequency referenced in the table below.

State	Standard Requirements	Worksite Coverage Applicability	Training Frequency	Intended Audience
California	8 CCR 3395	Indoor and Outdoor/ year-round	Initial and refresher as needed and daily tailgate meetings recommended to reinforce key information.	Employee and Supervisors
Colorado	House Bill 25-1286	annual	Initial	Employees and Supervisors
Maryland	COMAR09.12.32	Indoor and Outdoor / year-round	Initial and Annual	Employees
Minnesota	MAR 5205.0110	Indoor /year-round	Annual	Employees
Nevada	R131-24AP	Year round	Initial, annual refreshers recommended	Employees
Oregon	437-002-0156	Outdoor Year round	Annual	Employees
Washington	WAC 296-62-095	Outdoor/year-round	Annual	Employees and Supervisors

6.1 Employees

All employees who are or could possibly be exposed to heat as a workplace hazard will be informed of high heat hazards and controls. The topics to be discussed include but are not limited to the following:
- The environmental and personal risk factors for heat-related illness
- The importance of hydration
- The importance of acclimatization
- The different types of heat-related illness and their common symptoms
- The importance of immediately reporting to the supervisor any symptoms of heat-related illness in themselves, or in co-workers

- Appropriate responses to symptoms of possible heat-related illness

6.2 Site Supervisors

Supervisors will be informed prior to being assigned to supervise another individual and may require training (see above listed table). Topics will include but not limited to:

- Procedures to be followed for reducing the potential of heat stress on site
- Actions to take when a worker on site exhibits the signs and symptoms of a heat-related illness
- Incident reporting procedures

7 Resources and References

7.1 Internal

- HSE1290: California Heat Illness Prevention Requirements
- HSE 1293: Heat Illness Prevention
- SWP-113a –Heat Illness Prevention Plan

7.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library
- American Conference of Governmental Industrial Hygienists (ACGIH): Heat Stress and Strain
- Australia: Working in heat | Safe Work Australia
- California Division of Occupational Health and Safety (Cal/OSHA): Heat Illness Prevention program resource page
- National Safety Council, *Principles of Industrial Hygiene*, 6th Edition (2012)
- New Zealand: Working in Extreme Heat – A Guide for Businesses
- United Kingdom: Temperature in the workplace – 7. Heat stress
- US National Institute for Occupational Safety and Health: Workplace Safety and Health Topic - Heat Stress
- US National Weather Service: WetBulb Globe Temperature/Heat Index calculator (Prototype)
- US Occupational Safety and Health Administration (OSHA):
  - Safety and Health Topic: Occupational Heat Exposure
  - OSHA Technical Manual, Chapter 4: Heat Stress
  - Using the Heat Index: A Guide for Employers

8 Definitions

- **Acclimatization**: Per ACGIH, a gradual physiological adaptation that improves an individual's ability to tolerate heat stress.
- **Continuous Work:** Implies an 8-hour workday with a 15-minute morning and afternoon break and a 30-minute lunch break
- **Evaporative Cooling (Heat Loss)**: A reduction in temperature resulting from the evaporation of a liquid, which removes latent heat from the surface from which evaporation takes place, such as when sweat evaporates from the skin.
- **Heat-Related Illness:** Disorders that arise when heat stress overwhelms the body's ability to maintain its normal core temperature. See Appendix A for more information on specific heat-related illnesses, symptoms, and treatment.
- **Heat Stress:** The net heat burden on the body from a combination of the body heat generated while working, environmental factors, and radiant heat from the sun and other sources (such as machinery or open flames).
- **Heat Wave (California):** Per Cal/OSHA, "any day in which the predicted high temperature for the day is at least 80°F (27°C) and at least ten degrees higher than the average high daily temperature in the preceding five days."

9 Documentation Summary

File these records in the Office Safety File:

- Employee Training Records

File these records in the Project Health & Safety File:

- Risk Management Strategy (RMS1)
- Field Level Risk Assessment (RMS2)
- HASP (as appropriate)

10 Revision History

Date	Changes	Acknowledgments	Approval
July 9, 2025	Removed all caps, Updated State specific heat illness requirements (Sections 5.3.5, 5.3.6, and 6)	T. Wong	K. Hancock
November 16, 2022	Edits to 1. Purpose, 3.2 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings. Update information on heat illness prevention plan requirement, Identified States that have High Heat requirements, 6.0 Training – added state specific training requirements	T. Wong, M. Doherty, S. Maxey	P. Poelzer
July 31, 2020	Updates to links and references for migration from StanNet to The Lens; minor changes to formatting	K. Bayer	C. Ferguson-Scott
March 20, 2019	Substantial revisions, including changes to conform with Cal/OSHA requirements and provide better direction and references.	K. Bayer, R. Roy	J. Lessard
September 20, 2011	Update	K. Robinson	Corporate Governance Committee (CGC)
June 4, 2010	Posted to StanNet	G. Doran	

APPENDIX A
THE BODY'S RESPONSE TO HIGH TEMPERATURE AND HEAT STRESS

The human body is warm-blooded and maintains a fairly constant internal temperature even while being exposed to varying environmental conditions. There are various autonomic responses designed to maintain the internal temperature near 98.6 F (37°C). This can involve varying the rate and amount of blood circulation through the vessels near the skin and the release of fluid onto the skin by the sweat glands. By increasing blood flow, the brain is telling the body to cool off. As the environmental temperature approaches normal skin temperature, cooling of the body by this mechanism becomes more difficult. If the air temperature is equal to or warmer than the skin temperature, the evaporative cooling mechanism doesn't work as efficiently, if at all. Under conditions of high relative humidity (increased moisture in the air), the evaporation mechanism is further hindered. If the increased blood flow and increased sweating are not working effectively, a person is less effective on the job due to heat stress.

Heat-related illnesses can be broken down into four disorders, based on the severity of the symptoms experienced.

Heat Disorder	Symptoms	First Aid
HEAT RASH	Occurs in hot, humid environments where sweat is not easily removed from the body by skin evaporation. Skin is red. In severe cases, infection may occur.	Get the victim out of the sun and allow the skin to dry. Washing or sponging the skin may further cool the person.
HEAT CRAMPS	Heat cramps are painful muscle cramps caused by losing too much salt through sweating. Heat cramps usually occur in the muscles that have been used the most strenuously, such as those in the legs and abdomen. The cramps typically occur late in a workday or after the muscles have cooled.	Move the worker to a cooler environment; if possible, recline or lay the worker down, and remove or loosen tight-fitting clothing. Cool the worker by sponging with cool water and fanning. Take care not to cool the worker too much. If the worker begins to shiver, stop cooling. If the worker is fully alert and not nauseated, provide oral fluids. Juice, non-caffeinated soft drinks, or commercially available oral rehydrating solutions (sport drinks) are best. Alcoholic and caffeinated beverages are not recommended.
HEAT EXHAUSTION	Heavy sweating, weakness, skin cold, pale, and clammy. Pulse thready. Confusion possible. Normal temperature possible. Fainting and vomiting. Usually caused when worker has failed to drink enough fluids, take in enough salt, or both.	Stop Work. Get victim out of sun. Lie down and loosen clothing. Apply cool, wet cloths. Fan or move victim to air-conditioned room. Sips of water. If nausea occurs, discontinue the fluids. If vomiting continues, seek immediate medical attention.
HEAT STROKE	High body temperature (106°F / 41C or higher). Hot, dry skin which may be red, mottled, or bluish. Rapid and strong pulse. Possible loss of consciousness. Mental confusion or convulsions. Caused by the body's inability to effectively regulate its core temperature.	**HEAT STROKE IS A SEVERE MEDICAL EMERGENCY. ALL HEAT STROKE VICTIMS REQUIRE HOSPITALIZATION.** Stop Work Immediately. Call 911 or Emergency Medical Number in HASP or RMS1. Move the victim to a cooler place. Remove heavy clothing. Cool the victim immediately by any available means (ice packs, wet towels or sheets, even wet clothing, or AC). Use extreme caution. If temperature rises again, repeat process. Do not give fluids or medication. Keep head and shoulders elevated.

APPENDIX B: WORK/REST REGIMENS

APPENDIX B.1 – Work/Rest Regimen: Acclimatized Worker (°F)

Acclimatized Worker - Light Work

Relative Humidity (%)	Environmental Temperature (°F)									
	70	75	80	85	90	95	100	105	110	115
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Acclimatized Worker - Moderate Work

Relative Humidity (%)	Environmental Temperature (°F)									
	70	75	80	85	90	95	100	105	110	115
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Acclimatized Worker – Heavy Work

Relative Humidity (%)	Environmental Temperature (°F)									
	70	75	80	85	90	95	100	105	110	115
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Key:

Continuous Work	75% Work – 25% Rest each hour	50% Work – 50% Rest each hour	25% Work – 75% Rest each hour	Stop Work

APPENDIX B.2 – Work/Rest Regimen: Acclimatized Worker (°C)

Acclimatized Worker – Light Work (2018)

Relative Humidity (%)	Environmental Temperature (°C)									
	20	23	26	29	32	35	38	41	44	47
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Acclimatized Worker – Moderate Work (2018)

Relative Humidity (%)	Environmental Temperature (°C)									
	20	23	26	29	32	35	38	41	44	47
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Acclimatized Worker – Heavy Work (2018)

Relative Humidity (%)	Environmental Temperature (°C)									
	20	23	26	29	32	35	38	41	44	47
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Key:

Continuous Work	75% Work – 25% Rest each hour	50% Work – 50% Rest each hour	25% Work – 75% Rest each hour	Stop Work

APPENDIX B.3 – Work/Rest Regimen: Unacclimatized Worker (°F)

Unacclimatized Worker – Light Work

Relative Humidity (%)	Environmental Temperature (°F)									
	70	75	80	85	90	95	100	105	110	115
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Unacclimatized Worker – Moderate Work

Relative Humidity (%)	Environmental Temperature									
	70	75	80	85	90	95	100	105	110	115
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Unacclimatized Worker – Heavy Work

Relative Humidity (%)	Environmental Temperature (°F)									
	70	75	80	85	90	95	100	105	110	115
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Key:

Continuous Work	75% Work – 25% Rest each hour	50% Work – 50% Rest each hour	25% Work – 75% Rest each hour	Stop Work

APPENDIX B.4 – Work/Rest Regimen: Unacclimatized Worker (°C)

Unacclimatized Worker – Light Work

Relative Humidity (%)	Environmental Temperature (°C)									
	20	23	26	29	32	35	38	41	44	47
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Unacclimatized Worker – Moderate Work

Relative Humidity (%)	Environmental Temperature (°C)									
	20	23	26	29	32	35	38	41	44	47
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Unacclimatized Worker – Heavy Work

Relative Humidity (%)	Environmental Temperature (°C)									
	20	23	26	29	32	35	38	41	44	47
0										
10										
20										
30										
40										
50										
60										
70										
80										
90										
100										

Key:

Continuous Work	75% Work – 25% Rest each hour	50% Work – 50% Rest each hour	25% Work – 75% Rest each hour	Stop Work

1 PURPOSE

The purpose of this safe work practice (SWP) is to provide information on hazards related to working in cold environments and provide controls to minimize the risk associated with cold stress and cold related injuries.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 9.0 Resources > External.

2 SCOPE

This SWP applies to all Stantec employees required to work in cold environments.

3 RESPONSIBILITIES

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this Safe Work Practice
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements of the SWP are being met

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP

3.3 Supervisor

- Confirm that affected employees have reviewed this SWP in accordance with the review cycle in the Safe Work Practices Checklist
- Confirm that each employee has completed the required training in this SWP

3.4 Project Manager

- Identify circumstances where employees may be exposed to thermal conditions that:
  - Could cause cold stress a worker's core body temperature to fall below 36°C (96.8°F)
  - Could cause a cold related injury such as frost nip or frost bite
- Conduct a cold stress assessment to determine the potential for hazardous exposure of workers, using measures and methods that are acceptable according to local regulatory requirements
- Using the hierarchy of controls, identify the Thermal Energy site-specific controls on the Risk Management Strategy (RMS1) form
- Require employees to implement the controls identified in the RMS1
- If an employee who is exposed to cold shows signs or reports symptoms of cold stress or injury, remove the employee from further exposure and ensure they are treated by an appropriate first aid attendant, if available, or a physician
- Confirm that applicable Stantec equipment is maintained and will be used in accordance with this SWP

3.5 Office Safety and Environment Coordinator

- Assist PMs, supervisors, and others in obtaining appropriate safety and environment equipment for employees working on their projects
- Coordinate HSSE training as identified by Stantec's HSSE Program requirements and hazard assessment
- Maintain a secure filing system containing the forms, reports, and training records required by Stantec's HSSE Program

3.6 Employees

- Be familiar with local Occupational Health and Safety regulatory requirements, applicable Safe Work Practices, and other relevant legislation and requirements
- Be aware of and comply with requirements outlined in this SWP
- Take every reasonable precaution to protect their personal health and safety, and that of their coworkers
- Be responsible for obtaining the prescribed safety equipment through their Project Managers or Office Safety and Environment Coordinators (OSECs)
- When at risk of hypothermia or frostbite, wear adequate insulating clothing and personal protective equipment
- Know the proper use and limitations of equipment and use it in accordance with the training provided
- Inspect work areas regularly for hazards
- Recognize and evaluate workplace hazards and implement controls to mitigate the risk
- Know how to control and respond to hazards and emergencies including use of emergency equipment

4 HAZARDS

Identifying hazards at work sites allow us to better control, or even eliminate them, thus preventing incidents, injuries, property damage, and downtime. Although related to cold environments, this SWP does not address hazards related to snow and ice.

Energy Source	Hazards
Thermal	• Cold stress resulting in frostnip or frostbite • Cold stress resulting in hypothermia • Cold stress affecting performance such as o Reduced dexterity of hands and feet o Reduced tactile sensation o Reduced joint mobility o Reduced grip strength o Reduced coordination o Reduced decision-making ability • Cold Surfaces affecting performance such as o Reduced dexterity of hands and feet o Reduced tactile sensation o Reduced grip strength

4.1 Thermal Energy

Cold is a physical hazard in many workplaces. When the body is unable to warm itself, serious cold-related illnesses may occur, leading to permanent tissue damage and even death. Exposure to cold causes two major health problems, hypothermia, and frostbite. Here is some general information about these cold-related illnesses.

4.1.1 Hypothermia

Hypothermia occurs when the body loses heat faster than it can be replaced. It is important to remember that hypothermia can occur when environmental temperatures are above freezing.

4.1.2 Frostbite

Frostbite usually occurs when temperatures are below 0°C (32°F), however wind chill factors can allow frostbite to occur in certain above freezing conditions. While exposed skin is most vulnerable to frostbite, it can also occur on skin covered by gloves or other clothing. Frostbite is most common on the fingers, toes, nose, ears, cheeks, and chin.

5 CONTROLS

Stantec uses the hierarchy of hazard control to eliminate or mitigate exposure to hazards. The hierarchy of hazard controls is based on the effectiveness of the controls. The hazard controls are, in order of decreasing effectiveness:

- Elimination
- Substitution
- Engineering controls
- Warnings
- Administrative controls
- Personal protective equipment

5.1 Engineering

5.1.1 Shelters

The combination of low temperatures and even moderate winds can quickly create dangerous working conditions. Steps should be taken to protect staff from wind. Wind breaks should be erected where possible.

Heated warming shelters (tents, truck cabins, rest rooms, etc.) should be available when work is performed continuously in a wind chill temperature of -7° C (19.5°F) or below.

5.1.2 Tools and Equipment

Often, manual dexterity is essential to the job, both for safety and quality of the work being performed. The following are recommendations for hand protection in cold temperatures.

- If fine work (un-gloved) is required for more than 10-20 minutes in temperatures below 16° C (60.8°F), additional heat, such as warm air jets, radiant heaters, or contact warm plates, may be required to keep hands warm.
- Metal handles of tools and control levers/bars should be insulated if air temperature is below 0°C (32°F).
- Tools and machine controls operated in cold conditions should be designed to be operated by a worker with insulated gloves.

5.2 Warnings

5.2.1 Wind Chill

Wind chill is the most common metric for cold stress. The US National Weather Service and Environment Canada issue wind chill advisories and warnings for extremely dangerous weather conditions. Warnings mean conditions are life threatening. Therefore, it is important to check the weather forecast as well as current conditions before heading for the jobsite.

Table 1: Wind Chill Temperature Index

Wind Chill Temperature Index																											
Frostbite Times for Exposed Facial Skin																											
Wind Speed		Air Temperature																									
		°C	0			-5			-10		-15		-20			-25			-30			-35		-40		-45	-50
(km/h)	(mph)	°F	32	30	25		20	15		10	5	0		-5	-10		-15	-20		-25	-30		-35	-40	-45			
5																											
	5																										
10																											
15	10																										
20																											
25	15																										
30																											
	20																										
35																											
40	25																										
45																											
	30																										
50																											
55																											
	35																										
60																											
65	40																										
70																											
	45																										
75																											
80	50																										
	55																										
	60																										

Frostbite Guide
High risk of frostbite for most people in 10 to 30 minutes of exposure
Very high risk of frostbite for most people in 5 to 10 minutes of exposure
Severe risk of frostbite for most people in 2 to 5 minutes of exposure
Extreme risk of frostbite for most people in 2 minutes of exposure or less

Note: Table was adapted from the National Weather Service: Wind Chill Temperature Index. NOAA, National Weather Service, Office of Climate, Water and Weather Services (2001)

5.3 Administrative

5.3.1 Risk Assessment and Mitigation

If staff are or may be exposed to conditions that could cause hypothermia or cold-related injury, a risk assessment must be performed to determine areas and tasks where the workers may be at risk. The potential for accidental exposure to cold conditions should be included in this assessment. Mitigation measures addressing the site-specific risks will be provided on the RMS1 under Thermal Energy, Specific Site Controls.

5.3.2 Environmental Measures

Temperature and wind conditions at the work location should be known (e.g., weather report on the radio, current weather office information).

Persons working in cold temperatures can offset the effect of the temperature with proper level of activity that generates additional heat. An additional danger occurs when the worker stops this activity but remains in the cold environment.

5.3.3 Work Practices

A schedule of regular rest breaks should be established to allow workers to warm up. These breaks should be not less than 10 minutes in length and should be taken in a heated area. Table 2 provides a work/warm-up schedule for employees working four-hour shifts. Outer clothing should be removed to prevent overheating and sweating when in the heated area. Returning to cold work while damp or sweaty may result in rapid chilling.

Table 2: Work/Warm-up Schedule for a Four-Hour Shift

Air Temperature - Sunny Sky		No Noticeable Wind		8 km/h Wind (5 mph Wind)		16 km/h Wind (10 mph Wind)		25 km/h Wind (15 mph Wind)		30 km/h Wind (19 mph Wind)	
°C (approx.)	°F (approx.)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26° to -28°	-15° to -19°	(Normal Breaks) 1		(Normal Breaks) 1		75 min	2	55 min	3	40 min	4
-29° to -31°	-20° to -24°	(Normal Breaks) 1		75 min	2	55 min	3	40 min	4	30 min	5
-32° to -34°	-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Non-Emergency Work Should Cease	
-35° to -37°	-30° to -34°	55 min	3	40 min	4	30 min	5	Non-Emergency Work Should Cease			
-38° to -39°	-35° to -39°	40 min	4	30 min	5	Non-Emergency Work Should Cease					
-40° to -42°	-40° to -44°	30 min	5	Non-Emergency Work Should Cease							
-43° & below	-45 & below	Non-Emergency Work Should Cease									

Source: Adapted from Threshold Limit Values (TLV) and Biological Exposure Indices (BEI) booklet (ACGIH: Cincinnati) 2016, page 210.

NOTES:

1. Applies to moderate to heavy physical work in any 4-hour period.
2. Warm-up breaks should be in a warm environment for 10 minutes.
3. Normal breaks means a break after 2 hours of work.
4. Guidelines apply to workers wearing dry clothing.
5. If there is limited physical activity, apply the schedule one step lower (more protective).

The following are recommendations for working in cold weather (adapted from ACGIH, 2008). Under conditions of continuous work in the cold:

- Exposed parts of the body should be inspected routinely.
- Warm fluids should be consumed at the work site to provide energy, warmth, and replace fluids lost during work. Significant fluid loss can occur in the cold due to sensible and insensible sweating, breathing, and the extra energy requirements of working in the cold. Dehydration in the cold is a serious concern as it increases a worker's susceptibility to hypothermia.
- The onset of severe shivering, the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the shelter.

- Work rate should not be high enough to cause sweating. If heavy work must be performed, rest periods in heated shelters and the opportunity to change into dry clothing should be provided.
- New employees should not be required to work full-time in the cold during the first days of employment until they become accustomed to the working conditions and required protective clothing.
- Weight and bulkiness of clothing should be included in estimating required work performance.

5.3.4 Identification of Signs and Symptoms

Stantec employees working in cold environments must be able to identify the signs and symptoms of hypothermia and frostbite.

5.3.4.1 Signs and Symptoms of Hypothermia

There are three stages of hypothermia: mild, moderate, and severe. Mild hypothermia occurs when the body temperature drops to between 32.2°C to 35°C (90°F to 95°F). Signs and symptoms of mild hypothermia include:

- Shivering
- Rapid breathing and heart rate
- Constricted blood vessels and high blood pressure
- Cold, pale skin, and bluish lips
- Apathy and fatigue
- Impaired judgment and lack of coordination

Moderate hypothermia occurs when the body temperature drops to between 28°C to 32.2°C (82.4°F to 90°F). Signs and symptoms of moderate hypothermia include:

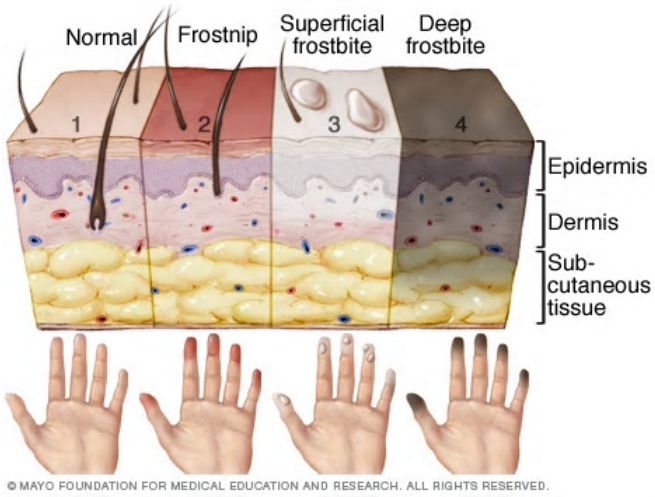
- Irregular heartbeat
- Slower heart rate and breathing
- Lower level of consciousness
- Dilated pupils
- Low blood pressure
- Decrease in reflexes

Severe hypothermia occurs when the body temperature drops below 28°C (82.4°F). Signs and symptoms of severe hypothermia include:

- Labored breathing
- Nonreactive pupils
- Heart failure
- Pulmonary edema
- Cardiac arrest

5.3.4.2 Signs and Symptoms of Frostbite

There are three stages of frostbite: frostnip, superficial frostbite and deep (severe) frostbite.



Frostnip is a mild form of frostbite. Signs and symptoms of frostnip include:

- Red, cold skin
- Numbness with continued exposure
- Pain and tingling as the skin warms

Superficial frostbite is a progression of a frostnip. Signs and symptoms of superficial frostbite include:

- Reddened skin turns pale or white
- Skin may begin to feel warm
- Surface of the skin may appear molted after rewarming
- May notice swelling along with stinging and burning sensations
- Fluid-filled blisters may appear 12 to 36 hours after rewarming of the skin

As frostbite progresses, all layers of the skin, including the dermis and the sub-cutaneous tissue, are affected. Signs and symptoms of deep (severe) frostbite include:

- The skin turns white or bluish gray
- Numbness may be experienced, losing all sensation of cold, pain, or discomfort in the affected area
- Joints or muscles may no longer work
- Large blisters appear 24 to 48 hours after rewarming
- Affected area turns black and hard as tissue dies

5.4 Personal Protective Equipment (PPE)

Persons working in cold temperatures can offset the effect of the temperature with proper clothing. Protective clothing is an important way to avoid cold stress. The type of fabric is critical for comfort and warmth; cotton loses its insulation properties when it becomes wet while wool, due to its wicking properties, retains its insulation properties even when wet. To remain comfortable as weather and work conditions change, clothing layers should be added or removed, or ventilation openings in clothing opened or closed to remain comfortable. Clothing layers should be managed to remain comfortably warm.

Every effort must be made to avoid sweating and becoming damp. Clothing selections are normally made on the basis of staying warm while inactive. However, employees should

consider the work to be performed as well as the anticipated weather conditions. They should dress in layers that they can shed and still remain comfortably warm.

- Base Layer: The "keep-you-dry" layer. Starting at the skin, this layer should be soft (conforming but allow free movement), comfortable, thin and contain good "wicking properties." Wicking is the ability of the material to pull the perspiration away from the skin toward the outer layers for escape. If moisture stays in contact with the skin, a "clammy" feeling results, and body heat is lost.
- Insulating Layer: The "keep-you-warm" layer. This layer includes shirt and pants, and, depending upon weather conditions, you may need to add a vest as another insulating layer. The clothes chosen should be loose fitting and lightweight with good insulating properties (ability to trap air but allow moisture to pass through).
- Outer Shell Layer: The "protect you from the elements" layer. This layer should be wind-proof, waterproof, light weight and able to breathe. This layer does not need a lot of insulation unless temperatures will be below -18°C (0°F) degrees most of the time. Jackets should extend below the waist and have a hood. Look for elastic or drawstrings at cuffs and hems.

If clothing layers do become damp and remain that way, workers should be prepared to replace them before becoming chilled and hypothermic. If a person is sweating, then their clothing is probably too warm for the conditions and tasks being performed.

A common approach to dressing for cold weather is the use of three clothing layers. However, synthetic fabrics may not be appropriate for situations requiring clothing with fire resistant (FR) or anti-static properties. FR clothing next to the skin must be made of non-melting natural fibers such as wool or silk or an acceptable fire-retardant material. The general practices described below should be followed, recognizing that the fabrics selected may be limited by specific, special work applications.

Table 3: Suggested Attire Based on Exposure Risk

Risk Level	Health Concern	Controls	Suggested Apparel
High	• High risk of frostnip or frostbite • High risk of Hypothermia	• Dress in layers of warm clothing, with a wicking base layer and wind-resistant outer-layer • Cover exposed skin • Stay Dry • Keep Active	• Thermal long underwear made of wool or synthetic fibers. • Wool Socks • Multiple middle layers • Suitable jacket/coveralls to protect against wind, rain, or snow • Gloves • Toque • Winter work boots
Very High	• Very high risk of frostbite • Very high risk of hypothermia	• Same controls as above	• Thermal long underwear made of wool or synthetic fibers. • Wool Socks • Synthetic socks (inner layer) • Multiple middle layers • Zippered neck openings and zippered leggings to allow for ventilation.
Severe	• Severe risk of frostbite • Severe risk of hypothermia	• Same controls as above	

		• Be ready to cut short or cancel outdoor activities	• Heavy jacket/coveralls to protect against wind, rain, or snow • Gloves • Balaclava and winter hat • Winter work boots
Extreme	**DANGER!** Outdoor Conditions are Hazardous!	• Stay Indoors	

5.4.1 Effect of PPE on Performance

Clothing that is worn to protect against cold exposure can limit performance and introduce additional hazards. Careful selection of appropriate clothing for the tasks being performed will help reduce some of these effects.

- Hats and hoods may interfere with hearing, vision, and movement
- Bulky clothing layers restrict movement
- Gloves, mittens, or over-mittens can reduce dexterity and "feel"
- Footwear may be heavy and bulky, compromising the ability to use footholds and vehicle foot pedals
- The weight and bulk of added clothing increases the amount of effort used while moving
- Winter hats worn under hardhats can reduce the shock absorption performance of the hardhat
- Hoodies with drawstrings can be an entanglement hazard

5.4.2 Hand Protection

- Gloves should be worn for general work not requiring fine dexterity if temperatures are below 4°C (39.2°F).
- Since contact frostbite can occur at temperatures below -7°C (19.4°F), insulated gloves should be worn when there is the potential to contact cold metal surfaces.

6 POST-INCIDENT TREATMENT

Incidents resulting from cold exposure must be reported using the HSSE Event Report (RMS3) following Stantec's Incident Reporting Protocol for the region.

6.1 Hypothermia

Anyone with symptoms of hypothermia will need immediate medical assistance. Until medical assistance arrives, taking the following action can help:

- Moving the person to a warm, dry place, if possible, or sheltering them from the elements
- Removing wet clothing
- Covering their whole body and head with blankets, leaving only the face clear
- Putting the individual on a blanket to insulate them from the ground
- Monitoring breathing and carrying out CPR if breathing stops
- Providing skin-to-skin contact, if possible, by removing clothing and wrapping yourself and the individual in the blanket together to transfer heat
- Providing warm drinks, if the individual is conscious, but no alcohol or caffeine

6.2 Frost Bite

Inadequate or improper treatment of a frozen part is the most common cause of serious loss of tissue after frostbite. Affected areas should be warmed by placing warm hands against them (do not rub), by blowing on them, or by moving to a warm area. Frostbitten tissue must not be thawed if there is any chance that it will refreeze. If the injury affects entire fingers or toes, they should be warmed by immersion in warm – not hot – water for approximately 20-30 minutes. The use of other heat sources such as flames and radiant heaters that may warm injured tissue unevenly or too quickly should be avoided. Once seriously injured tissue has been warmed, it should be wrapped in soft material, the affected area should be elevated, and medical help should be obtained as soon as possible.

7 TRAINING OR QUALIFICATIONS

- First Aid
- Review of job procedures and this SWP

8 OUTSIDE AUTHORITIES TO BE CONTACTED

None.

9 RESOURCES

9.1 Internal

- Risk Management Strategy (RMS1)
- HSSE Event Report (RMS3)
- Incident Reporting Protocol – See document for applicable country or region on The Lens

9.2 External Resources

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library
- ACGIH TLV's for Physical Parameters
- National Weather Service: http://www.nws.noaa.gov/
- OSHA Technical Manual http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_4.html
- OSHA Emergency Preparedness and Response: Safety and Health Guides - Cold Stress
- CCOHS Cold Environments - Working in the Cold: OSH Answers
- IHSA - Cold Stress

10 DEFINITIONS

- **Cold stress**: The result of the body being unable to warm itself or to sustain core temperature. In a cold environment, most of the body's energy is used to keep the core internal temperature at about 37°C (98.6°F). Over time, the body will shift blood flow (and heat redistribution) from the extremities (hands, feet, arms, and legs) and the outer skin to the core (chest and abdomen). The four factors that contribute to cold stress include: cold air temperatures, high wind, high relative humidity and contact with cold water or surfaces.
- **Frostbite**: An injury caused by freezing of the skin and underlying tissues.

- **Frostnip**: A mild form of frostbite that irritates the skin, causing redness and a cold feeling followed by numbness. Frostnip does not permanently damage the skin.
- **Hypothermia**: A medical emergency that occurs when your body loses heat faster than it can produce heat, causing a dangerously low body temperature. Normal body temperature is around 37°C (98.6°F). Hypothermia occurs as your body temperature falls below 35 °C (95 °F).
- **Insensible perspiration**: The loss of water through the skin which does not occur as perceivable sweat. Unlike in sweating, the fluid lost is pure water, i.e. no solutes are lost
- **Sensible perspiration:** Sweat excreted in large quantity, or when there is high humidity in the atmosphere, so that it appears as moisture on the skin.
- **Wicking**: The ability of the material to pull the perspiration away from the skin toward the outer clothing layers for escape
- **Wind chill**: The combined effect of air temperature and wind on exposed skin. The higher the wind speed and the lower the temperature in the work environment, the lower the wind chill will be. The index relates the wind and temperature to its effect on exposed skin at five feet elevation.

11 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- Not applicable

File these records in the Project Health & Safety File:

- Not applicable

12 REVISION HISTORY

Date	Change	Acknowledgments	Approvals
February 1, 2023	Administrative Update: Edits to 1 Purpose, 3.1 Responsibilities, and 9.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Ferguson-Scott	P. Poelzer
October 8, 2020	Section 5.4.3.1 – minor corrections and additions for clarity	R. Roy	C. Ferguson-Scott
August 27, 2020	Minor rewording throughout document for consistency. Section 3 – Responsibilities, updated reference of PC Leadership to BC Leadership, added responsibilities for Supervisor and OSEC. Section 4 – Hazards, aligned with Energy Wheel. Section 5 – Controls, Added Engineering Controls and Warning Controls. Added Section 6 – Post Incident Treatment. Revised section 8 – Definitions, Section 9 – Resources, added Internal Resources and updated links to External Resources.	K. Bayer, R. Roy	J. Lessard

March 5, 2010	Changed HSE to SWP; revised temperature conversions; reformatted body; revised responsibilities to match general format	G. Doran	K. Robinson

1 PURPOSE

Before an employee manually lifts, lowers, pushes, pulls, carries, handles, or transports a load, they should assess the hazards. It is important to evaluate the load itself, the characteristics of the task, the environment where the task is being performed, and the employee's physical capabilities. Please review SWP-115a - Lifting Hazard Assessment Worksheet to help evaluate the hazards in lifting and transporting loads.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 SCOPE

This Safe Work Practice (SWP) applies to any employee, in the office or field, who performs any of the following tasks:

- Lifting, carrying, or moving of material or equipment
- Transporting, placing, or storing material or equipment
- Removing material or equipment from its storage area, pile, or rack

3 RESPONSIBILITIES

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this SWP
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether or not requirements within this practice are being met

3.2 Supervisor/Local Leadership

- Become familiar with the signs, symptoms, stages of progression, and the importance of early reporting for Musculoskeletal Injuries (MSIs)
- Communicate and reinforce the importance of early reporting of symptoms and injury to all employees
- Be knowledgeable about the available resources including OSEC/Regional HSSE Advisor assessment, Regional HSSE Manager, and external consultants
- Review recommendations as presented by the OSEC/Regional HSSE Advisor/Regional HSSE Manager to determine purchasing options for tools and equipment that may be identified as essential to the mitigation of risk for the employee
- Reinforce to all employees that when recommended controls are implemented, they are to be used consistently and appropriately
- Make sure applicable equipment is maintained and used in accordance with this practice
- Verify that applicable employees are trained in the requirements of this practice
- Require that this SWP be implemented for all applicable operations

3.3 Employees

- Be aware of the potential hazards that may be encountered while conducting work that requires material handling
- Know the proper use and limitations of equipment:
  - Be aware of and comply with requirements outlined herein
  - Be familiar with manufacturer's instructions
- Inspect equipment and work areas regularly for hazards
- Implement and follow recommended controls as appropriate
- Employees shall immediately report any discomfort associated with material handling to the supervisor. Use the HSSE Event Report (RMS3) to document details and concerns
- Be knowledgeable about the available resources including OSEC/Regional HSSE Advisor assessment, Regional HSSE Manager, and external consultants
- Take a personal interest and accountability in the assessment and control process
- Know how to control and respond to hazards and emergencies including use of emergency equipment

3.4 OSEC/Regional HSSE Advisor

- Participate in training to become knowledgeable regarding the identification of MSIs
- When requested by an employee or supervisor, perform assessments and collect information on the employees' task demands using the tools associated with this SWP. Make sure the employee submits an HSSE Event Report (RMS3) to begin the documentation of their concerns
- Reinforce that recommended controls are to be implemented and used appropriately
- Be knowledgeable about the available resources, including Regional HSSE Manager support and the use of external consultants

3.5 Regional HSSE Manager

- Provide support and additional resources related to task assessment and case management
- When necessary, provide recommendations regarding use of external service provider for persistent issues, and/or issues related to medically diagnosed conditions
- Be knowledgeable about the available resources, including corporate HSSE documents related to this topic, and the use of external consultants
- Work with the Workers' Compensation Claims Coordinator (WCCC) or regional equivalent to ensure any issues that could be considered work-related claims are reported to the appropriate Workers' Compensation carrier

4 HAZARDS

The **load** or object being moved may be a hazard as a result of one or more of the following:

- Size
- Weight
- Shape that will make it awkward to handle
- Coupling more than one item together
- Slippery or damaged surfaces
- Absent or inappropriate handles, or
- Unbalanced load

The **task** may pose a hazard because of any of the following:

- The action of lifting or lowering the load can be repetitive, require quick or jerky movements, or be undertaken for extended periods of time, while seated or kneeling, or immediately after prolonged flexion, or shortly after a period of rest
- Inability to get close to the load
- Moving the load over long distances
- Accuracy and precision required because of fragile loads or specific unloading locations
- Materials or equipment positioned too low or too high
- Hazardous movements or postures, or
- Multiple handling requirements

The **environment** may be hazardous because of the following:

- Temperature
- Relative humidity
- Lighting
- Noise
- Time constraints, or
- Physical conditions

Individual factors specific to the **Employee** have the potential to pose a hazard, such as:

- General health
- Lack of familiarity with the material handling tasks
- Physical factors such as height, reach, flexibility, strength, weight, and aerobic capacity
- Pre-existing physical conditions or problems, or
- Psychological factors such as stress and motivation

5 CONTROLS

- Elimination/Substitution
- Engineering
- Warnings
- Administrative
- Personal Protective Equipment (PPE)

Manual handling tasks must be designed or adapted so that they are within the employee's capabilities. The following will help reduce the load the employee will have to handle.

- Reduce the weight of the load so that it can be easily handled by one employee
  - Note: The load for a single employee should never exceed 50lb (23kg); loads in excess of 50 lb (23 kg) should be divided between employees or carried by more than one person. Please see SWP-115a – Lifting Hazard Assessment Worksheet to evaluate tasks.
- Decrease the load on the employee by:
  - Utilizing mechanical means whenever possible
  - Limiting the number of objects to be handled
  - Have two or more people help with the load, or
  - Change the size and/or shape of the load so it is easier to handle
- Design the workstation so that the employee:
  - Can store and handle the material at waist height
  - Can work with the material at the same height throughout the task

  - Can face the load and handle the material as close to the body as possible
  - Does not have to handle the load with an awkward posture or extended reach
  - Does not have to handle the load in a tight space or area that prevents the use of good body mechanics, or
  - Can access all the materials required for the task without having to reach or twist
- Eliminate the need for lifting or lowering an object by providing, and requiring the use of, lifting devices such as: lift trucks, hoists, scissor lifts, ramps, dollies, chutes, carts, or power lifts (e.g., on the tail gate of a truck).
- Eliminate the need to push or pull by ensuring the use of carts, dollies, hand trucks, grips, or handles on the loads.
- If you have to push or pull a load:
  - Push it rather than pull it
  - Do not overload the material being pushed
  - Ensure that the load does not block your vision, and
  - Never push one load while pulling another
- Maintain an optimum environment by ensuring that:
  - The work temperature is acceptable
  - With hot temperatures, employees take frequent breaks from the heat and drink a lot of liquids
  - With cold temperatures, employees wear good insulating clothing and ensure that loads can be easily handled when wearing gloves and heavy clothing
  - Handling instructions can be heard in a noisy environment
  - Lighting levels are adequate
  - There is good access to the load and aisles are clear of obstacles, and
  - Signs are posted where there are grade changes in the floor
- Provide proper storage areas for the material being handled so the employee can easily access the material without bending, twisting, or reaching.
- Wear the appropriate clothing when lifting or handling material or equipment. Ensure that clothing is comfortable (not too tight or too loose), and that there are no loose flaps, strings or belts that can get caught on an object. Wear non-slip shoes with a low heel. Safety footwear is a must when handling loads greater than 10 lb (4.5 kg).
- Most injuries that occur from material handing or lifting occur over a period of time. To ensure that you are not injured it is important that you remain in good physical condition. Stretch before you lift or handle materials.

If you must lift, use the following principles to reduce the risk of musculoskeletal injury during lifting:

- Before you lift, give yourself a couple of minutes to plan the lift, especially if you've been sitting or driving.
- Assess the load to determine if it is within your physical capabilities.
- Get help if the load is too heavy (over 50 lbs/23 kg) or too awkward.
- Face the object with your feet about shoulder width apart
- Keep a wide, stable base of support.
- Keep the load close to your body.
- Bend your knees and flex at the hip to lower yourself to the load.
- Once you have a good grip on the load, keep your eyes up to monitor your surroundings.
- Maintain the curve in your lower back (lumbar curve).

- **Avoid twisting** – use your feet to reposition your body, don't twist at the waist or shoulder.
- Protect your hands against pinch points.
- Do not lift an object that will obscure your vision or footing.
- Lift the object smoothly and slowly using your leg muscles; do not jerk as you lift.
- Make sure that your footing is secure. Plan ahead and make sure that your path is clear of obstructions and that there are no slip hazards.
- Organize the work to avoid lifting from the floor to above your shoulders.
- If you have a lot of lifting to do, get help, or try not to do it all at once.
- Do not rush or cut corners.
- Use the same principles when lowering or placing the load after lifting.
- Try to avoid carrying a load more than 10 ft/3.0 m without getting assistance or using a cart or dolly.



5.1 Personal Protective Equipment (PPE) Required

The use of hard hats, safety footwear, gloves, and other personal protective equipment will be determined based on a hazard assessment. Refer to SWP 105 – Personal Protective Equipment (PPE).

5.2 Maintenance

Establish a preventive maintenance program to verify that the following is completed:

- Cleaning and lubricating of wheels and bearings on hand carts, dollies, or other mechanical devices
- Replacing worn and defective wheels and casters
- Checking that all mechanical aids work efficiently

6 TRAINING OR QUALIFICATIONS

Employees who are exposed to ergonomic hazards while performing manual handling or lifting activities receive information on the following:

- Identification of any conditions that could lead to musculoskeletal injury
- Signs of musculoskeletal injuries
- Potential health effects of musculoskeletal injuries
- Safe methods for lifting, holding, and carrying of loads
- Preventative measures including altering procedures, the use of mechanical aids, and personal protective equipment

On-the-job demonstrations and practice sessions are the best method of training.

7 OUTSIDE AUTHORITIES TO BE CONTACTED

Not applicable

8 RESOURCES

8.1 Internal

- SWP-105 – Personal Protective Equipment (PPE)
- SWP-125 – Workstation Ergonomics

8.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library
- Manual Handling Operations Regulations (1992) - UK
- Manual Handling at Work, Health and Safety Executive (HSE) - UK
- Canadian Centre for Occupational Health and Safety – Manual Materials Handling
- Safe Work Australia – Lifting, Pushing, and Pulling (Manual Handling)
- Occupational Safety & Health Administration (OSHA – US) – Ergonomics eTool: Materials Handling: Heavy Lifting

9 DEFINITIONS

None

10 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- Records of instruction or training

File these records in the Project Health & Safety File:

- HSSE Event Reports (RMS3)

11 REVISION HISTORY

Date	Changes	Acknowledgments	Approvals
February 1, 2023	Administrative Update: Edits to 1 Purpose, 3.1 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Ferguson-Scott	P. Poelzer
December 23, 2020	Addition of global resources s. 8.0 and minor edits throughout.	K. Bayer	C. Ferguson-Scott
July 31, 2020	Updates to links and references for migration from StanNet to The Lens; minor changes to formatting	K. Bayer	C. Ferguson-Scott
March 1, 2018	Removed references to AllOne Health.	K. Bayer	C. Ferguson-Scott
December 5, 2016	Addition to section 6.0 to include bulleted list of topics.	M. Philipp	C. Ferguson-Scott
May 11, 2015	Minor edits to section 5.0 for clarity.	C. Ferguson-Scott	C. Ferguson-Scott
May 9, 2012	Edits for format.	C. Ferguson-Scott	C. Ferguson-Scott
February 23, 2010	Changed HSE to SWP throughout	G. Doran	G. Doran
January 7, 2010	Initial Posting to StanNet	K. Robinson	K. Robinson

1 PURPOSE

This Safe Work Practice (SWP) is intended to mitigate risks to employees (including contractors) when they are working alone. Project managers will apply all reasonable measures to protect employees who are performing their duties in areas or under conditions where they are required to be on their own.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 SCOPE

This practice applies to all Stantec employees and contractors who are required to work alone or who are planning work activities that involve working alone.

3 RESPONSIBILITIES

3.1 Health, Safety, Security, and Environment (HSSE)

- Maintain this SWP
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements within this SWP are being met
- Provide consultation to staff in the development of departmental and site-specific working alone plans

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP

3.3 Project Manager

- Identify risks or hazards associated with the work to be performed or the environment where the work is to be done
- Utilize the Risk Management Strategy (RMS1) or Health and Safety Plan (HASP) to document the hazards, controls, check-in plan and emergency response procedures associated with working alone activities
- Communicate controls to all affected workers
- Develop effective methods of communication for those who may require emergency assistance, depending on the specific work, location of the work, and nature of the work (For example: cell phones, radio, satellite phones, or satellite-based communication systems such as InReach or SPOT devices)
    - When electronic devices are not feasible, an effective contact system must be established (For example: check-in procedures and periodic site visits requiring employees to check in after the completion of specific tasks)

- The length of time an employee may be out of contact with a supervisor (the frequency of regular communications) must be based on the result from the risk assessment

- Where appropriate, use SWP-118a – Working Alone Checklist, to develop documentation and communication to support when working alone is permitted and/or prohibited Schedule high risk work (see Section 5.1.1) such that employees do not work alone in these situations

3.4 Employee/Contractor

- Participate in hazard assessment and control process with project managers and understand the check-in plan
- Discuss any questions or concerns that you may have
- Read and understand this safe work practice
- Maintain regular communication as identified in the check-in plan outlined in the RMS1 or Health and Safety Plan

4 HAZARDS

4.1 Energy Wheel



The energy wheel is a visual tool used by Stantec to identify 10 sources of energy and to assess and control the hazards associated with each source. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. Before beginning any activity, review the potential hazards and controls associated with the task. For project work, these sources, hazards, and controls will be documented on the Risk Management Strategy (RMS1), and in a Field Level Risk Assessment (RMS2/field app). Below are the energy sources and hazards most commonly associated with working alone in the field.

Energy	Hazard / Condition
Biological	• Inability to call for help when required • Difficulty initiating and accessing appropriate emergency response activities • Security risks • Inability to see additional hazards during hazard assessment process • Lack of situational awareness

5 CONTROLS

Stantec uses the hierarchy of hazard controls to eliminate or mitigate exposure to hazards. The hierarchy of hazard controls is based on the effectiveness of the controls. The hazard controls are, in order of decreasing effectiveness:

- Elimination
- Substitution
- Engineering
- Administrative
- Personal Protective Equipment

5.1 Elimination

5.1.1 Working Alone Prohibited

High risk activities are activities where the severity of the incident will bring serious consequences. In these circumstances, working alone is strictly prohibited. High risk activities include, but are not limited to the following:

- In any confined space as defined in SWP-411 – Confined Space Entry
- Working with electricity or with lock out/tag out
- While using a vehicle, crane, or similar equipment near a live powerline where it is possible for any part of the equipment or load to come within the limits of approach of the powerline
- While operating a vehicle, crane, mobile equipment, or similar material handling equipment where the operator does not have full view of the intended path of travel
- While operating an off-road vehicle
- Working from heights if the task requires the use of fall arrest equipment or scaffolds
- Working with hazardous substances or materials, especially when using quick-acting, acutely toxic material
- When entering excavations
- When using supplied air respiratory equipment or self-contained breathing apparatus
- Working where there is a possible threat of violence
- Working in remote areas in isolation from first aid services or emergency assistance
- When working around water, including electrofishing, where there exists the risk of drowning
- When using a chainsaw
- During welding operations where a fire watcher is required
- While performing tasks which, based on the risk assessment in the RMS1 or Health and Safety Plan, are deemed to require more than one person
- When an employee does not have a reliable means of communication

5.2 Administrative

5.2.1 Risk Assessments and Mitigation Guidelines

The RMS1 or Health and Safety Plan is used to document working alone activities and the appropriate controls. Project managers and employees will evaluate working alone assignments on a case-by-case basis and will consider the following risk factors:

- Identification of hazards and associated risks with the work to be performed or the environment where the work is to be completed
- Likelihood for other persons to be in the area

- Possibility that an incident could prevent the employee from calling for help or leaving the workplace
- Emergency response time
- Employee's training and experience
- The time or shift when the work is to be completed
- Whether the individual is accustomed to working alone
- Procedures to mitigate the identified hazards
- Methods of communication by which the workers can secure emergency assistance and how emergency assistance will be provided in the event of an incident
- The length of time an employee may be out of contact with their supervisor (i.e., the frequency of regular communications)

Project managers must review the RMS1 or Health and Safety Plan with affected employees.

5.2.2 Communication

When an employee will be working alone, they must have a reliable means of communication and there must be a check-in plan that specifies when and how the employee will check-in to verify his/her location and wellbeing.

The means of communication can be:

- Cell phone
- Walkie-talkie/Radio
- Satellite phone
- Satellite communication device (e.g., SPOT or inReach device)
- Buddy system
- Check-in system and requirement for updating an individual's status while working alone
- Any other method that is considered effective for the situation

Each working alone scenario will use the appropriate communication options, either singularly or in combination. When Working Alone requires work in remote areas where cell phone coverage is limited, Project Managers will provide the employee with a satellite-based communication device.

For operations in Australia and New Zealand, use of a satellite-based communication/tracking device is mandatory for driving in remote areas, and its use will be included in the safety documentation and understood by the project team. For more information, please contact your HSSE representative.

6 TRAINING

Employees who, due to assigned duties, are required to work alone will receive training in the requirements for this procedure.

All employees required to work alone must have valid first aid training.

7 OUTSIDE AUTHORITIES TO BE CONTACTED

Not applicable

8 RESOURCES

8.1 Internal

- SWP-107 – First Aid

- SWP-118a – Working Alone Checklist
- SWP-411 – Confined Space Entry
- SWP-501 – Satellite-Based Communication Systems

8.2 External

Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:

- Stantec's Critical Task Inventory
- Health & Safety Regulatory Requirements Library
- Environmental Regulations Library

9 DEFINITIONS

- **After Hours**: The period of time when "normal" weekday or shift operations cease.
- **Emergency Assistance**: Assistance in the event of an incident or injury, illness, or threat of violence.
- **Field Work**: Field work consists of work activities that are being performed outside an office environment.
- **Working Alone**: Individuals are considered to be working alone when they are working by themselves and assistance in the event of an injury, illness, or emergency, is not readily available.

10 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- First aid training certificates

File these records in the Project Health & Safety File:

- Risk Management Strategy (RMS1)
- Working Alone Checklist (SWP-118a)

11 REVISION HISTORY

Date	Change	Acknowledgments	Approval
February 13, 2023	Edits to 1. Purpose, 3.2 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings. Significant revisions in 3.0 Responsibilities and 5.0 Controls. Small addition to 9.0 Definitions.	S. Robichaud	P. Poelzer
August 3, 2020	Updates to links and references for migration from StanNet to The Lens; minor changes to formatting	K. Bayer	C. Ferguson-Scott
August 2, 2018	Change to section 5.1: removed reference to specified voltage for energized electrical conductors/equipment.	R. Roy, K. Bayer	C. Ferguson-Scott

Date	Change	Acknowledgments	Approval
July 20, 2018	Update template and terminology, s. 5.2 addition SPOT tracker for ANZ, link to Framework in s. 8.1.3.	C. Ferguson-Scott	J. Lessard
February 22, 2010	Change from HSE to SWP in header; modified references in body from HSE-118a to SWP-118a; corrected RMS-1 to RMS1	G. Doran	K. Robinson
January 21, 2010	Initial posting to StanNet	K. Robinson	P. Salusbury

Stantec

WORKING ALONE CHECKLIST

Employee Name: _____ Business Center: _____

Work Location: _____ Date: _____

Project #: _____ Office Location: _____

Questions	Y/N	Action Required	Target Date for Action	Person Responsible for Action
Has staff received adequate training to carry out their duties when working alone?				
Has staff been provided with adequate means of communication?				
Is there sufficient cell coverage in the proposed work area to provide confidence of contacting emergency services if necessary?				
Can staff be readily contacted?				
Is staff physically able to undertake their duties?				
Where applicable have staff been provided with suitable protective equipment and/or clothing?				
Have all tools and equipment been regularly maintained and checked before use?				
Is access to first aid facilities readily available				
Is staff aware of the correct incident reporting procedures? They should also be encouraged to report any hazards.				
Are arrangements in place for staff to "phone in" after out-of-hours visits?				
Has the risk assessment been reviewed in the last year and is it still applicable to the current working arrangements?				

_____ _____

Project Manager's Printed Name Date

_____

Project Manager's Signature

REVISION HISTORY

Date	Changes	Acknowledgments	Approval
March 11, 2010	Changed HSE to SWP; reformatted header, footer and checklist layout; added revision history	G. Doran	G. Doran
October 31, 2019	Changed HSE to HSSE; added employee name, BC, work location, date, project number and office location; added project manager printed name	P. Fox	R. Roy

HEALTH, SAFETY, SECURITY, AND ENVIRONMENT
SAFE WORK PRACTICE
SAFE DRIVING (SWP-124)

1 PURPOSE

The purpose of the Safe Driving Safe Work Practice (SWP) is to provide standard practices and procedures to help mitigate the potential of injury to persons or damage to vehicles while driving on company business.

2 SCOPE

This SWP applies to work carried out by Stantec employees when that work involves driving on company business. This SWP is supplemented by the following forms:

- SWP-124a – Vehicle Pre-Use Checklist
- SWP-124b – Journey Management Plan
- SWP-124c – Safe Driving Supplement - Australia & New Zealand

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REVISION HISTORY

Revision Number	Date	Changes	Authors	Reviews	Approvals
1.0	29-Apr-2024	Initial re-release in revised format	J. Elkins, C. Sutton	K. Bayer, J. Parker	P. Poelzer

3 HRAC (HAZARD RECOGNITION ASSESSMENT AND CONTROL)

This section outlines the hazards that are expected in the work activity of this SWP and outlines the mandatory controls that must be implemented to prevent incidents. The list is not exhaustive, and each project and/or location must consider the specific hazards that may be present. Select the hyperlinked steps below to see the details for each step.

Job Hazard	Energy Hazard	Specific Hazard	Critical Risk	Mandatory Controls	Training
Travel distance and duration	 Motion	Fatigue and distractions	 Driving	Step1 – Train and Assess Step 2 – Plan Step 3 – Inspect and Monitor Step 4 – Communicate and Proceed	Defensive Driver training for operating Stantec-owned vehicles. Identify specific training requirements in line with driving license categories.
Driver experience and choices		Inappropriate driving experience, unfamiliar vehicle. or under the influence			
Location and road surface type		Loss of vehicle control due to rough roads			
Weather Conditions/ Forecast	 Thermal	Loss of vehicle control or stranding due to adverse weather conditions			
Lighting and Visibility		Driver is not able to see road or hazards			
Roadway obstructions	 Biological	Construction activities Animals, pedestrians, or debris in roadway			
Traffic volume and speed	 Motion	Frustration or limited reaction time			
Lack of Access to Emergency Services/ Communications		Inability to call for help or confirm location			

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where

Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on health and safety requirements by jurisdiction, refer to Stantec's Health & Safety Regulatory Requirements Library. The Critical Task Inventory also provides information for work activities that have been identified to have higher risks.

Stantec also recognizes that clients or project sites may have their own requirements; when a client or site requirements are more stringent than those required by Stantec or local legislation, the client's requirements will prevail.

Additional links:

- Project HSSE Plan (RMS1)
- Health & Safety Regulatory Requirements Library
- Environmental Regulations Library
- Vehicle Practice
- Additional Resources

4 MANDATORY CONTROLS

Deviation from the mandatory controls of this SWP must follow the Management of Change (RMS11) process.

Driving Critical Risk Control Flat Sheet

Step 1 – Train and Assess

- All employees who drive company vehicles will complete Defensive Driver training. It is recommended, but not required, that those who drive personal or rental cars for business more than 80 hours a year should receive Defensive Driver training.
    - This training will be refreshed if employee is involved in an at-fault accident while driving for company business.
    - Defensive Driver training will be provided via a corporate-approved provider. Refer to the HSSE tab on The Lens, or contact your Regional HSSE Manager, Regional HSSE Advisor, or OSEC for more information.
- Operating off-road vehicles and loading and towing a trailer require specific skills and may require specialized training. See SWP-505 – Off Road Vehicles for more information.
- The use of powered two-wheel vehicles requires a risk assessment and authorization; see Appendix B for additional information.
- Additional task-specific training may be required for certain types of high-risk driving. See Appendix B for more information.
- Additional requirements may apply to employees in Australia and New Zealand. See SWP-124c - Safe Driving Supplement - Australia & New Zealand for more information.

Step 2 – Plan

- Only authorized employees will drive a vehicle in the course and scope of work or operate a company-owned vehicle.
- Employees must hold a current driving license that is valid in that jurisdiction for the class of vehicle being operated.
    - Immediately notify your supervisor if the license is suspended, cancelled, has limitations placed upon it, or if they have personal limitations (e.g., difficulty driving at night or driving on icy roads, driving standard transmission vehicles, the use of medications that cause drowsiness, medical conditions, etc.)
- The driver and all passengers are required to wear a seat belt. The number of passengers cannot exceed the number of seat belts available for them.
- SWP-124b – Journey Management Plan must be completed for any trip exceeding 250 miles (400km) and/or a daily driving time of 6 hours, also known as a long-haul trip. Some regions or Business Operating Units (BOUs) may have more stringent minimum requirements – please verify with your local HSSE team. Beyond these minimum triggers, a journey management plan should be based on a risk assessment that takes the following into consideration:
    - Travel distance and duration
    - Driver experience
    - Location/road surface type
    - Weather conditions/forecast
    - Lighting/visibility
    - Traffic volume/speed
    - Access to emergency services/communication
- Each company vehicle should carry emergency equipment. Some Stantec offices make emergency kits available to employees when they are driving on company business. Please direct your questions to your local OSEC.

Step 3 – Inspect & Monitor

- It is recommended that all vehicles are inspected at least visually prior to each trip.
- Perform and document a pre-use vehicle inspection prior to each long-haul trip, which also includes taking time to become familiar with the vehicle (including its safety features); use SWP-124a – Vehicle Pre-Use Checklist.
    - Report rental vehicle defects to the rental company before the start of the trip.
    - Check vehicle regularly during long-haul trips.
- Check the condition of wipers and volume of washer fluid.

- Carry a reliable method of communication, such as a cell phone, in case of emergency. (Note: cell phone cannot be used while driving.)
- GPS and portable music devices must be set up before driving – adjusting them while driving is prohibited.

Step 4 – Communicate and Proceed

- The use of any mobile phones and other portable electronic device (including tablets and laptops) while driving is prohibited.
- Do not exceed posted speed limits; follow all local traffic laws.
- When driving, take regular and adequate rest breaks. See Appendix B for more information on fatigue and drowsiness.
- Stantec employees are prohibited from operating a motor vehicle while under the influence of alcohol or drugs. Refer to HSSE-100 – Alcohol and Drug Practice on The Lens for more information.
- Report motor vehicle incidents as required to the local police.
- Report every motor vehicle incident (including those that do not result in damage or injury) according to the applicable Incident Reporting Protocol. An incident report must be submitted in Pro-Sapien. Where police respond to the incident, the employee will submit a copy of the police report with the incident report.



- At no time should an employee put themselves in a position where they feel unsafe, whether it is on location or driving to a location.
- Conduct a Last-Minute Risk Assessment (LMRA) before proceeding.

5 RESPONSIBILITIES

- See the HSSE Program Manual for general responsibilities.

Project Manager

- Review, understand, and verify implementation of the four-step process listed in the Mandatory Controls section of this SWP.
- Verify the vehicle (owned, leased, rented, or hired by Stantec, or a Stantec employee) Is driven / operated only by a qualified person.
- If a journey management plan form is required, then verify it has been approved by the employee's supervisor or Project Manager prior to the journey commencing.

Employees

- Review, understand, and verify implementation of the four-step process listed in the Mandatory Controls section of this SWP.
- Be directly responsible for the safe operation of the vehicle, while observing all relevant regulations (e.g., obeying posted speed limits). This includes verification that loads are secured and within the vehicle manufacturer's specification and legal limits for the vehicle.
- If a client asks an employee to drive to the client's location and the employee believes the road conditions are unsafe, the employee will discuss the matter with their supervisor.
- STOP work immediately if they become aware of an unsafe act or condition that could place anyone in danger, or if they are not confident in the plan.

Leadership

- Review, understand, and verify implementation of the four-step process listed in the Mandatory Controls section of this SWP.
- Require that this SWP be implemented for all applicable operations.

APPENDICES

OPEN THE APPENDICES BELOW BY SELECTING THE RIGHT-FACING ARROW BESIDE EACH APPENDIX.

APPENDIX A: DEFINITIONS (RETURN TO MANDATORY CONTROLS)

APPENDIX B: ADDITIONAL INFORMATION

HEALTH, SAFETY, SECURITY, AND ENVIRONMENT
VEHICLE PRE-USE CHECKLIST
SWP-124A

Stantec

Employee Name:		Region/Business Unit:	
Date:		Time:	Vehicle Color:
Vehicle Make/Model:		Vehicle License Plate Number:	
Job:		Job #:	# of Km or Mi Driven
Job:		Job #:	# of Km or Mi Driven
Odometer Start:	Odometer Stop:	Total Km or Mi Driven:	
Stantec Vehicle ☐		Rental ☐	Personal Vehicle ☐

Perimeter Walk Around:	**Item is OK**	**Item is NOT OK**
Check for signs of vandalism, negligence, damage or unusual conditions		
Check all tires for excessive and unusual wear and proper inflation – include the spare tire if accessible		
Check under vehicle for signs of leaking fluids		
Check wiper blades (Do they work? Do they need replacement?)		
Check all light systems – brake, head, back-up, running, turn signals, emergency flashers		
Check to make sure doors, truck/toolbox lids, tailgates all open and close properly		
(Make sure you have keys to any toolboxes that you may need to access)		

Check Gauges on Dashboard:	**Item is OK**	**Item is NOT OK**
Fuel Level		
Oil light		
Engine Coolant Temperature Gauge		
Service Indicator Lights		
Battery Charge Indicator		

1 PURPOSE

The purpose of this Safe Work Practice (SWP) is to establish written guidelines for using hand and portable power tools.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 SCOPE

For the safety of all employees, Stantec will comply with the guidelines established by applicable regulations, industry standards, and manufacturers' instructions when dealing with hand and portable power tools. This SWP applies to all Stantec operations.

General electrical safety for office environments or where personnel are exposed to energized or potentially energized conductors as part of site visits or during their work is outside the scope of this SWP. Refer to SWP-406 – Electrical Safety Program for guidance.

3 RESPONSIBILITIES

3.1 BC Leader

The BC Leader or relevant supervisor responsible for the work has the primary responsibility for implementing this practice. This responsibility includes the following:

- Maintain and use applicable equipment in accordance with this practice
- Directing that tools are capable of safely performing the functions for which they are used, and are selected, used, and operated in accordance with:
  - The manufacturers' instructions, if available
  - This safe work practice, and
  - The requirements of the appropriate regulatory requirements
- Direct that written maintenance records are kept for each piece of equipment and that these records are readily available by individuals required to perform inspections or maintenance on the equipment. These records must be retained for the service life of the equipment.

3.2 Health, Safety, Security, and Environment (HSSE)

- Maintain this SWP
- Assist with interpretation and methods of compliance with this practice and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements within this practice are being met

3.3 Project Manager (PM)

The Project Manager or relevant professional responsible for the work has the responsibility to see that all equipment is maintained and operated as described in this procedure, and that their employees receive appropriate training that allows them to use the equipment safely.

4 HAZARDS

4.1 Energy Wheel



The energy wheel is a visual tool used by Stantec to identify 10 sources of energy and to assess and control the hazards associated with each source. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. Before beginning any activity, review the potential hazards and controls associated with the task. For project work, these sources, hazards, and controls will be documented on the Risk Management Strategy (RMS1), and in a Field Level Risk Assessment (RMS2/field app). Below are examples of energy sources and hazards most commonly associated with hand and power tools.

Energy	Hazard / Condition
Thermal	• Contact with hot materials / tool components due to surface friction associated with cutting, drilling, grinding, etc. • Contact with hot surfaces and associated tools due to welding, brazing, cutting using a torch, etc. • Fires and burns due to overloading power cords, wiring, or circuits or damaged power / extension cords • Shorts, fires, burns due to tool batteries being stored incorrectly • Contact with tools in freezing temperatures can result in frostbite • Cold or hot temperatures can impact hand dexterity or grip (from sweat), making manipulating tools difficult, leading to injury
Chemical	• Contact with hazardous chemicals / agents due to tool contamination from normal use (e.g., poison ivy oil) • Spill of hydraulic fluids or engine / tool lubricants from hose, fitting, or equipment failure • Exposure to carbon monoxide due to use of internal combustion engine or tools in poorly ventilated areas • Inhalation of dusts, mists, or toxic vapors from tool operation leading to respiratory failure or lung damage (e.g., silica dust)
Noise	• Noise exposure exceeding Stantec's Action Level for an eight-hour time-weighted average or instantaneous exposure due to hand or power tool use
Gravity	• Falling objects due to dropping tools and/or materials • Carrying tools that obstruct line of sight can lead to slips, trips, and falls
Motion	• Getting pinched / crushed due to normal **or** inadvertent tool activation; Between tool and item being worked on • Being struck by items, fragments, or debris while operating a tool, due to tool malfunction/damage, or using a tool incorrectly and getting struck by the active tool while in the line-of-fire • Muscle, joint, and soft tissue injuries (e.g., sprains, tendonitis, pain, fatigue, etc.) due to repetitive movements, awkward postures, static body positions, and/or holding heavy items (tools or materials) associated with normal tool use

Energy	Hazard / Condition
Mechanical	• Mechanical failure of tool or tool components (e.g., drill bits, blades, etc.) due to tool / component fatigue or poor tool maintenance • Injuries due body parts being caught / snagged and drawn into or wrapped around reciprocating or rotating tools • Stored energy from jammed power/pneumatic/hydraulic tools (including due to being jammed by the item being worked on) • Hand-and-arm vibration syndrome (HAVS) due to holding power tools that cause vibrations for prolonged periods of time
Electrical	• Contact with, or arcing from, exposed energized electrical conductors or connections on power tools or cords • Shock / electrocution from drilling / cutting / digging into live electrical circuits hidden in / behind the work material • Electrocution or equipment damage from overloading wiring or extension cords, incorrect connections, damaged power cords or damaged insulation
Pressure	• High pressure hydraulic fluid or air release from hose or fitting failure due to component fatigue or lack of maintenance

Hand and power tools can be hazardous and have the potential for causing severe injuries when used or maintained improperly. Special attention toward hand and power tool safety is necessary to reduce or eliminate these hazards.

5 CONTROLS

5.1 Pre-Use Inspection

Hand or portable power tools must be inspected by the user(s) **prior to each use** to confirm the tool is in good condition and safe to use/operate. Examples of defect conditions include:

Hand Tools

- Bent wrenches, pliers, pipe tools or with sprung/worn jaws
- Impact / striking tools with mushroomed heads or burrs
- Handles that are cracked, splintered, broken, or loose
- Screwdrivers that are bent, dull, or rounded
- Files with missing or no handles

Power / Pneumatic / Hydraulic Tools

- Handle or body casing cracked or damaged
- Auxiliary or double handles missing or not installed securely
- Damaged switches or faulty triggers/trigger locks
- Power cords with electrical tape, sheath damage, or insulation that is broken or pulled back from the plug connector; Cords that have lost their original flexibility
- Electrical connections with noticeable charring, melting; Loose/missing/faulty prongs; Loose connections when connected (indicates at least one side of connection is faulty)
- Evidence of air or fluid leaks in tool, fittings, supply hoses, compressor, etc.
- Cracked hoses or hoses with exposed braiding

Where a tool has a defect that will impair its strength or render it unsafe, remove it from service **immediately**, and tag it "out of service" (or make it inoperable) to ensure it is not inadvertently returned to service until it is either repaired by a qualified individual or properly disposed of.

Confirm tool and equipment power/trigger switches are "off" before connecting them to a power supply or energy source (e.g., compressed air).

If machinery, equipment, or a structure is dismantled in whole or in part and subsequently re-assembled, it must be checked by a qualified person and determined to be safe prior to use.

Before any equipment, machinery, or work process is put into operation the persons responsible for doing so must ensure that safeguards and air contaminant controls (if required by regulatory requirements) are in place and functioning and that no person will be exposed to undue risk by putting the equipment, machinery, or work process into operation.

5.2 Safe Tool Use

5.2.1 General Requirements

Many tools are accompanied by a safety and operating manual, which should always be retained with the tool (a lost manual may be obtained from the manufacturer's website). Operate the tool in accordance with the manufacturer's instructions.

All hand and power tools will be kept in good repair and used only for the purposes for which they were designed. Do not use tools for jobs they are not intended or sized to do. Ensure tools used for electrical work are designed for such work (e.g., properly insulated).

Modification of a tool, machine or piece of equipment, or parts thereof, is prohibited.

- No person will intentionally remove, impair, or render ineffective any safeguard which is provided for the protection of other workers unless approved under legislation or according to manufacturer's instructions for repair or maintenance and must be replaced before use.

Prior to cutting, drilling, digging, etc. into an item or surface, the user of the tool shall confirm there are no items behind/underneath that may pose a hazard if struck (e.g., power cables, water/sewer/electrical lines, buried utility lines, etc.).

Where practical, use clamps, a vice, or other device to hold or support the item being worked on to allow use of both hands for better control using the tool or if the tool jams/binds.

- Small parts must always be placed in a vice before being worked on to keep hands away from the point of operation. Do not hold items in the palm of your hand when using cutting tools or screwdrivers.

Touching the working parts of a tool with your hand is not permitted.

- If material must be dislodged from a tool (such as soil from a hand auger) another tool will be used to remove the material, and only when that tool has been rendered safe.
- Where the item or material being worked on causes a tool to jam or seize, the tool must be de-energized before attempting to free the tool. Users must also be prepared for stored energy that could be released when the tool is freed.
- Where tool components must be replaced or switched out (e.g., blades, drill bits, discs), the tool must be de-energized and confirmed zero-energy state before servicing the tool.
- Working surfaces of tools may become extremely hot from use or develop burrs or rough edges – allow components to cool before handling and wear gloves to protect fingers.

Any work that involves burning, welding, using fire or spark-producing tools that produce a source of ignition capable of igniting flammable or combustible vapors, or burning equipment or materials in the work area is considered "hot work."

- Refer to SWP-414 – Hot Work for guidance and recommendations, which may include only intrinsically safe or non-sparking tools being used in locations where sources of ignition may cause a fire or explosion.

Throwing tools or materials from one location or person to another or dropping them to lower levels is not permitted. Do not leave tools lying on elevated structures, such as a scaffold.

When climbing ladders, scaffolds, stairs, or other approved structures, do not carry tools in a way that interferes with using both hands to maintain 3-point contact. Consider raising or lowering tools using a bucket and hand line / winch.

Do **not** surprise or touch anyone who is operating a tool. Approach operators from the front, gain eye contact, and wait for the operation to stop before approaching the tool operator.

Practice good ergonomics when using hand or power tools, such as:

- Perform complimentary stretches based on the work, prior to, during, and after the work.
- Select tools designed to allow wrists to stay straight. Avoid using tools with your wrist bent. Reduce tool size (e.g., trowels) to reduce effort and torque on the wrists.
- Do not apply excessive force or pressure on tools – besides leading to ergonomic injuries, excessive force can lead to tool malfunction/failure, resulting in an injury.
- Do not over-extend any portion of your body while using tools; Avoid awkward and static postures; Keep good footing; Take frequent stretch breaks or switch tasks between tools.
- Avoid twisting the torso or lower back while using tools or lifting/reaching for tools/materials.
- Consider mechanical aids to address repetitive manual movements (e.g., electric winch over manual winch, power wrenches/screwdrivers, etc.); Use carts/dollies to carry tools over long distances.
- Some hand-held tools produce minor vibrations during normal use (e.g., impact tools, from electric motors, etc.) – take frequent breaks of at least 10 minutes away from tool use.
- Where a worker begins to experience ergonomic symptoms or discomfort attributed to tool use, they are to notify their supervisor immediately and submit an RMS3 to record the event.

Where a tool is damaged during use, remove it from service as described in Section 5.1 above.

5.2.2 Hand Tools

Hardened steel hammers must not be used to strike hardened steel tools or materials. A soft hammer must always be used for this purpose.

Extensions (i.e., cheater bars) must never be used on wrenches. Obtain tools with longer handles by design where additional leverage is required for the work.

When using brush cutting tools like machetes, Swedish brush axes, swing blades, etc., make sure the blades are sharp to reduce exertion required, the tool isn't damaged, and review SWP-517 – Safe Machete Use before use. Transport the cutting tools with the blade sheathed.

Users need to maintain their situational awareness while carrying, handling, and using tools to keep body parts out of the line-of-fire or out of pinch/crush points.

- PPE (e.g., gloves) provides some protection from injuries but should not be solely relied on.

- Pull on wrenches or pliers; Never push unless you hold the tool with your palm open.
- When using cutting tools (e.g., box cutters, utility knives, etc.), cut away from your body.
- Keep hands and fingers out of hinge areas and pivot points when using tools or setting up or disassembling folding stands and portable equipment.
- Carry tools in a sturdy toolbox to and from the worksite. Where a toolbelt is used to hold items, hang tools pointed down at your sides, not behind your back.

5.2.3 Power Tools

When power tools are designed to accommodate guards, they will be equipped with such guards when in use. Rotating, reciprocating, or moving parts exposed to employee contact, harm, or representing other hazards must be guarded; equipped with a guard or other device that prevents access to the point of action or pinch point. This includes:

- Belts
- Gears
- Shafts
- Pulleys
- Sprockets
- Spindles
- Drums
- Flywheels
- Chains
- Any machine, device, or equipment that has pinch points, a cutting edge, in-running nip hazard, or an area where material is cut, shaped, bent, bored, or formed.
- Any machine that produces an open flame, has steam pipes/fittings, or a surface with a temperature which may exceed 80°C/176°F, or fall below – 80°C/-112°F.

Guarding must meet local requirements as established in legislation and/or applicable standards.

The point of operation of machines must be guarded if operation exposes an employee to injury.

- The guarding device will be in conformity with any appropriate standards therefore, or, in the absence of applicable specific standards, will be so designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.
- Special hand tools for placing and removing material shall be such as to permit easy handling of material without the operator placing a hand in the danger zone.
    - Such tools will not be in lieu of other guarding required by this section but can only be used to supplement protection provided.

Abrasive wheels will be used only when safety guards are installed correctly, including safety guards covering spindle end, nut, and flange projections. Repair or maintenance will be done by qualified personnel as designated by the manufacturer.

Portable lamps/lights must have suitable protection to prevent lamp breakage if dropped or knocked over and to protect personnel from contacting the hot bulb/lens.

No person may require or permit machines or parts of machines to be left unattended or in a suspended position unless the machine or part has been immobilized and secured against accidental movement or enclosed by a safeguard to prevent access by any other worker to the machine or part.

Portable electric power tools will be grounded, and power cords will be maintained in good condition. Electric power tools must always be used with a Class A ground fault circuit interrupter (GFCI) receptacle or circuit – contact your supervisor if a GFCI continually trips.

- Keep electric and battery-operated power tools dry and out of the rain or wet conditions.
- Stop using an electric power tool if you feel a tingle/shock in your fingers – this is a warning sign that the tool is faulty and needs to be tagged "out of service" until repaired.

Rotating or reciprocating portable power tools will have a constant pressure switch that will shut off the power when the operator releases the tool.

- A portable power tool may have a lock-on control, provided turnoff can be accomplished by a single motion of the same finger or fingers that turned it on.
- To avoid accidental starting, do not hold fingers on the switch while carrying a plugged-in or energized (e.g., battery operated or pressurized) tool.

Extension cords are to be used to provide **temporary** power only – where power is permanently required, it shall be properly wired-in by a licensed electrician. Running extension cords through doorways/windows or holes in walls/ceilings/floors, concealed behind walls/ceilings/floors or by floor coverings, or burying them is **not** permitted.

- Extension cords must be located to not present a tripping hazard or become damaged by heat, sharp edges, pinch points, or pedestrian/vehicle traffic, otherwise, they must be protected by cord protectors, conduit, or planking on each side. If not in use, extension cords should be unplugged and securely stored.
- Ensure extension cords are routed to avoid wet or damp locations and areas with, or prone to, standing water/runoff.
- Inspect extension cords and plug ends periodically while in use – extension cords that are uncomfortably warm or with charred/damaged plug ends are signs of cord failure and/or incorrect use (i.e., overloading).
    - Extension cords should be replaced after five years of regular use – the cord's flexibility and capacity to carry current degrades over time.
- Do not tie power cords in knots – use twist-lock or locking plugs to secure connections.
- Extension cords must be sized for both tool amp load and extension cord length.
    - Light duty extension cords must not be used – use medium or heavy-duty extension cords that are UL, ETL, CSA, MET, or other regional authority approved. Where used outdoors, ensure extension cords are rated for outdoor use.
    - Local regulations will define the maximum length of extension cord permitted (e.g., in the US/CAN, the maximum length is 100 feet [30.5 metres] based on OSHA standards). However:
        - Extension cords experience a voltage drop as length increases - use a length that gives you as close to the exact distance as you need.
        - Maximum length is also impacted by duty rating and gauge, and tool draw. As tool amp load increases, extension cord length should be **decreased** and/or gauge **increased** (e.g., a tool pulling less than 10 amps may use up to a 50-foot (15 meter) 14 AWG (2.08 mm2) medium-duty cord, otherwise gauge should be increased to a 12 AWG (3.31 mm2) cord; Where tool draw is between 10 and 15 amps, a 10 AWG (5.26 mm2) heavy-duty extension cord should be used).
    - Any worksite that needs a longer extension cord than permitted by the local regulations must install a temporary power distribution box.
    - Extension cords must not be connected together as it reduces their capacity by 50% and leads to overheating. Octopus / "cube tap" connections are **not** permitted.

- Where a high draw tool is being used, a dedicated extension cord must be used.
- 220/240V tools require a 220/240V extension cord.

Recharge a battery-powered tool only with a charger that is specifically intended for that battery. Store batteries safely so that no metal items can contact the battery terminals.

Diesel or gasoline powered tools (including generators used to power electric tools), must only be operated outdoors in well ventilated areas.

- Opening doors and windows or operating fans does **not** guarantee safety.
- Ensure placement of diesel or gasoline engines is located away from building air intakes.

Some power tools require additional training before operating. To operate a chainsaw employees must receive hands on training and have read SWP 518 - Using a Chainsaw.

5.2.4 Pneumatic and Hydraulic Tools

- Manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings will not be exceeded.
- All pressurized hose connections must have safety clips installed and be secured with whip-checks prior to being pressurized.
- All hydraulic or pneumatic tools used on or around energized lines or equipment will have non-conducting hoses having adequate strength for normal operating pressures.
- Pneumatic power tools must be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.
- A tool retainer or safety clip shall be installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled/ejected.
- All pneumatic nailers, staplers, and similar tools, which operate at more than 100 psi (690 kPa) pressure at the tool, must have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.
- Fittings for pneumatic tools will be separate, unique, and unable to interconnect with other gas connections to avoid the potential of connecting breathing air equipment to non-air supplies.
- Compressed air will not be used for cleaning purposes, except where reduced to less than 30 psi (207 kPa) and then only with effective chip guarding and PPE which meets the requirements.
  - The 30 psi (207 kPa) requirement does not apply to concrete form, mill scale and similar cleaning purposes.
  - Using compressed air to clean debris from clothing, footwear, or work surfaces **is prohibited**.
- Hydraulic fluid used in power tools must retain its operating characteristics at the most extreme temperatures to which it will be exposed.

5.2.5 Personal Protective Equipment (PPE)

Loose or frayed clothing, loose long hair, finger rings, necklaces, chains, watches, bracelets or hanging earrings will not be worn when using power tools, working around machinery or on any site where chemical contamination is possible or has been identified.

Operating hand or power tools can produce projectiles, debris, cuts/abrasions and pose a risk to feet it dropped – standard PPE that includes long sleeves/pants, appropriate gloves, safety boots, and safety eyewear must be worn.

- Where the work being performed produces dusts, fumes, mists, or other respiratory hazards, appropriate respiratory protection shall be worn.
- Power tools or impact hand tools can also produce noise that exceeds thresholds, requiring hearing protection (i.e., earplugs and/or earmuffs) to be worn.
  - Refer to SWP-106 – Noise Control and Hearing Conservation Program for guidance.
- Where the work and/or tool use requires kneeling on concrete or hard surfaces, consider the use of kneepads and ground padding if balancing on hands while kneeling.
- Glove selection may vary depending on the nature of the work and tool being used, such as fitted leather gloves for general work to coated gloves with puncture protection where greater dexterity is required or exposure to chemicals may be a hazard.
- Where power tools produce continuous vibration, the use of anti-vibration gloves meeting the requirements of ISO 10819:2013, or applicable local standard, should be considered.
  - Gloves must be implemented alongside other controls, such as frequent breaks of at least 10 minutes away from the tool or selection of a tool that produces less vibration.
- Refer to SWP-105 - Personal Protective Equipment for guidance and recommendations.

5.3 Tool Maintenance and Repair

- Keep all tools in good condition with regular maintenance. Clean tools after use – this extends the life of the tool and removes contaminants that could damage the tool or be a hazard to users (e.g., poison ivy [Urushiol] oil on shovels).
  - Refer to the instruction manual supplied with the tool for proper cleaning procedures and compatible cleaning methods. Do not clean tools with flammable or toxic solvents.
- Tools not in use should be stored neatly in a dry, secure location. If hung or stood vertically, with the heavy end down.
- Wooden handles must not be painted or taped as this may cover up cracks.
- Chisels and cutting tools must be kept sharp. Cover sharp edges with a suitable covering or sheath to protect the tool and to prevent injuries from unintended contact.
- Adjustable wrenches must have jaws facing the direction of movement. Pipe wrench jaws must be kept sharp.
- Power tools must be de-energized (unplugged, battery removed, depressurized) and confirmed zero-energy state before performing maintenance or making repairs.
- Repairs shall only be made by qualified individuals or certified/licensed repair shops.
- Tools that cannot be repaired shall be tagged "DO NOT USE" and disposed of in accordance with local refuse and recycling guidelines. Power tools should be disabled from future use by cutting the electrical cord where it exits the **de-energized** tool.

6 TRAINING

A tool will only be used by employees who are adequately trained in its safe operation.

- Training is to include how to select the right tool for the job, how to correctly use the tool, and how to identify when tools need repair or may be malfunctioning.
- Competency will be assessed by a supervisor and/or experienced personnel.

Employees who are required to operate hand and portable power tools will be familiar with manufacturer-supplied instructions for use and care of required equipment.

7 OUTSIDE AUTHORITIES TO BE CONTACTED

Not applicable

8 RESOURCES

8.1 Internal

- SWP-105 - Personal Protective Equipment
- SWP-106 – Noise Control and Hearing Conservation Program
- SWP-406 – Electrical Safety Program
- SWP-414 – Hot Work
- SWP-517 – Safe Machete Use
- SWP-518 - Using a Chainsaw

8.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library

- Small Business Safety and Health Handbook. OSHA Publication 2209-07R, (2022). Also available as a 4,100 KB PDF, 81 pages.
- Hand and Power Tools. OSHA Publication 3080, (2002). Also available as a 171 KB PDF, 27 pages. Includes information on the dangers of hand and power tools and safety precautions.
- Carbon Monoxide Hazards from Small Gasoline Powered Engines. National Institute for Occupational Safety and Health (NIOSH) Safety and Health Topic.
- Easy Ergonomics: A Guide to Selecting Non-Powered Hand Tools. Electronic Library of Construction Occupational Safety and Health (eLCOSH).
- Hand/Power Tools. National Ag Safety Database (NASD). Searchable database to several informative documents covering machinery safety and hand/power tools.
- Powered Hand Tools. Canadian Centre for Occupational Health and Safety providing detailed, workplace-specific information regarding Powered Hand Tools.
- Hand Tools. Canadian Centre for Occupational Health and Safety providing detailed, workplace-specific information regarding Hand Tools.

9 DEFINITIONS

Guarding: One or more methods of machine guarding designed to protect the operator and other workers in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are barrier guards, two-hand tripping devices, electronic safety devices, etc.

Point of operation guarding: Point of operation is the area on a machine where work is actually performed upon the material being processed.

Pneumatic power tools: A type of power tool, driven by compressed air supplied by an air compressor. Pneumatic tools can also be driven by compressed carbon dioxide (CO2) stored in small cylinders allowing for portability. Examples of pneumatic tools include air and impact wrenches, nail guns, jackhammers, drills, grinders and sanders, paint sprayers, and riveters.

Hydraulic power tools: Similar to pneumatic tools, but use the force created by pressurized fluids to operate the tool. Hydraulic tools can generate much greater force than pneumatic tools of a similar size because fluids are incompressible, allowing hydraulic systems to operate at much higher pressure levels. Examples of hydraulic tools include presses, pullers, jacks.

10 REVISION HISTORY

Date	Changes	Acknowledgments	Approval
November 15, 2022	Edits to 1. Purpose, 3.2 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings; addition to 4. Hazards to incorporate energy wheel and matrix; general content upgrades and additions to 5. Controls; edits to 8.1 to correct links	T. Hoveland, T. Speer, M. Salama	P. Poelzer
August 3, 2020	Updates to links and references for migration from StanNet to The Lens; minor changes to formatting	K. Bayer	C. Ferguson-Scott
May 31, 2018	Added to section 5 references to pre-use inspection and removing from service/tagging defective tools.	R. Roy	C. Ferguson-Scott
April 28, 2017	Update HSE to HSSE; position updates. Edits in s. 2.0 and s. 3.2. Format.	C. Ferguson-Scott	J. Lessard
August 9, 2011	Updated for review by Corporate Governance Committee (CGC)	K. Robinson	CGC
February 23, 2010	Changed HSE to SWP throughout; reformatted header and footer.	G. Doran	K. Robinson
January 4, 2010	New SWP posted to StanNet.		K. Robinson

HEALTH, SAFETY, SECURITY, AND ENVIRONMENT
SAFE WORK PRACTICE
GROUND DISTURBANCE AND OVERHEAD UTILITY (SWP-213)

1 PURPOSE

The objective of this Safe Work Practice (SWP) is to provide standard practices and procedures to help mitigate the potential for encountering, damaging, compromising, or disrupting overhead and underground utilities during field activities.

2 SCOPE

This SWP applies to work carried out by Stantec that involves ground disturbance activities or is performed near overhead utilities. This SWP is supplemented by the following forms:

- SWP-213a – Pre-Ground Disturbance Worksheet & Approval Form: Applies to all ground disturbance work and is intended to be a pre-ground disturbance planning tool.
- SWP-213b – Above Ground/Underground Utility Infrastructure Checklist: Applies to all ground disturbance work and is intended to be completed on site prior to start of operations.
- SWP-213c – Backfill Observation Form: Applies to all ground disturbance where a utility has been uncovered and is intended as a checklist prior to the backfilling of the excavation.

Additional SWPs associated with this practice are:

- SWP-215 – Supervision of Vacuum-Excavation Activities

REVISION HISTORY

Revision Number	Date	Changes	Authors	Reviews	Approvals
1.0	24-May-2024	Initial re-release in revised format	J. Elkins, L. Tait, C. Sutton	K. Bayer, J. Parker	P. Poelzer

3 HRAC (HAZARD RECOGNITION ASSESSMENT AND CONTROL)

This section outlines the hazards that are expected in the work activity of this SWP and outlines the mandatory controls that must be implemented to prevent incidents. The list is not exhaustive, and each project and/or location must consider the specific hazards that may be present. Select the hyperlinked steps below to see the details for each step.

Job Hazard	Energy Hazard	Specific Hazard	Critical Risk	Mandatory Controls	Training
Utility strike (Overhead or underground)	 Pressure  Electrical  Chemical  Thermal  Biological	Contact with utilities such as gas, oil, steam, electric, communication, water (potable, irrigation, and process), sewer (storm and sanitary, potentially resulting in damage to property or the environment, personal injury, or death	 Ground Disturbance  Hazardous Materials and Environments	Step 1 - Project Planning Step 2 - Site Visit Step 3 - Locate and Mark Step 4 - Verification Step 5 - Communicate and Proceed Step 6 - Backfill	Stantec employees and subcontractors to Stantec will be competent by means of training, knowledge, experience, and any necessary qualifications. Check with the regulator as specific jurisdictions may have legislated training requirements. Contact your client to determine if they have specific training or certification requirements. Please contact your Business Line or Regional HSSE Manager or Advisor for training support.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on health and safety requirements by jurisdiction, refer to Stantec's Health & Safety Regulatory Requirements Library. The Critical Task Inventory also provides information for work activities that have been identified to have higher risks.

Stantec also recognizes that clients or project sites may have their own requirements; when a client or site requirements are more stringent than those required by Stantec or local legislation, the client's requirements will prevail.

Additional links:

- Project HSSE Plan (RMS1)
- Health & Safety Regulatory Requirements Library
- Environmental Regulations Library

4 MANDATORY CONTROLS

Deviation from the mandatory controls of this SWP must follow the Management of Change (RMS11) process.

Ground Disturbance Critical Risk Control Flat Sheet

Step 1 – Project Planning

- Identify the potential hazards and select appropriate controls using the project HSSE plan (RMS1) or HASP, including emergency response procedures in the event of a utility strike.
- Confirm subcontractors have been prequalified through Stantec's Subcontractor Prequalification program.
- Request required site documentation from the client or site owner.
- Request access to the property and all mechanical rooms for any buildings on site, as well as a point of contact who is knowledgeable about those mechanical systems.
- Request public utility locates by contacting the relevant local utility owner(s), utility locate service, or local authorities.

Step 2 – Site Visit

- Mark the primary ground disturbance location(s) and when required, alternative ground disturbance locations, with spray paint or other suitable method and identify overhead constraints.
- Measure ground disturbance locations to established site features and confirm locations allow for clear entry / exit and adequate workspace.
- Conduct visual survey of the site for evidence of previous ground disturbance or other visible indicators of buried utility infrastructure.
- Interview the knowledgeable person identified in Step 1 and gain access to the mechanical systems for the building(s) and property for the completion of utility locates.
- When on private land, contact a prequalified and appropriately insured private utility locating company and discuss what locate methodology is most suitable based on scope of work and site conditions.

Step 3 – Locate and Mark

- Review all proposed ground disturbance locations and information collected from Steps 1 and 2 with the public and private utility locator(s) as applicable.
- When the utility locates have been completed and the site has been marked:

- Obtain written approval (i.e., a written public utility locate report/data) or document the jurisdictional process followed for ground disturbance work from all public utility infrastructure owners.

- When on private land, obtain a written private utility locate report/data or document the jurisdictional process followed for ground disturbance work from the private utility locating company.

Step 4 – Verification

- The Project Manager will verify that a SWP-213a - Pre-Ground Disturbance Worksheet & Approval Form is completed with the information collected in Steps 1 – 3 and that the client has agreed ground disturbance work can safely proceed.

- In the field, the Stantec field employee will document the review of the ground disturbance documentation on SWP-213b - Above Ground/Underground Utility Infrastructure Checklist.

- When required, verify permits and utility crossing and/or encroachment agreements are in place and conditions have been met.

- Verify the tolerance distance from all marked buried utilities and the ground disturbance location(s). If the width of the utility is unknown, the minimum tolerance distance must be planned at 2 meters (6'6").

- Verify if safe methods of excavation/digging (e.g., vacuum excavation, borehole clearance, or daylighting) are required. Safe methods must be implemented if a 2-meter (6'6") tolerance distance is not achievable; when ground disturbance is taking place within a critical zone, municipal/county right-of-way, or an area congested with buried utilities; or if the information obtained during Steps 1 – 4 fails to provide sufficient information to accurately identify the location of all buried utilities within the project limits.

Step 5 – Communicate and Proceed



- Share and discuss all ground disturbance documentation, including the completed SWP-213a and SWP-213b forms, with the field team and subcontractors prior to undertaking work.

- Conduct your Last-Minute Risk Assessment (LMRA) before proceeding.

- Remember to use your Stop Work Authority if you see an unsafe action, behavior, omission or non-action of any party potentially leading to injury or damage or if work is not being performed in accordance with the plan.

- In the event of a utility strike, follow the predetermined emergency response procedures.

Step 6 – Backfill

- At the completion of work where utilities have been uncovered, use SWP-213c – Backfill Observation Form to document that all work has been completed, and that all backfill activities have been completed to the satisfaction of the site and/or utility owner.

5 RESPONSIBILITIES

See the HSSE Program Manual for general responsibilities.

Project Manager

- Review, understand, and verify implementation of the six-step process listed in the Mandatory Controls section of this SWP.
- Coordinate the scheduled work with the Client so that all Stantec employees performing work on site are aware of any precautions or controls required by the Client.

Employees

- Review, understand, and implement (as applicable) of the six-step process listed in the Mandatory Controls section of this SWP.
- STOP work immediately if they become aware of an unsafe act or condition that could place anyone in danger, or if they are not confident in the work plan.

Leadership

- Review, understand, and verify implementation of the six-step process listed in the Mandatory Controls section of this SWP.
- Require that this SWP be implemented for all applicable operations.
- Provide guidance on daylighting requirements when requested.

APPENDICES

OPEN THE APPENDICES BELOW BY SELECTING THE RIGHT-FACING ARROW BESIDE EACH APPENDIX.

APPENDIX A: DEFINITIONS (RETURN TO MANDATORY CONTROLS)

APPENDIX B: ADDITIONAL INFORMATION

APPENDIX C: OVERHEAD POWERLINE OFFSET DISTANCES (RETURN TO STEP 2)

APPENDIX D: LOCATING METHODOLOGIES EXPLAINED (RETURN TO STEP 2)

Health, Safety, Security, and Environment
Pre-Ground Disturbance Worksheet & Approval Form
SWP-213A

Stantec

Section One: Project Information			
Project Number: Project Number	Project Name: Project Name		
Client: Client			Date: Date
Street Address: Address	City: City	Province/Territory/State: Click here to enter text	
Lot / Concession: Click here to enter text	Public or Private Property: Property Type		
Nearest Intersection: Click here to enter text			
Additional Information: Click here to enter text			
Type of Property (check all that apply): ☐ Residential ☐ Commercial ☐ Industrial ☐ Institutional ☐ Vacant ☐ Roadway ☐ Boulevard ☐ Recreational ☐ Basement ☐ Agricultural ☐ Forested ☐ Other: Click here to enter text			
Planned Excavation Method: ☐ Mechanical ☐ Daylighting ☐ Hand Digging ☐ Combination (Specify): Click here to enter text			
Number of boreholes or extent of excavation: Click here to enter text	Maximum depth of ground disturbance: Click here to enter text		
Work Description (provide detail information as to what work is planned and how it will be executed): Click here to enter text			

Section Two: Pre-ground Disturbance Verification		
Subcontractor(s) involved in ground disturbance work have been prequalified through Stantec's subcontractor prequalification program.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	
Reviewed site documentation received from the client or site owner to identify subsurface utility infrastructure relevant to planned site activities. *(Review legal land surveys, easements, right of ways, most recent as-built drawings, site plans, historical plot plans, previous site investigation, soil surveys, boring logs, etc.)*	☐ Yes	
	☐ No	An explanation is required if No or N/A: Click here to enter text
	☐ N/A	
City/County utilities drawings obtained and reviewed.	☐ Yes	
	☐ No	An explanation is required if No or N/A: Click here to enter text
	☐ N/A	
Access to the property and all mechanical rooms for any buildings has been secured.	☐ Yes	
	☐ No	An explanation is required if No or N/A: Click here to enter text
	☐ N/A	
Requested an interview/discussion with someone knowledgeable of the mechanical systems for the building(s) and property (including site buried utility infrastructure).	☐ Yes	
	☐ No	An explanation is required if No or N/A: Click here to enter text
	☐ N/A	

The relevant local utility owner(s), utility locate service provider(s), or local authorities have been contacted to request public utility locates. **Once received, review and record public utility locate information in section 3 below.**	☐ Yes	
	☐ No	If No, do not proceed until corrected.
When on private land, private utility locates have been requested by a qualified private utility company. **Once received, review and record private utility locate information in section 3 below.**	☐ Yes	
	☐ No	An explanation is required if No or N/A: Click here to enter text
	☐ N/A	
Utility crossing or encroachment agreements for all required utility infrastructure owners are in place.	☐ Yes	If yes, please list all crossing agreements and attach agreements:
	1	Click here to enter text
	2	Click here to enter text
	3	Click here to enter text
	☐ No	An explanation is required if No or N/A: Click here to enter text
	☐ N/A	
Third party utility infrastructure owners have been given 48 hours' notice of crossing or encroachment.	☐ Yes	
	☐ No	An explanation is required if No or N/A: Click here to enter text
	☐ N/A	
Confirmed if the utility infrastructure owner's representative is required to be present when exposing or excavating near / across their infrastructure.	☐ Yes	
	☐ No	An explanation is required if No or N/A: Click here to enter text
	☐ N/A	
All applicable local, provincial, territorial, state, and federal permits have been obtained.	☐ Yes	Attach a copy of all permits.
	☐ No	An explanation is required if No or N/A: Click here to enter text
	☐ N/A	

Section Three: Site Utility Infrastructure Checklist
One Call confirmation number (If applicable): Click here to enter text

Private Utility Locator	**Is the ground disturbance work area located on private property?** ☐ **Yes** ☐ **No** If the ground disturbance is on private property, this section must be completed.			
	Private utility locate company: Click here to enter text		Emergency Contact #: Click here to enter text	
	Locator Name: Click here to enter text			
	Locate Methodology Used: ☐ Electromagnetic (EM) cable locating ☐ Ground Penetrating Radar (GPR) ☐ Other (Specify): Click here to enter text			
	Date of Locate: Date		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

A section has been provided for each type of utility infrastructure. If there is more than one utility infrastructure owner for a particular type of utility, it may be added using the unassigned sections on the last page of this form.

Natural Gas – Distribution	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next utility infrastructure item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐ or Site Meet Requested ☐		
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Natural Gas - Pipeline	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next infrastructure item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Petroleum Products - Pipeline	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next infrastructure item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Steam - Pipeline	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next infrastructure item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Electrical Power	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next infrastructure item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Telecom	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next infrastructure item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Fiber Optic	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next infrastructure item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Cable	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next infrastructure item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Water	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next infrastructure item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Storm Sewer	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next infrastructure item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Sanitary Sewer	☐ Verified as not applicable to the work area through written confirmation from the utility infrastructure owner. Move to next item in this list.			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes	☐ No	If no, do not proceed until corrected.
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes	☐ No	If no, do not proceed until corrected.
	Written locate report or authorization to proceed reviewed?	☐ Yes	☐ No	If no, do not proceed until corrected.

Safe methods of excavation / digging (such as vacuum excavation, borehole clearance, or daylighting techniques) must be implemented if 2 meters (6'6") tolerance distance is not achievable or when ground disturbance is taking place within a critical zone, municipal/county right-of-way, an area congested with buried utilities, or if the information obtained during Steps 1 – 4 fails to provide sufficient information to accurately identify the location of all buried utilities within the project limits.

Client Agreement to Proceed with Field Activities		
Client: Client		
Print: Name	Signature:	Date: Date

Approval to Proceed with Field Activities		
Project Manager Approval:		
Print: Name	Signature:	Date: Date

Written approval to proceed must be obtained from BC Leadership **or** a Principal level employee or above within the BC if safe methods of excavation/digging are not implemented as prescribed above.

Approval to Proceed where Safe Methods of Excavation/Digging are not Implemented		
BC Leadership:		
Print: Name	Signature:	Date: Date
Principal (or above within BC):		
Print: Name	Signature:	Date: Date

Additional Utility Infrastructure Owners

Additional Utility Infrastructure Owner				
	Utility Infrastructure Type: Click here to enter text			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Additional Utility Infrastructure Owner				
	Utility Infrastructure Type: Click here to enter text			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

Additional Utility Infrastructure Owner				
	Utility Infrastructure Type: Click here to enter text			
	Utility Infrastructure Owner: Click here to enter text		Emergency Contact #: Click here to enter text	
	Date of Locate: Date	Mark and Email/Fax ☐	or	Site Meet Requested ☐
	Located by: Click here to enter text		Locate Expiry Date: Date	
	Conditions: Click here to enter text			
	Correct address listed on utility locate report?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Limits of locate encompasses entire work area or property boundaries?	☐ Yes ☐ No	If no, do not proceed until corrected.	
	Written locate report or authorization to proceed reviewed?	☐ Yes ☐ No	If no, do not proceed until corrected.	

HEALTH, SAFETY, SECURITY, AND ENVIRONMENT
ABOVEGROUND/UNDERGROUND UTILITY INFRASTRUCTURE CHECKLIST
SWP-213B

Stantec

SECTION ONE: PROJECT INFORMATION			
Project Number:	Project Name:		
Client:			Date:
Street Address:	City:		Province/Territory/State:

SECTION TWO: PRE-GROUND DISTURBANCE CHECKLIST		
Involved site personnel have reviewed and understand the project HSSE plan or HASP.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
Performed tailgate meeting with involved site personnel and documented on Field Level Risk Assessment (RMS2).	☐ Yes	
	☐ No	If No, do not proceed until corrected.
Hard copy of all available ground disturbance documentation is on site and has been reviewed by involved site personnel.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
Verified that the public and private utility locate reports match the location of the ground disturbance activities (physical address, direction, measurements from features).	☐ Yes	
	☐ No	If No, do not proceed until corrected.
Limits of locate encompass entire work area or property boundaries for all utility locate reports.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
All utility locate markings are clear and visible.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
Ground disturbance site documentation matches the utility locate markings.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
Written utility locate reports received match the utility locate markings.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
Verified that the tolerance distance from the locate markings and the ground disturbance location(s) is greater than what is required by the utility owner. **If the width of the utility is unknown, the minimum tolerance distance must be planned at 2 meters (6' 6").**	☐ Yes	
	☐ No	If No, do not proceed until corrected.
All overhead hazards have been identified, a safe distance has been maintained, and signage is in place (if required).	☐ Yes	
	☐ No	If No, do not proceed until corrected.
Where permits are required, they have been reviewed, and involved site personnel understand permit conditions.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	Justification is required if N/A:
Site owner has been notified of ground disturbance activities.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	Justification is required if N/A:
The work area has been secured, if required.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	Justification is required if N/A:

SECTION THREE: SITE UTILITY INFRASTRUCTURE CHECKLIST			
Identified location of all **natural gas** meters and associated private infrastructure (i.e., boiler, HVAC, generator, BBQ, pool heater, etc.) and all interconnecting lines.	☐ Yes	Locate Expiry Date:	Emergency #:
	☐ No	Justification is required if No or N/A:	
	☐ N/A		
Identified location, orientation, arrangement, dimension, and burial depth of underground storage tanks and associated product and vent lines.	☐ Yes	Locate Expiry Date:	Emergency #:
	☐ No	Justification is required if No or N/A:	
	☐ N/A		
Identified location of underground lines for instrumentation, process analyzer, and motor-operated valves.	☐ Yes	Locate Expiry Date:	Emergency #:
	☐ No	Justification is required if No or N/A:	
	☐ N/A		
Identified location of underground pipelines associated with pumps and pump galleries, manifolds, tank fields, compressors, production wells, loading racks and equipment.	☐ Yes	Locate Expiry Date:	Emergency #:
	☐ No	Justification is required if No or N/A:	
	☐ N/A		
Critical zones identified within the ground disturbance work area • 5 m/16.5 ft. of pipeline crossing area, or the distance defined in the pipeline crossing agreement • 3 m/10 ft. distance from edge of tank; pumps and pump galleries; manifolds; on/below-grade transformers; compressors; production wells; flow lines; loading racks; other process equipment; operating dispenser islands and suspected hazardous/critical utilities; product lines; other subsurface structures; and entire area between tank field and dispensers at retail sites	☐ Yes		
	☐ No	Justification is required if No or N/A:	
	☐ N/A		
The utility infrastructure owner/representative has inspected the crossings or encroachment areas prior to beginning work.	☐ Yes		
	☐ No	Justification is required if No or N/A:	
	☐ N/A		
All conditions of the crossing/encroachment agreements have been met.	☐ Yes		
	☐ No	If No, do not proceed until corrected.	
	☐ N/A	Justification is required if N/A:	
Location of all **electrical** meters, transformers, vaults, junction boxes, generators, exterior lighting, lighted signs, traffic signals, receptacles, and all associated interconnecting lines are identified.	☐ Yes		
	☐ No	If No, do not proceed until corrected.	
	☐ N/A	Justification is required if N/A:	

Identified location of all **telecommunication** and associated subsurface lines.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	Justification is required if N/A:
Identified location of all **fiber optic** lines.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	Justification is required if N/A:
Identified location of all **cable** lines.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	Justification is required if N/A:
Identified location of all **water** valves, fire hydrants, post indicator valves, water wells and all associated interconnecting (including irrigation) lines. **Note:** If non-conductive lines (untraced PVC) are potentially in the ground disturbance area, identify means of identification in comments section.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	Justification is required if N/A:
Comments:		
Identified location of all **storm sewer** manholes, catch basins, oil/water separators, and all associated interconnecting lines. **Note:** If non-conductive lines (untraced PVC, concrete, clay, etc.) are potentially in the ground disturbance area, identify means of identification in comments section.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	Justification is required if N/A:
Comments:		
Identified location of all **sanitary sewer** manholes, cleanouts, septic tanks, and all associated interconnecting lines. **Note:** If non-conductive lines (untraced PVC, concrete, clay, etc.) are potentially in the ground disturbance area, identify means of identification in comments section.	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	Justification is required if N/A:
Comments:		
Identified location of all other surface features indicative of subsurface utility infrastructure (i.e., pipeline marker signs, ground depressions, asphalt/surface scaring, distressed vegetation, historical locate markings, etc.).	☐ Yes	
	☐ No	If No, do not proceed until corrected.
	☐ N/A	Justification is required if N/A:
Comments:		

Completed by (print name):	**Company:**
Signature:	**Date:**

1 PURPOSE

Some Stantec employees are required to work near, and at times enter, excavations. To reduce the risk of incidents and injuries associated with excavation work, this Safe Work Practice (SWP) assigns responsibilities to Stantec staff and subcontractors directed by Stantec. The SWP provides guidance on identifying hazards, and controls to protect employees working near or in excavations.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

NOTE: For consistency of use across jurisdictions, definitions of terms used in this SWP are provided in Section 9.

2 SCOPE

This SWP applies to all Stantec employees and subcontractors hired by Stantec to perform excavation work.

For projects where Stantec is not responsible for the excavation work, Stantec staff will use this SWP, along with their experience, knowledge, and training, to identify hazards present on the project site and advise the excavation contractor.

3 RESPONSIBILITIES

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this SWP
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements within this SWP are being met

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP

3.3 Supervisor

- For each employee reporting to them and who are likely to be exposed to excavation hazards
  - Advise them of the need to review this SWP
  - Verify that they have completed the review of this SWP based on the review cycle listed in the SWP Checklist and process
  - Confirm they have completed the training required by this SWP
- Identify individuals as competent personnel for inspection of excavations based on knowledge, training, and experience

3.4 Project Manager (PM)

- Use the Risk Management Strategy form (RMS1) or the site-specific Health and Safety Plan (HASP) to identify hazards employees could be exposed to and select appropriate controls
- Communicate the hazards and controls to employees
- Only assign employees that are trained in the requirements of this SWP and local legislation, who understand the hazards associated with the work, who can apply the appropriate controls, and, where required, have the certifications and training identified in this SWP
- Hold employees accountable for properly implementing this SWP
- Coordinate with the Office Safety and Environment Coordinator (OSEC) for the supply and/or purchase of the required personal protective equipment (PPE) and any other safety equipment that may be required
- Provide the required PPE to employees who need it
- Verify that the equipment provided has been selected, inspected, and maintained in accordance with the manufacturer's recommendations
- Require employees to use the PPE identified for their tasks
- Coordinate the scheduled work with the Client so that all Stantec employees performing work on-site are aware of any precautions or controls required by the Client
- Communicate emergency response and transportation procedures to employees should external medical assistance be necessary
- Comply with all relevant Occupational Health and Safety (OH&S) legislation and requirements
- Confirm that required permits and locates have been obtained
- Be skilled in the classification of soils and rock, or obtain advice from a person with this specialized knowledge, such as a geotechnical engineer
- Have experience with earthwork and construction activities
- Where an Excavation Safety Plan (ESP) is required, follow the ESP that has been drafted and/or approved by a Professional Engineer registered within the project site's jurisdiction
- Incorporated the ESP into the project-specific Health and Safety Plan
- For assistance with implementing the ESP, contact the HSSE Manager for your region

3.5 Office Safety and Environment Coordinator (OSEC)

- Maintain a secure filing system containing the forms, reports, and training records required by the HSSE Program
- Assist PMs, supervisors, and others in obtaining appropriate safety and environment equipment for employees working on their projects
- Coordinate HSSE training as identified by HSSE Program requirements and hazard assessment

3.6 Field Employees

- Conduct a Last-Minute Risk Assessment before starting any field tasks
- Be aware of the hazards that may be encountered while working in or around excavations
- Be able to recognize and evaluate workplace hazards
- Inspect equipment and work areas regularly for hazards
- Know how to implement controls and respond to emergencies, including use of emergencyequipment

- STOP work immediately when aware of an unsafe act or condition that could place anyone in danger or if they are not confident in the work plan
- Report unsafe acts and conditions, hazards, near misses, and incidents in accordance with Stantec's Incident Reporting Protocol for the region
- Only perform work in or around excavations if trained and authorized to do so
- Select and use appropriate PPE, together with the tools and equipment required to conduct the work safely
- Know the proper use and limitations of equipment
- Keep all such equipment properly cleaned and maintained when required to do so
- Report to their PM any concerns they may have with the equipment or procedures they have been provided, or any issues that may limit their ability to comply with the requirements of this SWP
- Use their training, knowledge, and experience to protect their health and safety and that oftheir coworkers

3.7 Competent Person

- Verify that utility locates and required permits are available on-site
- Classify soils
- Inspect the excavation as required by this practice
- Test for hazardous atmospheres
- Verify that the excavation safety plan is properly implemented
- Approve entry to an excavation
- Be on site when personnel are entering an excavation

3.8 Professional Engineer

- Be registered / licensed in the jurisdiction in which the project is located
- Design all excavations projects when:
  - The excavation is more than 6 m (20 ft) in depth.
  - The excavation is subject to vibration or hydrostatic pressure likely to result in ground movement hazardous to workers.
  - The ground slopes away from the edge of the excavation at an angle steeper than 3 horizontal to 1 vertical (3H:1V).
  - A surface encumbrance or structure is adjacent to the excavation.
  - **NOTE**: In this SWP, adjacent means the area of influence around the excavation.
- Identify hazards and inform the PM of the hazards and help select appropriate controls
- Develop a written excavation safety plan

3.9 Excavation Contractor

When an excavation contractor is hired by Stantec, the contractor is responsible for conducting the excavation safely and in accordance with applicable legislative, Stantec, and client requirements, whichever is most stringent.

When the excavation contractor is not hired by Stantec, in addition to ensuring that excavation work is conducted safely and in accordance with applicable legislative requirements, the contractor must confirm that all subsurface utilities have been properly located and marked prior to opening an excavation.

4 HAZARDS

4.1 Energy Wheel



The energy wheel is a visual tool used by Stantec to identify 10 sources of energy and to assess and control the hazards associated with each source. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. Before beginning any activity, review the potential hazards and controls associated with the task. For project work, these sources, hazards, and controls will be documented on the Risk Management Strategy (RMS1), and in a Field Level Risk Assessment (RMS2/field app). Below are examples of energy sources and hazards commonly associated with excavations.

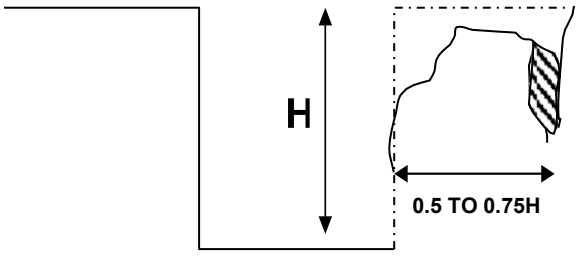
Energy	Hazard / Condition
Thermal	• The stability of an excavation wall in frozen soil may be affected by direct sunlight or above freezing temperatures, which can lead to wall failure resulting in crushing, entrapment, burial, and asphyxiation.
Chemical	• Work being carried out in or around the excavation can lead to an oxygen deficient atmosphere or elevated carbon monoxide in the excavation, which can result in impaired decision-making and confusion, nausea, unconsciousness, or death. • Work being carried out in or around the excavation, contaminated soil, or damaging a utility line can lead to an explosive atmosphere, which can result in burns, inhalation injuries, lung contusions, or death. • Work being carried-out in or around the excavation, as well as contaminated soil, can lead to atmospheric hazards, which can result in eye irritation, skin sensitivity, respiratory sensitivity, or damage.
Biological	• Excavation work can damage wastewater or sewage lines leading to exposure to wastewater or raw sewage which can contain bacteria, fungi, parasites, and viruses that can cause intestinal, lung, and other infections. • The soil being excavated may contain bacteria, funguses, parasites, and viruses which can cause intestinal, lung, and other infections. • Excavations may expose, and the soil being excavated may contain burrowing animals and insects that can bite and sting resulting in puncture wounds, infections, and reactions to venom.
Noise	• Work around powered mobile equipment can expose workers to noise equal to or greater than an eight-hour time-weighted average (8-hr TWA) of 82 decibels, A-scale (dBA) leading to possible hearing damage and loss.

Gravity	• Collapse of excavation walls can result in crushing, entrapment, burial, and asphyxiation. • Approaching the unprotected edge of an excavation can lead to falls to a lower level, resulting in blunt traumas such as bruises, fractures, strains, sprains, and even death. • Working under suspended loads, such as pipes being lowered into the excavation, can lead to being struck by falling objects resulting in bruises, fractures, strains, sprains, and even death. • Inadequate access to and egress from an excavation can lead to falls to a lower level resulting in bruises, fractures, strains, sprains, and even death. • Water causes weakness in the excavation bottom (boiling), which can destabilize ladders and inhibit safe egress. • Undermining surface encumbrances can lead to structure collapse. • Water can undermine the excavation walls leading to its collapse, resulting in crushing, entrapment, burial, and asphyxiation.
Motion	• Movement of mobile equipment or vehicular traffic near the excavation can lead to a being-struck-by incidents resulting in bruises, fractures, strains, sprains, and even death. • Vehicles or mobile equipment driving off the edge of an excavation can lead to a being struck by falling objects incidents resulting in bruises, fractures, strains, sprains, and even death.
Electrical	• Contact with electrical conduits, buried or overhead, while excavating can result in electrical shock or electrocution.
Pressure	• Static loads from spoil piles, materials stockpiles, and equipment can affect the stability of the excavation walls, leading to their collapse, which can result in crushing, entrapment, burial, and asphyxiation. • Vibration from machinery, powered mobile equipment, vehicles, or blasting can affect the stability of the excavation walls, leading to their collapse, which can result in crushing, entrapment, burial, and asphyxiation. • Rain can affect the stability of the excavation walls, leading to their collapse, which can result in crushing, entrapment, burial, and asphyxiation. • Groundwater can seep into, or a damaged utility line can cause water to flow into an excavation obscuring footing and causing slippery conditions leading to slips, trips, and falls. • Groundwater can seep into, or a damaged utility line can cause water to flow into an excavation, which can affect the stability of the excavation walls, leading to their collapse which can result in crushing, entrapment, burial, and asphyxiation. • Improperly set hydraulic shoring can cause excavation wall failure which can result in crushing, entrapment, burial, and asphyxiation.

4.2 Modes of Excavation Wall Failure

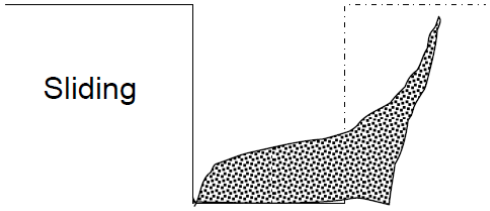
4.2.1 Tension Cracks

Tension cracks usually form parallel to the excavation, 0.5 to 0.75 times the excavation depth and can result in sliding, sluffing, or toppling. Increases or decreases in in soil moisture can affect soil cohesion, leading the tension cracks. Water can then fill tension and surface cracks causing a hydrostatic effect leading to sluffing failure (see section 4.2.2 for additional guidance).



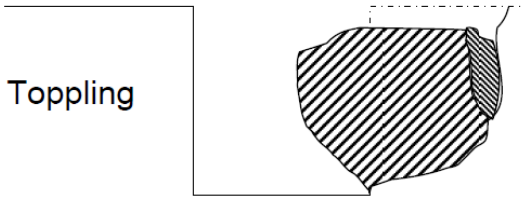
4.2.2 Sliding or Sluffing

Sliding mode of failure is more likely in granular soils, uncompacted or previously disturbed soils, or clay soils when saturated with water. The three most common factors that increase the chances of soil failure from sliding are excessive vibration, surface encumbrances, and wet conditions.



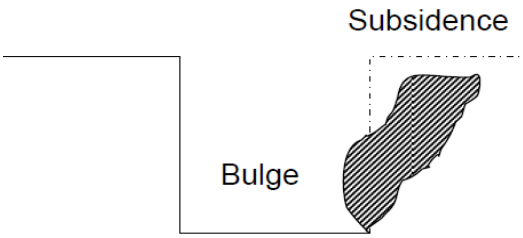
4.2.3 Toppling

Toppling occurs when the excavation's vertical face shears along the tension crack line and topples into the excavation. This often happens in clay soils that have dried in the sun and next to previously disturbed soils. It is also a problem in frozen or wet soils.



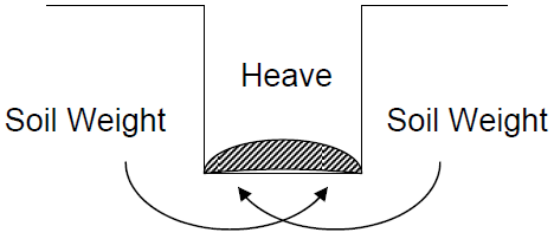
4.2.4 Subsidence and Bulging

An unsupported excavation can create an unbalanced stress in the soil, which, in turn, causes subsidence at the surface and bulging of the vertical face of the excavation. If uncorrected, this condition can cause face failure.



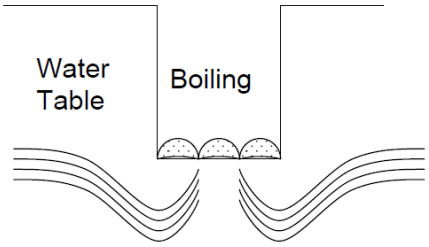
4.2.5 Heaving or Squeezing

Bottom heaving or squeezing can be caused by the downward pressure created by the weight of adjoining soil, or by pore water pressure at the base of the excavation. This pressure causes a bulge in the bottom of the cut. Heaving and squeezing can occur even when shoring or shielding has been properly installed.



4.2.6 Boiling

Boiling is evidenced by an upward water flow into the bottom of the cut. A high-water table is one of the causes of boiling. Boiling produces a "quick" condition, where the soil is liquified, in the bottom of the cut and can occur even when shoring or trench boxes are used.



5 CONTROLS

Stantec uses the hierarchy of hazard control, which is based on the effectiveness of the controls, to eliminate or mitigate exposure to hazards. The hierarchy of hazard controls is, in order of decreasing effectiveness:

- Elimination
- Substitution
- Engineering controls
- Administrative controls
- Personal protective equipment

5.1 Elimination

Project teams should consider eliminating the need to excavate by evaluating alternative methods to achieve project objectives. Every effort should be made to eliminate the need for a worker to approach or enter an excavation. Depending on the work, the need to excavate can be eliminated or reduced by using:

- Directional drilling to install new pipes
- Overhead infrastructure for power lines and telecommunication
- Pipe inspection cameras to detect breaks
- In-situ soil stabilization
- Slab-on-grade construction

5.2 Engineering

5.2.1 Access and Egress

A safe means of accessing and leaving (i.e., egress) an excavation must be provided if an employee is required to enter any excavation that is 1.2 meters (4 feet) or more in depth. This can be accomplished by having one or more safe and unobstructed ladders, stairways, or ramps in place. The wall of the excavation must be benched, sloped, or supported so the employee can reach the means of access/egress safely. The ladders or ramps must be located no further from any worker in the excavation than that required by local legislation. Means of access/egress may need to be added or moved as the excavation work progresses. See SWP-202 – Portable Ladder Safety for additional guidance on ladder safety.

Earthen ramps must be easily traversable, with a slope of three horizontal to one vertical (3H:1V) or flatter. The ramp should remain free and clear of tools and equipment that may hinder the safe egress from the excavation.

Note: When an excavation runs across a slope, the depth of the excavation will be measured on the upper side of the slope.

Any structural ramps, such as trestle ramps and gangways, used solely for worker access or egress must be designed by a competent person. Structural ramps used for access or egress of equipment must be designed by a Professional Engineer qualified in structural design. Structural members, such as beams, joists, and decking, must be of uniform thickness and connected to prevent displacement or separation.

5.2.2 Fall Protection

In accordance with local legislation, fall protection systems will be in place along the top of all excavations that are not sloped or benched and that are 1.8 meters (6 feet) or greater in depth. Employees will not approach within 1.8 meters (6 feet) of a properly shored or shielded excavation that is 1.8 meters (6 feet) or greater in depth without the presence of a fall protection system. See SWP-201 – Fall Protection/Working from Heights.

5.2.3 Walkways and Bridges

When employees are required to cross over an excavation, suitable walkways, or bridges, with standard guardrails if the excavation is greater than 1.2 meters (4 feet) in depth and over 0.76 meters (30 inches) wide, will be installed to reduce the potential for fall hazards. If vehicles are required to travel over the excavation, then sufficient means of protection will be provided in the form of a steel bridge-plate, bridge-timbers, or similar construction materials of adequate strength to withstand the expected loads. Stantec employees must consult with a Professional Engineer to confirm that the construction materials used have adequate strength to withstand the expected loads.

5.2.4 Soil Classification

Prior to allowing a worker to enter an excavation, a competent person will classify the soil and rock deposits according to decreasing order of stability. This is to be based on at least one visual and one manual analysis.

- Where applicable, the Competent Person will determine the applicable soil classifications based on local legislation and design guidelines.
- Soil analysis and field tests used to classify cohesive and non-cohesive soils can include but are not limited to:
  - Pocket penetrometer
  - Shear vane
  - Thumb penetration test
  - Dry-strength test
  - Thread test
  - Ribbon test
  - Sedimentation test
  - Wet shake test

5.2.5 Water

Water must not be allowed to accumulate in an excavation if it might affect the stability of the excavation or might endanger workers. Erosion of slopes by surface water must be prevented if workers may be endangered. Controls will vary with each situation but may include diversion, dewatering systems, special supporting systems, or water removal equipment.

5.2.6 Before Excavating

The PM will verify if the stability of a structure could be affected by the excavation. Where it has been determined that the stability of a structure could be affected by the excavation, a Professional Engineer will design a protective structure. The protective structure will be constructed, installed, used, maintained, and dismantled in accordance with that design.

Excavation work should not affect the stability of nearby poles, posts, trees, or other surface encumbrances. Where the stability of surface encumbrances may be compromised, they will be secured or supported. Where such surface encumbrances cannot be secured or supported, they will be removed before the excavation is commenced. Prior to securing, supporting, or removing any surface encumbrances, the owner will be contacted, and written approval will be obtained. A copy of the approval will be filed in the project health and safety file.

The PM must confirm that buried and overhead utility infrastructure that are within the work area have been located, marked, and if required, protected, or secured (e.g., electrical, gas, steam, water, and sewer) prior to excavating. To provide a safe work environment for employees, it may be necessary to support, by underpinning or bracing, the buried utility infrastructure. See SWP-213 – Ground Disturbance and Overhead Utility for guidance on mitigating the potential of encountering, damaging, compromising, or disrupting overhead and underground utilities.

Mobile cranes, machinery, powered mobile equipment, or vehicles must not be operated, loaded, or unloaded near an excavation so as to impact the stability of the walls of the excavation. When a mobile crane will be set up adjacent to an excavation, or machinery, mobile equipment, or vehicles will be operated next to an excavation in such a way as to potentially affect the stability of a wall of the excavation, a Professional Engineer will perform an analysis to determine what, if any, additional stresses are placed on the excavation wall. Any additional stresses on the excavation wall will be taken into consideration when specifying the shoring or shielding requirements for the excavation. Where shoring or shielding is not used, a Professional Engineer will determine an appropriate setback.

5.2.7 During the Excavation

5.2.7.1 Utility Infrastructure

Excavation work near underground utility infrastructure must be undertaken in conformity with the requirements of the applicable legislation, or the requirements of the owner of that underground utility infrastructure, whichever are more stringent. Before using mechanical equipment to excavate in this zone, the buried utility must be visually exposed by hand digging or use of vacuum excavation systems. See also SWP-215 – Supervision of Vacuum-Excavation Activities for additional guidance.

When excavation operations are underway and an operator encounters parallel or crossing underground utility infrastructure that were not previously located and marked, whether damage has occurred or not, all operations must cease immediately, and the utility owner must be contacted. If damage has occurred, all employees will evacuate to a predetermined safe distance upwind of the damage location and remain there until the hazard has been contained. See SWP-213 – Ground Disturbance and Overhead Utility for additional guidance.

5.2.7.2 Edge Protection

All excavation operators (by machine or hand) will always use one of the following methods to prevent objects from falling into the excavation and protect workers and members of the public from falling into the excavation.

- Locate barricades no closer than that permitted by local legislation, or, in the absence of legislation, no closer than 1.8 meters (6 feet) from the top of the excavation wall.
  - Protective "hard" barricades, such as guard rails or fencing
  - Warning "soft" barricades, such as warning tape
  - Illuminate the excavation and install lighted barricades at the top of the slope if working at night or in poor visibility.
- Maintain good housekeeping on the jobsite, including placing equipment, tools, or other material away from the edge of the excavation so that the items cannot fall into the excavation.
- Locate spoil piles no closer to the edge of the excavation than that permitted by local legislation.
  - The slope of the spoil pile must be at an angle of not more than 1H:1V.
  - Under no circumstances will the spoil pile or other materials be maintained in a manner that can present a hazard to workers on site
  - When an excavation runs across a slope the spoil piles will be placed on the lower side of the slope
- All stockpiles, near the excavations, must also meet the requirements of spoil piles for proximity, and whichever is less of the slope angle or angle of repose.

Backhoes, excavators, or other mechanical excavation equipment will not excavate in such a manner as to risk undermining their ground support.

When machinery, powered mobile equipment, or vehicles are operated adjacent to an excavation or required to approach the edge of an excavation and the operator does not have a direct and clear view of the edge, a warning system must be used to alert the operator when approaching the edge. This can be accomplished by using barricades, stop logs, a spotter, or signals.

5.2.7.3 Protective System Requirements

All Stantec employees and contractors will be protected from the collapse of excavation walls by sloping, benching, shielding, or shoring. Excavations greater than 1.2 meters (4 feet) and less than 6 meters (20 feet) in depth will be benched, sloped, shielded, or shored in accordance with governing OH&S legislation for that jurisdiction, or a Professional Engineer will inspect and certify the walls as having sufficient stability. Frozen soil will not be relied upon to support an excavation unless specifically addressed in local legislation. Any protective system used must have the strength to resist all expected loads, including mobile cranes, equipment, powered mobile equipment, or vehicles operating near the edge. Vibration will be considered when determining the requirements for sloping, benching, shielding, or shoring. Prior to installation of a protective system, the walls of the excavation must be stripped or trimmed of loose rock or other materials that may slide, roll, or fall on a worker. Stantec employees will not enter any excavation while the protective system is being installed and will exit the excavation while the protective system is being moved or dismantled. Stantec staff will remain outside the hoisting drop zone while protective system components are being moved.

Excavations 6 meters (20 feet) in depth or greater require that the protective system be designed by a Professional Engineer. In some jurisdictions it is acceptable that the protective system be based on tabulated data prepared and/or approved by a Professional Engineer. Only a Professional Engineer can approve excavations greater than 6 meters (20 feet) in depth, benching or slope configurations, and support systems of an excavation that deviate from the local OH&S Regulations and that personnel are to enter. No person will enter or be permitted to enter any excavation that does not comply with the applicable OH&S Regulations or Professional Engineer's design. A Professional Engineer's excavation, benching/sloping, shielding, or shoring plan must provide sufficiently detailed information to enable the excavation work to be safely undertaken to meet the design requirements. Information on the subsurface conditions expected to be encountered must be included. A copy of the plan and any written instructions signed by the Professional Engineer must be available on-site during excavation work and will be filed in the project's Health and Safety file.

5.2.7.3.1 Sloping and Benching

Where the sides of the excavation are sloped or benched, the slope or bench will be in accordance with the local legislation. The design of the slope or bench must take into consideration factors such as local legislative requirements, soil classification, weather conditions, previous disturbances, and job-site characterization.

5.2.7.3.2 Shielding and Shoring

Shielding must extend above the wall of the excavation to a height prescribed by local legislation.

Shoring will be installed, inspected, maintained, and removed in accordance with the local legislation, or in accordance with the manufacturer's recommendations, whichever is more stringent. In the absence of legislation or manufacturer's recommendations, shoring will be installed, inspected, maintained, and removed as specified in writing by a Professional Engineer.

5.3 Administrative

5.3.1 Pre-Job Steps

The PM is responsible for contacting the site operator, utility companies, property owner, and/or client as far in advance as practicable, but at least 48 hours prior to the start-up of any excavation work. Also, where required by legislation, the PM will notify the authority having jurisdiction, within the prescribed time, to obtain the required excavation authorizations/permits.

The PM will confirm:

- The site conditions, by reviewing project documentation (e.g., boreholes logs, plans, designs drawings, utilities).
- Field staff are aware of the hazards for the tasks they are to perform and the controls in place to mitigate the risk.
- Field staff are aware of their roles and responsibilities as previously outlined.
- Persons under the age of 18 are not permitted to work in an excavation.
- Underground utility infrastructure has been properly located and marked by a qualified, authorized, and appropriately insured locator, and written approval for ground disturbance

has been obtained (i.e., a public utility locates report) from all utility infrastructure owners. See SWP-213 – Ground Disturbance and Overhead Utility for additional guidance.

- The person supervising the excavation is competent, will be present at the site whenever another employee is in the excavation, and will observe the work being performed on the excavation for evidence of hazardous conditions.

If required, the Professional Engineer will develop a written ESP. The ESP will be developed to the level necessary to comply with appliable legislation and this SWP. The ESP will be filed in the project's Health & Safety file and will include:

- Underground utilities locate reports, both public and private
- Consideration of hazardous atmosphere potential
- Determination of soil composition and classification
- Determination of presence of surface and subsurface water
- Depth of excavation and length of time it will remain open
- Protective system requirements

5.3.2 Before Entering an Excavation

Stantec staff will meet with the Excavation Contractor's and/or General Contractor's site representative to confirm that they consider the excavation safe to enter and that it is compliant with applicable legislation, or the design provided by the qualified registered Professional Engineer.

- **Water**: No employee or worker will enter the excavation unless the excavation is free of standing or accumulating water. Water removal equipment, where used, must be monitored for proper operation. Never enter an excavation that extends below the groundwater table, unless approved by the Professional Engineer or competent person, or the walls are sloped to 3H:1V or flatter.
- **Unprotected excavations**: Employees must observe the periphery of the excavation for tension cracks or evidence of instability. If these are observed, no persons will enter the excavation until it can be evaluated by the Competent Person.
- **Weather:** Rain, melting snow, freezing, thawing, and heat from the sun can affect the stability of the excavation walls.
- **Protective System**: An employee will not work closer to the wall or bank than the depth of the excavation unless the employee is protected from wall failures in accordance with local legislation. When working next to a rock cut, an employee must maintain a distance of at least twice the drop height from any potentially loose blocks or declining intersecting joints and fractures within otherwise stable competent rock steeper than 1.5H:1V. For excavations that are shored, review the design drawings on-site and confirm, as far as is practicable, that the bracing is constructed, installed, used, maintained (and dismantled) in accordance with the design, and as per OH&S requirements and/or per the Professional Engineer's design.
- **Hazardous Atmospheres**:
  - Hazardous liquids or gases, or explosives must not be stored in an excavation
  - Where required by local legislation and a worker is required to enter an excavation, atmospheric monitoring will be undertaken, and appropriate hazard controls will be implemented as required

        - In the absence of legislation, if there is a potential for an oxygen deficient, an oxygen enriched, or a hazardous atmosphere, atmospheric monitoring will be undertaken, and appropriate hazard controls will be implemented as required.
        - Atmospheric monitoring results will be filed in the project's Health and Safety file
    - Atmospheric testing will be conducted by someone who is competent to do so based on their training, knowledge, and experience. Atmospheric testing will be conducted prior to entering an excavation to prevent exposure of employees to a hazardous atmosphere. This occurs where the following exists (or may exist):
        - Oxygen deficiency (based on local legislation or, in the absence of a legislative requirement, <19.5%)
        - Oxygen enrichment (based on local legislation or, in the absence of a legislative requirement, >23.5%)
        - A concentration of a flammable gas (based on local legislation or, in the absence of a legislative requirement, ≥10% of the lower explosive limit [LEL])
        - Is in an area with known or likely to contain contamination that may produce an atmospheric hazard
        - Where the excavation is:
            - Greater than 1.2 meters (or 4 feet) in depth, and
            - Located near hazardous materials, or is in a landfill area
    - Ventilation will be provided to prevent employee overexposure to a hazardous atmosphere.
    - Whenever control methods are depended upon to maintain atmospheric concentrations of contaminants within established safe levels, air monitoring will be conducted in accordance with the local legislation to confirm that safe levels are present. See SWP-411 – Confined Space Entry for additional guidance.
    - The use of respirators will require employees to follow SWP-409 – Respiratory Protection Program and the requirements outlined in either the HASP or on the RMS1.
    - Whenever internal combustion engines are operated in an excavation, and natural ventilation is not sufficient to prevent a hazardous atmosphere from forming, a mechanical ventilation system must be used to protect the operator and personnel entering the excavation.
    - Where a hazardous atmospheres exist or may reasonably be expected to develop during work in an excavation, emergency rescue equipment such as breathing apparatus, safety harness and retrieval line, and a basket stretcher will be readily available when entering an excavation is necessary.
- **Vibration:** Unless vibration was considered when determining the requirements for sloping, benching, shielding, or shoring, employees will not enter the excavation vibrations that can affect the stability of the excavation walls is occurring. When vibration starts while employees are in the excavation, they will exit the excavation without delay.
- **Observer, spotter**: A second person must be stationed at the top of the excavation to alert the worker in the excavation about the development of any potentially unsafe conditions (e.g., moving vehicles and equipment), and to assist in an emergency.
- **Falling materials and equipment**: Employees will not work on faces of sloped or benched excavations at levels above other employees unless employees at lower levels are adequately protected from the hazard of falling, rolling, or sliding equipment, material, or tools.

- **Inspections**: Documented inspections of excavations, adjacent areas, and protective systems will be performed by a competent person. The inspections will look for evidence of conditions that increase the chances of excavation wall failure (e.g., tension cracks, inflow of water), indications of damage or failures of any protective systems, hazardous atmospheres, or other hazardous conditions. This will be performed daily, prior to the start of any excavation work, as needed throughout the shift, after any rainstorm, sudden thaw of frozen ground, heavy compaction, or other hazard-increasing occurrence such as blasting, and after any other hazard that may affect the stability of the excavation walls has been detected.
    - Any evidence of a situation that could result in a possible cave-in, failure of a protective system, or occurrence of a hazardous condition will be made known by the competent person to all on-site personnel which may be affected, and all personnel will exit the excavation until such precautions are taken to provide a safe work environment.
    - An incident report will be submitted in accordance with the Incident Reporting Protocol for that region.
- **Excavation Equipment**:
    - The Stantec PM will request, as part of the contractor pre-qualification process, records to support the qualifications and experience of the operators as well as written records of inspections, maintenance, repair, and modifications for the equipment that will be brought to the site. It is the responsibility of the contractor to provide trained and experienced operators to run the equipment.
    - Workers around equipment being loaded and unloaded should be aware of the movement of the equipment and remain outside the zone of influence. Inspections of powered excavation equipment will be conducted as required in SWP-216 – Working Near Mobile Equipment.
    - The excavation equipment must be operated within its safe operations limits as provided by the manufacturer and stated in the operator's manual. The equipment will be shut down completely when the operator leaves the controls or steps down out of the cab. See SWP-216 – Working Near Mobile Equipment for additional guidance.
    - If the operator has a restricted view of the operation, such as when lowering materials into the excavation, a signal person will be used to guide the operator. Both the operator and the signal person must know the standard signals used in construction. The operator will move the load only on the signal of the signal person.
    - An operator will not carry a load over any person, and no person will be in the load's fall zone as the load is being moved.
    - Appropriate taglines will be used to allow a rigger to control swinging and/or rotation of a suspended load. Multiple taglines may be required to exercise full control. See SWP-208 – Hoisting and Lifting for additional guidance.

5.3.3 When Inside an Excavation

Once safe to approach and enter the excavation, an employee may complete the work, keeping the duration and frequency of approach and entry to as short as practicable, be observant, and maintain communication and visibility with nearby equipment operators. In this context, visibility is defined as maintaining a line of sight with all nearby operators and the observer/spotter.

5.4 Personal Protective Equipment (PPE)

5.4.1 Minimum Requirements for Project Sites

As required by SWP-105 – Personal Protective Equipment, as a minimum, staff working near or in an excavation, will wear the following PPE:

- Hard hat
- Safety glasses
- High visibility apparel
- Safety boots
- Gloves appropriate for anticipated hazards
- Appropriate hearing protection

NOTE: The PPE used must satisfy the standard cited in the local legislation, Stantec and/or client requirements, whichever is most stringent. Employees have the option of exceeding minimum PPE requirements.

5.4.2 Retrieval System

A retrieval system must be used whenever an employee enters a bell-bottom caisson/pier hole or similar deep and confined footing excavation. Each retrieval line must be individually attended by an observer at all times when the worker wearing the retrieval line is in the excavation. Also, the retrieval line will be attached to a mechanical device or fixed point outside the excavation in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. See SWP-411 – Confined Space Entry for additional guidance.

6 TRAINING OR QUALIFICATIONS

6.1 Employees required to work near or enter an excavations

- Excavation safety and hazard recognition
- Applicable legislative requirements

6.2 Competent Person

- Soil and rock classification
- Excavation inspection
- Excavation protective system inspection
- Applicable legislative requirements

6.3 Professional Engineer

- Soil and rock classification
- Excavation protective system design
- Applicable legislative requirements

7 OUTSIDE AUTHORITIES TO BE CONTACTED

Some jurisdictions require notification prior to undertaking excavation work. Contact your Regional HSSE Manager or Advisor for additional guidance.

8 RESOURCES

8.1 Internal

- SWP-105 – Personal Protective Equipment

- SWP-201 – Fall Protection/Working from Heights
- SWP-202 – Portable Ladder Safety
- SWP-208 – Hoisting and Lifting
- SWP-213 – Ground Disturbance and Overhead Utility
- SWP-215 – Supervision of Vacuum-Excavation Activities
- SWP-216 – Working Near Mobile Equipment
- SWP-409 – Respiratory Protection Program
- SWP-411 – Confined Space Entry

8.2 External

Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:

- Stantec's Critical Task Inventory
- Health & Safety Regulatory Requirements Library
- Environmental Regulations Library

9 DEFINITIONS

Area of Influence: The area around an excavation where loading the top of slope can affect the stability of the excavation, or where the excavation can affect the stability of nearby structures or other surface encumbrances. Contact the project's PM, competent person, or Professional Engineer for guidance on determining the site-specific area of influence.

Benching: A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels

Competent Person: A person who, because of their knowledge, training, and experience, can identify existing or predictable hazards in the surroundings, AND who has the authority to take prompt and corrective measures to stop work and mitigate the hazards AND who is performing the necessary excavation safety inspections.

Drop Height: The vertical distance loose cobbles, boulders, materials, or tools can fall into an excavation

Ground Disturbance: Any work that disturbs soil, rock or other material, no matter how shallow. This includes digging by hand with hand tools and digging with powered equipment. Also included are drilling, anchoring, blasting, ditching, scraping or other subsurface activities.

Excavation: Any cut, cavity, trench, or depression in the earth's surface resulting from rock or soil removal.

Hazardous Materials: Are substances that could harm human health or the environment.

Legislation: All Acts and Regulations applicable to the jurisdiction of the project site, or project type, and include the Federal, Provincial, State, Territorial, and all applicable local (e.g., county, parish, city, town, village, etc.) ordinances, or by-laws.

Professional Engineer: For the purposes of this SWP, an engineer having a professional designation, training, and experience in civil, geotechnical, structural and/or construction engineering, and licensed in the project site's jurisdiction. The Professional Engineer must be

familiar with and follow the procedure outlined in ASTM D2488 Standard Practice for Description and Identification of Soils for any soil and rock classification.

Retrieval System: The equipment, including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor, used for non-entry rescue of persons from an excavation.

Shoring: Materials used to brace the walls of an excavation to prevent collapse

Shielding: (also called trench boxes) adjust to fit the size of the excavation. Unlike shoring materials, they are not designed to hold up the walls of the excavation but will shield workers from an excavation wall collapse

Sloping: Cutting back the excavation wall at an angle that is inclined away from the work area of the excavation. The angle of slope required depends on the soil conditions

Surface Encumbrance: Can include existing site features, such as curbs, walkways, bridges, roads, utilities, foundations, transformer vaults, trees, poles, posts, and other structures adjoining the excavation

Trench: Any excavation that is deeper than it is wide, and less than 5 meters (15 feet) wide at the bottom.

Visibility: Maintain a line of sight with all nearby operators and the observer/spotter.

10 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- Training Records

File these records in the project's Health & Safety file:

- Risk Management Strategy (RMS1) or Health and Safety Plan (HASP)
- Field Level Risk Assessment [FLRA] (RMS2)
- Professional Engineer's excavation design, where applicable
- Excavation safety plan
- Public and private utility clearances reports
- Approvals to remove surface encumbrances
- Hazardous atmospheres monitoring results
- Excavation permits, where required

11 REVISION HISTORY

Date	Changes	Acknowledgments	Approval
October 11, 2022	Expanded section 2 - Scope to include work in proximity of excavations. Updated section 3 – Responsibilities to better align with current practice. Aligned section 4 – Hazards to Energy Wheel. Removed regulatory references from section5 – Controls to reflect global applicability. Aligned controls with other applicable SWPs. Edits to 1. Purpose, 3.2 Responsibilities, and 7.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	M. Doherty, D. Flynn, R. Roy, L. Tait	P. Poelzer
January 25, 2019	Corrected 5 feet to 6 feet in section 5, Top of Slope. Minorcorrections to formatting andtypographical errors.	K. Bayer, R. Roy	C. Ferguson-Scott
November 20, 2018	Changed 2 feet to 1 meter ins. 5.1.3.	K. Bayer, R. Roy	C. Ferguson-Scott
April 27, 2017	Change HSE to HSSE throughout. Edits to punctuation and format.	K. Bayer	C. Ferguson-Scott
December 2, 2016	Clarified spoil pile distance forNew Brunswick	M. Philipp	C. Ferguson-Scott
February 27, 2015	Additions to s. 5.0 Spoil Piles orOther Materials, s. 5.1.3 Edge Protection, s. 5.4.2 Lifelines and Harnesses. Minor wording edits and measurement	C. Ferguson-Scott	P. Salusbury
October 1, 2013	Correction to depth conversion on page 11. Addition to section 10 – Documentation Summary.	C. Ferguson-Scott	P. Salusbury
March 17, 2010	Changed HSE to SWP throughout; reformatted header and headings; reformatted body to be consistent with current layout;combined HSE – 203 – Trenching and Shoring with this document.	G. Doran	K. Robinson
January 25, 2019	Corrected 5 feet to 6 feet in section 5, Top of Slope. Minorcorrections to formatting andtypographical errors.	K. Bayer, R. Roy	C. Ferguson-Scott

HEALTH, SAFETY, SECURITY, AND ENVIRONMENT
SAFE WORK PRACTICE - SUPERVISION OF VACUUM-EXCAVATION ACTIVITIES SWP-215

1 PURPOSE

This safe work practice (SWP) is intended to provide guidance for Stantec employees directing or supervising vacuum-excavation activities.

Vacuum excavation is a mechanical means of soil extraction through vacuum when using water (hydro-excavating) or air (air knife) jetting devices for breaking ground. Vacuum excavation is a less intrusive method of excavating. It uses pressurized water or air and a vacuum system to excavate soil, typically around underground utility infrastructure. Vacuum excavation can be used for daylighting (the process of uncovering and exposing underground utility infrastructure to the daylight) or for borehole clearance (the removal of soil to a minimum depth) to minimize potential damage to buried utility infrastructure during ground disturbance activities.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 7.0 Resources > External.

2 SCOPE

This SWP is to be applied when Stantec is directing or supervising subcontractors engaged in vacuum-excavation (hydro-excavation or air knife) activities.

3 RESPONSIBILITIES

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain the Safe Work Practices, including:
  - Posting the most current copy to The Lens
  - Monitoring applicable legislation to incorporates any new or revised regulatory requirements
- Assist with interpretation and methods of compliance with the SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements of the SWPs are being met

3.2 Business Center (BC) Leader

- Require that applicable SWPs are implemented for all operations
- Hold designated employees accountable for properly implementing applicable SWPs

3.3 Supervisor

- Confirm with each employee reporting to them the need to review this SWP
- Verify that each employee has completed their SWP review based on the review cycle listed in the SWP Checklist

3.4 Project Manager (PM)

The PM has the primary responsibility for implementing this SWP. This responsibility includes:

- Identify potential hazards employees could be exposed to and select appropriate hazard controls using the Risk Management Strategy form (RMS1) or the site-specific Health and Safety Plan (HASP)
- Communicate the hazards and controls to employees
- Only assign employees that are trained in the requirements of the applicable SWPs, who understand the hazards associated with the work, and who can apply the appropriate controls identified in the SWPs
- Hold employees accountable for properly implementing this SWP
- Coordinate with the Office Safety and Environment Coordinator (OSEC) for the supply and/or purchase of the required personal protective equipment (PPE) and any other equipment that may be required
- Provide the required PPE to employees that need it
- Make sure provided equipment has been selected, inspected, and maintained in accordance with the manufacturers' recommendations
- Require employees to use the PPE identified for their tasks
- Coordinate the scheduled work with clients so that all Stantec employees performing work on-site are aware of any precautions or controls required by the client
- Communicate emergency response and transportation procedures to employees should external medical assistance be necessary

3.5 Office Safety and Environment Coordinator (OSEC)

The primary mandate of an OSEC is to act as a resource to local office operations in the administration of day-to-day safety activities. This responsibility includes:

- Maintain a secure filing system containing the forms, reports, and training records required by the HSSE Program
- Assist PMs, supervisors, and others in obtaining appropriate safety and environment equipment for employees working on their projects
- Coordinate HSSE training as identified by HSSE Program requirements and hazard assessment

3.6 Employees

Employees are responsible to take every reasonable precaution to protect themselves and to provide a safe work environment for all employees. This responsibility includes:

- Learn and follow the practices and procedures outlined by Stantec's HSSE Program and by local legislation
- Perform work in a safe manner; not engaging in horseplay or working while impaired by alcohol, drugs, or other causes
    - Require that vacuum excavating subcontractors consistently follow safe operating procedures
- Will not assist the vacuum excavator operator with the operation or handling of vacuum excavation equipment for safety and liability reasons
- Immediately report all unsafe acts and conditions, hazards, near misses, and incidents to their Supervisor or PM
- Know how to control and respond to hazards and emergencies, including the use of emergency equipment
- STOP work immediately when aware of an unsafe act or condition that could place anyone in danger or if they are not confident in the work plan

- Wear PPE as required and use any special protective equipment, supplies, and tools required to do the job safely
- Keep all such equipment properly cleaned and maintained when required to do so
- Know the proper use and limitations of equipment
- Inspect work areas regularly for hazards

4 HAZARDS

4.1 Energy Wheel



The energy wheel is a visual tool used by Stantec to identify the 10 sources of energy and the hazards associated with each source, and to select appropriate controls to mitigate the risks. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. For project work, these energy sources, identified hazards, and selected controls will be documented on the Risk Management Strategy (RMS1), and in a Field Level Risk Assessment (RMS2/ eFLRA). Before beginning any activity, review the hazards and controls associated with the task. Following are the Energy Sources and Hazards/Conditions commonly associated with vacuum-excavation activities.

Energy	Hazard
Thermal	• Hot exposed engine parts, devices, and exhaust pipes • High pressure water may also be hot • Heat/cold exposures from weather conditions • Operation of spark generating tools and equipment
Chemical	• External and internal fuel containers • Refueling equipment • Chemical exposures of project site materials, including hydro-excavation slurry • Exposure to hazardous substances or naturally occurring gases such as Hydrogen Sulfide (H2S), methane, and natural gas
Biological	• Wild or domestic animals, and livestock • Stinging and biting insects • Poisonous and noxious plants • Contaminated soil and water • Human behaviors such as protesters, onlookers, etc.
Radiation	• Encountering naturally occurring radioactive material (NORM) or low-level radioactive contamination

	• Exposure to solar radiation (UVA and UVB)
Noise	• High noise levels (above 82 dBA) in the vicinity of the vacuum excavation equipment • High pressure release • Impact of noise on communication
Gravity	• Slippery conditions, such as water, ice, and mud on ground surfaces • Tripping hazards from vacuum hoses, tools, and equipment • Fall from heights – open excavation or top of vacuum excavation equipment
Motion	• Rotating exposed engine parts and devices • Loading and unloading vacuum hoses and equipment • Overhead vacuum hose swing arm and vacuum hoses laying on the ground • Lifting, pushing, pulling, and carrying • Use of hand and power tools • Body positioning • Slopes and uneven terrain • Struck by, caught between, and crushed by mobile equipment and vehicles • Flying debris associated with high pressure spray and vacuum • Traffic, especially if vacuum excavating on a road right-of-way
Mechanical	• Exposed rotating equipment • Pinch points, crush points, and cutting edges
Electrical	• Contact with overhead powerlines • Electrical shock from cutting through faulty power lines or connections • Generation of static electrical charges • Lightning storm
Pressure	• High pressure water or air spray • High pressure lines containing hydraulic fluid • Suction related to vacuum hose and fittings

5 CONTROLS

5.1 Engineering Controls

- The vacuum excavating equipment must be equipped with:
  - Whip checks or hose safety cables
  - A system capable of continuous monitoring of temperature and pressure to ensure safe operating limits are not exceeded
  - Hoses, fittings, and attachments designed and rated for the maximum specified operating pressures of the equipment
  - A shut-off valve on the wand/lance or a shut-off switch on a remote control that is controlled by a second worker

- When working in a hazardous atmosphere with diesel-powered vacuum excavating equipment, the equipment must be equipped with:
  - An exhaust system fitted with a functional spark arrestor (excluding turbocharged equipment)
  - An air intake system fitted with a positive air shut-off with a rev/rpm limiter, or
  - An air intake system fitted with a positive air shut-off without a rev/rpm limiter, and
    - A competent person stationed with the equipment to engage the manual shut-off switch, and
    - Continuous atmospheric monitoring
- When working in an area where overhead or underground electrical cables are present:
  - De-energize the overhead or underground electrical cables where possible.
  - The vacuum excavating crew must use a bonding mat and the vacuum excavating equipment must be grounded during operation.
- When vacuum excavating around underground utility infrastructure, confirm the maximum allowable water or air pressure with the utility owner(s).
  - Stantec supervisory personnel are responsible to verify the vacuum excavating subcontractor is operating within prescribed parameters.
- An exclusion zone must be established to prevent non-essential personnel, including vehicles or pedestrians from entering the vacuum excavation operation area. It is recommended to place protective barriers 5 meters (15 feet) from the vacuum excavation activities.
  - Where an exclusion zone of 5 meters (15 feet) is not achievable due to site constraints, consider erecting shields to prevent flying debris from impacting a passerby, vehicles, or equipment.
- Excavated areas must be backfilled or adequately covered as specified by the requirements of the authority having jurisdiction.
- All rotating components must be equipped with proper guards per manufacturers guidelines, and/or federal, state, provincial, territory, and local standards and regulations.

5.2 Warnings

- Traffic cones, signs, flag person as required by regulation for traffic control
  - Refer to SWP-407 – Traffic Control and Protection Planning for additional guidance.
- Hazard or caution tape and/or barricades to demarcate exclusion zone
- If vacuum hoses or other equipment cross areas outside the exclusion zone where there is a potential for pedestrian traffic, then they must be clearly marked and protected to prevent trips/falls.
- Lights and audible alarms when moving equipment

5.3 Administrative

- Clearly communicate with the vacuum excavating subcontractors and personnel at the Stantec Project Manager and Field Supervisor levels that safety is paramount for vacuum excavation work.
- On contaminated sites, site-specific health and safety plans may be required.
  - Such plans must be provided to the vacuum excavating subcontract prior to their personnel going to site.
  - Vacuum excavating personnel must read and sign-off on such plans prior to beginning site work.

    - These plans must also include provisions for backfilling and disposal of impacted soil and water.
- Vacuum excavating locations must take into consideration the location of aboveground utilities before vacuum excavating commences.
    - The most stringent of the following three requirements must be respected:
        - Occupational Health and Safety regulations require a minimum distance from high voltage power lines.
        - Local power utility owners and/or regulatory agencies may stipulate different separation distances .
        - Vacuum excavating may require additional separation distance (e.g., 6-10 meters or 20-32 feet) depending upon type of equipment, site conditions, and types of power/utility lines involved.
    - Refer to SWP-213 – Ground Disturbance and Overhead Utility for additional guidance.
- Stantec personnel must defer to the operator's judgment and experience when positioning the unit and equipment.
    - Stantec personnel must never require equipment be placed in potentially dangerous locations.
    - If questions exist regarding type of lines overhead, required clearances, or additional protective measures that may be required, these should be resolved during the utility locating planning process as described in SWP-213.
- At times, vacuum excavating is required adjacent to highways, local roadways, or areas of vehicular traffic.
    - Local authorities or Stantec personnel knowledgeable in local traffic regulations should be consulted to determine whether permits, specialized traffic control, signage and/or traffic cones are required during equipment movements or excavating.
    - Refer to SWP-407 – Traffic Control and Protection Planning for additional guidance.
- When vacuum excavating adjacent to a water body, a site-specific emergency response plan must be developed, outlining the steps to be taken in the event of a release into the water body and identifying the applicable reporting agencies.
- Safety Data Sheets (SDSs) for each product or chemical used at the project site must be available at the site.
    - Refer to SWP-103 – Workplace Hazardous Materials Information System (WHMIS), SWP-104 – Hazard Communication (US), SWP-133 – Hazardous Chemicals or Substances (ANZ) and SWP-134 – Control of Substances Hazardous to Health (COSHH) for guidance.
- The vacuum excavation subcontractor must have at the work site the following emergency equipment, maintained in good condition and placed in an easily accessible location for the prompt use:
    - A fully stocked first aid kit containing as a minimum the first aid items required by local regulations
    - Appropriate fire extinguisher(s) that are inspected, maintained, and fully functional
    - A complete and suitable spill response kit that is regularly inspected and maintained in a state of readiness to respond to a spill
    - An eyewash bottle or portable eyewash station that is suitable for the identified project hazards

5.4 Personal Protective Equipment (PPE)

The required PPE and additional safety equipment will be determined during the hazard assessment process.

At a minimum, the following PPE will be worn by Stantec staff while vacuum excavating is taking place. (Refer to SWP-105 – Personal Protective Equipment (PPE) for additional guidance.)

- Hearing protection
- Safety glasses with rigid side shields
- Face shield, in addition to safety glasses, while working within the exclusion zone
- Hard hat
- Hand protection appropriate for the hazards
- High visibility safety apparel
- Safety boots (minimum 6" ankle support)

Additional PPE may be required based on client or site requirements or as deemed required by the hazard assessment.

- When working at a height of 1.8 meters (6 feet) or more in an unguarded area, or as otherwise required according to SWP-201 - Fall Protection/Working from Heights, all employees will use appropriate fall protection equipment.
- When working in a flammable or explosive atmosphere, flame resistant (FR) outer layer garments (i.e., shirts, pants, jackets, coveralls) must be worn. FR clothing must meet the requirements of NFPA 2112 (Standard on Flame-Resistant Garments for Protection of Industrial Personnel against Flash Fire) for fire resistance.

All required safety equipment will be maintained and use as per manufacturers' recommendations.

Loose clothing, drawstrings, long hair, dangling accessories, jewelry, or other similar items that are likely to be a hazard will not be worn around machinery unless they are tied, covered, or otherwise secured so they prevent the hazard. In all cases, body attire must comply with or exceed client/owner site requirements.

Stantec supervisory personnel, when on site, will have responsibility for seeing that all personnel within the exclusion zone comply with established PPE requirements.

6 OUTSIDE AUTHORITIES TO BE CONTACTED

- Refer to SWP-213 – Ground Disturbance and Overhead Utility for guidance on obtaining public and private utility locates in advance of vacuum excavating activities.
- For vacuum excavation on third-party property, including roadways and rights-of-way, the owner must be contacted for permission to access the property.
- For spills of reportable quantities of chemicals on land or for any release into a water body, the applicable state/provincial/territorial agency and/or client/property owner must be notified
    - The appropriate Regional HSSE Manager must be contacted for guidance.

7 RESOURCES

7.1 Internal

- SWP-103 – Workplace Hazardous Materials Information System (WHMIS)
- SWP-104 – Hazard Communication
- SWP-133 – Hazardous Chemicals or Substances (ANZ)
- SWP-134 – Control of Substances Hazardous to Health (COSHH)
- SWP-105 – Personal Protective Equipment (PPE)
- SWP-201 – Fall Protection/Working from Heights
- SWP-213 – Ground Disturbance and Overhead Utility
- SWP-407 – Traffic Control and Protection Planning

7.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library

8 DEFINITIONS

Hydro-excavating: Soil extraction through vacuum when using water jetting devices for breaking ground

Air-knifing: Soil extraction through vacuum when using air jetting devices for breaking ground

Daylighting: The process of uncovering and exposing underground utility infrastructure to the daylight

Borehole clearance: The removal of soil to a minimum depth

9 DOCUMENTATION SUMMARY

File these records in the Project Health & Safety File:

- All public and private utility locate reports
- Risk Management Strategy (RMS1)
- Field Level Risk Assessment – RMS2 or generated through eFLRA
- Copies of as-built drawings, if available
- SWP-213a – Pre-Ground Disturbance and Overhead Utility
- SWP-213b – Aboveground/Underground Utilities Checklist
- SWP-213c – Backfill Observation Form

10 REVISION HISTORY

Date	Changes	Acknowledgments	Approvals
February 18, 2025	Section 5.1 second to last bullet updated to include language on authority having jurisdiction.	J. Bezaire, G. Burnett	K. Hancock

Date	Changes	Acknowledgments	Approvals
February 1, 2023	Administrative Update: Edits to 1 Purpose, 3.1 Responsibilities, and 7.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Ferguson-Scott	P. Poelzer
August 26, 2022	Expanded the SWP to include other vacuum excavating methods such as air knifing. Expanded on the Responsibilities section to mirror format of other SWPs. Aligned the Hazards section with the Energy Wheel. Expanded Control section to include other vacuum excavation options and added controls not previously listed.	W. Cline, L. Tait, R. Roy	P. Poelzer
February 9, 2015	Added mention of wastewater disposal by subcontracted companies to section 3 – Responsibilities.	C. Ferguson-Scott	C. Ferguson-Scott
February 22, 2010	Formatted for upload to StanNet with few edits	G. Doran	K. Robinson

Health, Safety, Security, and Environment
Safe Work Practice
Working Near Mobile Equipment (SWP-216)

1 Purpose

The purpose of the Working Near Mobile Equipment Safe Work Practice (SWP) is to provide standard practices and procedures to help mitigate the potential for injury when employees are working near mobile equipment. It will also help provide information about the hazards posed by such equipment, and to assist in the identification of proper controls while on company business.

2 Scope

This SWP applies to work carried out by Stantec employees and subcontractors working on behalf of Stantec when that work involves working near mobile equipment. This SWP **does not** address the equipment operator's specific requirements (per the manufacturer or industry practice) for correct operation within the designed capabilities of the mobile equipment.

Additional SWPs associated with this practice are:

- SWP-105 - Personal Protective Equipment
- SWP-203 - Aerial Work Platforms
- SWP-217 - Forklift Operations
- SWP-406 - Electrical Safety Program
- SWP-407 - Traffic Control & Protection Planning
- SWP-407a – Traffic Control Plan

Revision History

Revision Number	Date	Changes	Authors	Reviews	Approvals
2.0	30-Oct-2025	Section 3 HRAC table – added Mechanical to energy source and noted applicable hazard. Section 5 Updated 1st bullet under PM. Appendix E updated graphic text box to show all text. Updated regulation library and SWP hyperlinks. All caps text revised for ADA compliance.	G. Burnett	L. Tait	K. Hancock
1.0	22-Apr-2024	Initial re-release in revised format	P. Petro; J. Garcia	K. Bayer; J. Elkins; J. Parker	P. Poezler

3 HRAC (Hazard Recognition, Assessment, and Control)

This section outlines the hazards that are expected in the work activity of this SWP and outlines the mandatory controls that must be implemented to prevent incidents. The list is not exhaustive, and each project and/or location must consider the specific hazards that may be present. Select the hyperlinked steps below to see the details for each step.

Job Hazard	Energy Hazard	Specific Hazard	Critical Risk	Mandatory Controls	Training
Employee Struck by Mobile Equipment (Person and machine interface)	 Motion  Gravity  Mechanical	Mobile equipment contacts a worker on foot resulting in the loss of life or injury. Suspended loads or mobile equipment left in high energy states creating unwanted contact, resulting in loss of life or injury. Equipment operating at a higher elevation than workers causing debris flow or equipment slide. Failure to secure equipment, such as not setting brakes, leaving in gear, or not locking out controls can cause unintended movement, posting a risk to nearby workers. Mechanical failures (e.g., hydraulic, steering, tire pressure) may result in injuries or property damage.	 Mobile and Heavy Equipment  Traffic Control	Step 1 – Understanding the Hazards Step 2 - Project Planning Step 3 – Working On-site	Each Business Operating Unit (BOU)/ Regional Operating Unit (ROU) - Global will address competency related to this topic as needed. Clients may require that employees attend a site orientation so they can be made aware of expectations for work on or around mobile equipment. Employees working on or around mobile equipment will review this SWP to understand the hazards they may encounter and the controls needed. Other SWPs and/or manufacturer's literature may also be relevant to the scope of work and should be reviewed prior to engaging in work activities.

Noise Exposure	 Noise	Noise levels damaging hearing. Noise levels making it difficult to identify other hazards.			

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard.

For information on health and safety requirements by jurisdiction, refer to Stantec's Health & Safety Regulatory Requirements Library. The Critical Task Inventory also provides information for work activities that have been identified to have higher risks.

Stantec also recognizes that clients or project sites may have their own requirements; when a client or site requirements are more stringent than those required by Stantec or local legislation, the client's requirements will prevail.

Additional links:

- HSSE Regulations Library
- Field Level Risk Assessment (RMS2)
- Project HSSE Plan (RMS1)
- Subcontractor Prequalification

4 Mandatory Controls

Deviation from the mandatory controls of this SWP must follow the Management of Change (RMS11) process.

Step 1 – Understanding the Hazards

- Mobile equipment is capable of making rapid and improvised turns, has the potential to tip over, and may not be capable of stopping in a timely manner.
- Mobile equipment operators may not follow procedures, may not respect speed limits, may have different levels of competency, and may make mistakes.
- Mobile equipment has blind spots that affect the operator's ability to see a worker on foot or other equipment on-site. See Appendix C for examples of common mobile equipment blind spots.

Step 2 – Project Planning

- In the Project HSSE Plan (RMS1)/HASP, identify the potential hazards to Stantec employees and Stantec contractors when working near mobile equipment, as well as specific controls to address each hazard. The project team may need to coordinate some of the details with the equipment operators who will be on-site.
    - Identify blind spots, swing zones, and fall zones.
    - Establish work zones to help inform workers of hazards and risk levels. Use a diagram to establish mobile equipment operating areas (Red Zone), general work areas where PPE is required (Orange Zones), and staging/break areas (e.g., personal vehicle parking, lunch, and sanitation areas) free from mobile equipment hazards (Green Zone).
    - Decide how workers on foot will be kept separated from the mobile equipment. See Appendix D for examples of barrier devices to identify different zones.
    - Determine what communication methods to be used on-site. Check in with site supervisor and explain what you will be doing on-site and when.
    - Establish a procedure for approaching mobile equipment. Prior to approaching any mobile equipment, workers on foot will first confirm with the operator that the mobile equipment is in a low energy state or powered down, that the operator has hands off the controls, and that they signal to the workers on foot that it is safe to approach.
    - Determine how workers on foot will interact with spotters.
- **Third party site with mobile equipment** – PM (Project Manager) to determine if a client escort is required on-site or confirm that Stantec work will be conducted when mobile equipment is not operating.

Step 3 – Working On-Site

- During the Field Level Risk Assessment / Tailgate Meeting with the project team and equipment operator(s) on-site:
    - Review the work zones and how workers on foot will be kept separated from the mobile equipment.
    - Review identified blind spots, swing zones, and fall zones.
    - Review the procedures for approaching mobile equipment and interacting with spotters.
    - Review the communication methods to be used. Test communications prior to operation to ensure they work. This may include two-way radios or walkie-talkies

(equipped cell phones) or air horns. Check in with site supervisor and explain what you will be doing on-site and when.

- Confirm that workers on foot understand the following:
  - Know how to control and respond to new hazards and emergencies including use of emergency equipment.
  - Identify the equipment that will be operating within the work area and use controls and procedures appropriate to the location. If unable to determine the controls and procedures, use the Stop Work Authority and contact the Project Manager.
  - Know how to communicate with the operator of mobile equipment (e.g., 2-way radio, hand signals) and demonstrate proficiency in established site communication methods.
  - Before approaching mobile equipment, make sure the operator has put it in a low energy state [no raised loads, or components of the equipment (i.e., dozer blade, excavation bucket), or raised forks on a forklift] and the operator has hands off the controls and they signal to you before approaching. Note: some operators may power down equipment before signaling to approach.

- Never place yourself between mobile equipment and fixed objects. Stay out of the line of fire of equipment or loads held by the equipment in case they move in an unanticipated direction.
- Know the emergency muster point location and evacuation pathway based on mobile equipment movement and changes to site configuration.
- STOP WORK immediately if an unsafe act or condition could place anyone in danger, or if they are not confident in the work plan.
- Will not operate any mobile equipment unless they have been properly trained to operate the specific equipment safely.
- Vehicle operation on site must conform to rules of the road.
- Document any new hazards as they arise, and the controls being put in place.
- Stantec has no control over the operators or subcontractors of another company, but Stantec employees do have the authority to exercise Stop Work Authority.



- **Mobile Equipment Warning Devices**: Recognize mobile equipment warning devices and do not ignore them. Extended time on active sites with mobile equipment can lead to complacency to alerts from warning devices. See additional information in Appendix F.

5 Responsibilities

See the HSSE Program Manual for general responsibilities.

Project Manager (PM)

- Review, understand, and verify implementation of the process listed in the Mandatory Controls section of this SWP.
- Develop the necessary control elements listed in the SWP for the plan.
- Coordinate the scheduled work with the client and subcontractor so that all Stantec and subcontractor employees performing work on-site are aware of precautions or controls required by the client.
- Develop and communicate an emergency response plan specific to the work location and scope of work.
- Verify that subcontractors are following SWP requirements.
- Supports all uses of Stop Work Authority.

Employees

- Be aware of and comply with the requirements detailed in this SWP.

Leadership

- Review, understand, and verify implementation of the six-step process listed in the Mandatory Controls section of this SWP.
- Require that this SWP be implemented for all applicable operations.
- Hold designated employees accountable for properly implementing this SWP.
- Verify that each employee who is required to work near / on mobile equipment has completed the review of this SWP based on the review cycle listed in the SWP Checklist and process.
- Confirm that each employee has completed the training required by this SWP as applicable.
- Supports all uses of Stop Work Authority.

Appendices

Open the appendices below by selecting the right-facing arrow beside each appendix.

Appendix A: Definitions (Return to Mandatory Controls)

Fall Zone: The area beneath or adjacent to the equipment into which the load could fall. The fall zone is not always just beneath the load.

Line of fire: The direction of travel of mobile equipment, including rotation, or materials that could come into hazardous contact with an employee.

Mobile Elevated Work Platform: Scissor lift, cherry picker, boom lift, etc.

Spotter: An employee who assists drivers and equipment operators on a project site by providing them with information that they may not be able to see or hear themselves. They are responsible for guiding the driver or operator when they are moving their vehicle or equipment, especially when working around overhead hazards such as live power lines, structures, and steel columns. Equipment spotters can also scan the area for trip and fall hazards and ensure other workers stay out of the path of travel of equipment. Training can also ensure that everyone is using the same hand signals and knows the best course of action.

Swing Zone: The area where an excavator arm/bucket, picker boom, counterweights, personnel lift, crane, etc., can rotate through. The equipment or its load could swing anywhere within this zone.

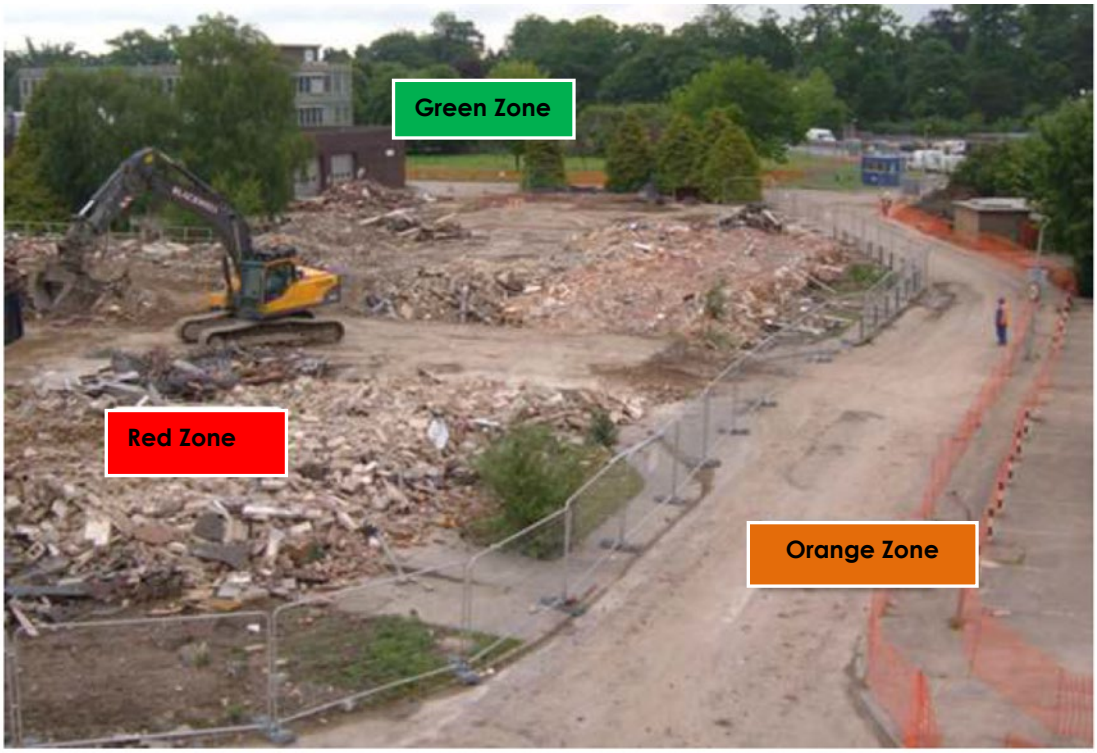
Third Party Site: Third party construction refers to the involvement of parties other than the contractor and the owner in a construction project. These parties may include subcontractors, designers, engineers, or insurers.

Tip Zone: The area into which the equipment could fall if it is not balanced or stabilization fails, regardless of whether the equipment is operating or under a load. Examples include a crane or forklift tipping under a load, or a dump truck tipping on unstable ground.

Work Zones:

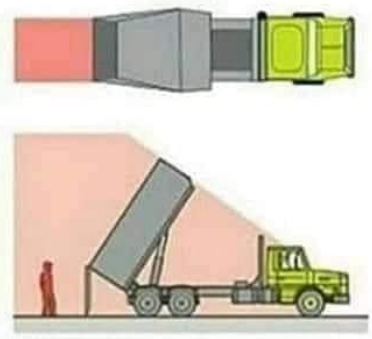
- **Red Zone** - Area where personnel that are not essential to the **Red Zone** activity are prohibited while heavy equipment is operating. This includes the fall zone, predicted debris area, swing zone, and tip zone.
- **Orange Zone** - General site work zone requiring PPE.
- **Green Zone** - Used to address personnel needs, for example a rest area or meeting area.

Example of Large Project Site Plan Showing Red, Orange, and Green Zones

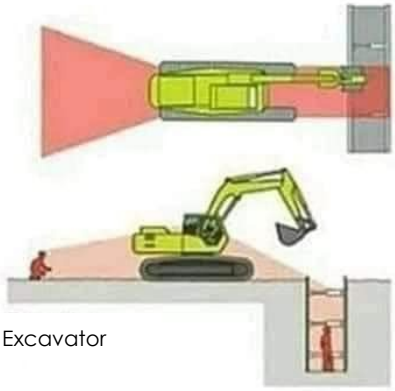


Appendix B: Mobile Equipment Examples and Additional Information

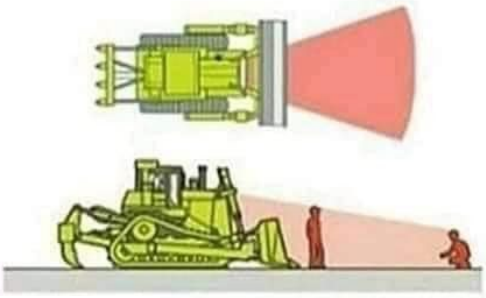
Appendix C: Mobile Equipment Blind Spot Diagram Examples and Website Reference



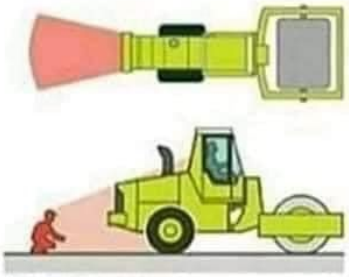
Dump truck



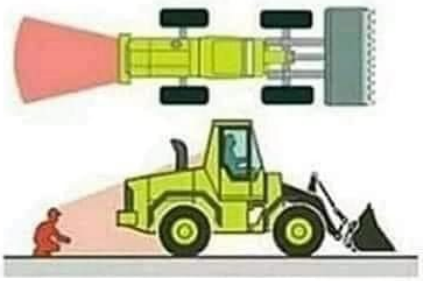
Excavator



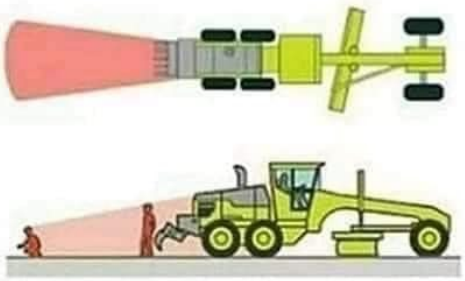
Bulldozer



Articulated roller



Articulated loader



Grader

[Construction Equipment Visibility - Diagram Lookup | NIOSH | CDC]

Appendix D: Barrier Device Examples

Barrier Examples



Chain Link Fence



Construction Panels/Hoarding



Chain Link Panels



Construction Panels/Hoarding



Wire Mesh/Heras Fencing



Barricades



Jersey Barricades (K-rail or water filled barriers



Safety fencing (snow fencing)



Collapsible or Expandable barriers



Delineators/ Bollards



Collapsible or Expandable barriers



Cone (minimum of 90 cm / 36 inches in height

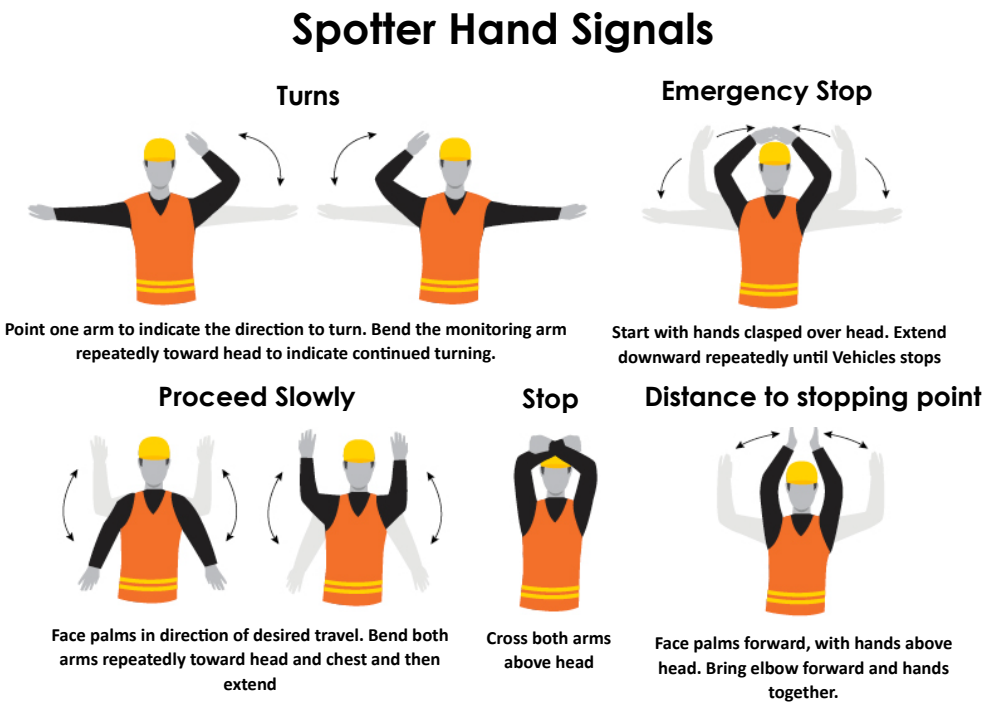
Appendix E: Spotter Roles and Responsibilities

The spotter has the following responsibilities:

- To give clear directions to the equipment operator, to act as the eyes of the operator where operator visibility is limited.
- Establish hand signals and verbal communication (two-way radios) with operator to ensure immediate stop work and notify operator of hazards.
- Must avoid distractions and is not permitted to use a mobile phone while actively working.



- Must always stay visible and, if moving, not walk backwards; have the operator stop, move to new location, and reengage with operator.
- Always expect the unexpected and plan for paths of travel and escape routes accordingly (do not get caught in a line-of-fire).
- Must be qualified by their employer.



Appendix F: Mobile Equipment Warning Devices

HEALTH, SAFETY, SECURITY, AND ENVIRONMENT
VEHICLE PRE-USE CHECKLIST
SWP-124A

Inside Vehicle:	Item is OK	Item is NOT OK
Make sure seatbelts are present for all who will be riding in the vehicle		
Secure all cargo in the vehicle so that items will not become projectiles in the event of sudden stops or collisions		
Adjust the seat position, rearview and side mirrors		
Adjust temperature controls, vents, radio, etc.		

If Pulling a Trailer:	Item is OK	Item is NOT OK
Is trailer properly hitched to the vehicle (including safety chains)		
All lights are working properly		
Proper trailer for the load (check weight specifications) and load is balanced. If you anticipate the load is near the trailer weight limit, weigh the trailer at a weigh station		
Are tires in good condition and properly inflated?		

Notify the vehicle manager or rental company if you feel that any deficiencies are unsafe and DO NOT drive the vehicle

Signature: _____

ATTACHMENT C

HEALTHCARE OFFICIAL'S WRITTEN OPINION

Employee Name: _____ Date: _____

I have evaluated the Stantec employee identified above following occupational exposure to bloodborne pathogens.

The hepatitis B vaccine (is / is not) indicated.

The hepatitis B vaccine (has / has not) been given to the employee.

The exposed employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials that require further evaluation and/or treatment.

_____ _____

Name of Healthcare Official Signature

1 PURPOSE

Compressed gas cylinders, due to their content and high pressure, have the potential for creating hazardous working environments. It is essential that all employees who store, handle, or use such items be thoroughly familiar with procedures and safety requirements relating to their use. This safe work practice (SWP) provides information on the safe use, handling, and storage of compressed gas cylinders.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 SCOPE

This SWP is applicable to all Stantec employees who are exposed to hazards related to compressed gas cylinders. This SWP also applies to contractors, vendors, and visitors at Stantec locations and work sites under Stantec's control.

The SWP addresses the identification, transport, storage, and use of compressed gas cylinders and related equipment. It does not address:

- Compressed gas containers intended for medical use
- The charging of compressed gas cylinders or transferring compressed gases from one cylinder to another

Self-contained breathing apparatus (SCBA), fire extinguishers and single use compressed gas cylinders are exempt from the requirements of this SWP.

3 RESPONSIBILITIES

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this SWP, including:
  - Posting the most current version to The Lens
  - Monitoring applicable legislation to incorporate any new or revised regulatory requirements
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements within this practice are being met

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP

3.3 Supervisor

- Confirm that affected employees have reviewed this SWP in accordance with the review cycle in the Safe Work Practices Checklist
- Confirm that affected employees have completed training and have understood their responsibilities as outlined by this SWP

3.4 Project Manager (PM)

- Identify projects and worksites where this SWP is applicable
- Select appropriate hazard controls and document them using the Risk Management Strategy (RMS1) or Health and Safety Plan (HASP)
- Communicate the hazard identified and controls to be implemented in accordance with the RMS1 or HASP
- Confirm that applicable Stantec equipment is maintained and will be used in accordance with this SWP

3.5 Employees

- Review and understand this practice prior to working with compressed gas cylinders
- Know the proper use and limitations of equipment
- Follow the requirements set out in this practice and any additional requirements determined by the area supervisor regarding compressed gas cylinder handling, use, and storage for their area
- Report hazardous conditions immediately to their supervisor and/or Project Manager
- Wear and properly maintain the required Personal Protective Equipment (PPE)

4 HAZARDS – USING THE ENERGY WHEEL



The energy wheel is a visual tool used by Stantec to identify 10 sources of energy and to assess and control the hazards associated with each source. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. Before beginning any activity, review the potential hazards and controls associated with the task. For project work, these sources, hazards, and controls will be documented on the Risk Management Strategy (RMS1), and in a Field Level Risk Assessment (RMS2/field app). Below are the energy sources and hazards most commonly associated with compressed gas cylinders.

Energy Source	Hazards
Thermal	• Frostbite: o Gases may be at or below freezing temperatures when released from the cylinder o Some gases, when released, cause cylinder surfaces to become extremely cold; frost may form, given sufficient ambient humidity
Chemical	• Vary by gas. See section 4.1 for additional discussion.
Noise	• Loud hissing sounds from uncontrolled releases.
Gravity	• Cylinders and associated equipment, such as hoses, can create slip, trip, or fall hazards
Motion	• Uncontrolled or accidental releases of pressurized gas can turn cylinders, their components, and their attachments into projectile hazards. o Broken valves and detached regulators can be propelled through the air at dangerous speeds. o Damaged cylinders can be propelled like rockets or spin like pinwheels.
Electrical	• Electrical wiring and equipment can act as potential ignition sources in the presence of gases with combustible, flammable, or oxidizing properties.
Pressure	• Compressed gases are stored under high pressure and exert high levels of force when released.

Energy Source	Hazards
	• Poorly controlled releases in chemical reaction systems can cause vessels to burst, create leaks in equipment and hoses, or produce runaway reactions.

4.1 Chemical Energy

Each gas has unique chemical properties, some of which have the potential to be hazardous. Detailed information about the chemical hazards associated with a gas can be found in the Safety Data Sheets (SDS). SDSs must be provided by the manufacturer or distributor for every chemical received in a compressed gas cylinder. More information on SDSs and chemical hazards can be found in SWPs, including SWP-103 – WHMIS (Canada), SWP-104 – HazCom (US), SWP-133 – Hazardous Chemicals or Substances (ANZ), and SWP-134 – COSHH (UK).

Here is some general information about types of chemical energy hazards.

4.1.1 Flammable Gases

Flammable gases, such as acetylene, butane, ethylene, hydrogen, methylamine, and vinyl chloride, can burn or explode under certain conditions.

- Concentration: Flammable gases will only burn or explode when the concentration of the gas in air (or in contact with an oxidizing gas) is within a certain range. That range is different for each gas. The range is defined by a lower limit, known as the lower flammable limit (LFL) or lower explosive limit (LEL), and an upper limit, known as the upper flammable limit (UFL) or upper explosive limit (UEL). The LFL/LEL and UFL/UEL are identified on the gas's Safety Data Sheet (SDS).
    - The flammable range of any gas is widened in the presence of oxidizing gases such as oxygen or chlorine and by higher temperatures or pressures.
- Ignition: For a flammable gas within its flammable limits in air (or oxidizing gas) to ignite, an ignition source must be present. There are many possible ignition sources in most workplaces including open flames, sparks, and hot surfaces.

Many flammable compressed gases are heavier than air. If a cylinder leaks in a poorly ventilated area, these gases can settle and collect in sewers, pits, trenches, basements, or other low areas. The gas trail can spread far from the cylinder. If the gas trail contacts an ignition source, the fire produced can flash back to the cylinder.

4.1.2 Oxidizing Gases

Oxidizing gases are gases that may cause or contribute to the combustion of other materials more than normal air does, generally by providing oxygen and increasing atmospheric oxygen concentrations. In an oxygen-enriched atmosphere, combustible materials ignite more easily, burn faster, and are more difficult to extinguish. Oxidizing gases also react quickly and violently with most flammable gases.

4.1.3 Corrosive Gases

Corrosive gases can be grouped into two categories. The first category is acidic gases, which form acids upon contact with water. The second category includes gases that form alkaline materials upon exposure to water.

On contact with skin and other body tissue, many acids and alkali can cause chemical burns and even burn through flesh. In addition to this, many are also toxic.

4.1.4 Toxic Gases

Toxic gases can cause damage to body tissues and systems, up to and including severe illness and death. Some gases are so toxic that their release through a safety device would be hazardous. Cylinders for these gases are built to withstand higher pressures than normal cylinders.

4.1.5 Inert Gases

Asphyxiation is the greatest hazard associated with inert gases like nitrogen, argon, and helium. These gases displace oxygen in the air, and, in sufficient concentrations, can create an oxygen-deficient atmosphere, leading to asphyxiation. Inert gases are odorless and colorless, so workers may continue to breath normally without realizing that they are being deprived of oxygen. Effects of exposure to low oxygen concentrations can include giddiness, confusion, loss of judgment, loss of coordination, weakness, nausea, fainting, loss of consciousness, and death.

5 CONTROLS

Where compressed gases are used or stored, the hazard assessment and control of hazards related to it must take into consideration:

- The general hazards of working with compressed gas
- Movement of gas cylinders
- Safe storage of cylinders
- The method of communicating the hazards to workers in the area
- Training of staff.

The controls outlined in this section are applicable to compressed gas cylinders in general. Some jurisdictions may have additional requirements for compressed gas cylinders under regulations governing occupational health and safety, hazardous chemicals or materials, or transportation of dangerous or hazardous goods and materials.

5.1 Handling of Compressed Gas Cylinders

5.1.1 General Safe Handling

In general, compressed gas cylinders will be used, handled, stored, and transported in accordance with manufacturers recommendations and specifications.

- Compressed gas cylinders and associated equipment must be protected from damage and excessive heat during transportation, storage, and use.
  - They must not be dropped or struck violently.
  - They must be protected from corrosive chemicals, fumes, and vapors.
  - They must be protected from the ground as necessary to prevent bottom corrosion.
  - They must not be exposed to continuous dampness.
  - They must not be exposed to an open flame.
  - They must not be exposed to temperatures above 125°F (52°C) or the maximum exposure temperature specified by the manufacturer, whichever is lower.
  - Where extreme temperatures prevail, cylinders must be protected from direct sunlight.
- Cylinders must be secured with a chain or strap between the “waist” and “shoulder” of the cylinder at all times.
- Cylinders must be kept away from electrical wiring or structures where the cylinder could become part of an electrical circuit.

- All cylinders must have a valve-protection cap that remains in place except when the cylinder is currently in use. ("In use" includes cylinders connected to equipment or processes used at least 3 times per week.)
  - When in place, valve-protection caps must be screwed all the way down on the cylinder neck ring and fit securely.
  - Valve-protection caps should also have a means of attachment that keeps them with the cylinder when the cylinder is in use.
  - If a cap cannot be removed by hand or by using a cylinder valve and cap wrench, then the cylinder must be tagged "Do Not Use" and removed from service, properly stored, then returned to the vendor
- Where a cylinder is frozen to the ground, do not pry the valves or valve protection caps with a bar. The use of warm (not boiling) water is recommended.
- Never discard pressurized cylinders in the normal trash.
- Never attempt to mix gases in a cylinder.
- Cylinders containing pressurized liquid oxygen, nitrogen, or argon must be transported, stored, and used in an upright position.

5.1.2 Empty Cylinders

Empty cylinders must be dated and clearly marked "EMPTY" or with the initials "M.T." Beyond that requirement, they will be handled, transported, and stored in the same way as cylinders that still contain gas.

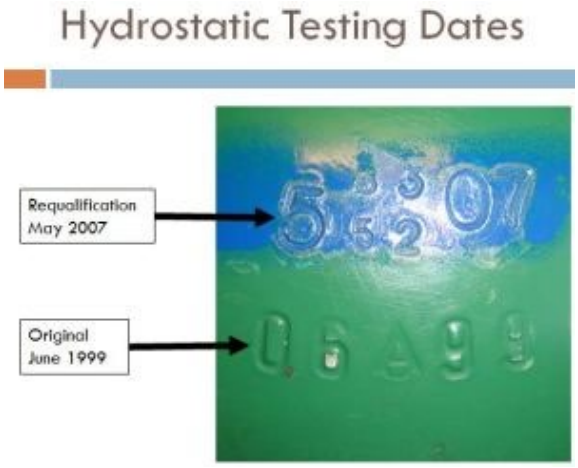
- Valves will be closed.
- The valve-protection cap will be in place and screwed all the way down.
- The cylinder will be secured with a chain or strap.

5.1.3 Hydrostatic Certification

Compressed gas cylinders are generally required to undergo hydrostatic testing to verify the integrity of the cylinder and check for leaks. Cylinders must be tested and certified before they are initially placed into service. They must also be tested and recertified periodically throughout their service life. The frequency of recertification, as well as limits on a cylinder's service life, are determined by the material from which the cylinder is made.

Certification and recertification requirements are governed by regulation and can vary by jurisdiction. In some jurisdictions, including Canada and the United States, the requirements are found in regulations governing the transportation of dangerous or hazardous goods and materials. Refer to the relevant regulations for more information.

Certification of the initial hydrostatic test should be stamped into the exterior of the cylinder, usually on the top end, neck, or shoulder. Stamps for periodic recertification should also appear on the neck or shoulder of the cylinder. The formatting of the date stamps may vary. For example, in the photo below, the stamp of 06A99 indicates that the cylinder was originally hydrostatically tested in June of 1999; "A" is the inspector's stamp. $5^{33}/_{52}07$ means that the cylinder was re-tested in May of 2007 at facility "$^{33}/_{52}$".



- Do not accept compressed gas cylinders without verifying that they have a current hydrostatic certification and when that certification expires.
  - If there is any doubt about the recertification frequency or how to interpret the certification stamps, ask the manufacturer or distributor supplying the cylinder.
- Cylinder certification dates will be checked during monthly office or lab inspections and documented on the Worksite Inspection – Office or Lab (RMS4) form.
- When compressed gas cylinders are present on project site under Stantec's control, site inspection will be documented on the Worksite Inspection – Field (RMS5) form.
- Do not keep cylinders past the expiration of their current certification. Local regulations may prohibit or restrict the transportation of cylinders without a valid certification.

5.1.4 Identification of Contents

Every cylinder must carry a label that clearly identifies its contents by name. Labels must be durable and legible; they cannot be removeable.

- Do not accept or use any cylinder that does not identify its contents legibly by name.
- If the labelling on the gas cylinder becomes unclear or defaced so that the contents cannot be identified, the cylinder must be marked "contents unknown." Contact the manufacturer to obtain appropriate handling and storing procedures.

Color coding is not a reliable means of identification; cylinder colors vary from supplier to supplier. Similarly, labels on valve-protection caps have little value because they can be removed, and many caps are interchangeable.

5.2 Transporting and Moving Gas Cylinders

5.2.1 General Safe Transporting and Moving

The following provisions apply when transporting cylinders from one site to another and when moving a cylinder between locations within a site.

- Prior to transport or moving, all compressed gas cylinders must be visually inspected for obvious damage, leaks, corrosion, and illegible markings.
- Cylinders must not be transported or moved without a valve-protection cap in place.
- Do not use the protective valve caps to lift or move a cylinder.
- Cylinders must not be transported with the regulator attached to the cylinder.
- Do not slide, drag, or roll cylinders on edge.

- When a cylinder has been transported or moved in a horizontal position, it must be placed in the upright position for at least 1 hour before it is used, to avoid freezing of the cylinder valve.

5.2.2 Lifting

Where using a hoisting apparatus to lift cylinders (such as a crane or a mechanical lift in a shop), suitable cradles or platforms for holding the cylinder must be used.

- Do not hoist or lift cylinders using a sling or magnet.
- Do not lift cylinders by the cap.

5.2.3 Carts and Trucks

- Always use a cylinder cart or truck to move compressed gas cylinders.
- Cylinders in a cart or truck must be fastened securely so that they will not fall or strike each other.

5.2.4 Elevators

When moving cylinders on elevators, use freight elevators whenever possible. Do not allow other passengers to ride the elevator with the gas cylinder.

5.3 Storage of Compressed Gas Cylinders

5.3.1 General Safe Storage

- Cylinders will be stored in a dry, well-ventilated area away from:
  - Flames, sparks or any source of heat or ignition
  - Readily flammable substances
  - Electrical circuits
  - Direct sunlight
- Cylinders may not be stored in hallways, in or under stairways, or in egress areas for emergency exits.
- Cylinders must be stored with the labels facing out and readily visible to employees and emergency responders.
- Full and empty cylinders of all gases must be stored separately and identified by signs to prevent confusion.
- Liquefied flammable gas cylinders will be stored in an upright position or such that the pressure relief valve is in direct communication with the vapor space of the cylinder.
- Storage areas must be prominently posted with the name of the gases stored and with signs prohibiting smoking.

5.3.2 Chemical Compatibility

Cylinders containing incompatible gases will not be stored together.

- Flammables and oxidizers may not be stored together. (This applies to cylinders in use, stored cylinders, and "empty" cylinders.)
  - Keep oxygen cylinders a minimum of 20 feet (6 meters) from flammable gas cylinders or combustible materials.
  - If that is not possible, the cylinders will be separated by a non-combustible barrier that is at least 5 feet high (1.5 meters). The barrier must have a fire-rating of at least one-half hour or as required by the authority having jurisdiction, whichever is greater.
- Corrosives may not be stored with flammables or oxidizers.

- In outdoor storage areas, keep corrosive cylinders a minimum of 20 feet (6 meters) from flammables or oxidizers.
  NOTE: Corrosive gas cylinders may not be stored indoors unless they are stored in gas cabinets.

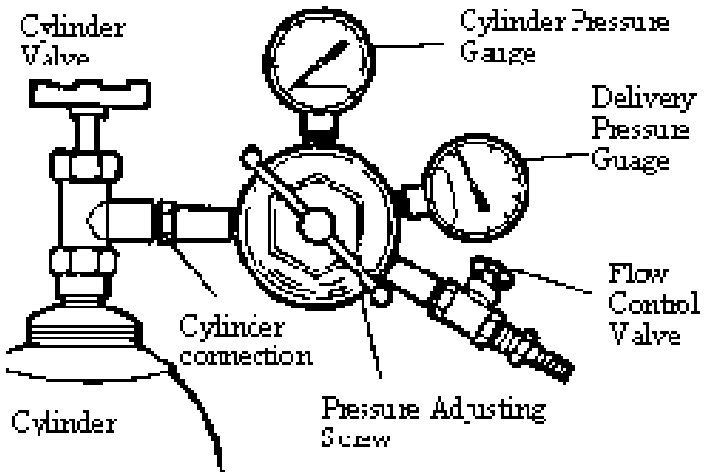
In Alberta, incompatible compressed gases may not be stored in the same room unless storage arrangements are in accordance with Part 3 of the Alberta Fire Code (1997).

5.4 Regulators and Fittings

- Only devices approved for use with compressed gas cylinders, such as torches, regulators, or pressure-reducing valves, will be used.
- Do not permit oil or grease to come in contact with cylinders, regulators, other fittings, or their valves.

5.4.1 Regulators

- Never use a compressed gas without a pressure-reducing regulator.
  - The regulator must be marked for its maximum cylinder pressure.
  - The regulator must be designed for the specific gas.
  - The regulator must reduce the pressure to the design of the system.
- Regulators should have a gauge to measure the cylinder pressure and another to monitor the outlet pressure.
- Use only regulators compatible with the valve connector of the gas being used.
- Never use an adaptor between a cylinder and a regulator.
- Never force connections that do not fit.
- Never use grease, lubricating materials, or an aid (e.g., a pipe dope or Teflon tape) between the threads of the cylinder and regulator.
- Before connecting a regulator to a cylinder valve:
  - Inspect the regulator for obvious damage, any signs of grease, dirt or solvents, appropriate threads.
- Crack the valve by opening it slightly, then immediately closing it.
  - When opening the valve, stand to one side of the outlet, never in front of it.
  - Never crack a fuel-gas cylinder valve in areas where welding work is being performed or near sparks, flames, or other possible sources of ignition.
- After attaching a regulator to a compressed gas cylinder:
  - Turn the regulator adjustment screw out (counterclockwise) until it feels loose.
  - Stand behind the cylinder with the valve outlet facing away from you and observe the high-pressure gauge on the regulator from an angle; never pressurize a gauge while looking directly at it.
  - Open the valve handle on the gas cylinder slowly until you hear the space between the cylinder valve and regulator fill with gas. You can also watch the pressure rise on the high-pressure gauge. If you turned the adjustment screw properly, there should be no gas flow out of the regulator and no pressure rise on the low-flow pressure gauge.
  - When you are ready to use the cylinder, open the valve until you feel it stop, then turn it back one-quarter turn.



- When regulators or parts of regulators, including gages, need repair, the work will be performed by skilled mechanics who have been properly instructed.
- Before a regulator is removed from a cylinder valve, the cylinder valve must be closed, and the gas released from the regulator.

5.4.2 Fittings

- Do not tamper with safety devices and valves nor attempt to repair them.
- Always use proper fitting wrenches when making connections. Do not use vice grips or pipe wrenches.
- When testing for leaks in the connections between the cylinder, hoses, and the regulator, use soapy water. Never use a flame to locate gas leaks.
- If leaks are found and cannot be remedied, do not attempt to repair cylinder valves or their relief devices.
    - Secure the valve.
    - Attach a tag stating the cylinder is "Out of Service."
    - Remove the leaking cylinder to a safe, secure outdoor location.
    - Notify the gas supplier and follow their instructions as to the return of the cylinder.

    NOTE: If the gas is flammable or toxic, place an appropriate sign at the cylinder, warning against these hazards.

5.5 Use of Compressed Gas Cylinders

5.5.1 General Safety Requirements

- All compressed gas cylinders, regulators, hoses, and connections will be visually inspected prior to use.
    - Do not use any cylinder which is not provided with a legible decal that identifies its contents.
- Cylinders not having fixed cylinder valve (hand wheels) must have keys, handles, or nonadjustable wrenches on valve stems while these cylinders are in service.
- Before attaching cylinders to a connection, be sure that the threads on the cylinder and the connection mate are of a type intended for the gas service.
- Never lubricate, modify, force or tamper with cylinder valves.

- Wipe the outlet with a clean, dry, lint-free cloth before attaching connections or regulators. The threads and mating surfaces of the regulator and hose connections should be cleaned before the regulator is attached.
  - Hoses showing leaks, burns, worn places, or other defects will be repaired or replaced.
- Attach the regulator securely before opening the valve wide. Always use a cylinder wrench or another tightly fitting wrench to tighten the regulator nut and hose connections.
- Open cylinder valves slowly. Do not use a wrench to open or close a hand wheel type cylinder valve. If it cannot be operated by hand, the valve should be repaired. Stand to the side of the regulator when opening the cylinder valve.
- Where cylinders cannot be kept away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them, a fire-resistant shield must be provided
- Close the main cylinder valves and release the pressure in the hose:
  - Before moving
  - When left unattended
  - When not in use

See SWP-414 – Hot Work for additional information on welding.

5.5.2 Gas-specific Safety Requirements

Employees must know and understand the properties, uses, and safety precautions of a gas before using the cylinder. The applicable Safety Data Sheet (SDS)) will be referenced.

5.5.2.1 Liquified Gases

- Cylinders containing pressurized liquid oxygen, nitrogen, or argon must be transported, stored, and used in an upright position.

5.5.2.2 Flammables Gases

- Flammables and oxidizers may not be stored together. (This applies to cylinders in use, stored cylinders, and "empty" cylinders.)
- Liquefied flammable gas cylinders should be stored in an upright position or such that the pressure relief valve is in direct communication with the vapor space of the cylinder.
- Keep oxygen cylinders a minimum of 20 feet (6 meters) from flammable gas cylinders or combustible materials.
  - If that is not possible, the cylinders will be separated by a non-combustible barrier that is at least 5 feet high. The barrier must have a fire-rating of at least one-half hour or as required by the authority having jurisdiction, whichever is greater.

5.5.2.3 Corrosive Gases

- Corrosives may not be stored with flammables or oxidizers.
  - In outdoor storage areas, keep corrosive cylinders a minimum of 20 feet (6 meters) from flammables or oxidizers.

5.5.2.4 Oxygen-Fuel Systems

- Use a flame arrestor or a flashback arrestor device at the regulator end of an oxygen-fuel system.
- Use a back-flow prevention device (non-return valve) at the torch end of each hose of an oxygen-fuel system.

- When parallel lengths of oxygen-fuel system hose are taped together for convenience and to prevent tangling, not more than 4 inches (10.2 cm) out of 12 inches (30.5 cm) will be covered by tape.

5.5.2.5 Acetylene

A compressed gas cylinder containing acetylene must be used only in the upright position.

- An acetylene cylinder valve will not be opened more than one and one-half turns of the spindle, and preferably no more than three-fourths of a turn.
- A suitable device for closing the valve on an acetylene cylinder must be immediately available when the cylinder is connected for use.
- Do not lay acetylene cylinders on their sides.
  - Cylinders of acetylene contain acetylene dissolved in acetone
  - Acetylene cylinders must not be placed on their sides, since the acetone and binders will have dislodged
  - If an acetylene tank has accidentally been left on its side, set it upright for at least one hour before it is used

5.5.2.6 Oxygen

Oxygen gas must not be used to:

- Operate a pneumatic tool
- Start an internal combustion engine
- Clean equipment or clothing
- Create pressure in a container
- Ventilate a workplace

5.6 Compressed Air Receivers

Compressed air receivers are tanks or cylinders designed to work in conjunction with an air compressor to receive and store the compressed air for later use.

- All compressed air receivers will be equipped with an indicating pressure gauge. The gauge must be located where it can be easily read and will be equipped with one or more spring loaded safety relief valves. The safety relief valves will be set to prevent pressure from exceeding the maximum allowable working pressure of any receiver by more than 10%.
- All safety relief valves, indicating and/or controlling devices and other safety equipment will be constructed, located, and installed in positions where they cannot be damaged or made inoperable in any way.
- All safety relief valves must be tested frequently and at regular intervals.
- All compressed air receivers will be equipped with a drain. Receivers will be drained frequently and at regular intervals. This is done to prevent the accumulation of liquids in the receiver.
- Compressed air will not be used for any cleaning purposes except when the pressure is regulated to below 30 P.S.I. and only if chip guarding and PPE are being utilized

5.7 Personal Protective Equipment (PPE)

Choosing suitable personal protective equipment (PPE) for a job is essential. In addition to the PPE identified in the RMS1 or HASP, the Safety Data Sheets (SDSs) for specific gases will provide additional guidance.

Know and be familiar with the right PPE for use in emergencies as well as during normal operations.

5.7.1 Skin Protection

PPE such as gloves, aprons or other clothing can be a last line of defense against gases that are harmful to the skin. Choose clothing made of materials that resist penetration or damage by the chemical. Follow the recommendations contained in the SDS.

5.7.2 Eyes and Face Protection

Eye protection is required any time you are working with compressed gases. The use of safety glasses may not be sufficient. In some cases, you will need to wear a face shield in addition to safety glasses or use of chemical safety goggles. Again, you must follow the recommendations contained in the SDS.

5.7.3 Respiratory Protection

Where the SDS requires the use of respirators for breathing protection, consult SWP-409 – Respiratory Protection for additional guidance

6 TRAINING OR QUALIFICATIONS

Employees who are required to work with compressed gas cylinders will receive on-the-job instruction in the requirements for this practice, including but not limited to the proper use, handling, and inspection of compressed gas cylinders and regulators. They will also review manufacturer supplied instructions for use and care of required equipment. Competency will be assessed by a supervisor and/or experienced personnel.

Additional training may also be required under:

- SWP-103 – Workplace Hazardous Materials Information System (WHMIS) [Canada]
- SWP-104 – Hazard Communication (HazCom) [United States]
- SWP-133 – Chemical Safety (Australia, New Zealand)
- SWP-134 – Control of Substances Hazardous to Health (COSHH) [United Kingdom]

7 OUTSIDE AUTHORITIES TO BE CONTACTED

Not applicable

8 RESOURCES

8.1 Internal

- Energy Wheel Field Guide
- Risk Management Strategy (RMS1)
- Worksite Inspection – Office and Laboratory (RMS4)
- Worksite Inspection – Field (RMS5)
- SWP-103 – Workplace Hazardous Materials Information System (WHMIS) [Canada]
- SWP-104 – Hazard Communication (HazCom) [United States]
- SWP-133 – Hazardous Chemicals or Substances (ANZ)
- SWP-134 – Control of Substances Hazardous to Health (COSHH) [United Kingdom]
- SWP-409 – Respiratory Protection
- SWP-414 – Hot Work

8.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library
- OSHA Compressed Gas and Equipment Safety and Health Topics
- Compressed Gas Association Safety Alerts
- Compressed Gas Safety Guide. Stony Brook University, Environmental Health and Safety (EHS), (2005, July). Provides information on compressed gas safety, such as requirements, training, reporting, applicable regulations, and compressed gas association pamphlets.
- Compressed Gas Safety: General Safety Guidelines. Montana Department of Labor and Industry, Occupational Safety and Health Bureau, 291 KB PDF, 12 pages. Provides information that may be used as a guideline for the safe use of compressed gas.
- If your jurisdictional standard is not listed, please contact your HSSE representative for guidance.

8.2.1 Australia and New Zealand

- WHS States and Territories – SafeWork Australia Model Code of Practice "Managing risks of hazardous chemicals in the workplace"
- Western Australia – "National Code of Practice for the Control of Workplace Hazardous Substances [NOHSC:2007(1994)]"
- Victoria – Worksafe "Compliance Code – Hazardous Substances"
- New Zealand – Worksafe Practical Guide "Working Safely with Hazardous Substances"

8.2.2 Canada

- Hazardous Products Act (federal)
- Hazardous Products Regulations (federal)
- Transportation of Dangerous Goods (federal)
- CSA B339 – Cylinders, spheres, and tubes for the transportation of dangerous goods
- Provincial WHMIS legislation
- CCOHS Fact Sheet: Compressed Gases – Hazards
- Transport Canada FAQ on Cylinders and Tubes

8.2.3 United Kingdom

- Control of Substances Hazardous to Health Regulations (COSHH) 2002
- Classification, Labelling and Packaging of Substances and Mixtures Regulations (CLP 2015)

8.2.4 United States

- 29 CFR 1910.101
- 49 CFR Part 178, Subpart C
- 49 CFR Part 180, Subpart C

9 DEFINITIONS

Back-flow prevention device (non-return valve): Reduces the probability of a flashback, as it serves to prevent reverse flow of oxygen into fuel lines and fuel into oxygen lines.

Compressed Gas Association: Founded in 1913, is dedicated to the development and promotion of safety standards and safe practices in the industrial and medical gas industry.

Flame arrestor: Usually contains an element which may consist of narrow passages through a wire mesh or metal foam. When a flame enters the element, it is quickly cooled by the cold surface of the element and the flame is extinguished.

Flashback arrestor: A flame arrestor that contains a pressure or temperature actuated cut-off valve.

Safety Data Sheet (SDS): Documents that contains specified, required information about a hazardous product, including information related to the hazards associated with any use, handling, or storage of the hazardous product in a workplace. Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., firefighting). Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also contain Sections 12 through 15, to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Regulator: A pressure and/or temperature activated device used to prevent the pressure from rising above a predetermined maximum, thereby preventing rupture of a normally charged cylinder when subjected to a standard fire test.

Valve-protection cap: A rigid removable cover provided for container valve protection during handling, transportation, and storage.

10 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- Not applicable

File these records in the Project Health & Safety File:

- Not applicable

11 REVISION HISTORY

Date	Changes	Acknowledgments	Approval
February 1, 2023	Edits to 1 Purpose, 3.1 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Ferguson-Scott	P. Poelzer
October 19, 2021	Provided exclusions in Scope (s. 2). Aligned Responsibilities (s. 3) with roles. Aligned Hazards (s. 4) with Energy Sources. Edits and additions to Handling (s. 5.1)	K. Bayer, R. Roy	J. Treen
April 28, 2017	Change HSE to HSSE, format. Edits to s.5.2 Transportation and 5.3 Storage.	M. Philipp, C. Ferguson-Scott	J. Lessard

May 11, 2016	Addition of section 5.6 Compressed Air Receivers.	C. Ferguson-Scott	
January 21, 2015	Minor additions to transport (5.2), storage (5.3), regulators (5.4), and use (5.5). Training statement clarified (6.0).	C. Ferguson-Scott	
February 23, 2010	Changed HSE to SWP; reformatted header and body.	G. Doran	K. Robinson
January 4, 2010	New SWP posted to StanNet.		K. Robinson

1 PURPOSE

This safe work practice (SWP) is meant to provide guidance to employees whenever they are required to add fuel to gasoline engines tanks, slip tank or intermediate bulk containers (IBC), or portable fuel container (PFC); also known as a gas can or jerry can.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 SCOPE

This SWP applies to the vehicles that employees use on a regular basis, to the heavy equipment, and smaller portable gas-powered equipment that field staff may be required to use.

3 RESPONSIBILITIES

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this SWP
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements within this practice are being met

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP

3.3 Supervisor

- Confirm with each employee reporting to them which SWP they need to review
- Verify that each employee has completed their SWP review based on the review cycle listed in the SWP Checklist

3.4 Project Manager

- Identify potential hazards employees could be exposed to
- Using the hierarchy of controls, communicate the site-specific controls to employees using the Risk Management Strategy (RMS1) form or Health and Safety Plan (HASP)
- Only assign employees that are trained in the requirements of the applicable SWPs, who understand the hazards associated with the work, and who can apply the appropriate controls
- Hold employees accountable for properly implementing this SWP
- Coordinate with the Office Safety and Environment Coordinator (OSEC) for the supply and/or purchase of the required personal protective equipment (PPE) and any other equipment that may be required
- Provide the required PPE to employees that need it

- Make sure provided equipment has been selected in accordance with the manufacturer's recommendations
- Require employees to use the PPE identified for their tasks
- Coordinate the scheduled work with clients so that all Stantec employees performing work on-site are aware of any precautions or controls required by the client
- Communicate emergency response and transportation procedures to employees should external medical assistance be necessary
- Comply with all relevant Occupational Health and Safety (OH&S) requirements and regulations

3.5 Office Safety and Environment Coordinator (OSEC)

- Assist PMs, supervisors, and others in obtaining appropriate safety and environment equipment for employees working on their projects

3.6 Employees

- Be aware of the hazards that may be encountered while fueling gasoline engines tanks, slip tank or IBC, or PFCs
- Select and use appropriate Personal Protective Equipment (PPE), together with the tools and equipment required to conduct the work safely
- Know the proper use and limitations of equipment
- Inspected, and maintained provided equipment in accordance with the manufacturer's recommendations
- Be aware of and comply with requirements outlined herein
- Inspect work areas regularly for hazards
- Know how to control and respond to hazards and emergencies including use of emergency equipment

4 HAZARDS

Energy Source	Hazards
Chemical	Explosion/Fire: • Gasoline vapors are highly flammable and can ignite at temperatures as low as -45° C/-49° F. • Explosive air/vapor mixtures can form at ambient temperatures.
	Inhalation: • The main route of exposure to gasoline is likely to be by inhalation. • Exposure to the vapor during normal refueling is not a significant health concern. • Short-term exposure to high concentrations of vapor (greater than 500 ppm) may cause irritation of the eyes, nose and respiratory tract and possibly signs of central nervous system depression (e.g. headache, dizziness, mental confusion).
	Skin contact: • Minor accidental skin contact may occur and is not a significant health concern.

	• Gasoline is unlikely to cause systemic toxicity following accidental skin exposure. • Skin contact may cause local irritation, and if contact is frequent or prolonged, skin reactions may be severe. • Skin contact can also cause dry, cracked skin or dermatitis.
Chemical	Eye contact: • Accidental splashes entering the eye may cause irritation and discomfort. • Such effects are usually temporary, and permanent damage is considered unlikely.
	Ingestion & Aspiration: • Gasoline is unlikely to cause systemic toxicity following accidental ingestion. • Aspiration of even small amounts of gasoline into the lungs can lead to severe damage to lung tissue and can be potentially fatal.

5 CONTROLS

Stantec uses the hierarchy of hazard control, which is based on the effectiveness of the controls, to eliminate or mitigate exposure to hazards. The hierarchy of hazard controls is, in order of decreasing effectiveness:

- Elimination
- Substitution
- Engineering controls
- Warning
- Administrative controls
- Personal protective equipment

5.1 Elimination

Consider eliminating the use of gasoline-powered engines by using tools, machinery, and vehicles powered by electric motors.

5.2 Substitution

Consider substituting gasoline-powered engines with engines that use less hazardous fuels such as diesel.

5.3 Engineering

5.3.1 Ventilation

- Areas where gasoline is stored must be well ventilated.
- Areas where gasoline-powered engines are fueled must be well ventilated.

5.3.2 Eye Wash and Emergency Showers

- Where significant skin contact has occurred:
  - Drench clothing with water before removing to avoid risk of sparks from static electricity
  - Wash all affected skin thoroughly with soap and water
- If the eyes are affected, irrigate them immediately with copious amounts of water. If irritation occurs and persists, obtain medical advice.

5.3.3 Slip Tank, Intermediate Bulk Containers (IBC), and Portable Fuel Containers (PFC)

- Only approved tanks and containers will be used for storage, transportation, and handling of flammable and combustible liquids.
- When transporting fuel to a work site, make sure the tank or container is fit for the trip and where applicable, in accordance with the Transportation of Dangerous Goods Regulation.

5.3.3.1 Transportation of Dangerous Goods (Canada)

- In Canada, you can carry up to 150 kg of gasoline, provided each container weighs 30 kg or less (about 20 liters or 5 gallon).
- For volumes greater than 150kg, or containers weighting more than 30kg, gasoline delivered or transported must use a Transport Canada standardized slip tank or IBC (means of containment) that has been certified by the Canadian General Standards Board and manufactured by an ISO certified company.
    - Slip tanks or IBCs must be a UN standardized mobile tank/IBC or an equivalent specification permitted by the CAN/CGSB-43.146 standard
    - Slip tanks/IBCs are subject to periodic leak tests and inspections by a facility registered with Transport Canada
    - Slip tanks/IBCs used to transport gasoline is/are limited to a total maximum combined capacity of 2000 L.

5.3.3.2 US Occupational Safety and Health Administration (OSHA)

Approved safety cans or US Department of Transportation (DOT) approved containers will be used for the handling and use of flammable liquids in quantities of 5 gallons or less.

- Plastic gas cans may meet US Environmental Protection Agency (EPA) requirements, but they do NOT meet DOT requirements.
- Some gas cans meet CARB spill-proof regulations in certain states or Air Quality Management District (AQMD) rules; however, they do not meet the DOT rules.

5.3.4 Transfer Pumps and Siphons

- Use a fuel pump or siphon to transfer gasoline from a slip tank, IBC, or PFC to a gasoline-powered engine.
- Never siphon gasoline by mouth.

5.3.5 Funnels and No-Spill/Anti-Spill Spouts

- Use appropriate equipment, such as pour spouts and funnel, for fuel transfer.
- Equip all gas cans with no-spill/anti-spill spouts.

5.3.6 Secondary Containment

In this SWP, secondary containment is a control measure used to prevent accidental releases or spills of gasoline to the environment (water, soil & air). Secondary containment can be a structure that is chemically compatible to hold a release and remain liquid tight until clean up occurs. Secondary containment can also be an engineered means to redirect a spill away from water or other sensitive receptor to a temporary diversion system. The requirements for secondary containment vary from one jurisdiction to another. Secondary containment should be provided for:

- Single wall fuel tanks
- Fuel transfer activities, both mobile and stationary

- Stored fuel in IBCs, drums, and PFCs

5.4 Warnings

- Do not smoke within 3 m (10 ft) of the working area.
- Keep gasoline away from ignition sources like heat, sparks, and flame.
  - Do not add gasoline to a running engine.
  - Allow machines or equipment to cool down before refueling.
- Exposure to gasoline liquid or vapor can adversely affect health.
  - Avoid prolonged breathing of the gasoline vapors.
  - If symptoms arise from exposure to gasoline, take the person to fresh air.
  - Keep gasoline away from your eyes and skin.
  - Never use gasoline as a cleaning solvent or to wash your hands.
  - If gasoline is ingested do not induce vomiting, obtain medical advice immediately.
- Follow the manufacturer's fuel requirement, as found in the owner's manual.
  - Special attention must be given to the ethanol content as many engines are not designed to run on E15 or higher ethanol content.
  - Generally, small engines are not designed to deal with the more corrosive E15 blend.
  - When left in a fuel tank too long, ethanol can clog fuel-system components.
  - Two-stroke engines run hotter with an ethanol blend, which accelerates the potential damage.
- Two-stroke engines use a mixture of oil & gasoline in a single fuel tank.
  - You must know what ratio is required (e.g., 25:1 or 30:1) before filling the tank.
  - The incorrect fuel mixture will cause engine problems and/or damage.

5.5 Administrative

- Use product in gasoline-approved equipment only (not diesel).
- Inspect the gas tank for signs of damage.
- Provide adequate clearance, particularly around lights and heating equipment.
- Store PFCs in accordance with Fire Code requirements (either in a well-ventilated area away from emergency exits, or in a marked cabinet designed for storage of flammable materials).
- Outdoor storage and refueling areas must be free of weeds, debris, and combustible material.
- Transfer gasoline only in well ventilated areas (outdoors).
- Immobilize equipment while fueling.
- Fill the tank with fresh, clean unleaded gasoline.
- To prevent spillage, do not "top off" or overfill the tank.
  - Allow room for fuel expansion.
  - Caution is to be exercised when fueling close to a lake or a stream. You must be far away enough to contain a spill so it will not enter the water
- Clean off any spilled gasoline before starting the engine.
- Report spillage to your manager.
  - If you spill a small amount of gasoline (that which can be safely contained and recovered using the spill kit on-hand), ventilate the area at once and then use absorbent material to clean up the spill.
  - If the spill is large, call the fire department.

5.5.1 Guidelines for Filling a PFC

- When filling a PFC, follow same rules as when fueling car:
  - Turn off engine
  - Extinguish smoking materials
  - Leave electronic devices in the vehicle
- Place the PFC on the ground during filling and keep the metal nozzle spout in contact with the container to prevent build-up and discharge of static electricity.
  - Never fill a PFC on the bed of a pickup, in the back of an SUV, or in the trunk of a car.
- Keep PFCs five feet away from vehicle to prevent ignition of fumes by hot engines or mufflers.
- Ask others to stand back during filling, at least 1.5 meters (5 ft).
- Manually control the nozzle valve throughout the filling process.
  - Fill a PFC slowly to decrease the chance of static electricity build-up and minimize spilling or splattering.
  - Back off on the trigger to slow fuel flow as the PFC becomes full.
  - Fill the PFC no more than 95 percent full to allow for expansion.
  - When filling is complete, tighten the cap on the PFC.
  - Wipe off any gasoline that spilled on the outside of the PFC.
  - Ask the station attendant to properly dispose of the material used to wipe off the gasoline.

5.5.2 Guidelines for Transporting Gasoline in PFCs

- Make sure the cap is on tightly before you put the PFC in your vehicle.
- Put PFCs in the trunk of the car or in bed of pickup.
  - Do not put container in the passenger area of your vehicle.
- Restrain the PFC so it cannot tip over or slide around while you are driving.
- Never leave a vehicle with a PFC in direct sunlight.

5.5.3 Guidelines for Storing Gasoline Safely

- Store PFCs in a well-ventilated place.
  - Do not store gasoline in the living area of a home.
- Store PFCs away from ignition sources (e.g., gas pilot lights or flames, electric motors, stoves, and heaters) and from combustibles (e.g., paper, rags, and cardboard).
- When gasoline is not used within 30 days, it's important to use a fuel stabilizer.

5.5.4 Guidelines for Dispensing from a Drum

- Bonding and grounding are needed when dispensing flammable liquids from storage drums to smaller electrically conductive PFCs.
- Use an electric fuel pump when dispensing from a drum.
  - When an electric fuel pump is not available or not practical, use a manual pump.
  - Always store and secure the fuel hose above the drum to prevent siphoning.
- Dispensing procedures must be clearly outlined and posted where operators can see them.
- Keep the drum upright; avoid dispensing from a horizontal drum.

5.5.5 Guidelines for Fueling from a PFC

- Before refueling, turn off the engine.
  - Allow hot surfaces to cool enough so they cannot ignite gasoline vapor.

- Transfer gasoline in an area with good ventilation to reduce the hazard of fire and exposure to vapors.
  - Do not fill gas tanks indoors.
- Make sure that there are no sources of ignition (e.g., gas pilot lights or flames, electric motors, stoves, heaters) within 50 feet/15 meters.

5.5.6 Signage/Labeling Requirements

- Signs should be displayed where storage (e.g., fuel cache) or dispensing takes place.
- Slip tanks, IBCs, and PFCs must be labeled or marked to indicate contents.
  - In Canada:
    - Slip tanks and IBCs with a total gross mass of dangerous goods of 500 kg or less can use the "Placarding Exemption for Dangerous Goods Having a Gross Mass of 500 kg or Less."
    - Slip tanks and IBCs with a total gross mass of dangerous goods of more than 500 kg must meet the TDG regulation placard requirements.
    - PFCs must be labelled in accordance with the Workplace Hazardous Materials Information System (WHMIS), unless the person who fills the PFC uses it in its entirety during that one shift and keeps it with in their proximity.
  - In the US, secondary container labels must comply with OSHA's Hazard Communication standard if the material is not used within the work shift of the individual who makes the transfer.

5.5.7 Guidelines for Disposal

- Gasoline is a hazardous material and can only be disposed of in an approved manner.
  - Do not discharge gasoline onto the ground.
  - Do not discharge gasoline into a sewer, street drain, or bodies of water.
  - Do not dispose of a container containing gasoline in a garbage can or trash container.
  - For old or dirty gasoline, find a recycling organization that will accept it. Locate such an organization by contacting your community's fire department, recycling center or hazardous waste disposal center.
- Check local regulations for disposal requirements, including disposal of gasoline-soaked material (e.g., absorbent, rags, clothing, etc.).

5.5.8 Other Emergency Procedures

- In the event of a spill:
  - Stop the spill if it can be done safely.
  - Contain and recover the spill.
  - Collect any contaminated sorbent.
  - Secure the waste.
  - Isolate the area from all potential sources of ignition, recognizing that the vapor is heavier than air, and may travel some distance to remote sources of ignition.
- Where a spill has already reached water:
  - Use "oil only" sorbent pads or booms which absorb oil and repel water, float on top of the water and are easily retrievable.
  - Alternatively, use dry straw, grass, corn cobs or other natural material that will float.
- Where a spill has entered a sewer system, contact the authority having jurisdiction.
- Remove gasoline-soaked clothing immediately.

- Before removing gasoline-saturated clothing drench it with water to avoid risk of sparks from static electricity.
- In the event of a fire near a gasoline storage area, do not fight it.
  - Move away and call the fire department.

5.6 Personal Protective Equipment (PPE)

5.6.1 Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

5.6.2 Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

5.6.3 Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

5.6.4 Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex®, or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

6 TRAINING OR QUALIFICATIONS

Gasoline is considered a hazardous product/chemical. Employees require to use gasoline beyond that in a vehicle are required to have the following training:

- Canada – HSE1221: WHMIS
- United States – HSE1220: HAZCOM
- SWP 133 – Hazardous Chemicals or Substances (ANZ)
- SWP 134 – Control of Substances Hazardous to Health – COSHH (UK)
- If not listed, regional equivalent.

In Canada, Transportation of Dangerous Goods (TDG) training is required unless:

- Means of containment weigh less than or equal to 30 kg (66 lbs., except Class 2)
- The gross mass of all dangerous goods is less than or equal to 150 kg (330 lbs.)

In the United States, DOT Materials of Trade Training is required when transporting gasoline in containers eight gallons or smaller and the total weight of hazardous materials being transported is 440 pounds or less.

- Up to nine full safety transport cans can be transported with only OSHA Hazard Communication and Materials of Trade training.
- Up to 20 full safety transport cans can be transported without a commercial driver's license (CDL) or placarding.
- Up to nine full metal military jerricans can be transported with only OSHA Hazard Communication and Materials of Trade training.
- Up to 21 full metal military jerricans can be transported without a CDL or placarding.

- A CDL with Hazmat Endorsement is needed when any container larger than 119 gallons is being transported.

7 OUTSIDE AUTHORITIES TO BE CONTACTED

7.1 Canada

In Canada, Transportation of Dangerous Goods (TDG) reporting is required when:

- Means of containment weigh more than 30 kg (66 lbs., except Class 2)
- The gross mass of all dangerous goods is more than 150 kg (330 lbs.)
- The quantity or concentration of dangerous goods released from the means of containment is in excess of that specified by regulation if it endangers, or could endanger, public safety.
    - All gasoline releases, regardless of volume, meet the requirement for quantity.

A list of local authorities responsible for responding to emergencies is provided in Appendix A.

7.2 United States

In the United States, federal reporting requirements and RQs apply in ALL states in addition to the states' additional requirements. A significant majority of the states require spill reporting to their specific emergency response number in addition to notifying the National Response Center (NRC), even if they do not have more stringent RQs. In addition, local cities and counties (for example, local emergency planning committees [LEPCs]) may have additional reporting requirements.

A list of state agencies to be contacted for spill reporting is provided in Appendix B.

If your jurisdictional standard is not listed, please contact your HSSE representative for guidance.

8 RESOURCES

8.1 Internal

- SWP-103 – Workplace Hazardous Materials Information System (WHMIS)
- SWP-104 – Hazard Communications – United States
- HSSE Event Report (RMS3)

8.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
    - Stantec's Critical Task Inventory
    - Health & Safety Regulatory Requirements Library
    - Environmental Regulations Library

If your jurisdictional standard is not listed, please contact your HSSE representative for guidance.

8.2.1 Canada

- Transportation of Dangerous Goods (TDG): Safety Awareness Materials and FAQ, Exemptions TDG Regulations (Part 1)

8.2.2 United States

- OSHA – Standard – 29 CFR, Part: 1926, Part Title: Safety and Health Regulation for Construction, Subpart F, Subpart Title Fire Protection and Prevention, Standard Number 1936.152, Title Flammable Liquid

United States Environmental Protection Agency (EPA):

- When are You Required to Report an Oil Spill and Hazardous Substance Release?
- What Information is Needed When Reporting an Oil Spill or Hazardous Substance Release?
- Overview of the Discharge of Oil Regulation ("Sheen Rule")
- Oil Spills that Do Not Need to be Reported

9 DEFINITIONS

Fuel tank: a safe container for flammable fluids typically applied to part of an engine system in which the fuel is stored and propelled or released into an engine.

Intermediate bulk containers (IBC): a reusable, multi-use industrial-grade containers engineered for the mass handling, transport, and storage of liquids, semi-solids, pastes, or solids.

Portable Fuel Container (PFC): a receptacle specifically designed to hold small amounts of liquid fuel. The containers can range in size from one quart to five gallons or more.

Safety Can: An approved, closed container, of not more than 5 gallons capacity, having a flash arresting screen, spring closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

10 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- N/A

File these records in the Project Health & Safety File:

- N/A

11 REVISION HISTORY

Date	Change	Acknowledgments	Approvals
February 1, 2023	Administrative Update Edits to 1 Purpose, 3.1 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Ferguson-Scott	P. Poelzer

Date	Change	Acknowledgments	Approvals
August 31, 2020	Section 3: added responsibilities for Supervisor and OSEC. Section 4: aligned with Energy Wheel Hazard Recognition, Assessment, and Control (HRAC) process. Section 5: restructured to follow Hierarchy of Controls. Section 6: added training requirements. Section 7: added contact information for authorities to be contacted in case of spill/releases. Section 8: added internal and external resources.	K. Bayer, R. Roy	J. Lessard
February 23, 2010	Changed HSE to SWP; reformatted header and footer	G. Doran	
January 13, 2010	Initial Posting to StanNet	K. Robinson	

APPENDIX A:
CANADIAN LOCAL AUTHORITIES RESPONSIBLE FOR RESPONDING TO EMERGENCIES

Province	Authority
Alberta	911 (or local police) and relevant provincial authorities (1-800-272-9600) or Canadian Coast Guard (1-800-889-8852)
British Columbia	911 (or local police) and Provincial Emergency Program (1-800-663-3456) or Canadian Coast Guard (1-800-889-8852)
Manitoba	911 (local police or fire department) and Sustainable Development (1-855-944-4888) or Canadian Coast Guard (1-800-889-8852)
New Brunswick	911 (or local police) or Canadian Coast Guard (1-800-565-1633)
Newfoundland and Labrador	911 (or local police) and Canadian Coast Guard (1-800-563-9089)
Northwest Territories	911 (or local police) and relevant authorities (867-920-8130) or Canadian Coast Guard (1-800-889-8852)
Nova Scotia	911 (or local police) or Canadian Coast Guard (1-800-565-1633)
Nunavut Territory	911 (or local police) and relevant authorities (867-920-8130)
Nunavut Territory and arctic waters (waters north of the Northwest and Yukon Territories)	Canadian Coast Guard (1-800-265-0237)
Ontario	911 (or local police) or Canadian Coast Guard (1-800-265-0237)
Prince Edward Island	911 (or local police) or Canadian Coast Guard (1-800-565-1633)
Quebec	911 (or local police) or Canadian Coast Guard (1-800-363-4735)
Saskatchewan	Local police, Spill Control Centre (1-800-667-7525)) or Canadian Coast Guard (1-800-889-8852)
Yukon Territory	911 (or local police) and relevant authorities (867-667-7244) or Canadian Coast Guard (1-800-889-8852)
CANUTEC	1-888-CAN-UTEC (226-8832), 613-996-6666, or *666 on a cellular phone
Natural Resources Canada	613-995-5555

APPENDIX B:
US STATE AGENCIES FOR SPILL REPORTING

State Agency	Website
Alabama Department of Environmental Management	http://adem.alabama.gov/moreInfo/emergencyResponse.cnt
Alaska Department of Environmental Conservation	https://dec.alaska.gov/
Arizona Department of Environmental Quality	https://azdeq.gov/
Arkansas Department of Environmental Quality – Emergency Management	https://www.adeq.state.ar.us/
California Governor's Office of Emergency Services	https://www.caloes.ca.gov/cal-oes-divisions/warning-center
Colorado Department of Public Health and Environment	https://www.colorado.gov/pacific/cdphe/categories/concerns-and-emergencies
Connecticut Department of Energy and Environmental Protection	https://portal.ct.gov/DEEP/Emergency-Response-and-Spill-Prevention/Spill-Reporting/Reporting-Requirements-for-Spill-Incidents
Delaware Department of Natural Resources and Environmental Control – Division of Waste and Hazardous Substances	https://dnrec.alpha.delaware.gov/waste-hazardous/
Florida Department of Environmental Protection	www.dep.state.fl.us/oer/default.htm
Georgia Department of Natural Resources	https://gadnr.org/
Hawaii Department of Health – Office of Hazard Evaluation and Emergency Response	https://health.hawaii.gov/heer/reporting/how-to-report-a-release-spill/
Idaho Department of Environmental Quality	https://www.deq.idaho.gov/
Illinois Emergency Management Agency	https://www2.illinois.gov/iema/Pages/default.aspx
Indiana Department of Environmental Management	https://www.in.gov/idem/
Iowa Department of Natural Resources	http://www.iowadnr.gov/
Kansas Department of Health and Environment and Kansas Division of Emergency Management	https://www.kdhe.ks.gov/158/Division-of-Environment
Kentucky Department for Environmental Protection – Energy and Environment Cabinet	https://eec.ky.gov/Environmental-Protection/Pages/default.aspx
Louisiana Department of Environmental Quality	https://deq.louisiana.gov/

APPENDIX B:
US STATE AGENCIES FOR SPILL REPORTING

State Agency	Website
Maine Department of Environmental Protection	https://www.maine.gov/dep/spills/emergspillresp/contacts.html
Maryland Department of the Environment	www.mde.state.md.us
Massachusetts Department of Environmental Protection	https://www.mass.gov/orgs/massachusetts-department-of-environmental-protection
Michigan Department of Environment, Great Lakes, and Energy	https://www.michigan.gov/egle/contact/environmental-emergencies
Minnesota Pollution Control Agency	https://www.pca.state.mn.us/waste/emergency-response
Mississippi Department of Environmental Quality	https://www.mdeq.ms.gov/
Missouri Department of Natural Resources	http://dnr.mo.gov/env/esp/esp-eer.htm
Montana Disaster and Emergency Services	http://readyandsafe.mt.gov/emergency
Nebraska Department of Environmental Quality	http://deq.ne.gov/NDEQProg.nsf/OnWeb/Complaint
Nevada Division of Environmental Protection	https://ndep.nv.gov/
New Hampshire Department of Environmental Services	https://www.des.nh.gov/waste/spill-response/report-spill
New Jersey Department of Environmental Protection – Emergency Management Program	https://www.nj.gov/dep/emergency/
New Mexico Environment Department	https://www.env.nm.gov/general/report-an-environmental-issue-or-incident/
New York Department of Environmental Conservation	http://www.dec.ny.gov/chemical/8428.html
North Carolina Department of Environment and Natural Resources	https://deq.nc.gov/about/divisions/water-resources/water-resources-permits/percs/emergency-response
North Dakota Department of Health	https://www.ndhealth.gov https://deq.nd.gov/WQ/
Ohio Environmental Protection Agency	https://epa.ohio.gov/
Oklahoma Department of Environmental Quality	www.deq.state.ok.us/lpdnew/saratitleiii/spillreporting.Htm
Oregon Department of Environmental Quality	https://www.oregon.gov/deq/Pages/index.aspx
Pennsylvania Department Environmental Protection	https://www.dep.pa.gov/Pages/default.aspx

APPENDIX B:
US STATE AGENCIES FOR SPILL REPORTING

State Agency	Website
Rhode Island Department of Environmental Management	http://www.dem.ri.gov/
South Carolina Department of Health and Environmental Control – Land and Waste Management	https://scdhec.gov/environment/land-management
South Dakota Department of Agriculture and Natural Resources	https://danr.sd.gov/
Tennessee Emergency Management Agency	https://www.tn.gov/tema.html
Texas Commission on Environmental Quality	https://www.tceq.texas.gov/
Utah Department of Environmental Quality	https://deq.utah.gov/
Vermont Department of Environmental Conservation	www.anr.state.vt.us/dec/wastediv/spills/spills_program.htm
Virginia Department of Emergency Management	http://www.vaemergency.gov/
Washington Department of Ecology	https://ecology.wa.gov/
West Virginia Department of Environmental Protection	www.dep.wv.gov/WWE/ee/geninfo/Pages/spillnotification.aspx
Wyoming Department of Environmental Quality, Water Quality Division	http://deq.wyoming.gov/wqd/

HEALTH, SAFETY, SECURITY, AND ENVIRONMENT
SAFE WORK PRACTICE - ARSENIC SAFETY
SWP-315

1 PURPOSE

This practice applies to Stantec employees who work on sites where there is a potential for exposure to inorganic arsenic containing materials or arsenic contaminated environmental media related to specific industrial processes.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 SCOPE

It should be recognized that much of the content of this SWP reflects regulatory parameters for employees who regularly work in industrial settings where arsenic is used in manufacturing or is present in wastes or other materials. The intent of these regulations is to protect workers whose job duties may result in exposure to arsenic on a daily basis over many years. The primary route of exposure in industrial settings is inhalation of arsenic dusts or vapors.

The elements of the local regulations that may apply to any given Stantec employee must be determined on a case-by-case basis.

The most significant potential routes of exposure are inhalation of arsenic in air, and skin contact with surfaces or materials. Sites where employee exposures to arsenic may be of concern are distinguished from other sites where arsenic is present by the following characteristics:

- Arsenic is airborne or potentially airborne in the form of fine particulate or vapors
- The chemical form(s) of arsenic is potentially acutely hazardous and/or readily absorbed through the skin or respiratory tract, and
- There is a potential for airborne concentrations of arsenic to be at or above the occupational exposure limits of the local regulatory authority

Although not an exhaustive list, sites and industrial operations where exposure to arsenic may be a concern include:

- Sites where metal ore processing or smelting is or has been conducted (e.g., cobalt, lead, nickel, and zinc)
- Coal-fired power plants where coal ash and coal combustion residuals (CCR) are present on surfaces or as airborne dusts (arsenic is one of many metals and metalloids present in CCR)
- Sites where wood treatment/preservation with chromated copper arsenate (CCA) or other arsenical formulations has been conducted or waste has been disposed
- Sites where lead acid batteries are or were manufactured
- Site where animal hides were or are tanned into leather
- Sites where specific types of arsenical herbicides (e.g., Triox) and insecticides were manufactured, or waste was disposed
- Sites where some types of glass were manufactured
- Production and use of certain cancer chemotherapeutic agents
- In the electronics industry, during production of semi-conductors using gallium arsenide and arsine gas

This safe work practice (SWP) has been established to reduce employee exposure and potential hazards that may be encountered during various environmental or industrial hygiene projects including, but not limited to:

- Investigation projects involving drilling
- Groundwater or soil sampling
- Installation of remediation systems
- Excavation or trenching projects
- Tank removal projects
- Industrial hygiene surveys, or
- Industrial cleaning operations conducted at assigned work locations.

Contact your HSSE representative with any questions about this practice. This written practice is available for affected employee or employee representative review, and upon request for examination or copying by an auditing or regulatory agency.

3 RESPONSIBILITIES

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this Safe Work Practice
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Assist with industrial hygiene monitoring for inorganic arsenic and compounds on Stantec personnel if warranted
- Perform an annual program review to assure that:
  - Employees are substantially aware of the requirements of this practice, and
  - Employees are substantially meeting the requirements of this practice

3.2 BC Leader

- Require that this SWP be implemented for applicable operations
- Hold designated employees accountable for properly implementing this SWP

3.3 Project Manager (PM)

- Communicate with client about potential sources of exposure to inorganic arsenic and compounds
- Use the Hazard Recognition, Assessment, and Control (HRAC) process to identify projects where there may be potential exposure to arsenic at levels of concern.
  - Levels of concern for exposure to arsenic for each project will be defined during the HRAC process based on the anticipated conditions on the site and the nature of the work to be performed. In those cases where exposure to arsenic in airborne dusts or vapors is likely, the OSHA Action Level of 5 µg/m3 is the level of concern.
  - This includes the Risk Management Strategy (RMS1) and Field Level Risk Assessment (RMS2), and where required by client or business, the Quantified Hazard Assessment (RMS7) form.
- Identify employees who potentially may be exposed to levels and forms of inorganic arsenic that may be of concern on their projects, as distinguished from exposure to naturally occurring levels of arsenic in environmental media

- Identify employees who must be medically examined in accordance with this SWP, and assist them in meeting the requirements listed herein
- Schedule industrial hygiene monitoring for arsenic on potentially exposed employees on a case-by-case basis

3.4 Employees

- Work with the OSEC to schedule required medical procedures and tests and complete them as required
- Report potential exposures to their supervisor and/or Project Manager
- Comply with the work practices and personal hygiene practices
- Employees will be made aware of any site-specific emergency or contingency plans as part of a site/project specific orientation. The client/contractor responsible for the site or facility will provide information on where arsenic exposure is possible and will indicate if additional safety rules are required.

4 HAZARDS

4.1 Energy Wheel



The energy wheel is a visual tool used by Stantec to identify 10 sources of energy and to assess and control the hazards associated with each source. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. Before beginning any activity, review the potential hazards and controls associated with the task. For project work, these sources, hazards, and controls will be documented on the Risk Management Strategy (RMS1), and in a Field Level Risk Assessment (RMS2/field app). Below are the energy sources and hazards most commonly associated with exposure to arsenic.

Inorganic arsenic is a natural component of soil, rocks and some surface water and groundwater sources. Trace levels of inorganic arsenic are found in some foods such as rice, and organic forms of arsenic such as arsenobetaine are found in fish and shellfish. Organic arsenic compounds are distinguished from inorganic arsenic compounds in that the former contain carbon atoms. Consequently, almost everyone is exposed to arsenic as a function of everyday life. Arsenic poses a health hazard under very specific conditions of exposure.

The following description of health effects associated with arsenic pertains primarily to acute exposures or extended exposures to very high levels of inorganic arsenic and compounds and is not relevant to the types of exposure situations that Stantec employees routinely encounter. The potential for health effects must be evaluated in the context of any given situation.

Elemental arsenic has no smell or taste. Arsenic occurs in two solid forms, yellow arsenic and gray or metallic arsenic. Arsenic is non-flammable, very brittle and in solid, crystalline form. IARC defines arsenic and its inorganic compounds as a human carcinogen. When heated, arsenic oxidizes to arsenic trioxide, which gives it an odor likened to garlic. If hydrogen comes

in contact with arsenic (e.g., if mixed with, or in contact with, an acid), it reacts to form a toxic gas called arsine. Arsenic can enter the body through ingestion, inhalation, or skin absorption. Arsenic has long been recognized as a poison causing death when ingested or inhaled at excessive doses. Arsenic can irritate the digestive tract and affect the production of blood cells. It can also cause fatigue, abnormal heart rhythm, blood vessel damage, sore throat, irritated lungs, and impaired nerve function manifest as a "pins and needles" sensation in the hands and feet.

4.2 Occupational Exposure Limits (OELs)

Occupational exposure limits are intended to protect employees from exposures to toxic substances in workplace air during a standard 8-hour shift. These OELs may be applicable to situations where Stantec employees are working in environments where there are arsenic dusts or fumes.

It should also be recognized that dermal exposure to some forms of inorganic arsenic can cause skin irritation.

The US OSHA Permissible Exposure Limit (PEL) is 10 micrograms per cubic meter of air (10 µg/m^3) as an 8 – hour time weighted average (TWA), with an Action Level (AL) of 5 µg/m^3-TWA.

A Recommended Exposure Limit (REL) Ceiling (C) was established by NIOSH (National Institute of Occupational Safety and Health/US) at 2 µg/m^3 as a ceiling limit (i.e., not to be exceeded for any amount of time). The American Conference of Governmental Industrial Hygienists (ACGIH) recommends a TLV of 10 µg/m^3. OELs are also published for arsenic by other governing authorities and local teams will verify local regulatory parameters for the tasks they will undertake.

Stantec considers exposure to airborne concentrations of inorganic arsenic compounds, including arsine gas above the NIOSH REL of 2 µg/m^3 to be a level of potential concern.

5 CONTROLS

Stantec employees will be protected from exposure to arsenic at levels of potential concern by implementation of control measures appropriate to the specific conditions on the site. The preferred methods of minimizing or eliminating potential exposures are engineering and work practice controls, good hygiene, and appropriate personal protective equipment (PPE).

Control areas will be established whenever TWAs exceed or can reasonably be expected to exceed any recognized OEL as defined in local, state, provincial, and/or federal OHS regulations. Where engineering controls cannot be employed to reduce the TWAs to an acceptable level, access to these areas will be limited to those authorized personnel provided with appropriate levels of personal protective equipment.

Work practice controls that may be instituted to limit arsenic exposure include:

- Spraying foam on contaminated soil to minimize the release of arsenic containing dusts,
- minimizing the area of contaminated soil disturbed at any one time,
- adjusting the rate at which soil is disturbed,
- removing, blinding, blanking, draining, cleaning, steaming, purging, high-pressure washing, or neutralizing of affected product lines, tanks bins, or any other object that held arsenic or arsenic containing materials,

- Limiting time worked on activities or operations with potential arsenic exposure,
- Working upwind from any activities or operations generating arsenic-containing dusts, aerosols, mists, etc.

If employees are likely to be exposed to inorganic arsenic and compounds at levels of potential concern, as identified on the Risk Management Strategy (RMS1)/HASP, Stantec will implement measures and procedures to control or limit the employee's exposure.

The control program will provide for the following as deemed appropriate and/or required:

- Engineering controls, work practices, hygiene facilities (change rooms and showers), and personal hygiene practices to limit the exposure of an employee to arsenic.
- Methods and procedures to monitor. (i.e., personal breathing zone/industrial hygiene monitoring)
- Personal records of employee exposure to arsenic in the workplace must include:
  - An identification of the employee, including his/her date of birth
  - The employee's tasks or activities at the workplace
  - Results of monitoring the employee's exposure to airborne concentrations of
  - arsenic
  - The type of respiratory equipment used by the employee (if any)
- Employee training, including the health effects of arsenic and the measures and procedures required under the control program

If a change in a process involving arsenic containing contaminants, or in the methods and procedures in which it is processed, used, handled, or stored occurs that could result in a significant difference in exposure, additional assessment will be conducted. The written control program will be reviewed and updated at least annually but may need to be done more often to reflect the status of the program. The program will be made available onsite for examination and/or copying by any employee, their authorized representative, or the Assistant Secretary/, or any occupational health regulatory authority requesting access.

5.1 Action Level

If the eight-hour concentration of arsenic is equal to or exceeds the Action Level (AL) in the local jurisdiction, employers must begin periodic (i.e., semi-annual) exposure monitoring (i.e., industrial hygiene testing) and employee training. For example, the OSHA (US) 8-hour action level is 5 ug/m^3. Please verify action levels in your local jurisdiction.

5.2 Assessment

Where inorganic arsenic is identified as a potential hazard, the Hazard Recognition, Assessment, and Control (HRAC) process will assess the likelihood of exposure. This assessment will be documented on the Risk Management Strategy (RMS1) or site Health and Safety Plan (HASP). The following will be taken into account:

- The methods and procedures to be used in the processing, use, handling and/or storage of materials containing inorganic arsenic and compounds, or have the potential to release arsine gas or arsenical vapors at levels of potential concern
- The potential extent of an employee's exposure (how frequently and for what length of time the employee is expected to work in the environment, and the estimated or measured concentrations of inorganic arsenic in air or other media)

- The appropriate industrial hygiene monitoring and other objective testing that should be conducted, and
- The measures and procedures necessary to control exposure by means of engineering controls, work practices and hygiene facilities (change rooms and showers) and personal hygiene practices

A copy of the Risk Management Strategy (RMS1) or HASP will be maintained in the project files and made available to everyone on the project site.

5.3 Exposure Monitoring

Monitoring for arsenic and selected related metals in air can be conducted according to NIOSH method 7900 and OSHA Method 5003 (inorganic arsenic, cadmium, and lead), or local regulatory equivalent. Specifications for NIOSH 7900 are found at https://www.cdc.gov/niosh/docs/2003-154/pdfs/7900.pdf.

Stantec will use a method of monitoring and measurement that is in compliance with local regulatory requirements, such as OSHA and NIOSH 7900 - methods most applicable for the inorganic arsenic and compounds of potential concern and the physical characteristics of the work environment.

5.3.1 Initial Air Monitoring

For each worksite where there is a potential for exposure to inorganic arsenic and compounds in airborne dusts, fine particulate or mists, or to arsine gas, Stantec will collect a full shift, (minimum 7 continuous hours, when possible) personal breathing zone samples which will include at least one person for each job classification. Evaluation of airborne exposure levels will be made from air samples that are representative of each employee's exposure over an 8-hour period. If the initial air monitoring shows levels below the AL, then additional monitoring is not required unless there is a change in production, process, control, or activity which could result in a new or additional exposure to arsenic, or when Stantec has any other reason to believe a change in exposure could occur.

5.3.2 Air Monitoring Frequency

If the any monitoring shows exposure to be above the OEL, immediate measures must be taken to control exposure of potentially impacted teams. Follow-up monitoring is required at least quarterly.

If the results are between the AL and below the OEL for the local jurisdiction, then monitoring will occur at pre-determined intervals, depending on the length of the task, activity, or operation, and at least semi-annually.

Monitoring will continue at the required frequency until at least two (2) consecutive measurements taken at least seven (7) days apart, are below the AL. Stantec can then discontinue monitoring for that employee or job classification unless there is a change in production, process, control, or activity which could result in a new or additional exposure to arsenic. If any of these conditions occur, then additional air monitoring will be required.

5.4 Regulated Areas

Stantec will identify areas where exposure to inorganic arsenic and compounds may occur at levels of potential concern. Due to the type of work typically performed by Stantec, areas may be identified by the client or owner/operator of the site or facility where Stantec is working. If

the exposure measurements exceed the OEL, the areas and operations in which the OEL was exceeded must be identified and segregated from the rest of the work area(s). It must be clearly marked. Only properly trained and authorized persons are allowed to enter. Coordination between Stantec personnel and the client or owner/operator of the site or facility is essential.

Persons entering a regulated area will be equipped with the appropriate respiratory protection. When there is the possibility that arsenic may irritate the skin or eyes, workers in regulated areas will use appropriate personal protective equipment (PPE) such as coveralls or similar full-bodied clothing, gloves, and steel toed boots with or without coverlets, and face shields or vented goggles. These items will be provided at no cost to the employee

Good personal hygiene practices must be observed in regulated areas, which includes the prohibition of eating, drinking, the use of any tobacco products, chewing gum, and applying cosmetics.

Change rooms and showers must be provided for workers in regulated areas due to the potential for skin and eye irritation. These facilities will be equipped with storage areas for street clothes and separate storage for contaminated /potentially contaminated PPE and equipment. Personnel working in a regulated area are required to shower at the end of each work shift. Personnel will wash their face, hands, and any other exposed skin before eating.

A written housekeeping and maintenance plan must be created that lists the schedule and procedures for general site housekeeping and dust collection equipment maintenance (where applicable). This plan will be accessible for inspection by the Assistant Secretary or equivalent regulatory authority. Again, the language in this section needs to be tailored to what Stantec is going to do.

5.5 Personal Protection Equipment (PPE)

Respirators must be used to control exposure only in the following circumstances:

- While feasible engineering and work practice controls are being installed
- During maintenance, repair, and other operations for which engineering controls are not feasible
- In work situations where there is a potential for exposure at or above the OEL, and
- In emergencies

The employer will provide the required PPE at no cost to the employee (refer to SWP-105 – Personal Protective Equipment). It must be cleaned, dried, and freshly laundered at least once weekly, and daily if personnel are exposed to arsenic over 10 ug/m^3 (TWA) or in areas where it is needed to prevent skin contact. Appropriate disposable PPE may be used in place of laundering coveralls etc., as long as the proper containers are available, and the contents are properly disposed of. Shaking or blowing off arsenic-contaminated dust or debris from contaminated PPE and equipment is prohibited. Rather, a HEPA-filtered vacuum cleaner will be used for this type of cleaning.

5.6 Communication of Hazards

At a minimum, the following hazards will be addressed:

- Cancer
- Liver effects

- Skin effects
- Respiratory irritation, nervous system effects
- Acute toxicity effects

5.7 Medical Surveillance

Medical surveillance will be implemented in accordance with SWP-111 – Medical Surveillance.

If an employee is exposed to arsenic in an emergency situation, Stantec will provide the employee an appropriate medical examination by following the procedures identified in the applicable Incident Reporting Protocol.

6 TRAINING OR QUALIFICATIONS

Initial arsenic training will be provided to employees prior to their initial assignment in areas where a potential for exposure to inorganic arsenic or arsenic-containing materials at levels of potential concern may occur. If TWAs exceed the AL, or where there is a potential for skin or eye irritation, employees shall be provided with readily accessible information and training at least annually thereafter.

Arsenic training will include, at a minimum, the following topics:

- The quantity, location, the manner of use, storage, sources of exposure and the specific operations which could result in exposure.
- Specific hazards and health effects associated with arsenic.
- The specific nature of the operations which could result in exposure to arsenic above the AL.
- The purpose, proper selection, fitting, use, limitations and health effects of respirators and other PPE.
- The engineering and work practice controls associated with each employee's job classification.
- Other elements of the jurisdictional chemical safety programs (e.g., HAZCOM, WHMIS, COSHH, etc.) that are applicable to this operation.
- An explanation of the contents of the jurisdictionally applicable arsenic regulation and medical surveillance requirements.
- A review of the applicable local, state, provincial, territorial, and federal regulations pertaining to arsenic exposure.

Training will be documented, and a copy of the completion certificate maintained in the employee's training record. The documentation should include the name of the employee, training date and the name of the training facilitator.

7 OUTSIDE AUTHORITIES TO BE CONTACTED

N/A

8 RESOURCES

8.1 Internal

- SWP-103 – Workplace Hazardous Materials Information System (WHMIS) - Canada
- SWP-104 – Hazard Communication – US
- SWP-133 – Hazardous Chemicals or Substances (ANZ)
- SWP-134 – Control of Substances Hazardous to Health (COSHH)

- SWP-105 – Personal Protective Equipment
- SWP-111 – Medical Surveillance
- SWP-409 – Respiratory Protection Program

8.2 External

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library

If your jurisdictional standard is not listed, please contact your HSSE representative for guidance.

- 29 CFR 1910.134 "Respiratory Protection", Code of Federal Regulations (CFR)
- 29 CFR 1910.1088 "Inorganic Arsenic", Code of Federal Regulations (CFR)
- 29 CFR 1910.1200 "Hazard Communication", Code of Federal Regulations (CFR)
- Canadian Standards Association Standard CAN/CSA Z4.4-02
- ON Reg 490/09 "Designated Substances", under the Occupational Health and Safety Act

9 DEFINITIONS

Action Level (AL) – The action level of a substance is where regulatory or remedial action becomes necessary and is generally half of the occupational exposure limit as stipulated by the local regulatory authority. For example, an airborne arsenic concentration of 5 µg/m^3 calculated as an 8-hour time-weighted average, which represents half the OEL for many governing authorities.

ACGIH: American Conference of Governmental Industrial Hygienists – a professional, member-based organization that advances occupational and environmental health, and that publishes, reviews, and annually updates advisory/recommended occupational exposure limits called Threshold Limit Values (TLVs).

Arsenic: (As (metal)) (CAS Registry No. 7440 -38 -2 (metal)) - a copper aceto-arsenite and all inorganic compounds Not Otherwise Specified containing inorganic forms of arsenic except arsine, measured as arsenic (As).

Arsine Gas: (CAS Registry No. 7784-42-1) - As3, also known as arsenic hydride, arsenic trihydride, or arsenous hydride.

Assistant Secretary: The Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

Authorized Personnel: any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employees for the purpose of exercising the right to observe monitoring and measuring procedures.

CAS Registry Number: Chemical Abstracts Service Registry Number – a unique numerical identifier assigned by the "Chemical Abstracts Service" to every chemical described in the open scientific literature

IARC: International Agency for Research on Cancer. An inter-disciplinary agency to promote international collaboration in cancer research.

NTP: National Toxicology Program. An interagency program whose mission is to evaluate agents of public health concern by developing and applying tools of modern toxicology and molecular biology.

OEL: Occupational Exposure Limit. A term used to define the maximum concentration of a chemical to which a worker may be exposed. Provides enforceable restrictions on the amount and length of time a worker is exposed to airborne concentrations of hazardous biological or chemical agents. Includes OSHA PEL, NIOSH REL, ACGIH TLV and other OELs prescribed by governing authorities.

OSHA: Occupational Safety and Health Administration. U.S. governmental agency responsible for health and safety standard development and compliance enforcement in the workplace.

PEL: Permissible Exposure Limit. The regulatory (i.e., mandatory) term used in the U.S. to define the maximum amount or concentration of a chemical to which a worker may be exposed without suffering ill effects. Similar to OEL in Canada.

Regulated Area: any area where airborne concentrations of arsenic exceed, or can reasonably be expected to exceed, the permissible exposure limit.

TLV: Threshold Limit Value – a term describing the airborne concentration of a substance below which all workers are believed to be protected while exposed to it day after day for standard 8-hour work periods. For gases and vapors, TLV is stated as parts per million (PPM) of surrounding air, and for fumes, mists, and dusts as milligrams per cubic meter (mg/m3) of surrounding air. ACGIH classifies TLV in three ways:

- TLV-TWA: time weighted average concentration for a normal 8-hour workday or 40- hour workweek.
- TLV-STEL: short term exposure limit: the maximum concentration of a substance to which a worker may be exposed continuously for a short period of time (as noted below) without suffering from irritation, chronic or irreversible tissue damage, or narcosis sufficient to increase the likelihood of accidental injury, to impair self-rescue, or to materially reduce work efficiency.
    - For a continuous 15-minute exposure period,
    - For maximum of 4 such periods per day,
    - With at least one 60-minute exposure-free period between two exposure periods, and
    - Provided the daily TLV-TWA is met.
- TLV-C: ceiling exposure limit or maximum exposure concentration that should not be exceeded under any circumstance, and for any amount of time, while meeting the daily TLV-TWA.

10 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- Arsenic Training Completion Certificate
- Arsenic Refresher Training Completion Certificate (as required)

File these records in the Project Health & Safety File:

- Project Chemical Inventory

- SDS for arsenic-containing materials on site
- Site Air Monitoring Logs
- Compliance Program

11 REVISION HISTORY

Date	Changes	Acknowledgments	Approval
March 21, 2023	Updated information on medical surveillance to align with current version of SWP-111 and associated processes.	K. Bayer	C. Ferguson-Scott
February 13, 2013	Wording throughout to reflect local regulatory connections to be considered in planning and controls. Edits to 1. Purpose, 3.2 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings	D. Gray	P. Poelzer
July 7, 2016	New Safe Work Practice.	D. Gray, D. Feldt, S. Wilde.	J. Lessard

1 Purpose

This Safe Work Practice (SWP) provides guidance in the identification of respiratory hazards and the proper selection, care, use, maintenance, and fitting of appropriate respiratory protection. Guidance is also provided for the voluntary use of respiratory protection when not required to meet any regulatory requirement. This SWP complements local legislation and applicable standards.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 Scope

This SWP applies to all situations where respiratory protection is required.

3 Responsibilities

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this SWP, including:
  - Posting the most current copy to The Lens
  - Monitoring applicable legislation to incorporate any new or revised regulatory requirements
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements within this practice are being met
- Designate a Respiratory Protection Program Administrator (RPPA) who, by experience and training, is qualified to oversee the program and conduct evaluations of program effectiveness

3.2 Respiratory Protection Program Administrator

- Compile the results of the Respiratory Protection Program (RPP) evaluations at least annually

3.3 Business Center (BC) Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP

3.4 Supervisor

- Confirm with each employee reporting to them and who are required to wear a respirator the need to review this SWP
- Verify that each employee who is required to wear a respirator has completed the review of this SWP based on the review cycle listed in the SWP Checklist and process
- Confirm that each employee has completed the training required by this SWP

3.5 Project Manager (PM)

Has the primary responsibility for implementing this practice, including:

- Identify the potential hazards employees could be exposed to and select appropriate hazard controls using the Risk Management Strategy (RMS1), or the site-specific Health and Safety Plan (HASP)
- Communicate the hazards and controls to employees
- Assign only employees that are knowledgeable in the requirements of this SWP, who understand the hazards associated with the work, who can apply the appropriate controls, and have training identified in the SWP
- Where project work requires respirators, use only employees that are medically cleared (refer to Section 5.4.1), trained, and fit-tested in accordance with this practice
- Review the tasks and procedures prior to commencing work
- Obtain air sampling data for the work area from the client (if available) or coordinate air quality monitoring during the scheduled work
- Coordinate the scheduled work with the Client or other party responsible for occupational health and safety programs on site to ensure that all Stantec employees performing work on-site are aware of any required precautions
- Coordinate with the OSEC for the supply and/or purchase of the required personal protective equipment and any other equipment or precautions that may be required, and to coordinate respirator fit testing and training

3.6 Office Safety and Environment Coordinator (OSEC)

The primary role of an OSEC is to act as a resource to local office operations in the administration of day-to-day safety activities. This responsibility includes the following:

- Maintain a secure filing system containing the forms, reports, and training records required by this SWP
- Assist PMs, supervisors, and others in obtaining appropriate safety and environment equipment, including respiratory protection equipment, for employees working on their projects
- Coordinate HSSE training as identified in this SWP

3.7 Employees

- Be aware of the hazards that may be encountered
- Use their training, knowledge, and experience to protect their health and safety and that of their coworkers
    - Observe posted respiratory protection requirements and implement controls as needed
    - Select and use appropriate Personal Protective Equipment (PPE), together with the tools and equipment required to conduct the work safely
    - Understand and apply knowledge of manufacturer's instructions
    - Know the proper use and limitations of equipment
    - Inspect equipment and work areas regularly for hazards
    - Know how to control and respond to hazards and emergencies including use of emergency equipment
- Be aware of and comply with requirements outlined herein
- Participate in air monitoring procedures for applicable air contaminants such as dust, mists, fumes, gases, and vapors

- Report to their PM any concerns they may have with the equipment or procedures they have been provided, or any issues that may limit their ability to comply with the safe work requirements of this practice
    - STOP work immediately when aware of an unsafe act or condition that could place anyone in danger or if they are not confident in the work plan

4 Hazards

Below is a list of possible hazards related to wearing respiratory protection.

Energy	Hazard/Condition
Thermal	• Increased heat load due to carrying heavy, bulky equipment resulting in heat stress • Workers' tolerance to moderate or higher levels of work under hot conditions while wearing a respirator may be reduced
Chemical	• Exposure to airborne chemical agents in the form of dust, mist, fumes, and vapors • Exposure to oxygen deficient atmosphere leading to impaired judgment and coordination, nausea and vomiting, unconsciousness, or death
Biological	• Exposure to airborne biological agent • Allergic reactions to the face piece materials • Claustrophobia experienced by some users • Increased physiological stress from alterations in breathing pattern, hypoventilation, retention of carbon dioxide, and increase in the work of breathing.
Radiation	• Exposure to airborne radiation particles
Noise	• Reduced verbal communication ability caused by respirators without speaking diaphragms • Reduced hearing caused by hooded respirators
Gravity	• Risk of tripping caused by supplied air lines (if required) • Risk of slips, trips, and fall due to limited peripheral vision caused by respirator face piece
Motion	• Reduced mobility due to carrying heavy, bulky equipment

Additionally, in general, the higher the level of protection offered by the respirator, the higher the level of physical fitness needed by the user. This hazard can be referred to as overall physiological strain.

5 Controls

Airborne hazards (dusts, mists, fumes, and vapors) must be mitigated or minimized in accordance with the hierarchy of controls. As such, more effective types of controls must be evaluated before respirator use is considered. If hazards cannot be reduced below the applicable occupational exposure limit as set by the authority having jurisdiction or published by the American Conference of Governmental Industrial Hygienists (ACGIH), then properly selected respiratory equipment is required.

5.1 Elimination

The most effective defense against respiratory hazards is to remove the hazard from the work area.

5.2 Substitution

Where is it not possible to eliminate the respiratory hazards, consider substituting the hazardous material with a less hazardous one.

5.3 Engineering

The next best effective defense against respiratory hazards is to control the contaminant at the source and prevent it from entering the air. This may involve:

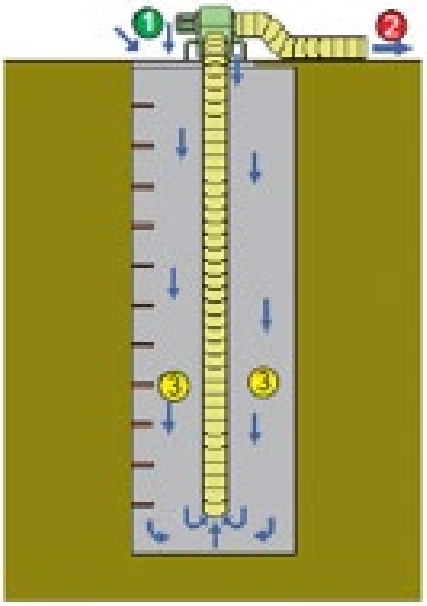
- Isolating the process generating the contaminant
- Enclosing the process generating the contaminant
- Changing the process generating the contaminant
- Capturing the contaminant at the source before entering the work area (e.g., local exhaust ventilation)

Further information on ventilation is provided below.

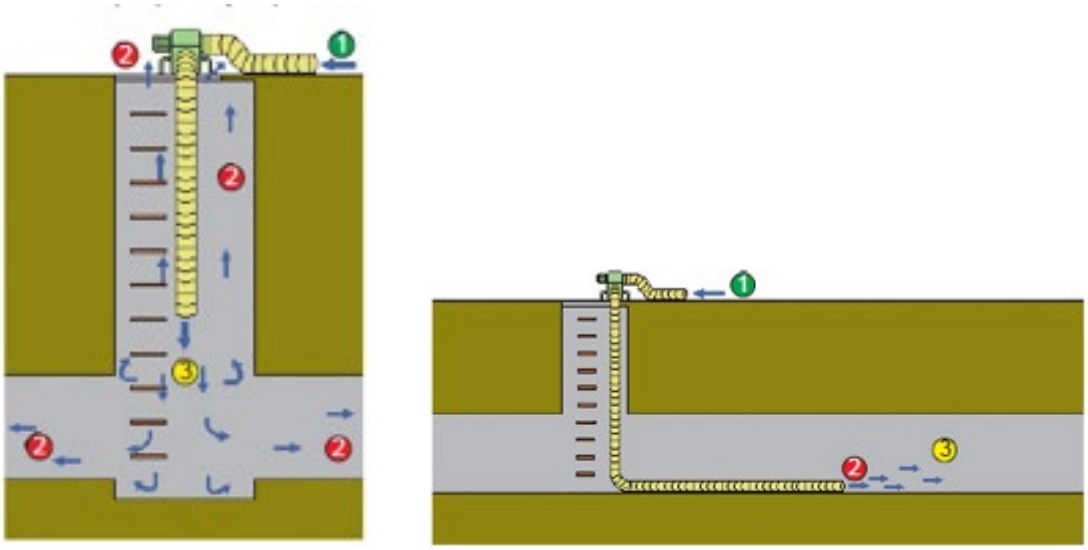
5.3.1 Ventilation

Where practicable, ventilation will be used to maintain airborne contaminants to acceptable published regulatory occupational exposure levels or maintain the oxygen content of the atmosphere between 19.5% and 23.5%.

- Local exhaust ventilation captures contaminants at, or very near, the source and exhausts them outside.
    - Fume hoods used in labs and source capture arms used for welding are examples of local exhaust ventilation systems.
- Dilution ventilation reduces the concentration of the air contaminants by mixing (diluting) the contaminated air with fresh, clean, uncontaminated air.
    - Forced air ventilation of enclosures without openings to sewage systems, horizontal pipes, or tunnels are more effective when used to exhaust the enclosure.
        - The ventilation system must be installed in such a way as to prevent the return of exhausted air into the enclosure and to prevent the exhausted air from creating an uncontrolled hazard at the surface.



- Forced air ventilation of enclosures with openings to sewage systems, horizontal pipes, or tunnels are more effective when used to blow fresh air into the enclosure.
  - The ventilation system must be installed as to prevent the return of exhausted air into the sewage system, pipe, or tunnel.
  - Controls must be in place to minimize the hazards associated with the exhausted air.



Note: (1) in GREEN denotes air inlet, (2) in RED denotes air outlet, and (3) in YELLOW denotes exposure area. Taken from IVERNA 2000

5.4 Administrative

When respiratory hazards cannot be eliminated, and substitution or engineering controls prove to be ineffective in maintaining airborne contaminants within an acceptable concentrations or oxygen content above 19.5% and less than 23.5%, then workers must wear respiratory protection, and follow the additional required administrative controls.

5.4.1 Medical Evaluations

5.4.1.1 Canada

Prior to fit testing, workers will complete SWP-409b – Respirator Screening Form.

- Workers who answer "YES" to Part 5(a), (b), or (c) require further assessment by a health care professional prior to respirator fit testing and use.
- The health care professional may refer the worker for medical assessment.
- See SWP-111 – Medical Surveillance - Appendix B for additional guidance.

5.4.1.2 United States (US)

Workers will complete Appendix C to Sec. 1910.134: OSHA Respirator Medical Evaluation Questionnaire.

- Workers must be allowed to answer the questionnaire during normal working hours, or at a time and place that is convenient to them.
- The employer will advise the worker how to deliver or send this questionnaire to the health care professional who will review it.
- The employee must be offered an opportunity to discuss the questionnaire and exam results with the Medical Service Provider (MSP) [Question 9 in section 2 of Part A].

A physician must provide a form indicating the employee is fit to wear a respirator before an employee is fit tested or assigned to wear a respirator.

- The MSP will use the OSHA Respirator Medical Evaluation Questionnaire or equivalent form in making their determination.
- A follow-up medical examination will be provided for an employee who gives a positive response to any of the questions 1 through 8 in Section 2, Part A of the Questionnaire, or whose initial medical examination demonstrates the need for a follow-up medical examination.
- Annual re-evaluations will be conducted for employees required to use respirators if the workplace changes sufficiently to justify the re-evaluation, or if other concerns are indicated by employee complaints or air monitoring, or as directed by Stantec management.
- Spirometry or other acceptable tests will be conducted on all US employees required to wear a respirator. The MSP will make the final determination if an individual is limited in the use of a respirator. Refer to SWP-111 – Medical Surveillance - Appendix A for guidance.

5.4.2 Respirator Selection

When selecting respirators, the PM must consider the chemical and physical properties of the contaminant, the toxicity and potential airborne concentration of the hazardous material, as well as the oxygen concentration.

Table 1 will be used to determine acceptable types of respirators based on the chemical and physical properties of the contaminant, the toxicity and concentration of the hazardous material, as well as the oxygen concentration present.

Table 1: Acceptable Respirator Type Based on Atmospheric Hazard

Hazard	Respirator
Immediately dangerous to life or health (IDLH)	
Oxygen deficiency Gas, vapor contaminants and other highly toxic air contaminants	• Full-facepiece, pressure-demand self-contained breathing apparatus (SCBA) certified for a minimum service life of 30 minutes • A combination full-facepiece, pressure-demand supplied air respirators (SAR) with an auxiliary self-contained air supply
Contaminated atmospheres - for escape	• Positive-pressure SCBA • Combination positive-pressure SAR with escape SCBA • An escape respirator, acceptable to the authority having jurisdiction, with a chemical/particulate filter specific to the atmosphere in which they will be used
Not immediately dangerous to life or health	
Gas and vapor contaminants	• Positive-pressure SAR • Any air-purifying respirator with a chemical filter specific to the atmosphere in which they will be used
Particulate contaminants	• Positive-pressure SAR including abrasive blasting respirator • Powered air-purifying respirator (PAPR) equipped with high-efficiency filters • Any air-purifying respirator with a particulate filter specific to the atmosphere in which they will be used
Gaseous and particulate contaminants	• Positive-pressure SAR • Any air-purifying respirator with a combined chemical/particulate filter specific to the atmosphere in which they will be used
Smoke and other wildfire-related contaminants	• Positive-pressure SCBA

Source: Adapted from OSHA Standard 29 CFR 1910.134(d)(2)

5.4.2.1 Assigned Protection Factors

An air monitoring sampling strategy must be in place prior to starting work in accordance with generally accepted industrial hygiene practices. The protection factor (PF) will then be calculated based on the concentration of contaminants.

- Concentration of contaminants should be determined by reviewing air monitoring results.

$$PF = \frac{\text{Concentration of contaminant outside facepiece}}{\text{Occupational exposure limit of contaminant}}$$

- Once the protection factor is determined, the respirator type can be determined.

Table 2: Assigned Protection Factors[a]

Respirator Type	Quarter Mask	Half Mask	Full Facepiece	Helmet/Hood	Loose-Fitting Facepiece
Air-Purifying	5 (10[b])	10[c]	50 (10[d] if QLFT[e] used)	---------	
Powered Air-purifying (PAPR)		50	1000 (100 if QLFT[e] used)	1000[f]	25
Supplied Air (SAR) • Demand mode • Pressure-demand mode • Continuous flow		 10 50 50	 50 1000 1000 (100 if QLFT[e] used)	1000[f]	25
Self-Contained Breathing Apparatus (SCBA) • Demand mode • Pressure-demand mode		 10 --------	 50 10,000 (100 if QLFT[e] used)	 50 10,000 (100 if QLFT[e] used)	

Source: US OSHA Standard 29 CFR 1910.134

Note a: These APFs do not apply to respirators used solely for escape

Note b: In Canada, filtering face pieces have a APF of 10

Note c: This APF category includes filtering facepieces, and half masks with elastomeric facepieces

Note d: In Canada, the APF for a full facepiece operating in air-purifying mode (negative pressure) is 10 when using the QLFT test methods

Note e: QLFT: Qualitative Fit Testing

Note f: Evidence must be available from the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. Absent of such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators and receive an APF of 25.

- This selection must consider emergency and non-emergency use.
  - The type of respirator selected for both instances may be the same, but respirators intended for escape should not be used for non-emergency situations.
- Only respirators approved by the authority having jurisdiction will be used.
- Sizes of respirators will be determined based on fit testing.

5.4.2.2 Air-Purifying Respirators (APRs)

- APRs may only be used in environments:
  - With sufficient oxygen – no less than 19.5%
  - Where the contaminant(s) and concentration are known
  - That are **NOT** IDLH atmospheres.
- Select respirator based on the anticipated PF.
  - Choose quarter mask, half-face, or full-face APR, as appropriate.
- Determine the correct type of cartridge/filter.
  - Cartridges will be appropriate for the chemical state and physical form of the contaminant and will be of the same manufacturer as the respirator.
    - **N**-type cartridges/filters are **N**ot resistant to oil.
    - **R**-type cartridges/filters are somewhat **R**esistant to oil.
    - **P**-type cartridges/filters are strongly resistant to oil (oil **P**roof).
- Determine the replacement schedule.

- Where available, cartridges with End of Service Life Indicators (ESLI) should be provided.
- When a cartridge does not have an ESLI:
  - A cartridge change-out schedule must be implemented based on reliable data to indicate that the employee is not being exposed (no longer than 1 year after opening of package if it is a charcoal-based filter).
  - N-type cartridges/filters will be changed out when breathing becomes difficult/labored.
  - Where oil is present, R- or P- type cartridges/filters will be changed after 8 hours of use.

Note: OSHA provides guidance for developing cartridge change-out schedules at the following link: http://www.osha.gov/SLTC/etools/respiratory/change_schedule.html.

5.4.2.3 Supplied Air Respirators (SARs)

Types of SARs typically used are air-line, air-line egress (ALE), and Self-Contained Breathing Apparatus (SCBA). SAR selection must be based on the scope of work being performed and the APF requirements.

SARs must be supplied with Grade D breathing air from cylinders or compressors.

- In the United States, the Criteria for Grade D Compressed Breathing Air are:
  - Oxygen concentration: 19.5% to 23.5%
  - Hydrocarbons: < 5 mg/ m3 (oil mist)
  - Carbon dioxide: < 1000 ppm
  - Carbon monoxide: < 10 ppm
  - No pronounced odor
- In Canada, SARs must be supplied with Grade D breathing air that complies with the most current Canadian Standards Association (CSA) *CAN/CSA-Z180.1-Med, Compressed Breathing Air and Systems*.

5.4.2.3.1 Air-line Respirators

Air-line respirators are designated "Type C" or "Type CE." The air line can be no longer than 300 feet (91 meters) and the air supply hose must be provided in multiples of 25 feet.

Note: Manufacturers of ambient air pumps may have maximum air-line length ratings of considerably less than 300 feet, so always check the manufacturer's recommendations if an ambient air pump is used as the breathing air source.

Supplied air must flow at a rate of 4 ft^3/min (0.11 m^3/min) for tight-fitting facepiece and 6 ft^3/min (0.17 m^3/min) for hoods and helmets, and can be available in demand, pressure-demand, or continuous flow arrangements.

For Stantec, only pressure-demand or continuous flow will be used.

Fittings for air connections must be unique to breathing air, so as not to be confused with other gases.

5.4.2.3.2 Air-line Egress (ALE) Respirators

ALE respirators are air-line respirators with an attached egress bottle. These bottles are typically 5-minute bottles and allow for quick egress from hazardous atmospheres when the air line becomes damaged or inoperative.

5.4.2.3.3 SCBA

There are 2 types of SCBA:

- Open-circuit type – typically uses bottled air from 2000 to 4500 psi and will provide protection from 15 min to 60 min typically. This type of SCBA can be set up for demand, pressure-demand, or continuous flow, and can be combined with air lines.
- Closed-circuit type (also called re-breathers) – are either negative or positive pressure type. With this type of SCBA, it is possible to hyperventilate or "over breathe." These respirators are more complicated to maintain and require additional training. The advantage to this type of SCBA is that they can be used for longer periods - sometimes up to 4 hours.

For Stantec, only pressure-demand or continuous flow, open-circuit SCBAs will be used.

5.4.3 Fitting of Respirators

Respirator fit testing will conform to the requirements of the authority having jurisdiction.

- In the United States, in accordance with 29 CFR 1910.134, Appendix A Fit Testing Procedures (Mandatory).
- In Canada, in accordance with CSA Standard Z94.4 – Selection, Use, and Care of Respirators.
- Fit testing will occur at a frequency prescribed by the authority having jurisdiction.

A qualitative respirator fit test will be performed to determine the ability of each individual respirator wearer to obtain a satisfactory fit when using a negative pressure respirator, including a filtering facepiece.

SWP-409a – Respirator Fit Test Process and Form will be used to document the respirator make and model, size, satisfactory fit, and training. The form will be completed and signed by the employee upon completion of fit testing and training.

Employees will present themselves for fit testing in the same personal condition they would expect to be in when using the respirator. This includes hair style, wearing or not wearing of dentures, eyeglasses, or contact lenses.

- Employees wearing corrective lenses must have an eyeglass mounting system in place for full-face respirators.
- Soft gas-permeable contact lenses must only be worn if the employee can demonstrate that he/she has had success wearing contact lenses previously.
- Employees will present themselves for fit testing in such a way that personal accessories such as head coverings, garments, facial jewelry, or other items do not come between the skin and the sealing surface of the respirator.

Note: Stantec will arrange for quantitative fit testing on personnel working for a specific client if that client requires quantitative fit testing.

The persons administering the fit test must be able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order. They must keep the equipment clean and well maintained so as to operate within the parameters for which it was designed. If quantitative fit testing is being performed, testers must be competent to use the instrumentation utilized for this purpose.

Records of respirator fit test will be kept in the individual's training record file and kept in accordance with Stantec's Records Retention Schedule, record class: HSE1100 – Health and Safety Testing – General.

Employees who are unwilling or otherwise unable to obtain an acceptable fit will be prohibited from using a tight-fitting respirator.

5.4.4 Respirator Use

5.4.4.1 Tight-fitting Respirator Use

In order to ensure an adequate face seal, the following rules must be observed:

- Modifications to the respirator or straps must not be made.
- Respirators must be inspected visually prior to each use by the user to verify that they will provide adequate protection against the anticipated hazards.
- Employees who are required to use tight-fitting respirators must be clean-shaven where the mask seals.
- Proper fit must be checked each time the respirator is worn, prior to entering a potentially contaminated area, by performing positive and negative pressure tests:
    - Positive Pressure Test: The exhalation valve is blocked while the user exhales. If the facepiece pushes out uniformly with no escaping air, the test is satisfactory.
    - Negative Pressure Check: The inhalation ports are blocked while the user inhales and holds their breath for 10 seconds. If the facepiece sucks down on the user's face with no air entering the facepiece, the test is satisfactory
- Tight-fitting respirators must not be worn when conditions prevent an adequate face seal
    - Conditions that may interfere with face piece sealing include a significant change in body weight (10% or more), facial configuration, significant scarring in the area of the face seal, dental changes, reconstructive or cosmetic surgery, eyewear that projects under the face piece seal, or any other condition that may affect the fit of the face piece seal
    - Other conditions that may interfere with face piece sealing include the growth of a beard, sideburns, or wearing a skull cap that projects under the facepiece
    - Excessively sweating, either due from high temperature, humidity, or physical effort can also interfere with face piece sealing

5.4.4.2 Immediately Dangerous to Life and Health (IDLH) Procedures

When Stantec personnel enter work areas with known, suspected, or potential IDLH atmospheres, standby personnel must be available. The following requirements must be met.

- Employees will not remove their facepiece at any time while working in an IDLH atmosphere.
- At least one employee (or more than one if needed) who is properly trained and equipped to perform emergency rescue must be stationed outside the IDLH area wearing the appropriate PPE.
    - The employer (or designated person) must be notified prior to the rescue personnel entering the area, so that appropriate assistance may be provided as required.
- Standby personnel must be equipped with either:

    - Full-facepiece, pressure-demand SCBA certified for a minimum service life of 30 minutes, or a combination full-facepiece, pressure-demand SAR with an auxiliary self-contained air supply; or
    - Positive-pressure SCBA, or a combination positive-pressure SAR with escape SCBA
- Appropriate retrieval equipment for performing personnel rescue must be provided where it would contribute to the rescue and not increase the risks involved.
- A means of constant communication (visual, radios, signal line, etc.) between the employees within the IDLH area and the employees outside the IDLH area is required

5.4.4.3 Emergency Procedures

Due to the specific hazards found at each site, the site-specific emergency procedures will be developed during the documentation of the RMS1 or the creation of the site-specific HASP.

When developing those emergency procedures, the following items must be considered:

- Breakthrough when using an APR
- Low breathing air supply when using an SCBA or cascaded bottle system, pinched or damaged air hose
- Equipment failure
- Improper face seal
- Wrong cartridge for the chemicals of concern
- Reduced visibility due to intense smoke
- Rescue procedures
- Sudden increase in concentration of chemical hazards
- Wind direction/gathering location
- Immediate cleanup and disposal of uncontrolled release or spill of hazardous substance(s)

5.4.5 Cleaning and Storage

5.4.5.1 Cleaning Respirators

Respirators will be cleaned in accordance with the procedures provided in Attachment A. These cleaning procedures are general in nature, and the employer, as an alternative, may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed in Attachment A.

Note: Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Attachment A.

- Respirators assigned to individual employees will be cleaned and disinfected as often as necessary to be maintained in a sanitary condition.
- When the respirator is not individually assigned, cleaning and sanitizing will be performed before the next use.
- Emergency-use respirators will be cleaned and disinfected after each use.
- Respirators designed not to be cleaned will be disposed of, as directed by the manufacturer, after use.

5.4.5.2 Storing Respirators

Respirators will be stored in a manner that will protect them against hazards that can have a detrimental effect on the respirator, including contamination, dust, sunlight, extreme

temperatures, excessive moisture, damaging chemicals, and deformation of rubber or other elastomeric parts.

- Cleaned respirators should be stored in a clean plastic bag or bin.
- When storing a respirator, the facepiece and exhalation valve must be in a normal position to prevent the abnormal set of elastomer parts during storage.
- Emergency respirators will be stored in a readily accessible location that is clearly marked as containing emergency respirators and kept in a clean and sanitary condition.

5.4.5.3 Storing Cylinders

Cylinders not in current use and those in long-term storage should be stored at reduced pressure in the vertical position and never inverted. They should be stored in a warm and dry environment.

Prior to using an SCBA cylinder that has not been used in a twelve-month period, the cylinder will be slowly depressurized and then refilled.

5.4.6 Respirator Inspection

5.4.6.1 General

Each user must inspect respirators used in routine situations before each use and during cleaning.

All respirators dedicated for use in emergency situations will be inspected at least monthly by the user and in accordance with the manufacturer's recommendations and will be checked for proper function before and after each use.

- In the US, a record of the inspection will include the date of the inspection, the name of the person who carried-out the inspection, the findings, required remedial action, and serial number or other identifying number of the inspected respirator. See Attachment B. The information will be kept either physically (paper form) or electronically.

5.4.6.2 Facepiece Inspection

The facepiece inspection includes a check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters, or filters, and a check of elastomeric parts for pliability and signs of deterioration. Refer to Attachment B for guidance.

5.4.6.3 Supplied Air Respirator Inspection

SARs will be inspected monthly and by the employee before and after each use. Monthly inspection will be documented. Where SARs are rented, the rental agency will provide inspection records.

- Air and oxygen cylinders will be maintained in a fully charged state and will be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level.
- Function of the regulator and warning devices, including the breathing or low-level audible alarm (required on all SCBAs), will be verified.
- Deficiencies will be noted, and the SAR will be taken out of service until repairs can be made.
    - When worn or defective parts are found only designated and trained personnel should replace them.

- If the equipment is rented, all supplier inspection records will be kept on file, and the user is to conduct their own inspection prior to and after use.

5.4.7 Evaluation of Program Effectiveness

At least annually, the RPPA will evaluate the effectiveness of the Respiratory Protection Program (RPP). These evaluations will be documented using Attachment C and maintained in the RPP files.

Factors to be assessed include, but are not limited to:

- Procedures for selecting respirators for use in the workplace
- Medical evaluations of employees required to use respirators
- Fit testing procedures for tight-fitting respirators
- Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators
- Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators
- Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations
- Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance
- Procedures for regularly evaluating the effectiveness of the program
- Provide to employees who voluntarily use respirators the information contained in Appendix D to this section ("Information for Employees Using Respirators When Not Required Under the Standard")
- Provide respirators, training, and medical evaluations at no cost to the employee

5.4.8 Voluntary Use

Due to dust, fumes, mists, gases, aerosols or vapors, employees may request to voluntarily wear a respirator. This request will be made in writing to the project manager. Stantec may provide respirators for voluntary use or employees may bring their own respirators, even though hazard analysis and industrial hygiene monitoring indicate that they are not necessary. This will be allowed only if the use of the respirators will not constitute a hazard. The more stringent of local legislation and this SWP will apply.

5.4.8.1 Tight-Fitting Respirators

Where an employee requests to voluntarily wear a tight-fitting respirator, they must follow this SWP in its entirety.

5.4.8.2 Filtering Facepiece

Where filtering facepiece respirators are used voluntarily, Attachment D, “Information for Employees Using Respirators When Not Required Under the Standard” will be provided to the employees. No additional training is required.

Even though the respirator use is voluntary, the following apply:

- Respirators must be stored and maintained as required by the manufacturer.
- Facial hair is discouraged.

6 Training

Staff required to use respiratory equipment must be trained by a certified/qualified professional or vendor on the care, use and maintenance of respiratory protective equipment prior to use. They must be fit tested to the type of respirator required for the task prior to work start-up. The training will include, as a minimum:

- Respiratory hazards to which employees will potentially be exposed to
- Principles of operation and the proper use of respiratory protection
- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
- Limitations and capabilities of the respirator
- How to put on (don), remove (doff), use, clean, inspect, maintain, and store the respirator properly
- How to respond when the respirator malfunctions
- Emergency procedures
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators
- The general requirements of this SWP

Training will be refreshed annually.

7 Outside Authorities to be Contacted

N/A

8 Resources

8.1 Internal Resources

- Medical Surveillance Assessment Form (RMS9)
- SWP-111 – Medical Surveillance
  - Appendix A (United States)
  - Appendix B (Canada)
- Stantec Records Retention Schedule, Record Class: HSE1100 – Health and Safety Testing - General

8.2 External Resources

- Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:
  - Stantec's Critical Task Inventory
  - Health & Safety Regulatory Requirements Library
  - Environmental Regulations Library

If your jurisdictional standard is not listed, please contact your HSSE representative for guidance.

- CSA Standard *Z94.4 Selection, Care and Use of Respirators*
- IVERNA 2000: Working in confined spaces: Portable Blower Fan vs Portable Exhaust Fan
- US Occupational Safety and Health Administration (OSHA): *29 CFR 1910.134 Respiratory Protection*

9 Definitions

- **Action level** - means a concentration for a specific substance, calculated as an eight (8)-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.
- **Air-purifying respirator** – a respirator that removes specific contaminants as the user breathes air through a filter, cartridge, or canister. These respirators have at least two straps to secure to the user's face and may or may not have a speaking diaphragm.
- **Atmosphere-supplying respirator** - a respirator that supplies the user with breathing air/gas from a source independent of the ambient atmosphere.
- **Occupational exposure limit** - the maximum allowable concentration of an airborne contaminant, to which personnel may be exposed for specified periods. Shift-length, 15-minute, and/or instantaneous exposure limits are established in all jurisdictions. Occupational exposure limit terminology can vary. Examples include, but aren't limited to, Action Level, Permissible Exposure Limit (PEL), Recommended Exposure Limit (REL), Threshold Limit Values (TLVs), Time Weighted Averages (TWA), Workplace Exposure Limit (WEL), and Workplace Exposure Standard (WES).
- **Full facepiece -** can be an air-purifying, a powered-air purifying, a supplied-air respirator, or a self-contained breathing apparatus covering the face from above the eyes to below the chin.
- **Half-face mask** – can be an air-purifying, a powered-air purifying, a supplied-air respirator, or a self-contained breathing apparatus covering the face from the nose to below the chin.
- **Immediately dangerous to life or health (IDLH) atmosphere** - an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape. IDLH concentrations can be found on the NIOSH website (http://www.cdc.gov/niosh/idlh/intridl4.html)
- **Positive-Pressure** –a respirator that maintains a positive pressure in the facepiece during both inhalation and exhalation. The two main types of positive-pressure respirators are pressure-demand or continuous flow.
- **Quarter-mask** – an air-purifying respirator that covers the nose and mouth.

10 Documentation Summary

File these records in the Office Safety File:

- Employee training records
- Respiratory user screening form
- Employee fit-test records

File these records in the HSSE 1198hse shared drive:

- Respiratory Protection Program evaluation documentation

11 Revision History

Date	Change	Acknowledgments	Approval
August 1, 2025	All caps text revised for ADA compliance. Updated Section 5.4.1.1 Canada fit testing language to align with local legislation.	J. Gauthier, G. Burnett, K. Hancock	J. Parker
February 1, 2023	Administrative Update: Edits to 1 Purpose, 3.1 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Ferguson-Scot	P. Poelzer
August 17, 2022	Corrections to APF values in Table 2	K. Bayer	R. Roy
January 26, 2022	Updated section 3 – Responsibilities to better align with current practice. Aligned section 4 – Hazards to Energy Wheel. Various edits to section 5 – Controls with addition of Elimination, Substitution, and Engineering controls. Also removed several references to legislations and standards allowing for future integration to global operations. Updated SWP-409a – Respirator Fit Test Process and Form, and SWP-409b – Respirator User Screening Form.	K. Bayer, R. Roy, S. Wilde	J. Treen
May 6, 2020	Added reference to quantitative fit testing as required by clients to section 5.3; updated header	K. Bayer	
February 2, 2016	Formatting and addition of "Ventilation" Subsection under Section 5 Controls	M. Philipp	
May 3, 2014	Additions for CSA standards for SCBAs, and audible alarms for SCBAs.	M. Philipp	
February 2, 2012	Introduction of SWP-409b – Respirator User Screening Form as part of SWP 409	G. Doran	
August 2, 2011	Written for StanNet, including SWP-409a – Respirator Fit Test Process and Form, and	K. Robinson	

Attachment A: Respirator Cleaning Procedure

Copied from Appendix B-2 to § 1910.134: Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in Appendix B- 2. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2 (i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user).

Procedures for Cleaning Respirators

1. 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.
2. 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.
3. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.
4. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed (if permitted by the manufacturer) for two minutes in one of the following:
    a. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach (5 to 6% chlorine) to one liter of water at 43 deg. C (110 deg. F); or,
    b. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliter 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,
    c. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
5. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.

Note: The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces can result in adverse skin reaction (e.g., dermatitis). In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

6. Components should be hand-dried with a clean lint-free cloth or air-dried.
7. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.
8. Test the respirator to ensure that all components work properly in accordance with the manufacturer's instructions.

Attachment B: Respirator Inspection Checklist (Page 1 of 2) (For all Types of Respirators)

Respirator Owner: _____ Respirator #: _____

Manufacturer: _____ Model #: _____

Respirator Type: ☐ APR ☐ PAPR ☐ Air-line/ALE ☐ SCBA

Facepiece Type: ☐ Half Mask ☐ Full Facepiece ☐ Other: _____

Inspector Name: _____ Date: _____

	OK	Not OK
Rubber/Silicone Facepiece		
Excessive dirt (clean thoroughly)	☐	☐
Cracks, tears, or holes (replace facepiece)	☐	☐
Distortion (allow facepiece to "sit," free from all constraints, and see if distortion disappears; if not, replace facepiece)	☐	☐
Cracked, stretched, or loose-fitting lenses (contact manufacturer or dealer to see if replacement is possible; otherwise, replace facepiece)	☐	☐
Head Straps		
Breaks or tears (replace head-straps)	☐	☐
Loss of elasticity (replace head-straps)	☐	☐
Broken or malfunctioning buckles or attachments (replace buckles)	☐	☐
Excessively worn serrations on the head harness which might allow the facepiece to slip (replace head-strap)	☐	☐
Inhalation Valve & Exhalation Valve		
Detergent residue, dust particles or dirt on valve or valve seat (clean thoroughly)	☐	☐
Cracks, tears or distortion of the valve material or valve seat (contact manufacturer or dealer for instructions)	☐	☐
Missing or defective valve cover (replace valve cover from manufacturer or dealer)	☐	☐
Filter Elements		
Proper filter for the hazard	☐	☐
Missing or worn gaskets (contact manufacturer or dealer for replacement gaskets)	☐	☐
Worn threads - both filter threads and facepiece threads (replace filter or facepiece, whichever is applicable)	☐	☐
Cracks or dents in filter housing (replace filter)	☐	☐
Service life indicator, or expiration date	☐	☐

ATTACHMENT B: Respirator Inspection Checklist (Page 2 of 2) (for Supplied Air Respirators Only)

Respirator Owner: _____ Respirator #: _____

Manufacturer: _____ Model #: _____

Respirator Type: APR PAPR ☐ Air-line/ALE ☐ SCBA

Facepiece Type: ☐ Half Mask ☐ Full Facepiece ☐ Other: _____

Inspector Name: _____ Date: _____

Supplied Air Elements	OK	Not OK
Regulator • Diaphragm cap is hand tight; not dented or deformed • Small air holes around the outer edge of the cap are not blocked • Regulator gauge needle and face are undamaged; needle is not bent • Regulator outlet doesn't have stripped or damaged threads • Regulator gauge and cylinder gauge readings within +/- 10%	☐	☐
Audible Alarm • Coupling nut has no damaged threads; there is an O-ring and it is undamaged (connects to cylinder valve) • Bell is on tightly and properly aligned • Alarm rings briefly when the cylinder valve is opened	☐	☐
Cylinder • Cylinder gauge needle and face are undamaged; needle is not bent • Cylinder pressure is full [*Note: Pressure is based on cylinder material.*] • Cylinder body has no cracks, dents, weakened areas, or signs of heat-related damage • Cylinder valve has no signs of damage • Check the hydrostatic test date**.** [*Note: composite cylinders must be tested every three years, steel cylinders every five years.*]	☐	☐
Breathing Tube • Breathing tube has no perforations, small cracks, or signs of wear, especially along the corrugations • Breathing tube has no leaks	☐	☐
High Pressure Hose • No cuts or severe abrasions • Hose fittings are tight	☐	☐
Carrier (Harness Assembly) • Harness shoulder straps, adjustable pull-straps, waist-strap, and chest-strap have no cuts, tears, abrasion or signs of heat or chemically related damage • Tee nuts, washers, and screws are secure • Backplate has no cracks or splits that may indicate metal fatigue • Cylinder band and latch wing are undamaged and operational	☐	☐

Attachment C: Respiratory Protection Program Evaluation

Evaluator's Name:_____ Date of Evaluation:_____

Yes	No	The written respiratory protection program is specific to the workplace and covers the following:
		Specifications on who (employees of what department or units under what situations) are covered by the respiratory protection program
		Designation of a program administrator qualified to administrator the program

Written Program		Implemented		
Yes	**No**	**Yes**	**No**	
				Procedures for selecting respirators for use in the workplace
				Medical evaluations of employees required to use respirators
				Fit testing procedures for tight-fitting respirators
				Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations
				Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators
				Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators
				Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations
				Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance
				Procedures for regularly evaluating the effectiveness of the program
				Provide to employees who voluntarily use respirators the information contained in Appendix D to this section ("Information for Employees Using Respirators When Not Required Under the Standard")
				Provide respirators, training, and medical evaluations at no cost to the employee

Attachment D: Information for Employees Using Respirators When Not Required Under the OSHA Standard

Appendix D to OSHA 1910.134 (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

HEALTH, SAFETY, SECURITY, AND ENVIRONMENT
SAFE WORK PRACTICE
SUPERVISION OF DRILLING ACTIVITIES (SWP-416)

1 PURPOSE

The purpose of the Supervision of Drilling Activities Safe Work Practice (SWP) is to provide standard practices and procedures to help mitigate the potential of injury when employees are involved in drilling activities, both company-operated and subcontracted.

2 SCOPE

This SWP applies to work carried out by Stantec employees and subcontractors working on behalf of Stantec when that work involves drilling activities, both company-operated and subcontracted, in urban or rural locations.

Additional SWPs associated with this practice are:

- SWP-105 – Personal Protective Equipment
- SWP-213 – Ground Disturbance and Overhead Utility
- SWP-213a – Pre-Ground Disturbance Worksheet and Approval Form
- SWP-407 – Traffic Control and Protection Planning
- SWP-407a – Traffic Control Plan

REVISION HISTORY

Revision Number	Date	Changes	Authors	Reviews	Approvals
2.0	18-Feb-2025	Updated Location and Leaving Site sections to include language on authority having jurisdiction.	J. Bezaire	G. Burnett	K. Hancock
1.0	6-Mar-2024	Initial re-release in revised format	E. Voges, L. Tait	J. Elkins, J. Parker, K. Bayer	P. Poelzer

3 HRAC (HAZARD RECOGNITION ASSESSMENT AND CONTROL)

This section outlines the hazards that are expected in the work activity of this SWP and outlines the mandatory controls that must be implemented to prevent incidents. The list is not exhaustive, and each project and/or location must consider the specific hazards that may be present. Select the hyperlinked steps below to see the details for each step.

Job Hazard	Energy Hazard	Specific Hazard	Critical Risk	Mandatory Controls	Training
Overhead or underground utility lines	 Pressure  Electrical  Chemical  Thermal  Biological	Underground utility strike Overhead utility strike with derrick or equipment	 Ground Disturbance  Hazardous Materials and Environments  Mobile and Heavy Equipment	Step 1 - Project Planning Step 2 - Site Mobilization Step 3 - Setup & Verification Step 4 - Execution Step 5 - Demobilization	Stantec employees and subcontractors to Stantec will be competent by means of training, knowledge, experience, and any necessary qualifications. Check with the regulator as specific jurisdictions may have legislated training requirements. Contact your client to determine if they have specific training or certification requirements. Please contact your Business Operating Unit or Regional HSSE Manager or Advisor for training support.
Naturally occurring gases	 Chemical  Thermal	Exposure to hazardous naturally occurring gases during operation			
Naturally occurring radioactive materials (NORM)	 Radiation	Exposure to NORM during operation			
Pressurized fluids	 Pressure	High pressure release of fluid/water/grout			
Noise	 Noise	Drilling impact noise Communications affected by noise			

Hot work, heated surfaces	 Thermal	Fire / injury due to heating torches, temporary heating sources, or hot equipment surfaces	 Hot Work  Mobile and Heavy Equipment		
Equipment and tools	 Electrical  Pressure  Mechanical  Motion  Gravity	Rotating and moving equipment resulting in minimal reaction time Struck by equipment due to malfunction or breakage Tripping hazards from tools and equipment Unloading/loading equipment	 Mobile and Heavy Equipment  Ergonomic Hazards and Manual Handling		

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between a SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on health and safety requirements by jurisdiction, refer to Stantec's Health & Safety Regulatory Requirements Library. The Critical Task Inventory also provides information for work activities that have been identified to have higher risks.

Stantec also recognizes that clients or project sites may have their own requirements; when a client or site requirements are more stringent than those required by Stantec or local legislation, the client's requirements will prevail.

Additional links:

- Project HSSE Plan (RMS1)
- Health & Safety Regulatory Requirements Library
- Environmental Regulations Library

4 MANDATORY CONTROLS

Deviation from the mandatory controls of this SWP must follow the Management of Change (RMS11) process.

Additional information can be found Appendix B, including information on specific topics linked in the steps below.

Step 1 – Project Planning

- Identify potential hazards and select appropriate controls using planning tools such as the Project HSSE Plan (RMS1) or Health and Safety Plan (HASP), including emergency response procedures, traffic protection plan, and a waste management plan.
- Confirm subcontractors have been prequalified through Stantec's Subcontractor Prequalification program.
- Notify the drilling subcontractor that the use of drilling tools such as catheads, cheater bars (snipes), figure 8s, or j-hooks are limited on Stantec sites. Such tools can only be used with written approval to proceed from Business Center (BC) leadership or a BC employee at Principal level or above. A hazard assessment must be completed to document the need and required controls to use the referenced tools.
- Obtain hazard assessment documentation from the drilling subcontractor, when required.
- Obtain permission to access the site and, when required, confirm permits and agreements are in place and conditions have been met.
- Coordinate the completion of utility locates and all mandatory controls required by SWP-213 - Ground Disturbance and Overhead Utility. Confirm that all underground and overhead hazards have been identified, located, and if necessary, isolated.
- Verify qualifications/certifications for subcontractor and Stantec personnel.
- Coordinate completion of a traffic control plan as required by SWP-407 - Traffic Control & Protection Planning.
- Determine if Stantec will be acting in the capacity of Principal/Prime Contractor or Constructor. If so, adhere to legislated requirements.

Step 2 – Site Mobilization

- Review the approved traffic control plan (SWP-407a) with the drill operator and confirm safe locations have been established for parking, receiving, offloading, and storage of equipment and materials (as applicable).
- Prior to starting work, confirm the drill operator has completed a documented equipment inspection of the drill rig in accordance with the authority having jurisdiction and manufacturers requirements.
- Complete a site walk-through of each ground disturbance location with the drill operator to identify overhead and buried hazards, entry / exit pathways, site constraints, and to review utility locate marks and documentation. Record or update planning documentation, as required.

Step 3 – Setup & Verification

- Work with the drill operator to confirm that each ground disturbance location complies with the approved traffic control plan, and that all safety devices and warning signs are clear, legible, and appropriately located.
- When required, confirm the drill operator has properly bonded or grounded the drill rig.
- Verify with the drill operator that:
    - The borehole location is stable.
    - Edge protection is provided (where required).
    - Walkways are clear and unobstructed.
    - The drill rig and support vehicles are positioned to minimize exposure of personnel to drilling hazards. This includes identifying a safe supervising location.
- Verify the drill operator has established appropriate secondary containment and sediment control measures for fuel, equipment, and spoil piles, and that other required environmental management devices are in place.
- Test communication method(s) to verify they work in the specific location.
- Request the drill operator test equipment e-stop(s) prior to execution.
- Verify that the drill operator has guarding is in place to prevent entanglement or access to crush hazards.

Step 4 – Execution



- Conduct a Last-Minute Risk Assessment (LMRA) before starting to drill.
- Review and monitor adherence to the Project HSSE plan (RMS1) or HASP and relevant SWPs and Standard Operating Procedures.
- Stantec personnel should not assist drilling subcontractors with the operation or handling of drilling equipment for safety and liability reasons.
- Return to Step 3 if moving to a new drilling location. Otherwise, proceed to Step 5.

Step 5 – Demobilization

- Prior to leaving site, all drilled boreholes must be backfilled or made safe. Any hazards associated with the drilling activities must be removed or adequately controlled.
- Make sure waste is disposed of or stored in appropriately labelled containers on site and that arrangements have been made for the waste materials to be removed from site.

- When leaving site, arrange for the safe transportation of equipment and materials off the site. Review the traffic control plan with the drill operator and confirm safe locations for parking and loading of equipment and materials.

5 RESPONSIBILITIES

See the HSSE Program Manual for general responsibilities.

Project Manager

Has the primary responsibility for implementing this practice. This responsibility includes the following:

- Review, understand, and verify implementation of the five-step process listed in the Mandatory Controls section of this SWP.
- Coordinate the scheduled work with the client so that all Stantec and subcontractor employees performing work on-site are aware of any precautions or controls required.

Employees

- Comply with requirements outlined in this SWP.
- STOP work immediately if they become aware of an unsafe act or condition that could place anyone in danger, or if they are not confident in the work plan.

Leadership

- Review, understand, and verify implementation of the five-step process listed in the Mandatory Controls section of this SWP.
- Require that this SWP be implemented for all applicable operations.

APPENDICES:

Open the appendices below by selecting the right-facing arrow beside each appendix.

APPENDIX A: DEFINITIONS (RETURN TO MANDATORY CONTROLS)

APPENDIX B: ADDITIONAL INFORMATION

HEALTH, SAFETY, SECURITY, AND ENVIRONMENT
SAFE WORK PRACTICE - PREPARING FOR ANIMAL ENCOUNTERS
SWP-508

1 PURPOSE

This safe work practice (SWP) provides guidance for decreasing the possibility of hazardous animal encounters and the severity if an encounter does occur.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 SCOPE

This practice applies to all work carried out by Stantec's employees, subconsultants, and subcontractors in areas that may be considered rural or wilderness in nature, as well as suburban and urban areas where animal encounters may occur.

3 RESPONSIBILITIES

3.1 Health, Safety, Security, & Environment (HSSE)

- Maintain this Safe Work Practice (SWP)
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether the requirements within this SWP are being met

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP

3.3 Supervisor

Supervisors have the primary responsibility to:

- Confirm that employees who report to them who may be exposed to animal encounters have reviewed this SWP
- Confirm that each employee has completed the training required by this SWP

3.4 Project Manager

- Identify the potential hazard exposures for employees and select appropriate hazard controls using the Risk Management Strategy (RMS1), or the site-specific Health and Safety Plan (HASP)
- Review the tasks and procedures with the employees prior to commencing work
- Communicate the hazards and controls to employees
- Assign only employees that are knowledgeable in the requirements of this SWP, who understand the hazards associated with the work, who can apply the appropriate controls, and have training identified in the SWP
- Hold employees accountable for properly implementing this SWP
- Coordinate with the OSEC for the supply and/or purchase of the required personal protective equipment (PPE) and any other equipment or precautions that may be required, and to coordinate related training

- Provide the required PPE to employees and require them to use the PPE identified for their tasks
- Make sure provided equipment is selected, inspected, and maintained in accordance with the manufacturer's recommendations
- Outline the processes for obtaining external medical assistance by communicating the emergency response and transportation procedures
- Coordinate the scheduled work with the Client or other parties responsible for occupational health, safety, security, and environmental programs on site to verify that all Stantec employees performing work on-site are aware of any required precautions

3.5 Employees

- Be aware of the potential hazards that may be encountered while conducting work where animal encounters has been identified as a hazard
- Know the proper storage, use, and limitations of equipment:
  - Be aware of and comply with requirements outlined in this SWP
  - Be familiar with manufacturer's instructions
  - Be familiar with the local regulatory requirements
- Inspect equipment and work areas regularly for hazards:
  - Know how to control and respond to hazards and emergencies including use of emergency equipment

3.6 Subcontracted Wildlife Monitor

Subcontracted wildlife monitors are designated to monitor worksites and surrounding areas for the presence of wildlife entering the work area to alert project personnel to the presence of dangerous wildlife. Wildlife monitors can be unarmed and armed. Armed monitors are trained, pre-qualified personnel employed in areas where Stantec staff are working in remote locations where the risk of dangerous wildlife encounters is high enough that an additional level of protection up to and including the use of deadly force is required to mitigate the hazards.

A wildlife monitor will be:

- Dedicated to the role, with no other duties assigned as part of their work duties. trained as determined by the local regulatory authority
- Responsible for initiating the emergency response plan for dangerous wildlife encounters
- Hold valid certifications for any wildlife deterrents applicable in their respective region
- As firearms are not permitted to be carried by Stantec personnel this role is a subcontracted service, unless authorized by the HSSE Director of Operations for their respective region.

4 HAZARDS

Threats may include encounters with many different types of animals, depending on the geographic location of the work being performed. Threats from domesticated animals such as horses or cattle may also pose a risk. Most animal attacks are the result of unexpected encounters.

4.1 Energy Wheel



The energy wheel is a visual tool used by Stantec to identify 10 sources of energy and to assess and control the hazards associated with each source. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. Before beginning any activity, review the potential hazards and controls associated with the task. For project work, these sources, hazards, and controls will be documented on the Risk Management Strategy (RMS1), and in a Field Level Risk Assessment (RMS2/field app). Below are examples of energy sources and hazards commonly associated with animal encounters, and preparing for animal encounters.

4.2 Chemical

Exposure to Bear Spray: The inflammatory properties of bear spray affect humans in a similar way as it does bears. A person contaminated with bear spray will experience irritated mucous membranes of the eyes, nose, and lungs.

4.3 Biological

- Wildlife attacks resulting in puncture wounds, lacerations, fractures, and possibly death
- Wildlife bites resulting in the transmission of blood borne pathogens such as rabies
- Injuries caused by snake or spider bites, especially venomous snakes and spiders.

4.4 Pressure

Explosions caused by pressure building up in cans of bear spray when exposed to extreme heat [120°F/49°C or greater]; spray can come out at more than 70 mph (112 km/h), which could cause permanent eye damage

5 CONTROLS

5.1 Planning

- When risks are unknown or unclear, contact the local Wildlife Officer and/or client to obtain details and advice on local wildlife movements.
- In areas such as wildlife management areas or national, provincial, or state parks, contact the appropriate authorities to obtain details and advice on wildlife risks.
- Document the client's requirements or restrictions regarding defensive devices, including firearms.
- Based on the anticipated hazard(s), equip the field team with an appropriate first aid kit and defensive devices where applicable.
- HSSE Director of Operations approval is required for Stantec employees to carry firearms; wildlife monitors are a subcontracted service.

- Verify that crew members are properly trained and have necessary licenses and permits, etc. Where applicable, review guidance and requirements in SWP-119 – Gaining Access to Private Property and include documentation in the Risk Management Strategy (RMS1) or Health and Safety Plan (HASP) for the project or task.

5.2 Specific Animal Guidelines

The list below represents some of the animals that have the potential to cause serious harm to humans if an animal encounter is not handled correctly. If your project team will encounter animals that are not listed below, please develop a control plan for your project and communicate this to your team.

- Appendix A: Domestic Dogs
- Appendix B: Grizzly and Black Bears
- Appendix C: Polar Bears
- Appendix D: Ungulates (Deer, Moose, Elk, and Caribou)
- Appendix E: Wild Canines (Coyotes, Wolves, and Dingoes)
- Appendix F: Livestock
- Appendix G: Venomous Snakes and Spiders
- Appendix H: Large Reptiles (Alligators and Crocodiles)
- Appendix I: Cougars and Mountain Lions

6 TRAINING OR QUALIFICATIONS

- Training, licenses, and permits may be required for specific controls to be used; check your local legislation to verify the requirements.
- Some wildlife controls may be covered by specific transportation requirements; check your local legislation and transportation provider. For example, compressed gas containers may not be permitted on helicopters or aircraft.
- Valid certification in Standard First Aid, or regional equivalent

7 OUTSIDE AUTHORITIES TO BE CONTACTED

Where required, contact the appropriate local authorities to report wildlife encounters.

8 RESOURCES

8.1 Internal

- SWP-107 – First Aid
- SWP-119 - Accessing Private Property

8.2 External

Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:

- Stantec's Critical Task Inventory
- Health & Safety Regulatory Requirements Library
- Environmental Regulations Library

9 DEFINITIONS

None

10 DOCUMENTATION SUMMARY

N/A

11 REVISION HISTORY

Date	Change	Acknowledgments	Approval
December 19, 2022	Edits to 1. Purpose, 3.2 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings. Clarification and revision throughout. Specific animal guidance moved to appendices.	J. Bezaire, J. Currie, M. Doherty, J. Elkins	P. Poelzer
September 10, 2018	Updated formatting, terminology, and branding. Removed references to unpublished SWPs (503 and 505).	K. Bayer	R. Roy
February 23, 2010	Initial posting to StanNet	C. Ferguson-Scott	C. Ferguson-Scott

APPENDIX A: DOMESTIC DOGS

Meeting an Unknown Dog

Remember that, even though you have permission from the landowner to be on their property or have been invited by the owner to the site, you are considered a trespasser by the dog. The dog may already have formed an opinion about you based on past experience with previous people on-site. The first step to easing the approach to a dog is to display signals that are passive and non-threatening. You are a visitor to the dog's home or yard, and you want to let it know that you are not a threat.

Dogs communicate primarily by body language. How you use your body, your eyes, and your voice, can affect how a dog responds to you. We humans tend to break a lot of dog greeting rules of etiquette. We face the dog, make eye contact, and lean over - and then we try to touch the dog on top of his head or shoulders. All of these are threatening postures in "dog language." Assertive, dominant dogs approach other dogs face-on with steady eye contact. They stand tall, so they can look down on the other dog. They assert themselves by placing their chin or paw on the other dog's shoulders.

Non-threatening dogs turn sideways and look away. They look off into the distance, blink and might even yawn to show how non-threatening they are feeling. At the approach of the more assertive dog, the submissive dog might lower its head or whole body.

As you enter a dog's territory, you should remain passive, stand sideways, and look away, blink, maybe even yawn. When introducing yourself to a dog, turn to the side, lower your body, squat, kneel or sit. Don't stare! Look at them out of the corner of your eye, lower your eye lids in a friendly fashion. Extend your hand to the side for him to smell and, if he seems to accept you, scratch under his chin, not over the top of his head.

You can reduce the chance of being bitten or injured by a dog if you follow these guidelines.

- Never approach an unfamiliar dog.
- Never run from a dog or scream; loud noises make animals very nervous.
- Stay still when an unfamiliar dog comes up to you.
- Do not look a dog in the eye.
- Do not disturb a dog that is sleeping, eating, or caring for puppies.
- Do not pet a dog without letting it see and sniff you first.
- Do not play with a dog you do not know.
- If knocked over by a dog, roll into a ball and lie still.

Dog Spray

This product is for use against aggressive dogs only and shall be used in accordance with the label directions or other written instructions. An SDS, where available, must be provided to employees and will be available in the field.

When threatened by a dog, point the canister nozzle directly toward its face. Typically, the maximum range is 3 meters/10 feet. Move away from the spray to avoid exposure.

Human exposure to dog spray can cause severe irritation to the eyes, nose, respiratory system and/or skin. The following precautions apply:

- Avoid contact with skin and eyes and avoid inhalation of spray.
- Persons with respiratory problems or wearing contact lenses should not use this product.

- Wash hands before touching eyes or face and prior to using the washroom.
- When traveling, regardless of vehicle, do not store this product in the passenger compartment.
- Contact air carriers for regulations concerning air transport.
- Spray canisters are pressurized and may explode if heated.
  - Do not place in hot water or near radiators, stoves, or other sources of heat.
  - Do not leave the container in a hot vehicle.
  - Do not incinerate containers, even when fully discharged. When the container is empty, release all remaining pressure. Dispose of empty container in accordance with local regulatory requirements. For information on the disposal of unused, unwanted products, contact the regulatory agency or the manufacturer.
- Follow the instructions on the container for safe storage; do not store the product in areas above 50 °C/122 °F or below 0 °C/32 °F.

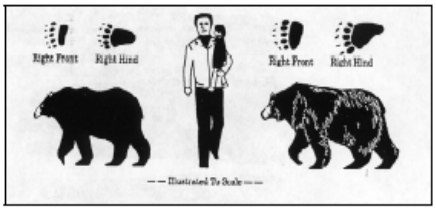
APPENDIX B: GRIZZLY AND BLACK BEARS

Characteristics

Bears have unpredictable behavior patterns, and all bears are potentially dangerous. When threatened or surprised, they will defend themselves, their young and their territory. Bears are very strong, surprisingly agile, and capable of inflicting serious injury in an attack.

Potential exposures exist for both black and grizzly bears. Black bears are found in heavily wooded areas and areas of dense brush year-round. Typically, grizzly bears stay at higher elevations during the summer and early fall months and move to valley bottoms in late fall, staying through the spring. Although bears hibernate during the winter months, it is not uncommon to see a bear in mid-winter taking a short break from its den.

The normal diet of a bear includes roots, berries, grubs and other insects, and the occasional small mammal or fish when available. Bears will sometimes feed on carcasses of dead animals or take over kills from other predators. A keen sense of smell directs the bear to food sources, sometimes from great distances. Both black bears and grizzly bears will venture into human environments if food is readily available. Table 1 provides descriptive characteristics of both bear species for identification purposes.

Characteristic	Black Bear (*Ursus americanus* Pallas)	Grizzly Bear (*Ursus arctos horribilis* Ord)
Colour	Varies from pure black to cinnamon or blond. Most are black with a brownish muzzle, and often display a white patch below the throat or across the chest.	Varies from black to blond, frequently with white tipped fur, giving a grizzled appearance.
Height and Length	About 90 cm at the shoulder. About 1.5 m long.	A little over 1 m at the shoulder - reaches 1.8 to 2 m when standing on hind legs.
Weight	Ranges from 57 kg to > 270 kg. Females are generally smaller than males.	Averages about 200 kg with some weighing up to 450 kg. Females are generally smaller than males.
Distinguishing Characteristics	Smallest member of the North American bear family. Usually has a straight facial profile with long nostrils. Feet are flat-soled with short curved claws. Black bears are smaller than grizzly bears and have a higher shoulder-rump line. Agile climber.	Prominent humps over the shoulder formed by the muscles of the massive forelegs. Sloping back line. Dished or concave face. Long curved claws. A small grizzly is often hard to distinguish from a large black bear.
Visual Comparison		

Avoiding Bears While Working

- When possible, travel in groups of 3 or more. Delegate at least one person to watch for bears and other animals, if one is not provided by the client.
- Stay in open areas as much as possible.
- If you are working near running water or dense brush, be sure to make noise as a bear may not otherwise hear you.
- Be aware of the wind direction and walk with the wind whenever you can.
- Do not investigate bad smells, especially the smell of rotting meat, as bears are usually attracted to them.

- Leave the area if you find fresh tracks, droppings, and new digging.
- Be noisy when travelling. Alert bears to your presence before getting too close to them, by making a lot of noise. While walking in area with limited sightlines, stay alert and make an extra effort to be noisy. This can be done by talking with your team, blowing on a whistle, using an air horn at regular intervals or any other means that will warn an animal of your presence (e.g., calling out —"yo bear" about every 50 paces or at regular intervals if you are stationary).
- Be as knowledgeable as possible about the habits and habitats of the various wild animals indigenous to your travel area.
- Never approach a wild animal as it may feel threatened and attack you.
- Avoid dead animals and berry patches. These are prime food sources for bears.
- Avoid the use of smelly cosmetics. Bears may be attracted to items such as perfumes or soaps.
- Feminine products should be disposed of in an airtight plastic bag.
- When designing a camp or rest spot:
    - Avoid sites with a history of bear problems. Check with the Wildlife Officer and/or local residents to obtain details and advice.
    - Keep all sleeping tents together and ensure they are situated away from kitchen, food storage and garbage collection or disposal areas.
    - Keep food locked in a vehicle (if possible) or hanging from a tree at least 4 m above the ground. Do not store items in your tent such as: food, garbage, soap, toothpaste, and deodorant.

Bear Confrontation

- Leave the area. If you see the bear from a distance, take a wide detour or leave. If you cannot retreat, then wait for the bear to move from your path. Always leave the animal an escape route.
- Stop, and remain calm and quiet; do not yell, scream, or make sudden moves. Act in a calm and relaxed manner so as not to threaten the bear.
- Do not turn your back on the bear and do not run. A bear can easily outrun you.
- Break eye contact - do not stare into the bear's eyes, as this is a sign of aggression.
- Assess your situation. Is it a black bear or a grizzly? Are there cubs, and where are they in relation to you and the bear? Where is the rest of your party? (Stay together as a group. A group of people is less likely to be attacked than an individual.)
- Give the bear enough time and room to leave on its own. Look for possible escape routes or safe trees. Keep in mind that some bears, even grizzlies, will climb trees after you. A grizzly can reach 10 feet up a tree while standing on the ground. However, climbing a tree may make the animal feel less threatened.
- Look for signs of agitation and aggression. When a bear is upset it may have its ears back, with head lowered and swinging from side to side. It may paw at the ground and make huffing or woofing noises or snap its teeth. It might not show any signs at all and just drop and charge with no warning. When a bear is standing on its hind legs, it is usually just trying to get a better look at and smell of you.
- Sometimes a bear will bluff charge several times. If you run from such a bluff, it will provoke a more aggressive charge.
- Back away slowly, speaking in a calming, monotone voice - you want to show the bear that you are being submissive and want to get out of its territory.
- Leave your backpack on unless it has very good smelling food in it. It may provide additional defensive covering in case of attack. Dropping it will not distract the bear.

- The bear may be curious - older and asserting dominance. On rare occasions, it may consider a person as prey.
- The bear may hold its head high with ears up and may not be drooling as it follows someone. This is considered an offensive position. If this is the case, acting aggressively while making noise may intimidate the bear.

How to React to a Bear Attack

- Stay calm.
- If you have bear spray, spray it directly at the bear's face or spray a fog between you and the bear that the bear must run through to get to you.
- If you don't have bear spray or if the spray doesn't deter the bear, roll into a ball or lie face down. Try to protect your neck, face, and abdomen by putting your hands on the back of your neck with elbows tucked in close to your head. Don't stick your arms out, kick, scream, or fight. Try to protect the vulnerable parts of your body while remaining as still as possible; this will be actively helping the bear remove the perceived threat. This method requires a significant amount of courage but may help you successfully survive an attack. Remain still on the ground for several minutes, or until you're sure the bear has left the area.
- Vacate the area, keeping in mind the bear could still be around.
- If the bear mauls you continuously, despite your passivity, you may have to fight back. Try using any available weapon - a knife, rock, fist - and concentrate on hitting the bear's head, eyes, and nostrils. If the bear follows you, stop and again use weapons to intimidate the bear.
- Apply or administer first aid as soon as possible.

Bear Repellents

Bear repellents use a compound called "capsaicin" as the active agent (derived from plants belonging to the genus Capsicum) and come packaged in a compressed gas container about the size of a large spray can. Usually, these hang from a holster on your belt and are employed by spraying the charge in the bear's face. The repellent causes the bear great difficulty in breathing and seeing, allowing the victim time to escape.

Bear spray is your "last-resort" tool: have it ready, but first, try to get out of the bear's way calmly and slowly. If the bear comes towards you, yell "Hey Bear!" The bear must be in close range for your spray to be effective. Use only if the bear acts aggressively.

Although all bear spray canisters are different and users must familiarize themselves with the product that they are using, in general the instructions are as follows. Remove the safety clip and aim for the bear's face (make sure the nozzle is pointing away from you). When the bear is 4 metres away, fire 1- to 2- second blast, aiming at its head. Give quick, one-second bursts until the bear retreats. Leave the area immediately. Wind or rain may reduce the spray's effectiveness; be careful not to get in the path of the spray. Carry it in a holster you can easily reach with your dominant hand (if you are right-handed, carry it on the right side of your body). You must always be alert, diligent and prepared. Being "bear smart" can prevent unwanted encounters from happening in the first place. Bear spray should be your last resort.

This product is to be used only in accordance with the label directions or other written instructions. It is an offense under the Pest Control Products Act to use a controlled product under unsafe conditions.

Use may be restricted to authorized customers where the vendor maintains a record of sales, including the name and address of the purchaser, the amount purchased, and a signed Notice to Purchaser.

Safety Data Sheets (SDS), where available, must be provided to employees and will be available in the field.

Bear repellent is designed to be used in wilderness applications to help defend individuals needing assistance when confronted by bears. This product is for spraying into the face of an aggressive bear only and is not to be used against domestic animals or human beings. This product has an effective range up to 5.5 m (18 feet). Canisters can be emptied in as little as 8 seconds.

Special procedures must be taken to arm the container, apply the product, and restore the safety clip to disarm the container. Before taking repellent into bear country, read the directions and familiarize yourself with the safe-use procedures. If you test-fire the container, make sure to discharge downwind and do not depress the actuator tab for more than one-half a second. Do not test fire in areas inhabited by bears. After test firing, replace the safety clip, and clean the nozzle and can with soap and water to remove all residues from the can.

Precautions

- This product should only be used as a last resort, and only in outdoor areas.
- Capsaicin sprays have been proven effective in repelling bears only when sprayed directly in the eyes or on the nose.
- There is no guaranteed method of responding to a bear encounter; each encounter is unique.
- Pay strict attention to the safety advice of wildlife professionals.
- Human exposure to a Capsaicin spray can cause severe irritation to the eyes, nose, respiratory system and/or skin. Avoid contact with skin and eyes and avoid inhalation of spray.
- Persons with respiratory problems or wearing contact lenses should not use this product.
- Wash hands before touching eyes or face and prior to using the washroom.
- When traveling, regardless of vehicle, do not store this product in the passenger compartment.
- Contact air carriers for regulations concerning air transport.
- Capsaicin spray canisters are pressurized and may explode if heated.
- Do not place in hot water or near radiators, stoves, or other sources of heat; do not leave in a hot vehicle, and do not incinerate empty containers.
- Training for the use of bear spray should be conducted with inert (with no capsaicin added) bear spray canisters designed for training.
- Dispose of expired or empty containers in accordance with local regulatory requirements. For information on the disposal of unused, unwanted products, contact the regulatory agency or the manufacturer.
- For safety and performance, do not store the product in areas above 50 °C/ 122 °F or below 0 °C/32 °F.
- Be careful not to puncture container.
- Use of this product for any purpose other than self-defense against bear attacks is a criminal offense; do not use against domestic animals or human beings.
- Capsaicin sprays will not repel bears from treated objects or areas; do not spray tents, clothing, work areas, etc. with this product.

First Aid

In case of external contact, remain calm, and flush thoroughly with water. Do not rub. If contact occurs with eyes, remove contact lenses (if present) and flush eyes with cool water. If swallowed, do not induce vomiting – the product contains petroleum distillate solvent. Obtain medical attention or call a Poison Control Centre immediately. If inhaled, move to fresh air. Symptoms usually disappear within one hour. If symptoms persist, obtain medical attention or call a Poison Control Centre immediately. Take container label, SDS, or product name and PCP Registration Number with you when seeking medical attention.

APPENDIX C: POLAR BEARS

The polar bear is the largest member of the family Ursidae. Males are approximately twice the size of females. On average, adult males weigh 500 to 900 pounds (250 to 400 kg), depending on the time of year. An exceptionally large individual might reach 1,320 to 1,760 pounds (600 to 800 kg). Adult females weigh 330 to 550 pounds (150 to 250 kg) on average. Polar bears have a heavy build overall, large feet, and a longer neck relative to their body size than other species of bears. The fur is white, but the shade may vary among white, yellow, grey, or almost brown, depending on the time of year or light conditions.

Bears typically feed on seals but occasionally will feed on small mammals, seaweed, grasses, and other vegetation. These bears are typically curious creatures and have been known to investigate human settlements and garbage areas. Bears may be found along the coast or far offshore in search of prey, particularly in areas where the ice continuously cracks and refreezes.

Threat or damage from a polar bear differs from that of other bears because it can occur at any time of the year. Although polar bears are the most predatory of the three North American bears, their threat to human life has been low.

When working or traveling in polar bear country some special considerations need to be taken. Polar bears inhabit an environment that often has minimal cover and often an encounter can be prevented when the bear is spotted at a distance. Be alert and aware of your surroundings.

Bear Avoidance While Working

- Scan all around with binoculars at regular intervals.
- Watch for signs such as tracks, droppings, diggings, wildlife carcasses and polar bear dens.
- Travel in daylight and avoid areas of restricted visibility.
- Be especially careful in areas along the coast, where a polar bear may be hidden behind boulders, pressure ridges (pushed up sea ice), driftwood or vegetation.
- Travel in groups and stay together to increase your safety. The larger the group the greater the chances of deterring a bear.
- **Avoid polar bear den sites.** Unlike black or grizzly bears, there is no time when all polar bears are inactive in dens.
    - Maternity dens are excavated by pregnant females in snow drifts on wind protected slopes of coastal hills and valleys. In the Baffin Region, dens can be found at high elevations on snowfields and glaciers. Maternity dens are occupied from fall to early spring. The dens are inconspicuous, however, bear tracks leading to and from the site in early autumn or late spring or ventilation holes can indicate their presence.
    - Temporary dens are excavated in snow drifts or pressure ridges by polar bears (males, females, and females with cubs) that are active over the winter. The dens can be used as resting places or as temporary shelter from bad weather. They can be used from a few days to several months.
    - Summer retreat dens are excavated during the open water season in the remaining snowbanks or into the permafrost. These can also be at higher elevations on snowfields and glaciers or the valleys leading up to them. Male and female bears of all age groups use them to keep cool and avoid harassment by insects.

Deterrents

- Bears will often retreat from a series of loud sounds; revving a snowmobile or ATV engine often works well.
- Loud explosive devices can be fired from specialized launchers or 12-gauge shotguns from 25 to 75 meters away.
- Bear spray might deter a bear at close range, but it has not been adequately tested on polar bears, and the canisters do not work well when cold.
- A well-maintained electric fence around your camp or work area can also keep polar bears out. It's important to choose devices carefully, know their capabilities and limitations.

Encountering a Polar Bear

Anytime you see a polar bear at a distance. Stop. Do not approach any closer, stay calm, and assess the situation. Does the bear know you're there? If the bear appears unaware or seems unconcerned, move away slowly and quietly. Do not run or make motions that might attract its attention. Leave the way you came, keeping your eye on the bear. If it moves in your direction, watch for any change.

On sensing you a bear will often look in your direction or stare right at you trying to determine just what you are. It may stand on its hind legs for a better look or circle downwind to pick up your scent. If a bear appears interested in you, it's time to change your strategy. It needs to know you're a person not a prey item; help it identify you as human by slowly waving your arms and talking in a low tone. If you can, form a group with others. Ready your deterrent or firearm.

Keep your eye on the bear and slowly increase your distance. When possible, move upwind to give the bear your scent. Once it recognizes you as a human, the bear will usually move away. Try to keep track of it as it moves off. Once it has gone, the safest thing to do is leave the area. If you must continue give the bear some time to move farther away, stay alert, make some noise, and proceed with caution.

APPENDIX D: UNGULATES (DEER, MOOSE, ELK, CARIBOU)

In the summer months, moose blend in well to their environment and can be surprisingly hard to see for such large animals. They are likely to stand their ground even when they hear people approaching, so pay close attention to your surroundings, especially in prime moose habitat such as willow thickets or around streams or ponds.

If you find yourself close to a moose or elk:

- If it hasn't detected you yet, keep it that way.
- If it knows you're there, talk to it softly and move away slowly.
- Don't be aggressive – you want to convince the animal that you aren't a threat.
- If you think the animal is going to charge you, take cover or run away.

Ungulates behave aggressively during their rutting season (typically late August to October in the northern hemisphere). If you encounter an ungulate, stop and evaluate the situation. In May and June, during the calving season in the northern hemisphere, females aggressively defend their young. But, as with any potentially dangerous animal, don't completely turn your back on the animal. Keep an eye on it and remain aware of what it is doing. Whatever the season, do not approach ungulates. Always maintain a distance of at least 30 meters/100 feet.

Watch for signs that the moose or elk is upset. If its ears are laid back and its hackles are up, it is likely to charge. Most of the time, when an ungulate charges, it is a 'bluff' or warning for you to get back – a warning you should take very seriously! Once a moose bluff-charges it is already agitated. If possible, get behind something solid (like a tree or a car). Unlike with bears, it is okay to run from a moose. They usually won't chase you and if they do, it's unlikely that they'll chase you very far. If a moose knocks you down, curl up in a ball and protect your head with your arms and keep still. Fighting back will only convince the moose that you may still be a threat. Move only when the moose has backed off to a safe distance or it may renew its attack.

APPENDIX E: WILD CANINES

COYOTES AND WOLVES

- If you encounter a coyote or a wolf, make the experience unpleasant for the animal.
  - Respond to their presence aggressively by making yourself appear larger; wave your arms overhead or thrust long objects like a walking stick toward the animal.
  - Throw rocks, sticks or other objects.
  - Carry a whistle and blow it to startle the animal or shout in a deep voice and maintain eye contact.
- If the animal continues to approach, back away slowly. Do not turn away or run. This will encourage the animal to chase you.
- Many encounters with coyotes or wolves often involve the animal being curious about workers in the area. Keep your focus on the animal and be wary.
- Do not run – this may trigger a predatory response.

DINGOES

Generally, dingoes go about their lives and stay clear of people. Unhabituated dingoes have a natural fear of people and shy away. From time to time, dingoes may come close, and some encounters can turn to tragedy. Stay alert and stay calm. If you feel threated:

- Stand still at your full height and fold your arms across your chest.
- Face the dingo, then calmly back away.
- If you are with another person, stand back-to-back.
- Confidently call for help.
- Wait until the dingo or dingoes are gone before you continue on your way.
- Do not run or wave your arms.

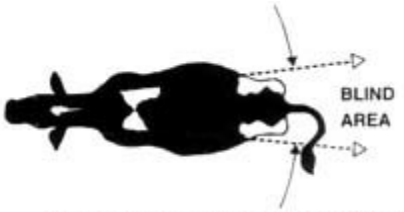
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APPENDIX F: LIVESTOCK

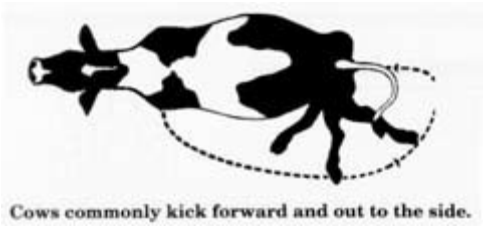
An individual may work carefully around animals most of the time but can be injured in an animal accident because of such things as preoccupation, haste, impatience, or anger. It is during these moments that one needs to understand animal behaviour.

Cattle and swine are generally colourblind and have poor depth perception. This results in an extreme sensitivity to contrasts, which may cause an animal to balk at shadows or rapid changes from light to dark. Sheep are also considered colourblind but do have good depth perception. Instead, sheep have difficulty picking out small details, such as the open space created by a partially opened gate.

Cattle, horses, and mules have a panoramic field of vision, which means they can see everything around them except what is immediately behind their hindquarters. Therefore, approaching from the side or front can be less startling to these animals than approaching from behind. Horses and mules commonly kick toward their hindquarters, while cattle kick forward and out to the side. Cattle also have a tendency to kick toward a side with pain from inflammation or injuries.



Cattle have a panoramic field of vision.


Cows commonly kick forward and out to the side.

Livestock with young exhibit a maternal instinct. They are usually more defensive and difficult to handle. When possible, let the young stay as close to the adult as possible when handling.

Most animals have a strong territorial instinct and develop a sense of "homeland" in their pens, corrals, and pastures. They develop a very distinctive, comfortable attachment to these areas. An example of the homeland instinct is the well-worn paths created in most pastures and between pastures and buildings, water troughs and feed bunks. Forcible removal from a homeland area can cause animals to react unexpectedly. Considering these animal traits, it is easy to understand why animals often hesitate when going through unfamiliar gates, barn doors, and handling and loading chutes.

In addition, shadows and rapid changes in lighting can further excite animals and make their behaviour unpredictable. Similar problems occur when animals are moved away from feed, separated from the herd, or approached by an unfamiliar person.

Animals are extremely sensitive to noise and yelling and are easily frightened or spooked. In their attempts to move away from the direction or source of the noise, they may crash into or through objects, including people, because of their colour blindness and poor depth perception. Be cautious around animals that are blind or deaf on one side. They favour that side and can suddenly swing around to investigate disturbances. If standing too close, a person could easily be knocked down and trampled.

Young farm animals can form relationships simultaneously with other animals and with human handlers. Animals respond to the way they are treated and draw upon past experiences when reacting to a situation. For example, a newborn raised on a bottle or bucket may develop a very strong affection for the person feeding it and feel comfortable around people. However, animals that are chased, slapped, kicked, hit, or frightened when young will naturally fear being approached.

Animals are often said to be "stubborn" because they balk or refuse to enter an area. Once this has happened, the animal is likely to refuse the next several times as well and may become a little more excited and dangerous with each refusal. It is important to take the time to prepare for moving animals. Many farmers are tempted to move animals without the necessary planning and often end up in a battle with the animal that could lead to an injury.

In addition to unique vision characteristics, sensitivity to noise and a strong territorial instinct, animals have physical and mental sensations similar to those of humans that can cause them to react fiercely to handlers. Animals experience hunger, thirst, fear, sickness, injury, and strong maternal instincts. They also develop individual behaviour patterns such as kicking or biting. The handler should be aware of these behaviours and take necessary precautions.

General Precautions

When talking to land or animal owners ask them a few general questions about the livestock, such as:

- Are animals present (cattle, horses, mules, sheep, goats, dogs)?
- Is a bull present in the heard of cows?
- Are there cows with calves in the herd?
- Is there a stud with the herd of mares?
- Do the mares have young foals?

When entering a fenced property (with permission), try to enter from the main gate. Check for signs that a bull/stud may be present with the heard (it may be posted, or you may see one).

Before entering the paddock, take a few moments to assess the general mood of the animal herd, are they agitated, is the bull/stud amative.

If you are uncomfortable with entering a pasture with a livestock herd, DO NOT ENTER!

If required, ask the livestock owner to attend with you. A familiar face and a person who is constantly around the animals will calm the situation.

11.1 Working Among Livestock

If you find yourself among a herd of animals (cattle, horses, sheep, goats etc.) do not panic. Be calm and confident. Some animals are naturally curious and will move in closer to figure out what you are; all they require is to catch your odour and they will move off. Speak gently but firmly to them. Most livestock handlers will call their animals by generic names, such as “Co-boss, Hey Girl / Fella” Talk to the animals using these familiar tones, this will help calm the animals and allow you to become familiar to them.

Be alert! When entering a property where you do not know the animals, it is impossible to predict an animal’s actions or behaviors. Always be aware of what is happening around you.

If you need to approach an animal, do this carefully without any sudden movements. Always announce yourself when approaching. Do not stand or walk directly in front or directly behind a horse or bovine; always approach from an angle and stay out of kicking range of an animal (3-6 feet, usually). If you need to work directly around a horse (leading, grooming, saddling, mounting, dismounting), stay close to the horse so that if it kicks, the full impact of the kick is not received. REMEMBER: If an animal kicks, DO NOT Slap, Kick or Hit back! This will cause the animal to kick again and become even more agitated.

APPENDIX G: VENOMOUS SNAKES AND SPIDERS

Encounters with snakes or spiders are common when you work in the outdoors in some regions. Being familiar with the animals that are common to a particular area and knowing what to do when you find one can keep a run-in from leading to a painful bite.

Snakes are around all year but are most active when warm weather brings them out to mate. Venomous snakes can be found in most part of the world.

These precautions can reduce your risk of being bitten:

- Never pick up or attempt to move a snake or a spider.
- If you see a snake, back away slowly; a snake's striking distance is about half the total length of the snake.
- If you need to pick up or move an object, always test for the presence of a snake or spider by slightly moving or kicking the object and monitoring for any movement.
- Never place your hands in holes where snakes or spiders may be present.
- Wear leather gloves if you have to handle debris, logs, rocks and other objects where a snake or spider could be hiding.
- Wear high boots, snake gaiters and thick pants when working or walking in grassy or wooded areas.

A common sign of a bite from a venomous snake or spider is the presence of two puncture wounds from the animal's fangs. Sometimes venom injection from the bite may occur. This may result in redness, swelling, and severe pain at the area, which may take up to an hour to appear. Vomiting, blurred vision, tingling of the limbs, and sweating may result. Fear following a bite is common with symptoms of a racing heart and feeling faint. The venom may cause bleeding, kidney failure, a severe allergic reaction, tissue death around the bite, or breathing problems. Bites may result in the loss of a limb or other chronic problems. The outcome depends on the type of snake, the area of the body bitten, the amount of venom injected, and the general health of the person bitten.

First Aid

- Call emergency services immediately. If the bite is from a venomous snake or spider, time is of the essence for being administered antivenom.
- Try to see the color and shape of the snake or capture the spider if safe to do so. This can help with treating the bite.
- Keep the bitten person calm. This can slow the spread of venom.
- First-aid while waiting for medical help should include:
    - Having the person lay or sit with the bite level below the heart
    - Instructing the person to stay still
    - Remove jewelry and tight clothing before swelling starts.
    - Covering the bite with a clean, dry dressing

APPENDIX H: LARGE REPTILES (ALLIGATORS AND CROCODILES)

Encounters with alligators and crocodiles are more likely to occur when you are next to a water body, approach a nesting female or her off-spring, if they have been fed and become habituated to humans, when they cross the road, or you are swimming, canoeing, or fishing in waterways where they are present. Both alligators and crocodiles are ambush hunters and can remain submerged for long periods of time.

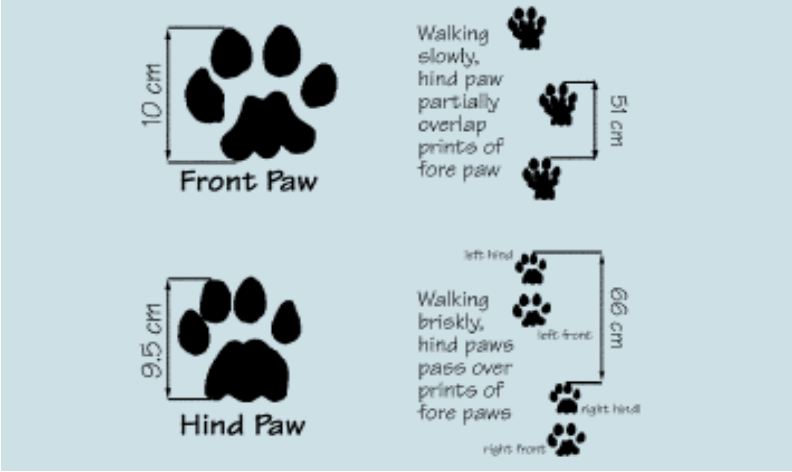
These types of precautions can reduce your risk of an attack:

- Perform work activities during the day hours; alligators and crocodiles are more active at night but are opportunists and their predator instinct can be triggered during the day
- Be aware of your surroundings near fresh or brackish waters and avoid vegetation-filled areas of rivers, lakes, and other bodies of water
- Research the project area for known habitats for alligators or crocodiles
- Keep your distance and avoid "cornering" or making the alligator feel trapped if you do see an alligator
- If an alligator or crocodile approaches back away slowly. If it charges, move away as fast as possible. Alligators and crocodiles are ambush hunters and rarely chase people but can outrun or outswim a human for the first 30 feet.

If you are attacked, fight back. If you feel the alligator's/crocodile's jaw clamp down on you, resist by screaming, yelling, and splashing. Then use whatever "tool" is available such as a stick, rock or your thumb/finger and drive it directly into their eye as it is the most sensitive area of their body.

Sources:
https://parksaustralia.gov.au/kakadu/plan/safety/
https://srelherp.uga.edu/alligators/alligator-safety.htm
https://sfyl.ifas.ufl.edu/archive/hot_topics/environment/alligator_safety.shtml
https://tpwd.texas.gov/state-parks/park-information/alligator-safety

APPENDIX I: COUGARS AND MOUNTAIN LIONS



- Mountain Lions usually do not like confrontation. Leave a wide berth between you and the animal for its escape.
- Never turn your back or run away from a mountain lion. Running stimulates a mountain lion's natural instinct to chase.
- Always make eye contact with the lion and stand up as tall as possible. Making yourself look larger intimidates the lion and often makes them turn and run. Open your jacket and flap it about, yell, or throw stones, but make sure you react so that the cat knows that you are the one in control, not him.
- Never squat or bend over at any time. Research has shown that when a human bends over, that person looks like four-legged prey to a large cat of any type. Avoid stooping, leaning over, squatting, or bending at the waist.
- If you are attacked, fight back. Never succumb or roll into a ball. Hit as hard as possible, especially to the head area. If you can retrieve a stick or large rock, use it as a weapon. If face to face with the cat, go for the eyes by clawing or throwing sand in the face. Mountain lions will usually strike the back of the head and especially the neck so be vigilant to protect these areas, and if at all possible, remain standing or face to face with the animal once it is attacking.
- If you are attacked from the back, try to reposition yourself to meet the cat face-to-face.
- Mountain lions usually weigh between 100 to 150 pounds (45 to 68 kg). Where possible, throw the cat over your head and forward to get it off your back. This maneuver, if you can complete it, will also sometimes stun the cat, and give you a chance to grab a weapon and defend yourself face-to-face with the animal.
- Under no circumstances fall to the ground and roll into a fetal position, because once you are down, the cat will see you as nothing but small prey.
- Avoid areas where carcasses have been left and be aware that cougars often cover their kill with forest debris. Distinguishing cougar kills from those made by wolves or coyotes may be done by determining how the prey was attacked. Further determination may be carried out by studying how the animal was initially fed-upon: cougars prefer to start on the liver, heart, and lungs in the abdominal cavity, whereas wolves and coyotes feed on the tail end first.

1 PURPOSE

The purpose of this Safe Work Practice (SWP) is to provide information on the hazards related to ticks and associated diseases and provide guidance on implementing controls to minimize the likelihood of tick bites and exposure to tickborne diseases.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

2 SCOPE

This SWP is intended for use by Stantec employees, subconsultants, and subcontractors while working in areas where ticks may reside.

3 RESPONSIBILITIES

3.1 Health, Safety, Security, and Environment (HSSE)

- Maintain this SWP
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Perform periodic formal and informal audits that verify whether requirements within this practice are being met

3.2 BC Leader

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for appropriately implementing this SWP and require that employees be trained in the requirements

3.3 Project Manager

Has the primary responsibility for implementing this SWP, which includes:

- Identify the potential hazards that employees could be exposed to and select appropriate hazard controls using the Risk Management Strategy (RMS1), Health and Safety Plan (HASP), or equivalent
- Provide the required Personal Protective Equipment (PPE) to employees. Refer to SWP-105 – Personal Protective Equipment for guidance
- Coordinate with the Office Safety and Environment Coordinator (OSEC) for the supply and/or purchase of the required PPE and any other safety equipment or precautions that may be required
- Require that applicable PPE, tools, and other equipment are maintained and used in accordance with this practice

3.4 Employees

- Be aware of and comply with controls specified in this SWP and the RMS1 or HASP
- Take appropriate precautions to prevent tick bites as detailed below:
  - Perform personal tick checks throughout the day, before entering vehicles, prior to leaving job sites, and again at home or temporary residence

- Understand and follow the steps for immediately removing a tick if it latches to the body
- Follow the HSSE Incident Reporting Protocol for the appropriate geography

4 HAZARDS

4.1 Energy Wheel



The energy wheel is a visual tool used by Stantec to identify 10 sources of energy and to assess and control the hazards associated with each source. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. Before beginning any activity, review the potential hazards and controls associated with the task. For project work, these sources, hazards, and controls will be documented on the Risk Management Strategy (RMS1), and in a Field Level Risk Assessment (RMS2/field app). Ticks represent a Biological energy source.

4.2 Ticks

Ticks are small arachnids that feed on the blood of humans and animals. They are commonly found in wooded, bushy, or grassy areas. For more detailed information about ticks, including their behavior and habitats, as well as the different types of ticks, see Appendix A.

Ticks can attach to any part of the human body but are often found in hard-to-see areas such as the waistline, behind the ears, groin, armpits, and hair or hairline. The bite wound from the tick is not generally painfully, however, some people may experience itching and redness around the area. Tick bites can become infected if not properly treated. They can also cause allergic reactions in some people. Allergic reactions are typically mild, but in rare cases, they can be severe and may result in anaphylactic shock.

4.3 Tickborne Diseases

Ticks can carry several types of bacteria and viruses and transmit them via their bite after they latch on to a host (transmission time varies). In humans, the most common symptoms of tick-related illnesses are fever and chills, aches and pains, and rashes. Tickborne diseases can result in mild symptoms treatable at home to severe illness requiring hospitalization.

Provided below are brief descriptions of commonly identified tickborne illnesses found in North America, Australia, New Zealand, and the United Kingdom. Links to additional information specific to various regions can be found in Section 7 – Resources.

4.3.1 Lyme Disease

Lyme disease is an illness caused by the bacterium *B. burgdorferi*. It is spread through the bites of Blacklegged ticks, also known as Deer ticks. They are commonly found in the northeastern, mid-Atlantic, and north-central United States. The Western-Blacklegged tick spreads the disease on the Pacific coast. Lyme-infected ticks are also found in many regions of Canada. Although locally acquired Lyme disease cannot be ruled out, there is little evidence that it occurs in Australia. There is a continuing risk of Lyme disease for overseas travelers.

Typical symptoms include fever, headache, fatigue, and a characteristic skin rash called erythema migrans (bullseye rash). According to the US Centers for Disease Control, in most cases, Lyme disease can be transmitted when infected ticks feed off the host for 36 or more hours. If left untreated, infection can spread to joints, the heart, and the nervous system.

4.3.2 Rocky Mountain Spotted Fever

Rocky Mountain spotted fever (RMSF) is a tickborne disease caused by the bacterium *Rickettsia rickettsii*. Typical symptoms include fever, headache, abdominal pain, vomiting, and muscle pain. A rash may also develop, but is often absent in the first few days, and in some patients, never develops. Rocky Mountain Spotted Fever can be a severe or even fatal illness if not treated in the first few days of symptoms. RMSF occurs throughout the United States, but are most commonly reported from North Carolina, Tennessee, Missouri, Arkansas, and Oklahoma.

4.3.3 Powassan Virus

Powassan (POW) virus is transmitted to humans by infected ticks. Approximately 50 cases of POW virus disease were reported in the United States over the past 10 years. Most cases have occurred in the Northeast and Great Lakes region. Signs and symptoms of infection can include fever, headache, vomiting, weakness, confusion, seizures, and memory loss. POW can be transmitted in as few as 2-3 hours.

4.3.4 Tularemia

Tularemia is a disease that affects animals and humans. It is caused by the bacterium *Francisella tularensis*. It can be transmitted in several ways, including tick bites. Symptoms vary by the route of infection but may include a skin ulcer that forms at the site of the bite, swollen and painful lymph glands, fever, chills, headache, and exhaustion. Although tularemia can be life-threatening, most infections can be treated successfully with antibiotics.

4.3.5 Heartland Virus and Bourbon Virus (United States)

The Heartland Virus was discovered in 2012 and appears to be transmitted by Lone Star ticks. As of 2017, more than 30 cases of the Heartland virus disease have been identified in states in the Midwest and South. As of 2017, a limited number of Bourbon virus disease cases have been identified in the Midwest and Southern United States. The symptoms for both illnesses include fever and exhaustion or fatigue, with some cases reporting headaches, muscle aches, diarrhea, loss of appetite, or nausea.

4.3.6 Tick Paralysis

Tick paralysis is a rare disease thought to be caused by a neurotoxin in tick saliva. It is more common in children than adults. The symptoms include acute, ascending, flaccid paralysis that is often confused with other neurologic disorders or diseases (e.g., Guillain-Barré syndrome or botulism). Other symptoms may include symptoms similar to influenza like headaches, fever, and tenderness of lymph nodes; rashes; an unsteady gait; and intolerance to bright lights.

Tick paralysis is rarely fatal, and when the tick is completely removed (including the head and mouth parts), the symptoms will ease, typically within 24 hours.

There are more than 40 species of ticks worldwide that have been known to cause tick paralysis, but most cases have occurred in North America and Australia. In North America, cases are most commonly reported following bites by American dog ticks or Rocky Mountain wood ticks. In Australia, tick paralysis is caused by the Paralysis Tick. The Paralysis Tick, *Ixodes*

holocyclus, is found along the eastern seaboard of Australia east of the Great Dividing Range, and possibly into Tasmania. It is commonly referred to as the grass tick, seed tick and bush tick depending upon its stage of development. It is not known to occur in South Australia, Western Australia, or the Northern Territory.

4.3.7 Queensland Tick Typhus and Flinders Island Spotted Fever (Australia)

Typhus is a term used to describe infections by several types of rickettsial bacteria. Rickettsiae are a diverse group of bacteria some of which can be transmitted to humans by ectoparasites such as fleas, lice, ticks, or mites. The typhus group of rickettsia includes:

- Spotted Fever group rickettsiae, including Queensland Tick Typhus (*R. australis*), and
- Flinders Island Spotted Fever (*R. honei*)

In most forms of typhus, symptoms usually develop 1 to 2 weeks after exposure. Common symptoms include fever, chills, headache, muscle aches, and malaise. There may be a prominent scab ('eschar') at the site of the ectoparasite bite.

4.2.8 Alpha-gal Allergy

According to the Mayo Clinic's website, alpha-gal syndrome is a recently identified type of food allergy to red meat and other products made from mammals. In the United States, the condition is most often caused by a Lone Star tick bite. The bite transmits a sugar molecule called alpha-gal into the person's body. In some people, this triggers an immune system reaction that later produces mild to severe allergic reactions to red meat, such as beef, pork or lamb, or other mammal products.

The Lone Star tick is found predominantly in the southeastern United States, and most cases of alpha-gal syndrome occur in this region. The tick can also be found in the eastern and south-central United States. The condition appears to be spreading farther north and west, however, as deer carry the Lone Star tick to new parts of the United States. Alpha-gal syndrome also has been diagnosed in Europe, Australia, and Asia, where other types of ticks carry alpha-gal molecules.

5 CONTROLS

5.1 Elimination/Substitution

Avoid direct contact with ticks by staying out of areas they may inhabit including areas with tall and/or dense vegetation.

5.2 Engineering

If possible, cut away tall grass or brush in work areas.

5.3 Administrative

- Check online for the geographic distribution of ticks prior to going into the field.
  - US Centers for Disease Control: https://www.cdc.gov/ticks/geographic_distribution.html
  - Public Health Agency of Canada: https://www.canada.ca/en/public-health/services/diseases/lyme-disease/provincial-territorial-resources.html
  - Australian Government Department of Health: https://www.health.gov.au/initiatives-and-programs/dscatt
  - New Zealand Ministry of Health: https://www.health.govt.nz/your-health/healthy-living/environmental-health/pests-and-insects/ticks

- Watch for posted warnings of tick activity in the area.
- Walk in the center of trails.
- Avoid wooded and bushy areas with high grass.
- When possible, take a different route that avoids potential tick habitats.

5.3.1 Checking for Ticks

- Conduct thorough tick checks of your person and that of your coworkers throughout the day while in the field.
  - The use of a tape style lint roller can be helpful when performing tick checks as it may capture any loose ticks on your clothing.
  - The use of a hand-held mirror to view hard to view parts of your body is also useful.
- Check for ticks under the arms, in and around the ears, inside the belly button, behind the knees, between the legs, around the waist, and especially in hair and hairline.
- Ticks can enter your home or workplace on clothing or equipment, then attach to a person later. Carefully examine clothing and field equipment. Remove field clothing, if possible, and place in a sealed plastic bag before entering vehicles.
- Take a hot bath or shower as soon as possible after returning home or to your hotel in an attempt to identify and remove ticks on your person. If a tick is attached to the skin (embedded), follow the steps in Section 5.4.2.2 for removing embedded ticks.
- Tumble clothes in a dryer on high heat for an hour to kill any remaining ticks. (Some research suggests that shorter drying times may also be effective, particularly if the clothing is not wet.)

5.3.2 Tick Bites and Embedded Ticks

5.3.2.1 Characteristics of a Tick Bite

Some people get a small bump or redness at the site of a tick bite that goes away in 1-2 days, like a mosquito bite. This is not a sign that you have Lyme disease or another tickborne illness. When a tick bites, it can transmit bacterial infection to the host through its saliva that may result in a rash. Untreated, the infection may spread from the site of the bite to other parts of the body, producing an array of specific symptoms that may come and go, including:

- Additional target lesions in other areas of the body
- Facial or Bell's palsy (loss of muscle tone on one or both sides of the face)
- Severe headaches and neck stiffness due to meningitis (inflammation of the spinal cord)
- Pain and swelling in the large joints (such as knees)
- Shooting pains that may interfere with sleep
- Heart palpitations and dizziness due to changes in heartbeat

Many of these symptoms will resolve over a period of weeks to months, even without treatment. However, lack of treatment can result in additional complications.

5.3.2.2 Removing Embedded Ticks

- Use a small pair of curved forceps, pointy tweezers, or tick removal tool (tick key, tick twister, etc.). If possible, wear hand protection such as disposable gloves to prevent the spread of pathogens from the tick to your hands.
- Using the tweezers or other tools, grasp the tick firmly as close to the skin as possible. Pull gently until the tick comes free.

- Follow the instructions provided with the removal tool or device. Incorrect usage or inappropriate removal may break off the head and mouthparts and increase the chances for infection.
- If portions of the head or mouthparts remain or you cannot remove the tick, medical attention may be required. Consult the Incident Reporting Protocol for your region for guidance.

- Once it is removed, don't crush the tick as it may release pathogens. Retain it in a tightly closed jar, a sealable plastic bag, or another suitable secure container or take a picture of the tick. Show the tick or picture to the doctor if the person bitten becomes ill after the tick bite.
- The area of the bite should leave a small crater or indentation where the head and mouthparts were embedded.
- After removing the tick, thoroughly cleanse the bite area with antibacterial soap and water or a mild disinfectant. Apply an over-the-counter antibiotic cream to prevent localized infection at the site of the bite. Keep the wound clean and dry; cover it with an adhesive bandage or gauze.
- Take a photo of the bite area and observe the area for several days for development of a reaction to the bite, such as a rash or signs of infection.
- Remember to wash your hands thoroughly after handling any tick or instruments that have touched a tick. Clean and disinfect any instruments that were used.

5.3.2.3 Incident Reporting

- Embedded ticks and tick bites are to be reported as "First Aid" incidents on the HSSE Event Report (RMS3).
  - Follow the incident reporting protocol for your region.
- Non-embedded ticks are to be reported as "Hazard IDs."

5.4 Personal Protective Equipment (PPE)

5.4.1 Clothing and Gloves

- Wear long sleeves and long pants.
  - Tuck pants into socks. Tape them off or wear tick gaiters.
  - Tuck shirts or jackets into pants if possible.
  - Light-colored clothing is preferable, so ticks are more easily seen.
  - Consider wearing white breathable Tyvek coveralls in known tick-infested areas.
  - Consider other products such as Rynoskin which is a form-fitting under garment that is tight around the cuffs and ankles.
  - **NOTE:** PPE and protective measures coupled with heat, humidity, and physical exertion may create an additional hazard. Refer to SWP-113 – Heat Stress for additional guidance.
- Wear appropriate gloves and tuck sleeves into glove or tape off if possible.

5.4.2 Insect Repellent

Use insect repellent with DEET or Icaridin/Picaridin on skin and/or clothing (if the product is listed for use on garments). If using DEET, use repellents that contain 20 to 30% DEET on exposed skin and/or clothing for protection that last several hours. Always follow product instructions.

- DEET used in combination with sunscreens may reduce the effectiveness of the sunscreen by up to one third. Apply sunscreen before repellents and reapply per label instructions. Sunscreen reapplication may need to be more frequent when used in combination with insect repellents.
- **NOTE:** The concentration of DEET in a product indicates how long the product will be effective. A higher concentration does not mean that the product will work better; It means that it will be effective for a longer period. Therefore, products containing lower concentrations of DEET may need to be reapplied, depending on the length of time a person is outdoors. Higher concentrations of DEET may have a longer repellent effect, however, concentrations over 50% provide no added protection.
- **NOTE:** DEET may reduce the effectiveness of fire resistant (FR) clothing. Verify cautionary statements or warnings with respect to chemical use on FR clothing prior to use.

Employees may also wear clothing or use gear (backpacks, gloves, gators, belts, etc.) that have been treated with Permethrin (where available).

- Permethrin is an insecticide that is applied to clothing, shoes, and outdoor gear (e.g., tents and sleeping bags). Permethrin has little systemic absorption and is considered safe for topical use in adults and children over the age of 2 months. Unlike DEET, it is rapidly inactivated by the body and therefore ineffective as a topical preventative measure.
- Follow manufacturer instructions when applying permethrin. Do not apply it to clothing or shoes while you are wearing them. Treat items outside (never indoors) and allow them to dry completely before wearing them. The permethrin will remain effective through several washings, so it does not need to be reapplied each time the clothing is worn.
- Products that have been pre-treated with permethrin are also widely available for purchase. Pre-treated products may provide protection that lasts through more washings.
- Using a towel or blanket treated with permethrin to place field gear on and to sit on in your vehicle is also highly effective at killing ticks who may have been missed in a tick check.
- **NOTE:** Permethrin has limited availability in Canada; only pre-treated clothing is available.

Other repellents registered in the United States by the Environmental Protection Agency may be found at http://cfpub.epa.gov/oppref/insect/.

5.4.3 Field Kits

To assist with tick identification and possible removal of an embedded tick the following items should be provided to field personnel who may be exposed to ticks:

- First aid kit
- Magnifying glass
- Tweezers, or tick removal tool
- Disposable gloves (latex, nitrile)
- Lint Roller (tape style)
- Ziploc bags or other suitable container to place tick in
- Tape (duct or packing)
- Hand mirror (plastic would be preferred)
- Insect Repellent
- Tick fact sheet and/or tick identification card
- Large plastic bag for placing outer layer of clothing or coveralls in
- This Safe Work Practice for reference
- Disposable coveralls (breathable Tyvek)

Many of these items are contained in a convenient pre-packaged kit available at https://canlyme.com/product/tick-removal-kit/.

6 TRAINING

It is recommended that employees working in areas where ticks may be present complete HSSE1281: Tick Awareness.

7 RESOURCES

7.1 Internal

- SWP-105 – Personal Protective Equipment
- SWP-113 – Heat Stress
- Risk Management Strategy (RMS1)
- HSSE Incident Reporting Protocols

7.2 External

7.2.1 Regulatory

Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:

- Stantec's Critical Task Inventory
- Health & Safety Regulatory Requirements Library
- Environmental Regulations Library

7.2.2 General Information

- Tickinfo.com: Permethrin
- TickEncounter:
  - Tick Identification
  - Identify and Eliminate Tick Habitat
  - Frequently Asked Questions
- Lyme Disease Association, Inc.: Tick Habitat
- StatPearls (accessed via the US National Library of Medicine): Tick Paralysis

7.2.3 United States

- US Centers for Disease Control:
  - Ticks (main topic page)
  - Tickborne Diseases of the United States
  - Geographic Distribution of Ticks

7.2.4 Canada

- Public Health Service of Canada: Canada Communicable Disease Report, Volume 45-4
- Government of Alberta: Lyme Disease and Tick Surveillance

7.2.5 Australia

- Department of Health: Tick Bite Prevention

7.2.6 New Zealand

- Ministry of Health: Ticks

7.2.7 United Kingdom

- UK Health Security Agency: Tick awareness and the Tick Surveillance Scheme

8 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- HSSE Event Report (RMS3)

9 REVISION HISTORY

Date	Changes	Acknowledgments	Approval
November 9, 2022	Edits to 1. Purpose, 3.2 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings. s. 3.4 stipulated immediate removal of tick, addition of s.4.2.8 outlining Alpha-gal Allergy, s.5.3.2.2 to follow instructions on removal tools, s.5.4.2 verify repellant is listed for use on garments and acknowledging the impact DEET has on fire retardant clothing.	W. Cline, M. Doherty, T. Hoveland	P. Poelzer
May 23, 2019	Initial Posting	R. Roy, J. Elkins, L. Tait, J. Memory, K. Bayer	J. Lessard

APPENDIX A: TICK BACKGROUND INFORMATION

1 BEHAVIOR AND FEEDING

1.1 Finding a Host

Ticks find their hosts in a variety of ways. At the end of a tick's front legs sits a tiny structure called Haller's organ, which detects chemicals and odors in the air, like carbon dioxide from exhaled breath, sweat, and even urine. The following information comes from the US Centers for Disease Control (CDC):

> Ticks find their hosts by detecting animals´ breath and body odors, or by sensing body heat, moisture, and vibrations. Some species can even recognize a shadow. In addition, ticks pick a place to wait by identifying well-used paths. Then they wait for a host, resting on the tips of grasses and shrubs. Ticks can't fly or jump, but many tick species wait in a position known as "questing."
>
> While questing, ticks hold onto leaves and grass by their third and fourth pair of legs. They hold the first pair of legs outstretched, waiting to climb on to the host. When a host brushes the spot where a tick is waiting, it quickly climbs aboard. Some ticks will attach quickly, and others will wander, looking for places like the ear, or other areas where the skin is thinner.

1.2 Feeding

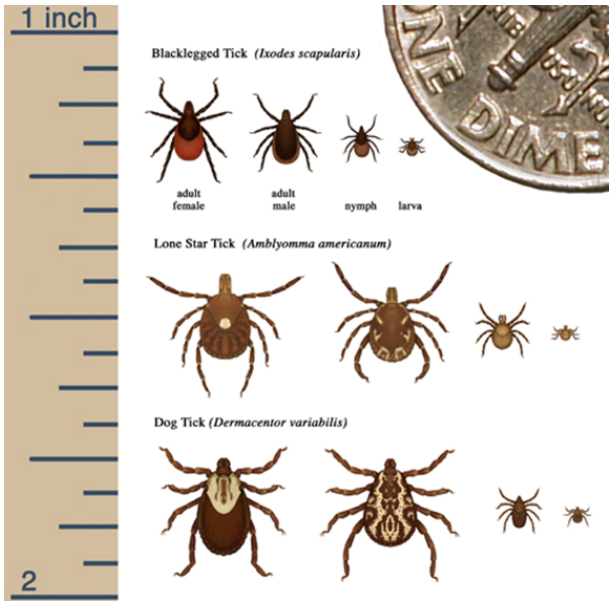
From the CDC:

> Depending on the tick species and its stage of life, preparing to feed can take from 10 minutes to 2 hours. When the tick finds a feeding spot, it grasps the skin and cuts into the surface. The tick then inserts its feeding tube. Many species also secrete a cement-like substance that keeps them firmly attached during the meal. The feeding tube can have barbs which help keep the tick in place. Ticks secrete small amounts of saliva with anesthetic properties so that the animal or person can't feel that the tick has attached itself. If the tick is in a sheltered spot, it can go unnoticed.
>
> A tick will suck the blood slowly for several days. If the host animal has a bloodborne infection, the tick will ingest the pathogens with the blood. Small amounts of saliva from the tick may also enter the skin of the host animal during the feeding process. If the tick contains a pathogen, the organism may be transmitted to the host animal in this way.
>
> After feeding, most ticks will drop off and prepare for the next life stage. At its next feeding, it can then transmit an acquired disease to the new host.

2 LIFECYCLE AND STAGES OF DEVELOPMENT

Ticks have several stages of development, including larva, nymph, and adult. To survive, they must feed during each stage of development. A full lifecycle generally takes two to three years, although most ticks fail to reach full adult maturity because they are unable to find a host to feed from. Figure 1 shows the relative sizes of several ticks at different life stages.

Figure 1: Tick Size Relative to Lifecycle Stages



Reference: US Centers for Disease Control

Ticks can feed on mammals, birds, reptiles, and amphibians. Most ticks prefer a different host animal at each stage of their life, as demonstrated below in Figures 2 and 3.

Figure 2: Lifecycle of Blacklegged, or Deer, Tick

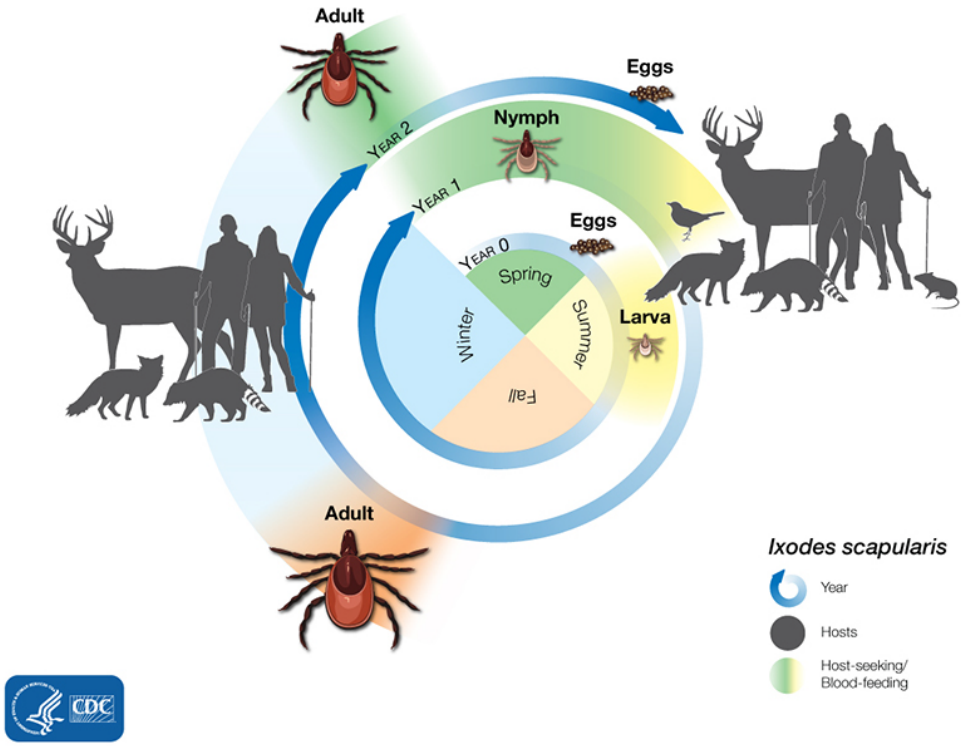
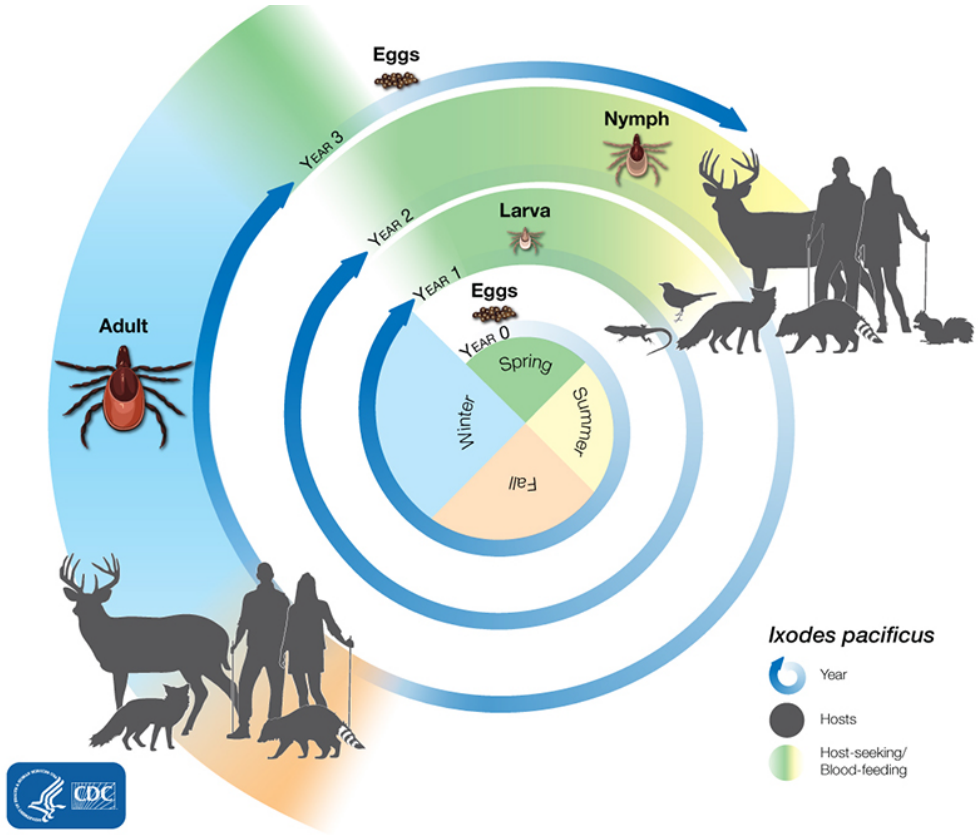


Figure 3: Lifecycle of Western-Blacklegged Tick



Reference: US Centers for Disease Control

3 TICK HABITAT

The primary habitats for ticks are wooded or forested areas, or areas with tall bushes and grasses. However, they can also be found in locations adjacent to their primary habitats, including yards and gardens, particularly near borders, under plants, fallen leaves, or wood piles, or around stone walls and sheds.

Additional information on tick habitats can be found at the TickEncounter Resource Center here and in their Frequently Asked Questions.

4 TYPES OF TICKS

There are two basic types of ticks, informally categorized as "hard" or "soft." Both types of tick's bodies become engorged when they feed and have the potential to spread disease.

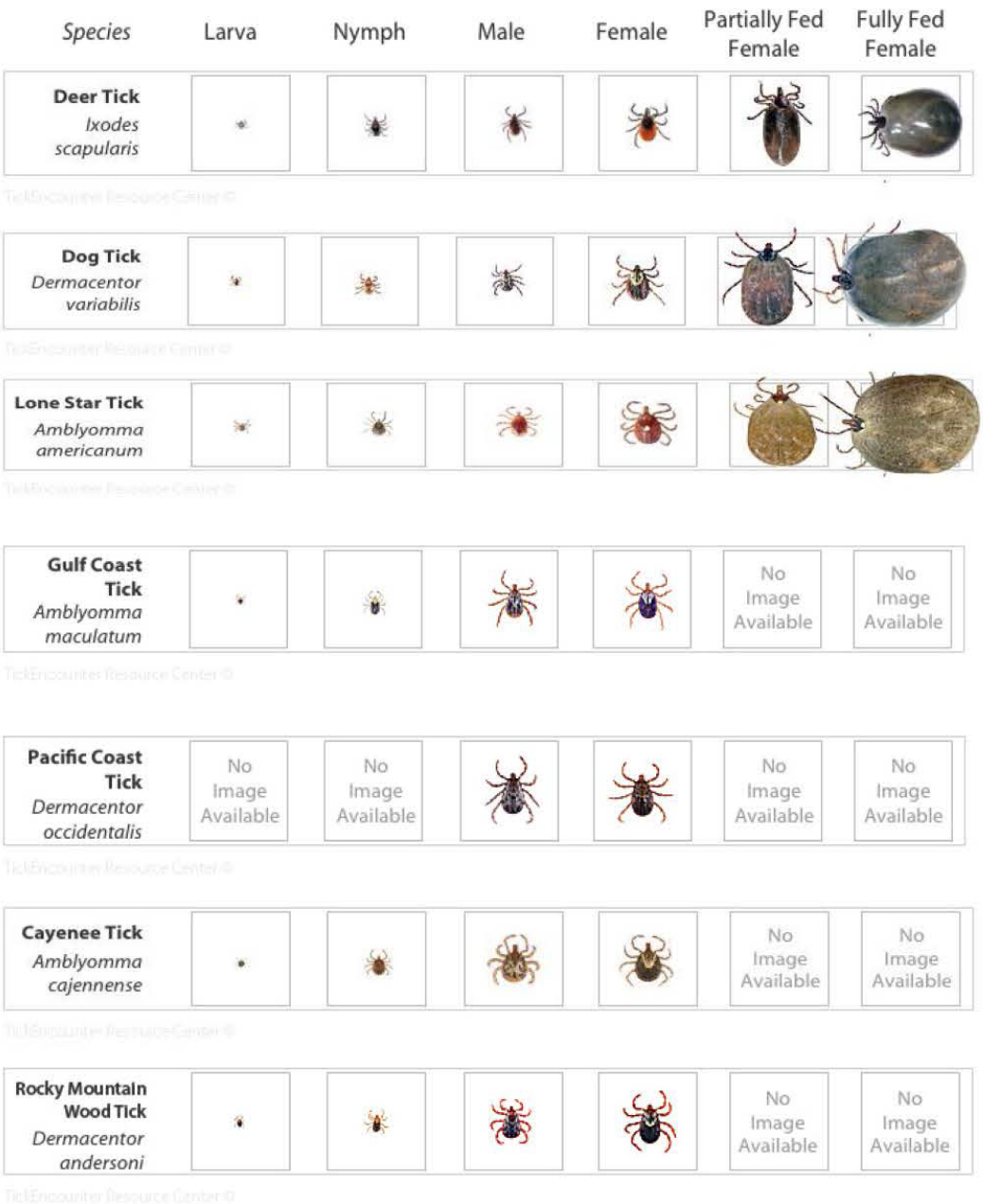
From the Australian Government Department of Health:

> Hard ticks (family: Ixodidae) have a hard-flat body and elongated mouthparts with rows of backward pointing teeth. This group includes the most important species that bite humans.
>
> Soft ticks (family: Argasidae) have a wrinkled leathery appearance. The mouth of the soft tick is located underneath their body. Only a few species of this type are known to come into contact with people.

4.1 Tick Species

While adult ticks are the easiest to identify by species, immature stages of ticks may also transmit some pathogens. In addition, male and female ticks of the same species may look different. Of the many different tick species found throughout the world, only a select few bite and transmit disease to humans. Figure 4 shows for the different types of species common to North America.

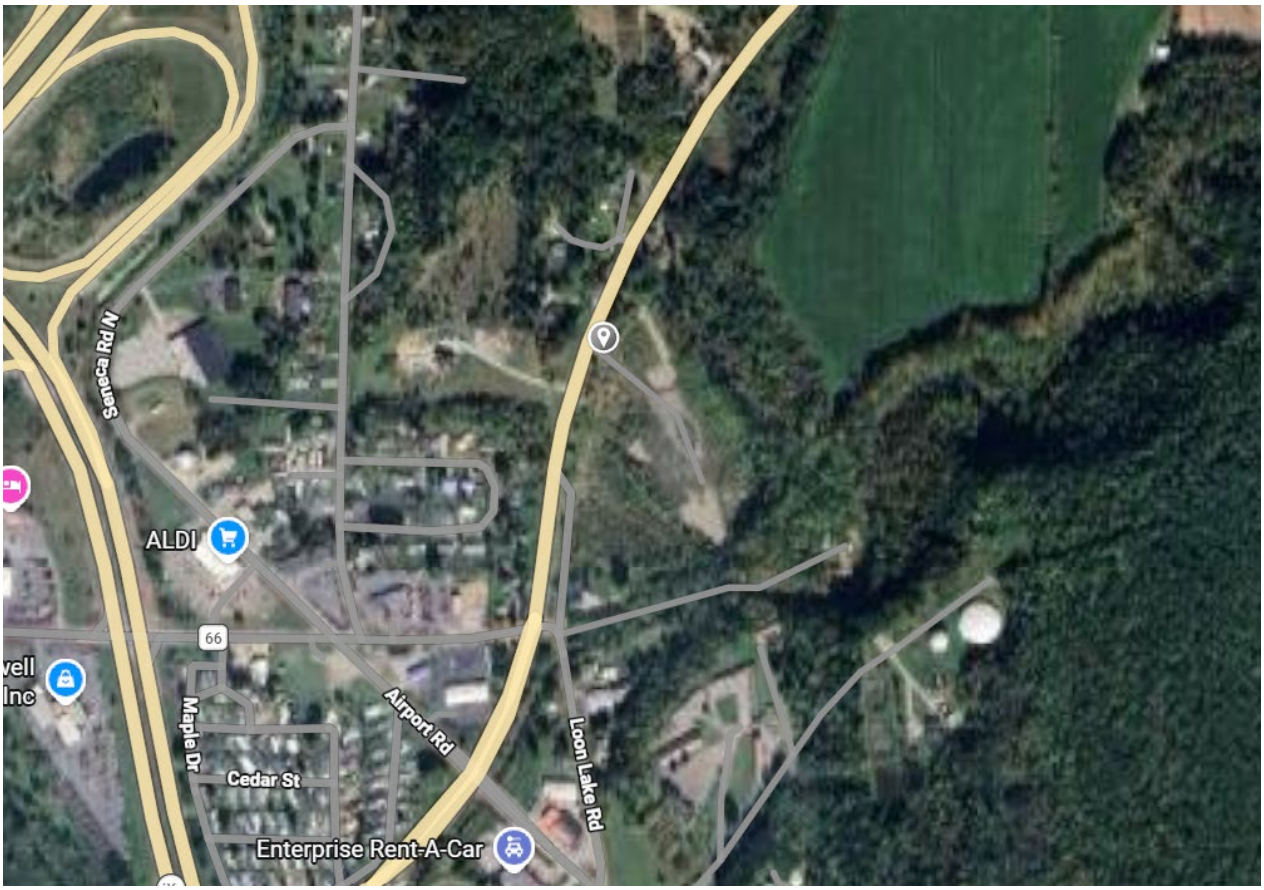
Figure 4: Ticks Common to North America



Reference: http://www.tickencounter.org/tick_identification

Appendix D EMERGENCY CONTACTS AND ROUTE MAPS

Muster Point: Evacuate the site and go to the emergency meeting location if safe conditions exist.



Emergency Contact List

Role	Name - Phone
Police/Fire/EMS	911
Poison Control	(800) 222-1222
One Call/Dig Alert	811
National Response Center (NRC)/Pollution Emergency	(800) 424-8802
New York Department of Environmental Conservation Spills Hotline	(800)-457-7362
St. James Mercy Hospital	(607) 247-2200
Client Contact/Project Coordinator	Lauren Richardson - To be contacted by Gene Florentino or the Project Manager
Stantec Project Manager	Brandon Gallagher – (508)-591-4318 (office); (585)-489-4739 (cell)

Task Manager	Gene Florentino – (716)-271-3503 (office), (716)-982-1952 (cell)
SHSO	Amanda Matkosky – (585)-413-5208 (office); (585)-285-3598 (cell)
Stantec Director of Health, Safety, Security and Environment Operations – US	Mike Doherty (503) 220-5434
HSSE Manager US ES	Andrew Martin (747) 244-1914
ES HSSE Manager	Andrew Martin (805) 719-9307 (phone); (747) 244-1914 (cell)
Stantec Office Safety and Environment Coordinator (OSEC)	Lauren Fenclau (585) 413-5282
Stantec Regional HR:	Michele Byam (791) 221-1115
Public Relations:	Trevor Eckart (215) 665-7187
Stantec Designated Company Representative (DCR) (A&D Testing):	Pauline Fox (720) 935-5825
Stantec Workers Compensation Claims Coordinator:	Cameron Cole (317) 829-4401
Medical Consultation Line	WorkCare (888) 449-7787

Route to Hospital: Penn Medicine – St. James Mercy Hospital





Imagery ©2026 Airbus, CNES / Airbus, Landsat / Copernicus, Maxar Technologies, Map data ©2026 Google 1000 ft

7578 State Rte 21
Hornell, NY 14843

1. Head toward State Rte 21 N
   0.1 mi
2. Turn left onto State Rte 21 S
   0.3 mi
3. Turn left onto Airport Rd/Seneca Rd N
   0.8 mi
4. Turn right
   0.1 mi
5. Turn right
   Destination will be on the left
   23 ft

UR Medicine St. James Hospital
7329 Seneca Rd N, Hornell, NY 14843

APPENDIX B

Quality Assurance Project Plan (QAPP)

Quality Assurance Project Plan

Remedial Action Work Plan

Miller Hill Yard
NYSDEC Site #C851045
7578 State Route 21
Fremont, Steuben County, New York

DRAFT

Stantec

Prepared for:
New York State Department of Transportation
50 Wolf Road, 6th Floor, Albany, NY 12232

Prepared by:
Stantec Consulting Services Inc.
61 Commercial Street, Suite 100, Rochester, NY 14614

Date:
March 5, 2026

Project/File:
213414012

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Acronyms / Abbreviations

Acronym / Abbreviation	Full Name
APR	Air purifying respirators
ASP	Analytical Services Protocol
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
DER	Division of Environmental Remediation
DUSR	Data Usability Summary Report
EDD	Electronic data deliverable
ELAP	Environmental Laboratory Accreditation Program
FER	Final Engineering Report
GC	Gas chromatography
GC-MS	Gas chromatography-mass spectrometry
HASP	Health and Safety Plan
ID	Identification
MHY	Miller Hill Yard
MS/MSD	Matrix Spike/Matrix Spike Duplicates
NBS	National Bureau of Standards
NY	New York
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PM	Project Manager
QA	Quality Assurance
QC	Quality Control
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RAWP	Remedial Action Work Plan
RPD	Relative percent difference
SOP	Standard Operating Procedure
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
WP	Work Plan

1 Introduction

This Quality Assurance Project Plan (QAPP) is to be used in conjunction with the Remedial Action (RA) Work Plan (Work Plan, or RAWP) for 7578 State Route 21 in Fremont, Steuben County, New York (the "Site"; see Figure 1). This QAPP presents the policies, organization, objectives, functional activities, and specific quality assurance and quality control activities to ensure the validity of data generated in the completion of the investigation. The purpose of this QAPP program is to ensure that technical data generated are both accurate and representative.

Quality assurance (QA) is a management system for ensuring that information, data, and decisions resulting from investigation and environmental monitoring programs are technically sound, and properly documented. Quality control (QC) is the functional mechanism through which quality assurance achieves its goals. Quality control programs, for example, define the frequency and methods of checks, audits, and reviews necessary to identify problems and dictate corrective actions to resolve these problems, thus ensuring high quality data. As such, a quality assurance and quality control program pertains to data collection, evaluation, and review activities which are part of the investigation.

QA/QC procedures will be in accordance with applicable professional technical standards, government regulations and guidelines, and specific project goals and requirements. This QAPP has been prepared in accordance with New York State Department of Environmental Conservation (NYSDEC) and United States Environmental Protection Agency (USEPA) Region II guidance documents.

The QAPP incorporates the following activities:

- Sample collection, control, chain-of-custody, and analysis;
- Document control;
- Laboratory instrumentation, analysis, and control; and
- Review of project reports.

Laboratory analysis of project samples will be performed by a laboratory with the experience and certifications appropriate to the analyses to be performed. Analyses will be performed by laboratories accredited pursuant to the New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) for the category of parameters to be analyzed by the laboratory.

Duplicates, replicates, and spiked samples will be used to identify the quality of the analytical data. Field audits may be conducted to verify that proper sampling techniques and chain-of-custody procedures are followed. Field data compilation, tabulation, and analysis will be checked for accuracy. Calculations and other post-field tasks will be reviewed by senior project personnel. Equipment used to take field measurements will be maintained and calibrated in accordance with established procedures. Records of calibration and maintenance will be kept by assigned personnel. Field testing and data acquisition will be performed following guidelines as described herein.

Document control procedures will be used to coordinate the distribution, coding, storage, retrieval, and review of data collected during sampling tasks.

A Data Usability Summary Report (DUSR) will be prepared for analytical results from each sampling and/or monitoring activity, with the exception of sampling data utilized for screening, waste characterization, and survey purposes only. These screening, waste characterization, and survey samples will be specified in the RAWP. The DUSR will be prepared by an independent consultant with the required experience, in accordance with NYSDEC's "Guidance for the Development of Data Usability Summary Reports," revised 1997 and NYSDEC's DER-10 "Technical Guidance for Site Investigation and Remediation," May 2010 (DER-10).

2 Project Description

This QAPP pertains to the completion of field activities and subsequent laboratory and data analysis associated with the RAWP at 7578 State Route 21 in Fremont, New York. A description of the Site and the RA activities planned is presented in the RAWP to which this QAPP is attached as an appendix. The RAWP also describes the previous environmental investigations performed at the Site.

3 Project Organization and Responsibility

This QAPP provides for designated qualified personnel to review products and provide guidance on QA matters. This QAPP also outlines the approach to be followed to ensure that products of sufficient quality are obtained. This structure will provide for direct and constant operational responsibility, clear lines of authority, and the integration of QA activities. The QA-related functions of the project positions are as follows:

Project Manager

The project manager (PM) will have overall responsibility for ensuring that the project meets the objectives and quality standards as presented in the RAWP and this QAPP. The PM will be responsible for implementing the project and will have the authority to commit the resources necessary to meet project objectives and requirements. The PM's primary function is to ensure that technical, financial, and scheduling objectives are achieved successfully. The PM will provide the major point of contact and control for matters concerning the project. In addition, the PM will be responsible for technical quality control and project oversight.

Team Leaders

The PM will be supported by a team leader or leaders who will be responsible for leading and coordinating the day-to-day activities of the various resource specialists under their supervision. The team leader is a highly experienced environmental professional who will report directly to the PM.

Technical Staff

The technical staff (team members) for this project will be drawn from corporate resources and appropriately qualified subcontractors. The technical staff will be used to gather and analyze data, and to prepare various task reports and support materials. The designated team members will be experienced professionals who possess the degree of specialization and technical competence required to effectively and efficiently perform the required work.

Project QA Director

The Project QA Director will be responsible for maintaining QA for the project.

Laboratory Director

The laboratory director will be responsible for analytical work and works in conjunction with the QA unit. The laboratory director maintains liaison with the QA officer regarding QA and custody requirements.

Laboratory Manager

The laboratory manager will maintain liaison with the laboratory director regarding QA elements of specific sample analyses tasks. The laboratory manager will report to the laboratory director and work in conjunction with the laboratory QA unit.

Laboratory QA Coordinator

The laboratory QA coordinator will be responsible for overseeing the QA program within the laboratory and for maintaining QC documentation. The laboratory QA coordinator reports directly to the laboratory director.

Laboratory Staff

Each member of the laboratory staff will perform an assigned QA or analytical function that is pertinent to and within the scope of his or her knowledge, experience, training, and aptitude. An individual will be assigned the responsibility for checking, reviewing, or otherwise verifying that a sample analysis activity has been correctly performed.

Laboratory Facilities

Laboratory work will be performed in accordance with guidelines established by NYSDEC, NYSDOH, USEPA, and/or the American Society for Testing and Materials (ASTM). In case of conflict, these guidelines and protocols will be considered in the order shown (i.e., NYSDEC criteria is of primary precedence). In addition, QA/QC programs will be maintained for the instruments and the analytical procedures used. A NYSDOH ELAP certified laboratory capable of providing NYSDEC Analytical Services Protocol (ASP) Category B deliverables will be identified to provide laboratory services for this project.

With the exception of data collected solely for screening, waste characterization, and survey purposes, data will be reported with a NYSDEC ASP Category B deliverable.

4 Quality Assurance Objectives for Data Measurement

Measurements will be made to ensure that analytical results are representative of the media and conditions measured. Unless otherwise specified, data will be calculated and reported in units consistent with other organizations who report similar data to allow comparability of databases among organizations.

4.1 Key Considerations

The key considerations for the QA assessment of generated data are accuracy, precision, completeness, representativeness, and comparability. These characteristics are defined below:

Accuracy: Accuracy is the degree of agreement of a measurement or average of measurements with an accepted reference or "true" value and is a measure of bias in the system.

Precision: Precision is the degree of mutual agreement among individual measurements of a given parameter.

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

Representativeness: Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.

Comparability: Comparability expresses the confidence with which one data set can be compared to another.

Refer to Section 13.0 for additional detail regarding the metrics listed above.

4.2 Goals

The QA/QC goals will focus on controlling measurement errors within the limits established and will ultimately provide a database for estimating the actual uncertainty in the measurement data.

Target values for detection limit, percent spike recovery and percent "true" value of known check standards, and relative percent difference (RPD) of duplicates/replicates are provided in the referenced analytical procedures. It should be noted that target values are not always attainable. Instances may arise where high sample concentrations, non-homogeneity of samples, or matrix interferences preclude achievement of target detection limits or other quality control criteria. In such instances, the laboratory will report reasons for deviations from these detection limits or noncompliance with quality control criteria.

5 Sampling Procedures

The sampling of various environmental media will be completed as part of the RA activities. The RAWP presents the location, type, and analytical requirements of samples to be collected as part of the RA activities.

5.1 Sampling Program

The sampling and field procedures for the components of the RA are described in the RAWP.

The sample containers, preservation, and holding times that will be used are identified in Table 1. The sample containers will be labeled in accordance with Section 6.2. Sample handling, packaging, and shipping procedures are presented in Section 6.3.

5.2 Field Quality Control Samples

Field quality control samples will consist of trip blanks, rinsate blanks, field duplicates, matrix spikes/matrix spike duplicates (MS/MSD), as shown on Table 2.

5.2.1 Trip Blanks

Trip blanks will be used to assess whether groundwater samples have been exposed to volatile constituents during sample storage and transport. The trip blanks will consist of a container filled by the laboratory with analyte-free water. The trip blanks will remain unopened throughout the sampling event and will only be analyzed for volatile organics. The trip blanks will be collected at a frequency of 1 per cooler containing aqueous samples to be analyzed for VOCs, as shown in Table 2.

5.2.2 Rinsate Blanks

Rinsate blanks will be used to assess decontamination procedures for non-dedicated equipment. Rinsate blanks will be collected at a frequency of 1 per sampling event for each sampling method using non-dedicated equipment, as shown in Table 2.

5.2.3 Field Duplicates

Field quality control samples will be collected to verify reproducibility of the sampling and analytical methods. Field duplicates will be obtained at a rate of one per 20 original field samples, as shown in Table 2.

5.2.4 Matrix Spike/Matrix Spike Duplicates (MS/MSD)

MS/MSDs will be obtained to determine if the matrix is interfering with the sample analysis. MS/MSDs will be collected at a rate of one per 20 original soil and water field samples, as shown on Table 2.

5.2.5 Laboratory Quality Control Checks

Internal laboratory quality control checks will be used to monitor data integrity. These checks include method (equipment) blanks, spike blanks, internal standards, surrogate samples, calibration standards, and reference standards.

5.3 Sample Containers

The volumes and containers required for the sampling activities are included in Table 1. Pre-washed sample containers will be provided by the laboratory. All bottles are to be prepared in accordance with USEPA bottle washing procedures.

5.4 Decontamination

Dedicated and/or disposable sampling equipment will be used to the extent possible to minimize decontamination requirements and the possibility of cross-contamination.

Split spoon samplers, shovels, and hand augers are some examples of sampling equipment that could be used at more than one location. Hand-held, non-dedicated equipment, as well as water level indicators will be decontaminated between locations by using the following decontamination procedures:

- Initial cleaning of any foreign matter with paper towels, if needed;
- Low-phosphate detergent (Alconox) wash; and
- Triple distilled water rinse;

Larger non-dedicated samplers used for drilling and soil sampling will be decontaminated with a bucket wash consisting of a low-phosphate detergent (Alconox) wash followed by potable water rinse. Drill rigs and excavator buckets as well as other related large equipment will be decontaminated using high-pressure steam between drilling/sampling locations. Steam cleaning will be performed in a designated onsite decontamination area. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will not be permitted. Decontamination wastewater will be containerized for later characterization and disposal. The equipment will also be cleaned upon completion of the RA prior to departure from the site using the following methods:

- Initial cleaning of foreign matter; and
- Wash down with high-pressure wash.

5.5 Levels of Protection/Site Safety

Sampling will be conducted under a written Health and Safety Plan (HASP). On the basis of air monitoring, the level of protection may be downgraded or upgraded at the discretion of the Site safety officer. Work will initially be conducted in Level D (refer to HASP, included as an appendix of the RAWP). Air purifying

respirators (APRs) will be available if monitoring indicates an upgrade to Level C is appropriate. Crew members will stand upwind of excavations, open boreholes, or wellheads during the collection of samples, when possible.

6 Sample Custody

This section describes standard operating procedures for sample identification and chain-of-custody to be used for field activities. The purpose of these procedures is to ensure that the quality of the samples is maintained during collection, transportation, storage, and analysis. Chain-of-custody requirements comply with standard operating procedures indicated in USEPA and NYSDEC sample-handling protocol.

Sample identification documents must be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include:

- Field sampling records (field notebook and/or field logs);
- Sample labels;
- Custody seals; and
- Chain-of-custody records.

6.1 Chain-of-Custody

The primary objective of the chain-of-custody procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from collection to completion of required analyses.

6.1.1 Sample Labels

Sample labels attached to, or affixed around, the sample container must be used to properly identify samples collected in the field. To the extent possible, the sample labels are to be placed on the bottles so as not to obscure any QA/QC lot numbers on the bottles. Sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the field sampling records or sample logbook. For chain-of-custody purposes, QC samples are subject to the same custodial procedures and documentation as original or parent samples.

6.1.2 Custody Seals

Custody seals are pre-printed adhesive-backed seals often with security slots which are designed to break if the seals are disturbed. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Sample shipping containers should, at a minimum, be placed with one on the front of the cooler lid and one on a cooler hinge. Seals must be signed and dated before use. On receipt at the laboratory, the custodian must check (and certify, by completing

logbook entries) that seals on shipping containers are intact. Strapping tape should be placed over the seals to ensure that seals on shipping containers are not accidentally broken during shipment.

6.1.3 Chain-of-Custody Record

The chain-of-custody record must be completed at least in duplicate by the field personnel designated by the PM as being responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations, etc.), the person completing the chain-of-custody record should note these constraints in the designated section of the custody record. The field personnel who shipped the samples will review the sample log-in information sent by the lab to confirm sample identification (ID), sample date, sample time, required analyses, and turnaround time. If any discrepancies are identified, the individual will contact the laboratory to correct those inconsistencies.

6.1.4 Field Custody Procedures

The following field custody procedures will be implemented:

- As few parties as possible should handle samples.
- Sample bottles will be obtained pre-cleaned by the laboratory and shipped to the sampling personnel in charge of the field activities. Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use.
- The sample custodian is responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under chain-of-custody rules. The sampler cooler must be in possession of the sample custodian at all times, unless it is under lock and key or sealed with custody seals.
- The sample collector will record sample data in a controlled field notebook and/or on appropriate field sampling records.
- The Site team leader will determine whether proper custody procedures were followed during the fieldwork and decide if additional samples are required.

6.2 Documentation

6.2.1 Sample Identification

Collected samples will be identified using the following format on a label or tag fixed to the sample container:

MHY-xxxx-Z, where:

- “MHY” - This shorthand indicates the Miller Hill yard project located at 7578 State Route 21 in Fremont, Steuben County, NY.

- "xxxx" - These characters (alpha-numeric) will be individual sample-specific. The number of characters may vary depending on the sample location and type. Sample identifications and locations will be recorded on the sampling record. Field duplicates, field blanks and rinsate blanks will be assigned unique sample numbers.
- "Z" - This initial will identify the sample matrix in accordance with the following abbreviations:
    - W – Water Sample
    - S – Soil Sample

Each sample will be labeled, chemically preserved, if required, and sealed immediately after collection. To minimize handling of sample containers, labels will be filled out prior to sample collection to the extent possible. The sample label will be filled out using waterproof ink and will be firmly affixed to the sample containers. The sample label will give the following information:

- Name or initials of sampler;
- Date and time of collection;
- Sample identification;
- Intended analysis; and
- Preservation.

6.2.2 Daily Logs

Daily log entries in the dedicated field notebook and field data log forms are necessary to provide sufficient data and observations to enable participants to reconstruct events that occurred during the project. Daily logs will be kept in a project-dedicated notebook, with the pages/entries consecutively numbered. Entries will be made in waterproof ink, dated, and signed. Sampling data will be recorded in the sampling records (may be separate field logs). Information will be completed in waterproof ink. Corrections will be made using a single strike-through with the editor's initials and date.

6.3 Sample Handling, Packaging, and Shipping

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of the sample but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packaging, marking, labeling, and shipping hazardous materials are promulgated by the United States Department of Transportation (USDOT) in the Code of Federal Regulations, 49 CFR 171 through 177.

All chain-of-custody requirements must comply with standard operating procedures in the NYSDEC and USEPA sample handling protocol. Field personnel will make arrangements for transportation of samples to the laboratory. When custody is relinquished to a shipper, field personnel will ensure that the laboratory

custodian or PM is aware of the expected time of arrival of the sample shipment and of any time constraints on sample analysis(es). Samples will be delivered to the laboratory in a timely manner to help ensure that holding times are followed.

7 Calibration Procedures and Frequency

Instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations as well as criteria set forth in the applicable analytical methodology references.

7.1 Field Instruments

A calibration program will be implemented to ensure that routine calibration is performed on field instruments. Calibration will typically be performed on a daily basis unless manufacturer’s instructions indicate differently. More frequent calibrations may be performed as necessary to maintain analytical integrity. If possible, bump tests shall be performed at the end of the workday. Field personnel familiar with the calibration and operations of the equipment will maintain proficiency and perform the prescribed calibration procedures outlined in the operation manuals accompanying the respective instruments. Calibration records for each field instrument used on the project will be maintained in the project files.

7.2 Laboratory Instruments

Laboratory calibration procedures are addressed in the laboratory’s Quality Assurance Manual which will be available upon request. Calibration procedures will be consistent with the method used for analysis.

8 Analytical Procedures

8.1 Field

Onsite procedures for analysis of total organic vapor and other field parameters are addressed in the RAWP, if applicable. Groundwater samples will undergo field water quality testing which includes measurements of pH, temperature, conductivity, turbidity, dissolved oxygen, and oxidation-reduction potential.

8.2 Laboratory

Specific analytical methods for constituents of interest in soil and groundwater are listed in Table 1. The laboratory will maintain and have available for the appropriate operators Standard Operating Procedures (SOPs) relating to sample preparation and analysis according to the methods stipulated in Table 1. Laboratory SOPs and target reporting and detection limits will be available upon request.

9 Data Reduction and Reporting

QA/QC requirements will be strictly adhered to during sampling and analytical work. Data generated will be reviewed by comparing and interpreting results from chromatograms (responses, stability of retention times), accuracy (mean percent recovery of spiked samples), and precision (reproducibility of results).

Data storage and documentation will be maintained using logbooks and data sheets that will be kept on file. Analytical QC will be documented and included in the analytical testing report. A central file will be maintained for the sampling and analytical effort after the final laboratory report is issued.

Calculations and data manipulations are included in the appropriate methodology references. Control charts and calibration curves will be used to review the data and identify outlying results. Prior to the submission of the report to the client, data will be evaluated for precision, accuracy, and completeness. Sections 4.0, and 13.0 of this document include some of the QC criteria to be used in the data evaluation process.

Laboratory reports will be reviewed by the laboratory supervisor, the project QA director, laboratory manager, and/or director, and the PM. Analytical reports will contain a data tabulation of results. Supporting QC information will also be provided in the laboratory reports. Raw data will be available for later inspection, if required, and maintained in the control job file. With the exception of data collected solely for screening, waste characterization, and survey purposes, data will be reported in NYSDEC ASP Category B deliverable format.

Finalized data will be provided to NYSDEC in an electronic data deliverable (EDD) format, in accordance with DER-10 and NYSDEC's "Electronic Data Deliverable Manual" (v.3, April 2013). The EDD will reflect DUSR-related modifications, as appropriate.

10 Internal Quality Control Checks

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of glassware and reagents. The procedures to be followed for internal quality control checks are consistent with NYSDEC ASP protocols.

11 Performance and System Audits

11.1 Field Audits

The Project QA Director may conduct episodic audits of the operations at the Site to ensure that work is being performed in accordance with the work plan and associated standard operating practice. The audit will cover, but not necessarily be limited to, such areas as:

- Conformance to standard operating procedures;
- Completeness and accuracy of documentation;
- Chain-of-custody procedures; and

- Construction specifications.

11.2 Laboratory Audits

In addition to any audits required by the NYSDEC, the Project QA Director may choose to audit the laboratory. These additional audits may take the form of performance evaluation samples or onsite inspections of the laboratory. Performance evaluation samples may be either blind samples or samples of known origin to the laboratory. Reasonable notice will be provided if the audit is to include an on-site inspection of the laboratory.

12 Preventative Maintenance

12.1 Field

Field personnel assigned to complete the work will be responsible for preventative maintenance of field instruments. The field sampling personnel will protect the field instruments by placing them in portable boxes and/or protective cases, and by minimizing their exposure to precipitation to the extent practicable.

Field equipment will be subject to a routine maintenance program, prior to and after each use. The routine maintenance program for each piece of equipment will be in accordance with the manufacturer's operations and maintenance manual. Equipment will be cleaned and checked for integrity after each use. Necessary repairs will be performed immediately after any defects are observed, and before the item of equipment is used again. Equipment parts with a limited life (such as batteries, membranes, sensors, and some electronic components) will be periodically checked and replaced or recharged as necessary according to the manufacturer's specifications.

12.2 Laboratory

The laboratory's preventative maintenance procedures are provided in the laboratory’s Quality Assurance Manual (available upon request).

13 Data Assessment Procedure

Performance of the following calculations will be completed to evaluate the accuracy, precision, and completeness of collected measurement data.

13.1 Precision

Precision of a particular analysis is measured by assessing its performance with duplicate or replicate samples. Duplicate samples are pairs of samples taken in the field and transported to the laboratory as distinct samples. Their identity as duplicates is sometimes not known to the laboratory and usually not known to bench analysts, so their usefulness for monitoring analytical precision at bench level is limited. For most purposes, precision is determined by the analysis of replicate pairs (i.e., two samples prepared at the

laboratory from one original sample). Often in replicate analysis the sample chosen for replication does not contain target analytes so that quantification of precision is impossible. Replicate pairs of spiked samples, known as MS/MSDs, are used for precision studies. This has the advantage that two real positive values for a target analyte can be compared.

Precision is calculated in terms of relative percent difference (RPD), which is expressed as follows:

$$RPD = \frac{(x_1 - x_2) \times 100}{(x_1 + x_2)/2}$$

where X_1 and X_2 represent the individual values found for the target analyte in the two replicate analyses or in the MS/MSD analyses.

RPDs must be compared to the method RPD for the analysis. The analyst or analyst supervisor must investigate the cause of RPDs outside stated acceptance limits. This may include a visual inspection of the sample for non-homogeneity, analysis of check samples, etc. Follow-up action may include sample re-analysis or flagging of the data as suspect if problems cannot be resolved.

13.2 Accuracy

Accuracy of a particular analysis is measured by assessing its performance with "known" samples. These "knowns" can take the form of USEPA or National Bureau of Standards (NBS) traceable standards (usually spiked into a pure water matrix); or laboratory prepared solutions of target analytes into a pure water or sample matrix; or, in the case of gas chromatography (GC) or gas chromatography-mass spectrometry (GC-MS) analyses, solutions of surrogate compounds which can be spiked into every sample and are designed to mimic the behavior of target analytes without interfering with their determination.

In each case the recovery of the analyte is measured as a percentage, corrected for analytes known to be present in the original sample, if necessary, as in the case of a matrix spike analysis. For USEPA or NBS supplied known solutions, this recovery is compared to the published data that accompany the solution. For prepared solutions, the recovery is compared to USEPA-developed data or historical data as available. For surrogate compounds, recoveries are compared to USEPA Contract Laboratory Program (CLP) acceptable recovery tables. If recoveries do not meet required criteria, then the analytical data for the batch (or, in the case of surrogate compounds, for the individual sample) are considered potentially inaccurate.

For highly contaminated samples, recovery of matrix spike may depend on sample homogeneity. As a rule, analyses are not corrected for recovery of matrix spikes or surrogate compounds.

13.3 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the total amount expected to be obtained under normal conditions. Completeness for each parameter is calculated as:

$$Completeness = \frac{Number\ of\ Successful\ Analyses\ \times 100}{Number\ of\ Requested\ Analyses}$$

Target value for completeness for parameters is 100%. A completeness value of 95% will be considered acceptable. Incomplete results will be reported to the PM.

13.4 Representativeness

The characteristic of representativeness is not quantifiable. Subjective factors to consider include:

- The degree of homogeneity of the Site;
- The degree of homogeneity of a sample taken from one point in a Site; and
- The available information on which a sampling plan is based.

To maximize representativeness of results, sampling techniques and sample locations will be carefully chosen so that they provide laboratory samples representative of the Site and the specific area sampled.

14 Quality Assurance Reports

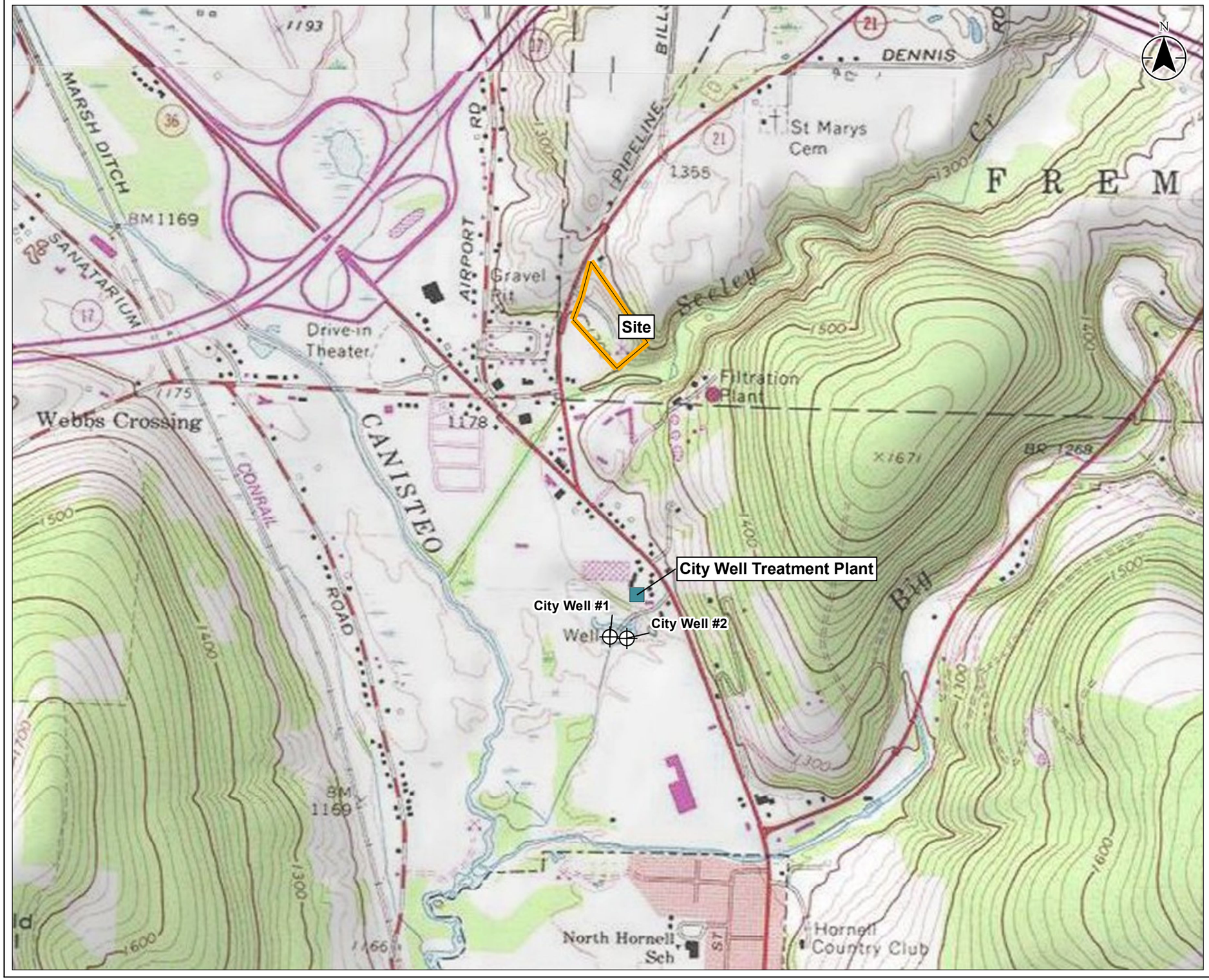
Upon completion of the RA sampling effort, with the exception of sampling efforts conducted solely for screening, waste characterization, and survey purposes, analytical and QC data will be included in a DUSR that summarizes the work and provides a data evaluation. A discussion of the usability of the results in the context of QA/QC procedures will be prepared for the Final Engineering Report (FER) and will also include a summary of the QA/QC activity. The DUSR will be performed in accordance with DEC's "Guidance for the Development of Data Usability Summary Reports," revised 1997, and DER-10.

As described in the following section, serious analytical problems will be reported, and appropriate corrective measures taken.

15 Corrective Action

Corrective actions can be initiated as a result of performance and system audits, laboratory and inter-field comparison studies, data validation, and/or a QA program audit. They may also be required as a result of a request from project representatives. Corrective action necessary to resolve analytical problems will be implemented.

Time and type of corrective action, if needed, will depend on the severity of the problem and relative overall project importance. Corrective actions may include altering procedures in the field, conducting subsequent audits, or modifying project/laboratory protocol. Corrective action will be implemented after notification of project representatives. The PM is responsible for initiating corrective action and the team leader is responsible for its implementation in the correction of field non-conformance corrective actions. Success or failure of corrective actions will be reported to project representatives, and addressed within the FER, including an estimate of effect on data quality, if any.



Stantec

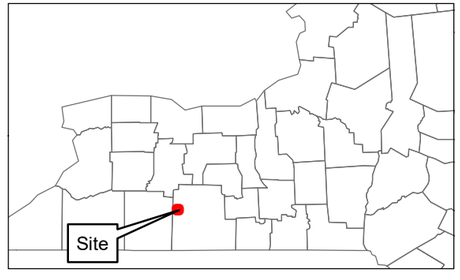
Legend

- City of Hornell Water Supply Wells
- City Well Treatment Plant (approximate location)
- Miller Hill Yard BCP Site (Magde Survey, 2017)

Notes:
1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: ArcGIS Basemap USA Topo Maps.

0 1,000 2,000 Feet

(At original document size of 11x17)
1:12,000



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

Figure No.
1

DRAFT

Title
Site Location Map

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Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of information provided by others.

QAPP Table 1
Sample Specifications
Quality Assurance Project Plan
Miller Hill Site - Fremont, NY
Remedial Action Work Plan

Media	Type of Analysis	Method	Required Container	Preferred Sample Volume	Preservation	Maximum Holding Time
Soil[A]	TCL VOCs	8260D	Voa Terracore Kit	1 kit	Cool 6°C	48 hours
	TCL SVOCs	8270D	32 oz. cwm	100 g	Cool 6°C	7 days
	TCL PCBs	8082A	4 oz. cwm	50 g	Cool 6°C	1 year
	TCL Pesticides	8081B	32 oz. cwm	100 g	Cool 6°C	7 days
	TCL Metals	6010D			Cool 6°C	180 days
	Cyanide	9012B	8 oz. cwm	50 g	Cool 6°C	14 days
Groundwater	TCL VOCs	8260D	(3) 40 ml glass vials	120 ml	HCl	14 days
	TCL SVOCs	8270D	(2) 250 ml amber glass jars	500 ml	Cool 6°C	7 days
	TCL PCBs	8082A	(2) 250 ml amber glass jars	500 ml	Cool 6°C	1 year
	TCL Pesticides	8081B	(2) 250 ml amber glass jars	500 ml	Cool 6°C	7 days
	TCL Metals	6010D	(1) 500 ml plastic jar	250 ml	Cool 6°C	180 days
	Cyanide	9012B	(1) 500 ml plastic jar	250 ml	Cool 6°C	14 days
	Alkalinity	2320B-1997	(1) 125 ml plastic jar	125 ml	Cool 6°C	14 days
	Nitrogen-Nitrate-Nitrite	353.2-1993 R2.0	(3) 125 ml plastic jar	150 ml	Cool 6°C	48 hours
	Iron/Dissolved Iron (Lab Filtered)	USEPA 6010D	(1) 250 ml plastic jar	50 ml	HNO_3	180 days
	Iron/Dissolved Iron	USEPA 6010D	(1) 250 ml plastic jar	50 ml	Cool 6°C	180 days
	Sulfate and Chloride	300.0 Rev 2.1	(1) 60 ml plastic jar	10 ml	Cool 6°C	28 days
	Methane, Ethane, Ethene	RSK-175	(3) 40 ml glass vials	120 ml	HCl	14 days
	Total Organic Carbon	9060A	(3) 40 ml glass vials	120 ml	H_2SO_4	28 days
	Total Sulfide	SM4500_S2_F	(1) 250 ml plastic jar	50 ml	Zinc acetate and NaOH	7 days

Key:

cwm	clear wide mouth jar
EPA	U.S. Environmental Protection Agency
HCl	hydrochloric acid
ml	milliliter
HNO_3	nitric acid
PCBs	Polychlorinated biphenyls
SVOCs	semivolatile organic compounds
TCL	USEPA's Target Compound List
VOCs	volatile organic compounds
g	grams
oz	ounces
H_2SO_4	Sulfuric Acid
NaOH	Sodium Hydroxide

Notes:
Holding time is the minimum allotted time from collection to extraction, prep or analysis.
Multiple analyses may be consolidated into fewer containers.
Waste characterization sampling not included in this table.

QAPP Table 2
Summary of Field Quality Control Checks
Quality Assurance Project Plan
Miller Hill Site - Fremont NY
Remedial Action Work Plan

Analysis Parameters	Analysis Method (USEPA SW846 method number)	Estimated Number of Site Samples[1]	QA/QC Samples				Total Number of Samples
			Field Duplicates[3]	Trip Blanks[4]	Rinsate Blanks[5]	MS/MSD[6]	
Soil Sampling							
TCL VOCs	8260D	5	1	1	1	1/1	10
TCL SVOCs	8270D	0	0	0	0	0	0
TCL PCBs	8082A	0	0	0	0	0	0
TCL Pesticides	8081B	0	0	0	0	0	0
TCL Metals ICP	6010D	0	0	0	0	0	0
Cyanide	9012B	0	0	0	0	0	0
Groundwater Sampling[2]							
TCL VOCs	8260D	21	2	3	1	2/2	31
TCL SVOCs	8270D	0	0	0	0	0	0
TCL PCBs	8082A	0	0	0	0	0	0
TCL Pesticides	8081B	0	0	0	0	0	0
TCL Metals ICP	6010D	0	0	0	0	0	0
Cyanide	9012B	0	0	0	0	0	0
Alkalinity	2320B-1997	21	2	0	1	2/2	28
Nitrogen-Nitrate-Nitrite	353.2-1993 R2.0	21	2	0	1	2/2	28
Iron/Dissolved Iron	USEPA 6010D	21	2	0	1	2/2	28
Sulfate and Chloride	300.0 Rev 2.1	21	2	0	1	2/2	28
Methane, Ethane, Ethene	RSK-175	21	2	0	1	2/2	28
Total Organic Carbon	9060A	21	2	0	1	2/2	28
Total Sulfide	SM4500_S2_F	21	2	0	1	2/2	28

Key:

MS/MSD	Matrix Spike/Matrix Spike Duplicate
QA/QC	Quality Assurance/Quality Control
SVOCs	TCL semivolatile organic compounds plus up to 20 TICs
PCBs	Polychlorinated biphenyls
TCL	USEPA's Target Compound List
USEPA	United States Environmental Protection Agency
VOCs	TCL VOCs by USEPA Method 8260D plus up to 10 TICs

Notes:

[1] Estimated number of site samples and associated QA/QC samples are anticipated and subject to change.

[2] This table reflects anticipated QA/QC sample requirements for the initial groundwater sampling event as part of the remedial action.

[3] Field duplicates will be collected at a frequency of 1 per 20 samples for each sample medium.

[4] Trip blanks will be collected at a frequency of 1 per cooler containing aqueous samples to be analyzed for VOCs.

[5] Rinsate blanks will be collected at a frequency of 1 per sampling event for each sampling method using non-dedicated equipment.

[6] MS/MSDs will be collected at a frequency of 1 per 20 samples for each sample medium.

With every community, we redefine what's possible.

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

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APPENDIX C

Community Air Monitoring Plan (CAMP)

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

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° C (14 to 122° 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.

APPENDIX D

Citizen Participation Plan (CPP)

NEW YORK STATE | Department of Environmental Conservation

Brownfield Cleanup Program

Community Participation Plan

for

Miller Hill Yard

February 2026

NYSDEC Site #C851045
7578 State Route 21
Town of Fremont
Steuben County, New York

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Note: The information presented in this Community Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Community Participation Plan may be revised during the site's investigation and cleanup process.

Please note that the contact information for adjacent property owners and residents on the contact list (Appendix B) are not to be included in the publicly-available versions of this CPP.

Applicant: **New York State Department of Transportation (NYSDOT) ("Applicant")**
Site Name: **Miller Hill Yard ("Site")**
Site Address: **7578 State Route 21**
Site County: **Steuben County**
Site Number: **C851045**

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: https://dec.ny.gov/environmental-protection/site-cleanup/brownfield-and-state-superfund-programs/brownfield.

2. Community 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 communities to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for public involvement and encourages early two-way communication with communities before decision makers form or adopt final positions.

Involving communities 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 communities 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 Community 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.

Please note that the contact information for adjacent property owners and residents on the contact list (Appendix B) are not to be included in the publicly-available versions of this CPP.

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 https://dec.ny.gov/environmental-protection/site-cleanup/regional-remediation-project-information/environmental-cleanup-email-newsletters.

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 community 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 https://dec.ny.gov/regulatory/regulations/technical-assistance-grant-tag-guidance-handbook-der-14

Note: The table identifying the community participation activities related to the site's investigation and cleanup program follows on the next page:

Community Participation Activities	Timing of CP Activity(ies)
NYSDOT Information Meeting about Water Treatment Plant:	
• Public Meeting held regarding a water treatment facility NYSDOT is installing to service city water supply wells	Meeting conducted July 1, 2015
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 Community 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	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.

Community Participation Activities	Timing of CP Activity(ies)
• Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (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.

Previous investigation results have indicated that chlorinated volatile organic compounds (CVOCs) are present both onsite and, to a limited extent, in offsite downgradient locations due to the long history of commercial usage and disposal activities on the Site.

Soils at the Site have been found to have contaminants present. Since access to the property is controlled by NYSDOT via a locked fence, potential exposure of the public to the potential soil contamination is not a concern at this time.

Groundwater at the Site is impacted by the following contaminants of concern: trichloroethene (TCE) and cis-1,2-dichloroethene or cis-1,2-dichloroethylene (cis-1,2-DCE). Potential exposure of the public to impacted groundwater may be through contaminated drinking water in wells. Two IRM soil excavation programs performed between 2017 and 2019 addressed the majority of the onsite source material for the groundwater plume, and offsite contaminant levels have largely declined below applicable NYSDEC standards and guidance values.

Remaining groundwater contamination, and the potential human exposure through ingestion, has been addressed through the installation of an offsite water treatment plant for the two City of Hornell auxiliary public water supply wells, as well as the installation of Point-of-Entry Treatment (POET) systems at three offsite private wells. TCE presence in the City of Hornell Water Supply Wells is routinely monitored by the City of Hornell and NYSDOH.

4. Site Information

Appendix C contains a site location map.

Site Description

The Site is located in the Town of Fremont, Steuben County, New York at 7578 State Route 21. The Site consists of one parcel of property, approximately 8.8 acres in size. Approximately 5.7 acres of the Site are surrounded by a chain-link fence with a locking gate. Portions of the Site area inside the fence are weed covered, although much of the interior of the Site is now covered with crushed stone. The area outside the perimeter of the fence is primarily grass/brush-covered or wooded. The Site is currently owned by NYSDOT. NYSDOT's usage of the Site has essentially been of a commercial and/or

industrial type, generally consisting originally of miscellaneous disposal and filling, followed by site grading and minor paving, then ultimately temporary storage of equipment and materials.

According to the Town of Fremont Zoning Map (Town of Fremont Comprehensive Plan, July 2013) the Site is zoned as Agricultural-Rural (AG-R). The surrounding area is also generally within the AG-R Zone, except to the west of the Site across State Route 21, which is classified as Low-Density Residential (LDR). Existing land use in the surrounding area is primarily agricultural and residential, with a nearby concentration of commercial businesses approximately 1,100 ft to the southwest.

Adjacent properties to the south of the Site, and to the west of the Site across State Route 21, are primarily occupied by residences. The adjacent parcels to the north and east of the Site are both residential and agricultural.

History of Site Use, Investigation, and Cleanup

NYSDOT obtained the property from the U.S. Army Corp of Engineers (ACOE) in 1960 (NYSDOT at the time was known as the New York State Department of Public Works). Soil materials on the Site were reportedly mined for use during construction of a nearby dam. After mining ceased, much of the Site was backfilled with miscellaneous soils and fill materials and graded into a flat or sloping configuration. The Site has been used since then by NYSDOT as a material storage and staging yard. NYSDEC's Environmental Site Remediation Database Search indicates that the Site was unofficially used a "dumping ground" by the local community, which may have occurred prior to installation of the fence and gate in 1991.

The City of Hornell operates two backup water supply wells located approximately 1/2 mile south of the Site. According to well completion reports, Well #1 was installed in 1977 and Well #2 was installed in 1973. The wells are used as a backup water source and are operated only periodically or seasonally depending on water supply demand. Periodic water sampling and analysis between 2009 and the present has indicated the presence of TCE in one or both of the supply wells. TCE was a common constituent of solvents used most commonly for degreasing purposes. It is also known to be a component of road marking paint, and has also been used in the testing of asphalt products. The TCE concentrations in these two wells were often found to be above the NYSDEC groundwater standard, however recent analyses indicate a drop in the concentration to levels at or just below the standard. The City has managed the well use in compliance with NYSDOH requirements such that the water being delivered via the public water system remains in compliance with required standards. Working together, the NYSDEC, NYSDOH, NYSDOT and the City implemented a carbon treatment system for these wells as an IRM; this system became operational in the summer of 2016 and currently continues to operate.

In 2011, NYSDEC initiated an investigation to determine the source of the municipal water supply well contamination. Low-level TCE presence was identified in selected groundwater monitoring wells installed near to, and north of the municipal well field. In 2013, NYSDEC installed six groundwater monitoring wells at the Miller Hill Yard and collected groundwater samples from those wells. The investigation results showed that: 1) groundwater flow direction is generally toward the southwest; and 2) TCE is present in the groundwater beneath some portions of the Miller Hill Yard. TCE was also detected in groundwater monitoring wells installed north of the supply wells; however, sampling in 2013 of private drinking water supply wells in the area did not encounter TCE.

In 2014, NYSDOT performed further environmental investigations at the Site, including:

- Additional groundwater sampling/analyses;
- Sampling and analysis of surface and subsurface soils;
- Geophysical testing to investigate the potential presence of buried objects such as drums or tanks; and
- A program of passive soil vapor testing across the site to further assess the presence and potential source areas of contaminants.

The groundwater testing confirmed that TCE is present in groundwater beneath certain portions of the property. The geophysical investigation identified several areas of potential buried metallic objects; test pit excavations performed at these locations identified miscellaneous objects such as vehicle parts, scrap metal, sign posts, reinforced concrete, and at one location a crushed, empty drum; however significant drum presence was not found. Soil sampling in each of the test pits revealed that some locations contained relatively low levels of solvent and petroleum-related compounds in soil. The passive soil gas sampling program revealed several areas with solvent- and petroleum-related compounds in the soil vapor.

In 2015, NYSDOT performed additional Site Characterization environmental investigations including:

- Sampling and analysis of surface and subsurface soils
- Installation and sampling of additional monitoring wells
- Excavation of test pits in several areas on the property based on the previously-conducted geophysical testing

One of the 2015 test pits encountered buried drums that contained what is presumed to be unused road marking paint. Soil samples collected near and co-mingled with the paint, and the paint itself were submitted for laboratory analyses. The analyses indicated that the paint contains elevated concentrations of TCE and benzene. At the time, it was suspected that more drums could potentially be buried in the vicinity

immediately surrounding the drums found at that time. The groundwater testing of the newly-installed monitoring wells indicated that, based on a detection at a downgradient well, impacted groundwater has the potential to migrate offsite.

In 2016, NYSDOT performed additional environmental investigations at the Site including:

- Targeted excavation of numerous test pits in the area where buried drums had previously been found
- Sampling and analysis of subsurface soils
- Hydraulic conductivity testing using existing monitoring wells

The test pits, which were dug in the northern portion of the site, showed that the depth of fill in some areas is greater than 20 feet. A variety of fill materials were found in this area including asphalt, tires, glass and plastic bottles, concrete, guard wires, large diameter tree trunks, empty intact drums, empty crushed drums. One 55-gallon drum containing liquid paint was encountered in only one test pit, which was located immediately next to the test pit that in 2015 was found to contain paint drums. These additional test pits indicated that the extent of buried drums in this area of the site was uncertain, and more drums may still be present at depths greater than the test pit maximum depth.

In spring 2017, an IRM was initiated by NYSDOT to remove buried drums in the northern portion of the site. This effort continued in a subsequent IRM that was executed in 2018. Concurrently, the Site was accepted into the Brownfield Cleanup Program in July 2018 and a Brownfield Cleanup Agreement was executed in September 2018.

A Remedial Investigation (RI) was completed for the Site, spanning from November 2018 to June 2021. The RI program generally included onsite surface soil sampling; sampling of offsite private water supply wells and resampling of select locations; re-development of offsite monitoring wells previously installed by NYSDEC; well gauging and groundwater sampling of existing onsite and offsite wells; drawdown monitoring at existing offsite wells during a scheduled pumping event on the City of Hornell Water Supply Wells; installation of seven additional offsite and five additional onsite monitoring wells; well gauging and groundwater sampling of newly-installed wells for VOCs; a comprehensive monitoring well gauging event; and a soil vapor intrusion (SVI) investigation. Results from the December 2022 SVI investigation at the two properties allowing access for sampling indicated that no further action was recommended related to SVI.
A supplemental groundwater gauging and sampling event 2022 was conducted in November-December 2022 to collect additional groundwater monitoring data to

evaluate any changes in onsite and offsite conditions. The results showed residual TCE in a portion of the onsite monitoring wells located near the southwestern Site boundary.

Current Status

A Revised Remedial Investigation Report (RIR) presented a comprehensive description of onsite and Study Area-wide geologic, hydrogeologic, and contamination conditions related to the Site dated May 28, 2024 was approved by the NYSDEC. An Alternatives Analysis Report (AAR) dated September 8, 2025 was approved by the NYSDEC and the New York State Department of Health (NYSDOH) on December 16, 2025. The AAR presented a plan for the remediation of environmentally impacted soil and groundwater at the Site.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Participant. This means that the Applicant was the owner of the site at the time of the disposal or discharge of contaminants or was otherwise liable for the disposal or discharge of the contaminants. The Participant must fully characterize the nature and extent of contamination onsite, as well as the nature and extent of contamination that has migrated from the site. The Participant also must conduct a "qualitative exposure assessment," a process that 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 in its Application proposes that the site will be used for restricted purposes.

To achieve this goal, the Applicant has conducted and will continue to conduct investigation and/or cleanup 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 partial site investigation before it entered into the BCP.

The Applicant will conduct an investigation of the site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment.

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.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

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.

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):

Evelyn Hussey
Project Manager
NYSDEC
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY, 12233-7017
(518) 402-6787

Linda Vera
Citizen Participation Specialist
NYSDEC Region 8
6274 East Avon-Lima Road
Avon, NY 14414-9519
Phone: (585) 226-2466

New York State Department of Health (NYSDOH):

Jim Sullivan
Project Manager
NYSDOH
Empire State Plaza, Corning Tower
17th Floor, Albany, NY 12237
(518) 402-5584

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Town of Fremont, NY Offices
8217 Cream Hill Road
Arkport, NY 14807
Attn: Town Clerk
Phone: (607) 324-7786
Hours: 1-4pm T, 6-8pm W,
9am-12pm F (call for an appointment)

NYSDEC Central Office
625 Broadway
Albany, NY 12233-0001
Phone: (518) 402-8044
Hours: 8:30-4:45pm M-F
(call for appointment)

Hornell Public Library
64 Genesee Street, Hornell, NY 14843
(607) 324-1210

Appendix B - Site Contact List

Local Government Officials

Town of Fremont

Emily Murray, Town Supervisor
Fremont Town Hall
8217 Cream Hill Road
Arkport, New York 14807
607-382-7423
e.murray@townoffremontny.com

Susan Peck, Town Clerk/Tax Collector
Fremont Town Hall
8217 Cream Hill Road
Arkport, New York 14807
(607) 324-7786
s.peck@townoffremontny.com

City of Hornell

John Buckley, Mayor
City of Hornell Mayor's Office
City of Hornell
82 Main St.
PO Box 627
Hornell, NY 14843
(607) 324-7421
mayorsoffice@cityofhornell.com

Holly Snyder, City Clerk
Hornell City Clerk's Office
City of Hornell
82 Main St.
PO Box 627
Hornell, NY 14843
(607) 324-7421
clerk@cityofhornell.com

Mitchell Cornish, Superintendent
Department of Public Works
City of Hornell
82 Main St.
PO Box 627
Hornell, NY 14843
(607) 324-7421
mcornish@cityofhornell.com

Heather Reynolds, City Planner
Planning Office
City of Hornell
82 Main St.
PO Box 627
Hornell, NY 14843
(607) 324-7421
hreynolds@cityofhornell.com

Steuben County

Jack Wheeler, Steuben County Manager
3 East Pulteney Square
Bath, New York 14810
(607) 664-2245

Judith M. Hunter, Steuben County Clerk
3 East Pulteney Square
Bath, New York 14810
(607) 664-2563

Marie Myers Shearing, Director
Planning Department
3 East Pulteney Square
Bath, New York 14810
(607) 664-2268
planning@co.steuben.ny.us

Steuben County
Water Quality Coordinating Committee
415 W. Morris Street
Bath, NY 14810
(607) 776-7398, ext. 5
parkerv@stny.rr.com
vparker@steubenswcdny.com

Media Outlets

The Evening Tribune / Spectator
32 Broadway Mall
Hornell, NY 14843
1-888-896-3107
https://help.eveningtribune.com/contact-us

WENY News
474 Old Ithaca Road
Horseheads, NY 14845
(607) 739-3636
news36@weny.com

Spectrum News - Southern Tier
815 Erie Blvd. East
Syracuse, NY 13210
(315) 234-1010
https://spectrumlocalnews.com/nys/binghamton

WKPQ Radio
112 Main Street
Hornell, NY 14843
(607) 968-8133
https://lovemyfroggy.com

WLEA Radio / WCKR Radio
5942 County Route 64
Hornell, NY 14843
(607) 324-1480
http://wlea.net/

WYDC TV
33 East Market Street
Corning, NY 14830
(607) 937-5000
https://www.wydc-tv.com

Please note that the names, addresses, and email addresses of adjacent property owners and residents on the contact list should not be placed in versions of this document available to the public. Instead, they should be maintained confidentially in the NYSDEC project manager's files.

Note: The following contacts are not to be included in the publicly-available versions of this CPP

Adjacent and Nearby Residents

Blades Real Estate LLC
Airport Road
Mail: PO Box 590
Hornell, NY 14843

Faulkner, Ronald and Dan, and Dolan, Mary E.
State Route 21
Mail: 7756 Reservoir Rd
Hornell, NY 14843

Harwood Burch Properties Inc
State Route 21
Hornell, NY 14843

Triple R Holding LLC
2000 State Route 21
Hornell, NY 14843

Snyder, Bonnie and Kenneth
2281 State Route 21
Hornell, NY 14843

Charles F Oliver and Son LLC
7522 Seneca Rd N
Hornell, NY 14843

Vetter, Laura and Smith, Brendan
7565 State Route 21
Hornell, NY 14843

Smith, Carissa and Daniel
Life Use - Keith and Carol Smith
7573 State Route 21
Hornell, NY 14843

Whiteman, Michael and Laurie A.
7577 State Route 21
Hornell, NY 14843

Whiteman, Michael and Laurie
7579 State Route 21
Hornell, NY 14843

Larena, Pablo and Jimenez Montero, Eva M.
7580 State Route 21
Hornell, NY 14843

Andrus, Ryan J.
7581 State Route 21
Hornell, NY 14843

Millman, Shannon and Wendy L
7591 State Route 21
North Hornell, NY 14843

Burch, John C and Elysia
1245 County Route 66
Hornell, NY 14843

Baer, Betty
1247 County Route 66
Hornell, NY 14843

Valentine, James E Sr.
7502 Loon Lake Road
Hornell, NY 14843

Ledd Properties, LLC
7508 State Route 21 / 7508 Loon Lake Road
Hornell, NY 14843

Chamberlin, Charles and Michelle
7570 Loon Lake Rd
Hornell, NY 14843

Bradley, Karen
1240 Maple Ct
Hornell, NY 14843

Theilan, James
1244 Maple Ct
Hornell, NY 14843

Drury, Keith and Wendy
1246 Maple Ct
Hornell, NY 14843

Farrell, Madeline E
1252 Maple Ct
Hornell, NY 14843

Norton, Thomas C.
1256 Maple Ct
Hornell, NY 14843

Everett, Marcia and Jas W
1250 County Route 66
Hornell, NY 14843

Moon, Patricia M.
7505 Loon Lake Rd
Hornell, NY 14843

Strawway, John and Linda
7512 State Route 21 / 7512 Loon Lake Road
Hornell, NY 14843

Giglio, Charlotte and Francis
7572 State Route 21 / 7572 Loon Lake Road
Hornell, NY 14843

Chamberlin, Charles and Brian
C/O Nelson Chamberlin Life Use
1242 Maple Ct
Hornell, NY 14843

Heller, Cory and Kassandrea
1245 Maple Ct
Hornell, NY 14843

Prior, Jane
1247 Maple Ct
Hornell, NY 14843

Kelly, Vincent
1254 Maple Ct
Hornell, NY 14843

Gertrude French Irrevocable Trust
Life Use – Gertrude, French and Kimberly
1260 Maple Ct
Hornell, NY 14843

Apostale, Lee and Jeanette
1261 Maple Ct
Hornell, NY 14843

Dagon, James
1262 Maple Ct
Hornell, NY 14843

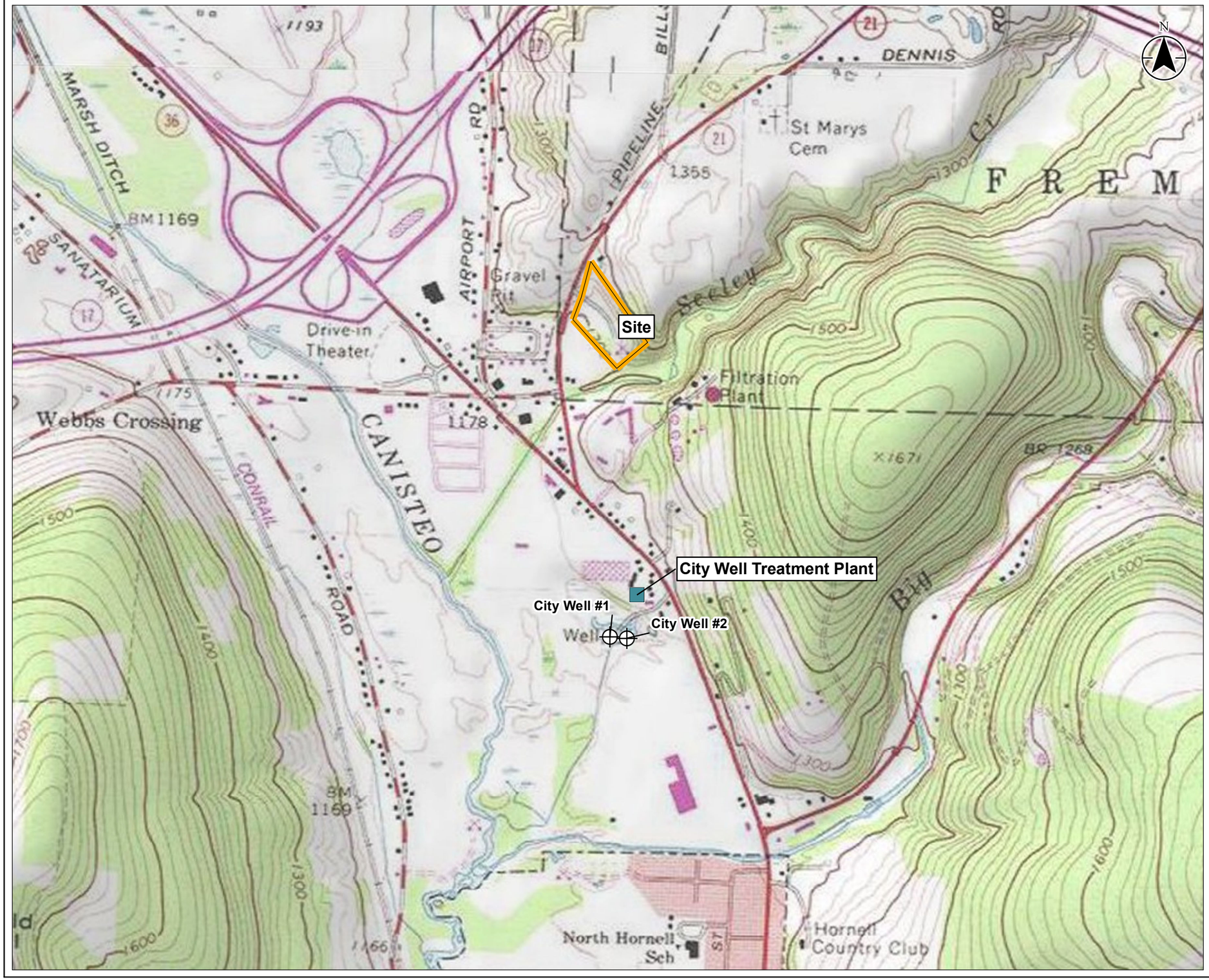
Pritchard, Blair and Terry
1266 Maple Ct
Hornell, NY 14843

Amell, James R III and Amy
1267 Maple Ct
Hornell, NY 14843

Lawrence, Travis and Kirsten
1268 Maple Ct
Hornell, NY 14843

Bennett, Lee
2200 State Route 21
Hornell, NY 14843

Appendix C - Site Location Map



Stantec

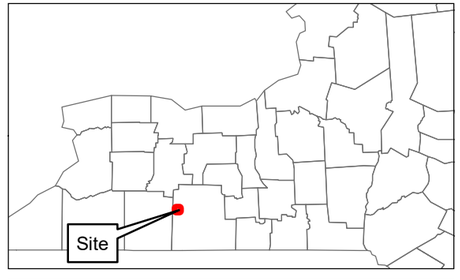
Legend

- City of Hornell Water Supply Wells
- City Well Treatment Plant (approximate location)
- Miller Hill Yard BCP Site (Magde Survey, 2017)

Notes:
1. Coordinate System: NAD 1983 StatePlane New York Central FIPS 3102 Feet.
2. Basemap: ArcGIS Basemap USA Topo Maps.

0 1,000 2,000 Feet

(At original document size of 11x17)
1:12,000



Project Location
7578 State Route 21
Fremont, Steuben County, NY

Prepared by AK on 2026-02-05
TR by LB/GF on 2026-02-09
IR by DH on 2026-02-11

Client/Project
NYSDOT Former Miller Hill Yard
BCP Site #C851045
Remedial Action Work Plan

213414012

Figure No.
APPENDIX C

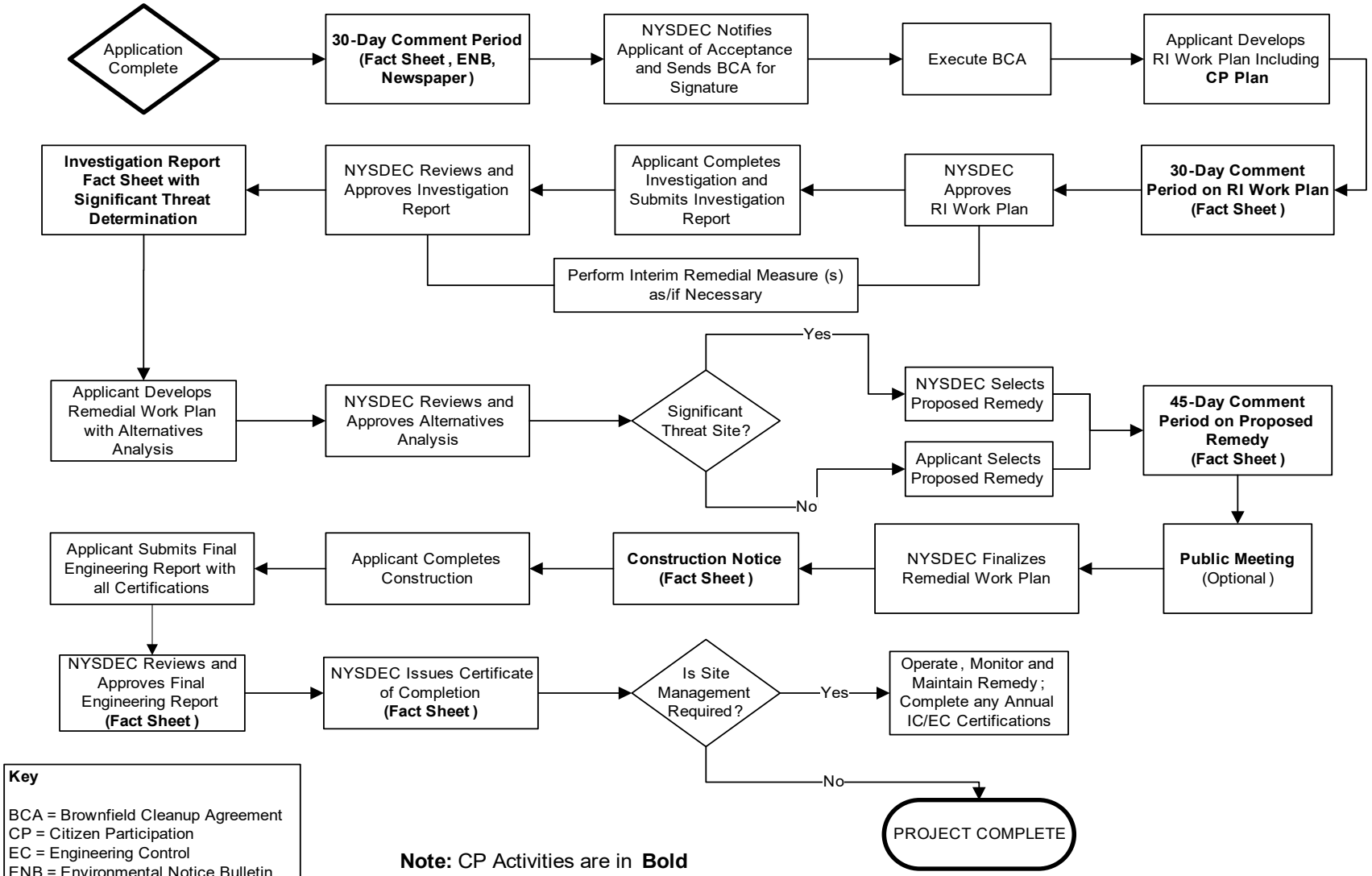
DRAFT

Title
Site Location Map

U:\213414012\05_report_delv\dwgs_design\GIS_figures\RAWP\mxd\fig1_RAWP_Site_Location_Map_20260209.mxd Revised: 2026-02-09 By: akita

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of information provided by others.

Appendix D– Brownfield Cleanup Program Process



Key

BCA = Brownfield Cleanup Agreement
CP = Citizen Participation
EC = Engineering Control
ENB = Environmental Notice Bulletin
IC = Institutional Control
RI = Remedial Investigation

Note: CP Activities are in **Bold**

APPENDIX E

Remedial Action/Site Management Forms

Stantec

Summary of Green Remediation Metrics for Remedial Action / Site Management
NYSDOT Former Miller Hill Yard Site
Brownfield Cleanup Program Site # C851045
7578 State Route 21
Fremont, Steuben County, New York

Summary of Green Remediation Metrics for Remedial Action / Site Management

Current Reporting Period
Reporting Period From: _____ To: _____

Contact Information
Preparer's Name: _____ Phone No.: _____
Preparer's Affiliation: _____

I. Material Production: Quantify the **total** amount of materials imported to the site.

	Quantity	Material Description
Bulk Material		
Backfill Material (e.g. gravel, (cf))		
Cover System Material (e.g. asphalt, concrete (cf))		
PVC (cf)		
Other (cf)		
Well Materials		
Sand (kg)		
Gravel (kg)		
Bentonite (kg)		
Typical Cement (kg)		
General Concrete (kg)		
Steel (kg)		
Other (kg)		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 6.

II. Personnel Transportation: Quantify the **total** amount of miles (*there and back)* traveled to transport personnel to and from the site.

	Quantity	**Vehicle (Car, Light Truck, SUV, etc.)**	**Fuel Type (gasoline, diesel)**	**# of Personnel**
Stantec Personnel (mi)				
Watts Personnel (mi)				
Contractor Personnel (mi)				
Toleman Personnel (mi)				
Other (mi)				

Provide a description of all energy usage reduction programs for the site in the space provided on Page 6.

III. Equipment Transportation: Quantify the **total** amount of miles (*there and back)* traveled to transport equipment and materials to and from the site.

	Distance Traveled with Equipment	**Distance Traveled without Equipment (Empty Return Trip)**	**Fuel Type (gasoline, diesel)**	**Weight of Equipment (tons)**
Excavator (mi)				
Roller (mi)				
Geoprobe (mi)				
Drill Rig (mi)				
Bulk/Fill Material (mi)				
Contractor Support Vehicles/Box Truck (mi)				
Other (mi)				

Provide a description of all energy usage reduction programs for the site in the space provided on Page 6.

IV. Equipment Use: Quantify the amount to which each type of equipment was used on-site.

	Quantity of material removed	Fuel Type (diesel, biodiesel)
Earthwork		
Excavator (cy)		
Other (cy)		

	Number of Drilling Locations	Time spent drilling at each location (hr)	Fuel Type (diesel, gasoline)
Drilling			
Geoprobe			
Hollow Stem Auger			
Other			

	Total Area Serviced (sf)	Total Work Days (day)	Fuel Type (diesel, gasoline)
Capping Equipment			
Roller			
Paver			
Other			

Provide a description of all energy usage reduction programs for the site in the space provided on Page 6.

V. Personnel Labor: Quantify the amount of hours worked on-site for all personnel.

	Quantity
Stantec Personnel (hr)	
Watts Personnel (hr)	
Contractor Personnel (hr)	
Toleman Personnel (hr)	
Other (hr)	

Provide a description of all energy usage reduction programs for the site in the space provided on Page 6.

VI. Residue Disposal/Recycling: Quantify the **total** amount of trips (*there and back)* to transport waste from the site to landfill/recycling.

	Landfill/ Recycling Facility Name	**# Trips from Site to Landfill**	**# Trips from Landfill to Site (Empty Return Trip)**	**Fuel Type (gasoline, diesel)**	**Weight of Waste per trip (tons)**
Non-hazardous Material					
Hazardous Material					
Decon Water					
Development Water					
Purge Water					
Other					

Provide a description of all energy usage reduction programs for the site in the space provided on Page 6.

VII. Water Consumption: Quantify the amount of potable water consumed or wastewater disposed of.

	Total water consumed from potable water treatment (gal)	**Total water disposed to wastewater treatment facility (gal)**
Decon Water		
Development/Drill Water		
Purge Water		
Water Added		
Dust Control		
Other		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 6.

VIII. On-site Land & Water Resource Consumption: Quantify the amount of topsoil used or groundwater/surface water lost.

	Groundwater / Surface water lost (gal)
Groundwater / Surface Water	
Development/Drill Water	
Purge Water	
Other	

	Topsoil Brought to Site (cy)
Soil	
Topsoil	
Other	

Provide a description of all energy usage reduction programs for the site in the space provided on Page 6.

Summary of Green Remediation Metrics for Remedial Action / Site Management
NYSDOT Former Miller Hill Yard Site
Brownfield Cleanup Program Site # C851045
7578 State Route 21
Fremont, Steuben County, New York

Description of green remediation programs reported above (Attach additional sheets if needed)
Material Production:
Personnel Transportation:
Equipment Transportation:
Equipment Use:
Residue Disposal/Recycling:
Water Consumption:
On-site Land & Water Resource Consumption:
Other:

Summary of Green Remediation Metrics for Remedial Action / Site Management
NYSDOT Former Miller Hill Yard Site
Brownfield Cleanup Program Site # C851045
7578 State Route 21
Fremont, Steuben County, New York

CONTRACTOR CERTIFICATION
I, _____ (**Name**) do hereby certify that I am _____ (**Title**) of _____ (**Contractor Name**), which is responsible for the work documented on this form. According to my knowledge and belief, all of the information provided in this form is accurate and the site management program complies with the DER-10, DER-31, and CP-49 policies. _____ **Date** **Contractor**

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil

This form is based on the information required by DER-10, Section 5.4(e) and 6NYCRR Part 360.13. Use of this form is not a substitute for reading the applicable regulations and Technical Guidance document.

SECTION 1 – SITE BACKGROUND

The allowable site use is: Commercial or Industrial Use

Have Ecological Resources been identified? no

Is this soil originating from the site? Choose an item

How many cubic yards of soil will be imported/reused? Choose an item

If greater than 1000 cubic yards will be imported, enter volume to be imported:

SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? Choose an item

Does it contain less than 10%, by weight, material that passes a size 100 sieve? Choose an item

Is this virgin material from a permitted mine or quarry? Choose an item

Is this material recycled concrete or brick from a DEC registered processing facility? Choose an item

SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.4(e)5 (other material), no chemical testing needed.

SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.

If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Location where fill was obtained:

Identification of any state or local approvals as a fill source:

If no approvals are available, provide a brief history of the use of the property that is the fill source:

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

_____ _____

Signature Date

_____

Print Name

_____

Firm

Revised April 2023