ROUX

Date: October 5, 2018

To: Justin Starr, P.G.
New York State Department of Environmental Conservation

From: Joseph Duminuco, P.G./Charles McGuckin, P.E.
Roux Environmental Engineering and Geology, D.P.C.

Subject: Groundwater Sampling of Per-and Polyfluoroalkyl Substances and 1,4-Dioxane
Post Road Corridor Site – New York State Department of Environmental Conservation
Brownfield Cleanup Program Site C360129
77 West Post Road, White Plains, New York

Roux Environmental Engineering and Geology, DPC. (Roux), on behalf of Post Maple 77, LLC (Post Maple) and at the request of the New York State Department of Environmental Conservation (NYSDEC), have prepared this Groundwater Sampling Work Plan Memorandum for the collection and laboratory analysis of groundwater samples for emerging contaminants (ECs) at the Post Road Corridor – White Plains Project Site located at 77 West Post Road, White Plains, New York (Site).

The Project Site includes 16 individual parcels with a total development area of 4.22 acres. Ten of the parcels (Parcels A through D and F through K) were accepted into the NYSDEC Brownfields Cleanup Program (BCP) in April of 2013. Historic Site operations predominately involved automobile sales and repair, which persisted for approximately 50 years. Each of the individual Parcels were either directly utilized for automobile sales, storage, and/or repair, or are located adjacent to Parcels that were. Additional historic Site operations included former use as a gasoline service station and a dry cleaner.

As per the NYSDEC letter dated June 27, 2018 (Attachment 1), groundwater samples are to be collected at the Site and analyzed for per-and polyfluoroalkyl substances (PFAS) and 1,4-dioxane, as part of a Statewide evaluation to better understand the risk posed to the public. To accommodate this requirement, Roux will collect a total of four groundwater samples from existing on-Site monitoring wells to represent the potential of the Site to be a source of ECs. As previously discussed between the NYSDEC Case Manager and Roux, groundwater samples for ECs will be collected from throughout Parcels A-J at RW-23 (upgradient well; located at the western property boundary), RW-8 (located in the center of the Site), and RW-16 (downgradient well; located at the eastern property boundary). In addition, and as required by NYSDEC, one groundwater sample for ECs will be collected from Parcel K, which is located separate from Parcels A-J, specifically from RW-19. The sample locations are provided on Figure 1.

As instructed in the NYSDEC request provided as Attachment 2, all groundwater samples will be collected in accordance with the NYSDEC March 1991 Sampling Guidelines and Protocols and the NYSDEC Groundwater Sampling for ECs dated April 2018. Roux will adhere to the specifications on the acceptable materials and containers used for sampling referenced in the Department's request and the Roux Field Sampling Plan (Appendix A). All groundwater samples will be analyzed for PFAS via the United States Environmental Protection Agency (USEPA) Method 537 Modified and 1,4-Dioxane via the USEPA Method 8270SIM by Alpha Analytical of Westborough, Massachusetts, an Environmental Laboratory Approval Program (ELAP)-certified laboratory (ELAP Lab ID #11148). One matrix spike/matrix spike duplicate for will be collected. In addition, a minimum of one equipment blank and field duplicate for every sample batch will be collected and submitted for analysis as indicated in the Quality Assurance Project Plan (QAPP), included as Appendix B.

Groundwater sample data will be reported in a full NYSDEC Category B deliverable and will be validated by an independent validator. All groundwater data and the Data Usability Summary Report (DUSR) will be uploaded to the NYSDEC database and concurrently submitted to the NYSDEC Case Manager.



209 Shafter Street ■ Islandia, New York 11749 ■ +1.631.232.2600 ■ www.rouxinc.com
California ■ Illinois ■ Massachusetts ■ New Jersey ■ New York ■ Texas

Upon receiving NYSDEC approval to complete this work, Roux will commence with this sampling within 14 days of the approval date.

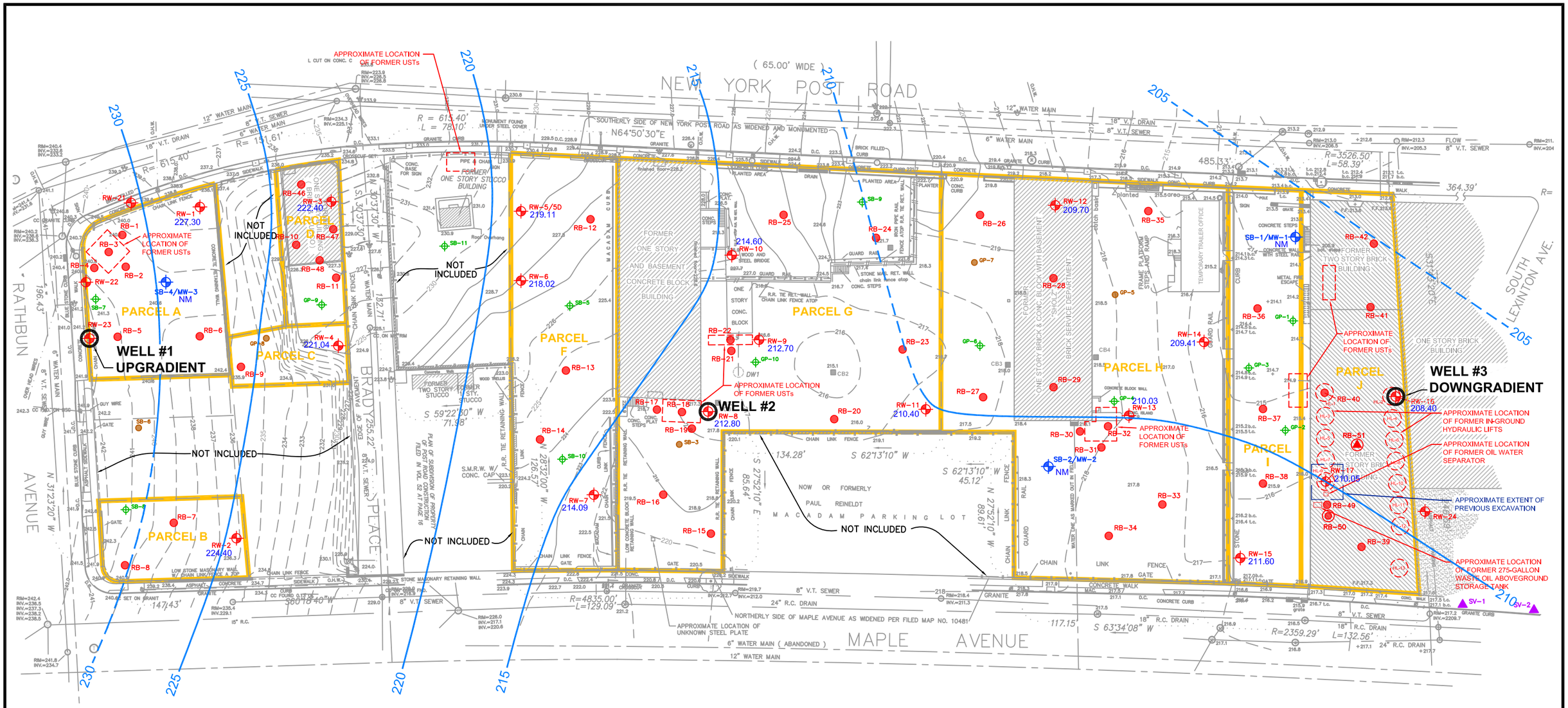
If you have any questions or require additional information regarding this Work Plan, please do not hesitate to contact Roux at 631-232-2600.

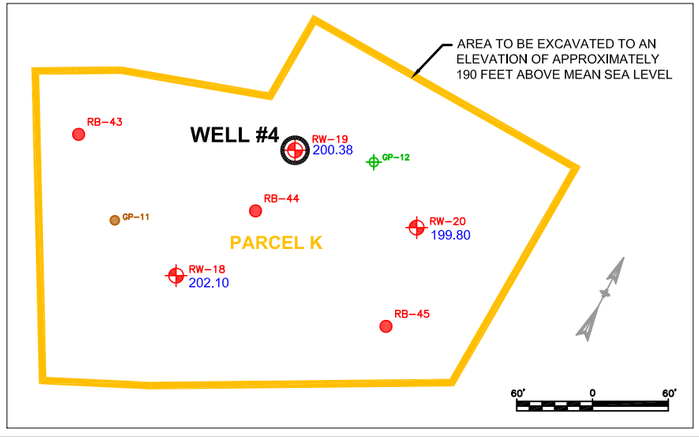
Attachments: Figure 1 – Proposed Sampling Locations
Attachment 1 – NYSDEC Emerging Contaminants Sampling Requirements Letter
Attachment 2 – NYSDEC Emerging Contaminants Field Sampling Guidelines
Appendix A – FSP
Appendix B – QAPP
Appendix C – HASP

CC: Scott Auster, Post Maple 77, LLC
James Tuman, Post Maple 77, LLC
Julie Moriarity, Roux Environmental Engineering and Geology, D.P.C.

# FIGURE

Proposed Sampling Locations




## LEGEND

- PROPOSED EMERGING CONTAMINANTS GROUNDWATER SAMPLE LOCATION
- SOIL BORING/MONITORING WELL, INSTALLED BY ROUX ASSOCIATES
- SOIL BORING, INSTALLED BY ROUX ASSOCIATES
- GROUNDWATER PROFILE BORING, INSTALLED BY ROUX
- SOIL/GROUNDWATER PROFILE BORING, INSTALLED BY ROUX
- EXISTING SOIL BORING COMPLETED AS TEMPORARY WELL, INSTALLED BY OTHERS
- EXISTING BORING COMPLETED AS MONITORING WELL, INSTALLED BY OTHERS
- EXISTING SOIL BORING
- TEMPORARY SOIL VAPOR SAMPLING POINT
- 211.60 — GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- NM — NOT MEASURED
- 220 — LINE OF EQUAL GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (DASHED WHERE INFERRED)

60' 0 60'

## NOTES

1. ELEVATIONS SHOWN HEREON REFER TO THE CITY OF WHITE PLAINS DATUM.
2. ELEVATIONS AT AREAS OUTSIDE SHOWN EXCAVATIONS ARE NOT EXPECTED TO CHANGE.

Title:

# PROPOSED SAMPLING LOCATIONS

EMERGING CONTAMINANTS WORK PLAN
POST ROAD CORRIDOR – WHITE PLAINS
77 WEST POST ROAD, WHITE PLAINS, NY

Prepared For:

POST MAPLE 77, LLC

ROUX

| | | |
|---|---|---|
| Compiled by: J.M. | Date: 18SEP18 | FIGURE 1 |
| Prepared by: B.H.C. | Scale: AS SHOWN | |
| Project Mgr: J.M. | Project: 2195.0001Y000 | |
| File: 2195.0001Y130.01.DWG | | |

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# ATTACHMENTS

A-1 – NYSDEC Emerging Contaminants Sampling Requirements Letter

A 2 – NYSDEC Emerging Contaminants Field Sampling Guidelines

# ATTACHMENT 1

A-1 – NYSDEC Emerging Contaminants Sampling Requirements Letter

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

**Division of Environmental Remediation, Remedial Bureau C**
625 Broadway, 11th Floor, Albany, NY 12233-7014
P: (518) 402-9662 I F: (518) 402-9679
www.dec.ny.gov

June 27, 2018

Julie Moriarity
Roux Associates, Inc.
209 Shafter Street
Islandia, New York 11749

RE: Request for sampling of Emerging Contaminants
Post Road Corridor - White Plains
NYSDEC Site No. C360129

Dear Ms. Moriarity:

The New York State Department of Environmental Conservation (DEC) is undertaking a Statewide evaluation of remediation sites to better understand the risk posed to New Yorkers by 1,4-dioxane and per- and polyfluoroalkyl substances (PFAS). PFAS have historically not been evaluated at remediation sites, and 1,4-dioxane has not been evaluated at the levels that are now thought to represent a health concern. This initiative is being undertaken as a result of these "emerging contaminants" having been found in a number of drinking water supplies in New York. Accordingly, the DEC is requiring that you test site groundwater for these chemicals. To accommodate this requirement, a select number of existing monitoring wells, representative of the potential of the above-referenced site to be a source of these emerging contaminants, must be sampled. DEC recommends that at least one of these wells should be upgradient of the site.

The attached guidance provides information on the analytical methods and reporting requirements. A second guidance document describes special precautions that need to be considered when sampling for PFAS.

Please prepare a draft letter work plan that identifies the wells proposed for sampling, brief description of the sampling methods, and anticipated sampling date within the next 60 days. If you wish to discuss the scope of the requested water testing, please contact me at 518-402-9797 or Justin.Starr@dec.ny.gov.

Sincerely,

Justin Starr, P.G.
Project Manager, Remedial Bureau C
Division of Environmental Remediation

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Attachments

ec: J.Starr
A.Omorogbe
S.Auster – sauster@gridproperties.com
DECDocs

# ATTACHMENT 2

A 2 – NYSDEC Emerging Contaminants Field Sampling Guidelines

# Groundwater Sampling for Emerging Contaminants

**April 2018**

Issue: NYSDEC has committed to analyzing representative groundwater samples at remediation sites for emerging contaminants (1,4-dioxane and PFAS) as described in the below guidance.

## Implementation

NYSDEC project managers will be contacting site owners to schedule sampling for these chemicals. Only groundwater sampling is required. The number of samples required will be similar to the number of samples where "full TAL/TCL sampling" would typically be required in a remedial investigation. If sampling is not feasible (e.g., the site no longer has any monitoring wells in place), sampling may be waived on a site-specific basis after first considering potential sources of these chemicals and whether there are water supplies nearby.

Upon a new site being brought into any program (i.e., SSF, BCP), PFAS and 1,4-dioxane will be incorporated into the investigation of groundwater as part of the standard "full TAL/TCL" sampling. Until an SCO is established for PFAS, soil samples do not need to be analyzed for PFAS unless groundwater contamination is detected. Separate guidance will be developed to address sites where emerging contaminants are found in the groundwater. The analysis currently performed for SVOCs in soil is adequate for evaluation of 1,4-dioxane, which already has an established SCO.

## Analysis and Reporting

Labs should provide a full category B deliverable, and a DUSR should be prepared by a data validator, and the electronic data submission should meet the requirements provided at: https://www.dec.ny.gov/chemical/62440.html ,

The work plan should explicitly describe analysis and reporting requirements.

PFAS sample analysis: Currently, ELAP does not offer certification for PFAS compounds in matrices other than finished drinking water. However, laboratories analyzing environmental samples (ex. soil, sediments, and groundwater) are required, by DER, to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537 or ISO 25101.

Modified EPA Method 537 is the preferred method to use for groundwater samples due to the ability to achieve 2 ng/L (ppt) detection limits. If contract labs or work plans submitted by responsible parties indicate that they are not able to achieve similar reporting limits, the project manager should discuss this with a DER chemist. Note: Reporting limits for PFOA and PFOS should not exceed 2 ng/L.

PFAS sample reporting: DER has developed a PFAS target analyte list (below) with the intent of achieving reporting consistency between labs for commonly reportable analytes. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. This list may be updated in the future as new information is learned and as labs develop new capabilities. If lab and/or matrix specific issues are encountered for any particular compounds, the NYSDEC project manager will make case-by-case decisions as to whether particular analytes may be temporarily or permanently discontinued from analysis for each site. Any technical lab issues should be brought to the attention of a NYSDEC chemist.

Some sampling using this full PFAS target analyte list is needed to understand the nature of contamination. It may also be critical to differentiate PFAS compounds associated with a site from other

sources of these chemicals. Like routine refinements to parameter lists based on investigative findings, the full PFAS target analyte list may not be needed for all sampling intended to define the extent of contamination. Project managers may approve a shorter analyte list (e.g., just the UCMR3 list) for some reporting on a case by case basis.

1,4-Dioxane Analysis and Reporting: The method detection limit (MDL) for 1,4-dioxane should be no higher than 0.28 µg/l (ppb). ELAP offers certification for both EPA Methods 8260 and 8270. In order to get the appropriate detection limits, the lab would need to run either of these methods in "selective ion monitoring" (SIM) mode. DER is advising the use of method 8270, since this method provides a more robust extraction procedure, uses a larger sample volume, and is less vulnerable to interference from chlorinated solvents (we acknowledge that 8260 has been shown to have a higher recovery in some studies).

## Full PFAS Target Analyte List

| Group | Chemical Name | Abbreviation | CAS Number |
|---|---|---|---|
| Perfluoroalkyl sulfonates | **Perfluorobutanesulfonic acid** | **PFBS** | **375-73-5** |
| | **Perfluorohexanesulfonic acid** | **PFHxS** | **355-46-4** |
| | Perfluoroheptanesulfonic acid | PFHpS | 375-92-8 |
| | **Perfluorooctanessulfonic acid** | **PFOS** | **1763-23-1** |
| | Perfluorodecanesulfonic acid | PFDS | 335-77-3 |
| Perfluoroalkyl carboxylates | Perfluorobutanoic acid | PFBA | 375-22-4 |
| | Perfluoropentanoic acid | PFPeA | 2706-90-3 |
| | Perfluorohexanoic acid | PFHxA | 307-24-4 |
| | **Perfluoroheptanoic acid** | **PFHpA** | **375-85-9** |
| | **Perfluorooctanoic acid** | **PFOA** | **335-67-1** |
| | **Perfluorononanoic acid** | **PFNA** | **375-95-1** |
| | Perfluorodecanoic acid | PFDA | 335-76-2 |
| | Perfluoroundecanoic acid | PFUA/PFUdA | 2058-94-8 |
| | Perfluorododecanoic acid | PFDoA | 307-55-1 |
| | Perfluorotridecanoic acid | PFTriA/PFTrDA | 72629-94-8 |
| | Perfluorotetradecanoic acid | PFTA/PFTeDA | 376-06-7 |
| Fluorinated Telomer Sulfonates | 6:2 Fluorotelomer sulfonate | 6:2 FTS | 27619-97-2 |
| | 8:2 Fluorotelomer sulfonate | 8:2 FTS | 39108-34-4 |
| Perfluorooctane-sulfonamides | Perfluroroctanesulfonamide | FOSA | 754-91-6 |
| Perfluorooctane-sulfonamidoacetic acids | N-methyl perfluorooctanesulfonamidoacetic acid | N-MeFOSAA | 2355-31-9 |
| | N-ethyl perfluorooctanesulfonamidoacetic acid | N-EtFOSAA | 2991-50-6 |

Bold entries depict the 6 original UCMR3 chemicals

# Collection of Groundwater Samples for Perfluorooctanoic Acid (PFOA) and Perfluorinated Compounds (PFCs) from Monitoring Wells Sample Protocol

**Samples collected using this protocol are intended to be analyzed for perfluorooctanoic acid (PFOA) and other perfluorinated compounds by Modified (Low Level) Test Method 537.**

The procedure used must be consistent with the NYSDEC March 1991 Sampling Guidelines and Protocols http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf with the following materials limitations.

At this time acceptable materials for sampling include: stainless steel, high density polyethylene (HDPE), PVC, silicone, acetate and polypropylene. Equipment blanks should be generated at least daily. Additional materials may be acceptable if pre-approved by NYSDEC. Requests to use alternate equipment should include clean equipment blanks. **NOTE: Grunfos pumps and bladder pumps are known to contain PFC materials (e.g. Teflon™ washers for Grunfos pumps and LDPE bladders for bladder pumps).** All sampling equipment components and sample containers should not come in contact with aluminum foil, low density polyethylene (LDPE), glass or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer. Standard two step decontamination using detergent and clean water rinse will be performed for equipment that does come in contact with PFC materials. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFC materials must be avoided. Many food and drink packaging materials and “plumbers thread seal tape” contain PFCs.

All clothing worn by sampling personnel must have been laundered multiple times. The sampler must wear nitrile gloves while filling and sealing the sample bottles.

Pre-cleaned sample bottles with closures, coolers, ice, sample labels and a chain of custody form will be provided by the laboratory.

1. Fill two pre-cleaned 500 mL HDPE or polypropylene bottle with the sample.
2. Cap the bottles with an acceptable cap and liner closure system.
3. Label the sample bottles.
4. Fill out the chain of custody.
5. Place in a cooler maintained at 4 ± 2º Celsius.

Collect one equipment blank for every sample batch, not to exceed 20 samples.

Collect one field duplicate for every sample batch, not to exceed 20 samples.

Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, not to exceed 20 samples.

Request appropriate data deliverable (Category A or B) and an electronic data deliverable.

**Date Created:** 05/15/17
**Created By:** Karyn Raymond
**File:** PM3580-1
**Page:** 1

**1,4-Dioxane via 8270SIM**

**Holding Time:** 7 days
**Container/Sample Preservation:** 500 mL amber glass jar/ no preservative

| Analyte | CAS # | RL | MDL | Units | LCS Criteria | LCS RPD | MS Criteria | MS RPD | Duplicate RPD | Surrogate Criteria |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 123-91-1 | 0.15 | 0.075 | ug/l | 40-140 | 30 | 40-140 | 30 | 30 | |
| *1,4-Dioxane-d8* | *17647-74-4* | | | | | | | | | *15-110* |

***Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc.***

**Date Created:** 12/06/17
**Created By:** Karyn Raymond
**File:** PM4306-1
**Page:** 1

**PFAAs via EPA 537(M)-Isotope Dilution (WATER)**

**Holding Time:** 14 days
**Container/Sample Preservation:** 1 - 3 Plastic Trizma/1 Plastic/1 H20+Trizma

| Group | Analyte | Abbreviation | CAS # | MDL | RL | Units | LCS Criteria | LCS RPD | MS Criteria | MS RPD | Duplicate RPD | Surrogate Criteria |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Perfluoroalkyl Sulfonates | **Perfluorobutanesulfonic Acid** | **PFBS** | **375-73-5** | **0.11** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **Perfluorohexanesulfonic Acid** | **PFHxS** | **355-46-4** | **0.1076** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluoroheptane Sulfonic Acid | PFHpS | 375-92-8 | 0.1552 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **Perfluorooctanesulfonic Acid** | **PFOS** | **1763-23-1** | **0.1116** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorodecanesulfonic Acid (PFDS) | PFDS | 335-77-3 | 0.2224 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| Perfluoroalkyl carboxylates | Perfluorobutanoic Acid | PFBA | 375-22-4 | 0.1312 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluoropentanoic Acid | PFPeA | 2706-90-3 | 0.0856 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorohexanoic Acid | PFHxA | 307-24-4 | 0.1264 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **Perfluoroheptanoic Acid** | **PFHpA** | **375-85-9** | **0.0924** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **Perfluorooctanoic Acid** | **PFOA** | **335-67-1** | **0.0504** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **Perfluorononanoic Acid** | **PFNA** | **375-95-1** | **0.1008** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorodecanoic Acid | PFDA | 335-76-2 | 0.1904 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluoroundecanoic Acid | PFUnA | 2058-94-8 | 0.1912 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorododecanoic Acid | PFDoA | 307-55-1 | 0.0916 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorotridecanoic Acid | PRTrDA | 72629-94-8 | 0.0904 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorotetradecanoic Acid (PFTA) | PFTA | 376-06-7 | 0.072 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| Fluorinated Telomer Fluorinated Telomer Sulfonates | 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) | 6:2 FTS | 27619-97-2 | 0.194 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS) | 8:2 FTS | 39108-34-4 | 0.2908 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| Perfluorooctanesulfonamides | Perfluorooctanesulfonamide | FOSA | 754-91-6 | 0.2268 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| Perfluorooctane sulfonamidoacetic acids | N-Methyl Perfluorooctanesulfonamidoacetic Acid | N-MeFOSAA | 2355-31-9 | 0.2504 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | N-Ethyl Perfluorooctanesulfonamidoacetic Acid | N-EtFOSAA | 2991-50-6 | 0.3728 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **CORRESPONDING SURROGATES** | | | | | | | | | | | |
| Perfluoroalkyl Sulfonates | **Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)** | | NONE | | | | | | | | | 50-150 |
| | **Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)** | | NONE | | | | | | | | | 50-150 |
| Perfluoroalkyl carboxylates | **Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)** | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[13C4]Butanoic Acid (MPFBA) | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[13C5]Pentanoic Acid (M5PFPEA) | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA) | | NONE | | | | | | | | | 50-150 |
| | **Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)** | | NONE | | | | | | | | | 50-150 |
| | **Perfluoro[13C8]Octanoic Acid (M8PFOA)** | | NONE | | | | | | | | | 50-150 |
| | **Perfluoro[13C9]Nonanoic Acid (M9PFNA)** | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA) | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA) | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) | | NONE | | | | | | | | | 50-150 |
| Fluorinated Telomer Fluorinated Telomer Sulfonates | 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS) | | NONE | | | | | | | | | 50-150 |
| | 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS) | | NONE | | | | | | | | | 50-150 |
| Perfluorooctanesulfonamides | Perfluoro[13C8]Octanesulfonamide (M8FOSA) | | NONE | | | | | | | | | 50-150 |
| Perfluorooctane sulfonamidoacetic acids | N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | | NONE | | | | | | | | | 50-150 |
| | N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA) | | NONE | | | | | | | | | 50-150 |
| | | | | | | | | | | | | |

***Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc.***
***Bold entries depict the 6 original UCMR3 chemicals .***

# APPENDICES

Appendix A – Field Sampling Plan

Appendix B – Quality Assurance Project Plan

Appendix C – Health and Safety Plan

# APPENDIX A

Field Sampling Plan

# Field Sampling Plan

Post Road Corridor – White Plains
77 West Pond Road
City of White Plains
County of Westchester, New York

October 5, 2018

Prepared for:

POST MAPLE 77, LLC
2309 Frederick Douglas Boulevard
New York, New York 10027-3612

Prepared by:

**Roux Environmental Engineering and Geology, D.P.C.**
209 Shafter Street
Islandia, New York 11749

2195.0001Y130.CV

# Table of Contents



# Tables



# Attachments

# 1. Introduction

Roux Environmental Engineering and Geology, D.P.C. (Roux) has developed this Field Sampling Plan (FSP) to describe in detail the field sampling methods to be used during groundwater sampling for emerging contaminants (ECs) at 77 West Post Road, White Plains, New York (Site).

The FSP was prepared in accordance with directives provided in the DER-10 Technical Guidance for Site Investigation and Remediation (May 2010) issued by the New York State Department of Environmental Conservation (NYSDEC), as well as 6 NYCRR Part 375 and the NYSDEC letter dated June 27, 2018 requesting groundwater sampling for ECs, which provide guidelines and procedures to be followed by field personnel during groundwater sampling. Information contained in this FSP relates to sampling objectives, sampling locations, sampling frequencies, sample designations, sampling equipment, sample handling, sample analysis, and decontamination.

# 2. Sampling Objectives

This FSP was developed based upon a detailed review of the available information of ECs sampling protocol and is designed to obtain the additional data necessary to achieve the NYSDEC's request for groundwater sampling for ECs. This FSP describes in detail the sampling and data gathering methods to be used during EC sampling.

The objective of the proposed sampling is to represent the potential of the Site to be a source of ECs, which as part of a Statewide evaluation, is to better understand the risk of ECs posed to the public. The procedures associated with groundwater sampling are discussed in detail in Section 4 of this FSP. A discussion of the data quality objectives (DQOs) is provided in the Quality Assurance Project Plan (QAPP) included as Appendix B.

# 3. Sample Media, Locations, Analytical Suites, And Frequency

The media to be sampled is groundwater. A discussion of the sampling schedule is provided below, while the assumed number of field samples to be collected, including quality control (QC) samples, is shown in Table A-1. Specifics regarding the collection of samples at each location are provided in Section 4 of this FSP.

Groundwater samples will be collected from four select existing on-Site monitoring wells. Along with a well located in the center of the Site, an upgradient and downgradient well were chosen for sampling and was approved during a discussion between Roux and the NYSDEC Case Manager. After gauging for potential separate-phase petroleum product using an oil/water interface probe and verifying no petroleum is present, each well will be sampled for per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. Purging and sampling will be performed consistent with United States Environmental Protection Agency (USEPA) low-flow sampling requirements. Field parameters will be collected using a water quality meter with flow-through cell until parameters stabilize before samples are collected.

All groundwater samples will be analyzed by Alpha Analytical of Westborough, Massachusetts, an Environmental Laboratory Approval Program (ELAP)-certified laboratory for PFAS via the USEPA Method 537 Modified and 1,4-Dioxane via the USEPA Method 8270SIM. Samples will be analyzed on a standard turnaround time and will be reported as a full NYSDEC Category B data deliverable.

# 4. Field Sampling Procedures

This section provides a detailed discussion of the field procedures to be used during groundwater sampling for ECs. The locations are shown on Figure 1 of the September 2018 Work Plan for PFAS and 1,4-dioxane sampling.

Due to the prevalence of PFAS compounds being present in many consumer products, additional precautions must be taken when selecting the proper field clothing and Personal Protective Equipment (PPE) to wear during sampling. For example, clothing or boots containing Gore-Tex or Tyvek, clothing washed with fabric softeners, and using cosmetics or other moisturizers prior to sampling will be avoided. Recommendations on the types of field equipment to use and avoid will be followed before and during EC sampling (i.e. no Teflon products, waterproofed material, plastics, or adhesives). Only sample containers requested from the ELAP-certified laboratory will be used during sampling.

Prior to sampling, depth to water will be measured at each well using an electronic oil/water level meter with an accuracy of +/-0.01 feet. All wells will then be purged and sampled using a peristaltic pump, or an alternative method, depending on the observed depth to groundwater and logistical issues. Designated high density polyethylene tubing will be used. Purging and sampling will be performed consistent with USEPA low-flow sampling requirements. Field parameters will be collected using a water quality meter with flow-through cell until parameters stabilized before samples are collected. Samples will be analyzed for PFAS and 1,4-dioxane. Additional details for the collection of groundwater samples are included in the Roux Standard Operating Procedures (SOPs; Attachment A-1).

All groundwater samples will be placed in the laboratory-supplied containers and shipped to the laboratory under chain of custody procedures in accordance with Roux's SOPs.

# 5. Sample Handling and Analysis

To ensure quality data acquisition and collection of representative samples, there are selective procedures to minimize sample degradation or contamination. These include procedures for preservation of the samples as well as sample packaging and shipping procedures.

## 5.1 Field Sample Handling

A detailed discussion of the number and types of samples to be collected during each task, as well as the analyses to be performed can be found in Section 3.0 of this FSP. The types of containers, volumes needed, and preservation techniques for the aforementioned testing parameters are presented in Table A-2.

## 5.2 Sample Custody Documentation

The purpose of documenting sample custody is to confirm that the integrity and handling of the samples is not subject to question. Sample custody will be maintained from the point of sampling through the analysis. Specific procedures regarding sample tracking from the field to the laboratory are described in Roux's SOP for Sample Handling (Attachment A-1).

Each individual collecting samples is personally responsible for the care and custody of the samples. All sample labels should be pre-printed or filled out using ink. The technical staff will review all field activities with the Field Team Leader to determine whether proper custody procedures were followed during the fieldwork and to decide if additional samples are required.

All samples being shipped off-site for analysis must be accompanied by a properly completed chain of custody form (Attachment A-2). The sample numbers will be listed on the chain of custody form. When transferring the possession of samples, individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to/from a secure storage area, and to the laboratory.

Samples will be packaged for laboratory pick up and/or shipment with a separate signed custody record enclosed in each sample box or cooler. Shipping containers will be locked and/or secured with strapping tape in at least two locations for shipment to the laboratory.

## 5.3 Sample Shipment

Laboratory courier services may be used for sample transport on this project. However, in the event that samples are shipped to the laboratory, the following procedures below will apply. Sample packaging and shipping procedures are based upon USEPA specifications, as well as U.S. Department of Transportation (DOT) regulations. The procedures vary according to potential sample analytes, concentration, and matrix, and are designed to provide optimum protection for the samples and the public. Sample packaging and shipment must be performed using the general outline described below. Additional information regarding sample handling is provided in Roux's SOP for Sample Handling (Attachment A-1).

All samples will be shipped within 12 hours of collection (when possible) and will be preserved appropriately from the time of sample collection. A description of the sample packing and shipping procedures is presented below:

1. Prepare cooler(s) for shipment.

- Tape drain(s) of cooler shut;
- Affix “This Side Up” arrow labels and “Fragile” labels on each cooler; and
- Place mailing label with laboratory address on top of cooler(s).

2. Arrange sample containers in groups by sample number or analyte.
3. Ensure all bottle labels are completed correctly. Place clear tape over bottle labels to prevent moisture accumulation from causing the label to peel off.
4. Arrange containers in front of assigned coolers.
5. Place packaging material at the bottom of the cooler to act as a cushion for the sample containers.
6. Arrange containers in the cooler so that they are not in contact with the cooler or other samples.
7. Fill remaining spaces with packaging material.
8. Ensure all containers are firmly packed with packaging material.
9. If ice is required to preserve the samples, ice cubes should be repackaged in double Ziploc™ bags and placed on top of the packaging material.
10. Sign chain of custody form (or obtain signature) and indicate the time and date it was relinquished to Federal Express or other carrier, as appropriate.
11. Separate chain of custody forms. Seal proper copies within a large Ziploc™ bag and tape to cooler. Retain copies of all forms.
12. Close lid and latch.
13. Secure each cooler using custody seals.
14. Tape cooler shut on both ends.
15. Relinquish to Federal Express or other courier service, as appropriate. Retain air bill receipt for project records (Note: All samples will be shipped for “NEXT A.M.” delivery).
16. Telephone laboratory contact and provide him/her with the following shipment information:
    - Sampler’s name;
    - Project name;
    - Number of samples sent according to matrix and concentration; and
    - Air bill number.

# 6. Site Control Procedures

Site control procedures, including decontamination and waste handling and disposal, are discussed below.

## 6.1 Decontamination

In an attempt to avoid the spread of contamination, all sampling equipment must be decontaminated at a reasonable frequency in a properly designed and located decontamination area. Detailed procedures for the decontamination of field and sampling equipment are included in the NYSDEC guidelines provided in the June 2018 request letter and in Roux's SOPs for the Decontamination of Field Equipment, which is provided in Attachment A-1. Only Liquinox will be used as decontamination material. Rinse water will be lab certified PFC free. The location of the decontamination area will be determined prior to the start of field operations. The decontamination area will be constructed to ensure that all wash water generated during decontamination can be collected and containerized for proper disposal.

## 6.2 Waste Handling and Disposal

All waste materials (purge water, decontamination water, etc.) generated during the groundwater sampling will be consolidated and stored in appropriate labeled bulk containers (drums, etc.), and temporarily staged at an investigation-derived-waste storage area onsite. Roux will then coordinate waste characterization and disposal by appropriate means.

# TABLES

**Table A-1. Emerging Contaminants Field and Quality Control Sampling Summary**

| Sample Medium | Target Analytes | Field Samples | Replicates[1] | Field Blanks[1] | Matrix Spikes[1] | Spike Duplicates[1] | Total No. of Samples |
|---|---|---|---|---|---|---|---|
| Groundwater | PFAS | 3 | 1 | 1 | 1 | 1 | 7 |
| | 1,4-dioxane | 3 | 1 | 1 | 1 | 1 | 7 |

Totals are estimated based on scope of work as written, actual sample quantities may vary based on field conditions. QA/QC sample quantities will be adjusted accordingly.

[1] Based on 1 per 20 samples or 1 per day

**Table A-2. Preservation, Holding Times, and Sample Containers**

| Analysis | Matrix | Bottle Type | Preservation(a) | Holding Time(b) |
|---|---|---|---|---|
| PFAA vis EPA 537(M)-Isotope Dilution (WATER) | Water | Three 250 mL plastic bottles | Trizma | 14 days |
| 1,4-Dioxane via 8270SIM | Water | 500 mL amber glass | Cool to 4°C | 7 days |

(a) All soil and groundwater samples to be preserved in ice during collection and transport

(b) Days from date of sample collection.

# ATTACHMENTS

A-1. Roux's Standard Operating Procedure for Tasks Described in this Field Sampling Plan

A-2. Chain of Custody Form

# ATTACHMENT A-1

## A-1. Roux's Standard Operating Procedure for Tasks Described in this Field Sampling Plan

Date: May 5, 2000

## 1.0 PURPOSE

The purpose for this standard operating procedure (SOP) is to establish the guidelines for decontamination of all field equipment potentially exposed to contamination during drilling, and soil and water sampling. The objective of decontamination is to ensure that all drilling, and soil-sampling and water-sampling equipment is decontaminated (free of potential contaminants): 1) prior to being brought onsite to avoid the introduction of potential contaminants to the site; 2) between drilling and sampling events/activities onsite to eliminate the potential for cross-contamination between boreholes and/or wells; and 3) prior to the removal of equipment from the site to prevent the transportation of potentially contaminated equipment offsite.

In considering decontamination procedures, state and federal regulatory agency requirements must be considered because of potential variability between state and federal requirements and because of variability in the requirements of individual states. Decontamination procedures must be in compliance with state and/or federal protocols in order that regulatory agency(ies) scrutiny of the procedures and data collected do not result in non acceptance (invalidation) of the work undertaken and data collected.

## 2.0 PROCEDURE FOR DRILLING EQUIPMENT

The following is a minimum decontamination procedure for drilling equipment. Drilling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

2.1 The rig and all associated equipment should be properly decontaminated by the contractor before arriving at the test site.

2.2 The augers, drilling casings, rods, samplers, tools, rig, and any piece of equipment that can come in contact (directly or indirectly) with the soil, will be steam cleaned onsite prior to set up for drilling to ensure proper decontamination.

2.3 The same steam cleaning procedures will be followed between boreholes (at a fixed on-site location[s], if appropriate) and before leaving the site at the end of the study.

2.4 All on-site steam cleaning (decontamination) activities will be monitored and documented by a member(s) of the staff of Roux Environmental Engineering and Geology, D.P.C (Roux).

2.5 If drilling activities are conducted in the presence of thick, sticky oils (e.g., PCBs) which coat drilling equipment, then special decontamination procedures may have to be utilized before steam cleaning (e.g., hexane scrub and wash).

2.6 Containment of decontamination fluids may be necessary (e.g., rinseate from steam cleaning) or will be required (e.g., hexane), and disposal must be in accordance with state and/or federal procedures.

## 3.0 PROCEDURE FOR SOIL-SAMPLING EQUIPMENT

The following is a minimum decontamination procedure for soil-sampling equipment (e.g., split spoons, stainless-steel spatulas). Soil-sampling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

3.1 Wear disposable gloves while cleaning equipment to avoid cross-contamination and change gloves as needed.

3.2 Steam clean the sampler or rinse with potable water. If soil-sampling activities are conducted in the presence of thick, sticky oils (e.g., PCBs) which coat sampling equipment, then special decontamination procedures may have to be utilized before steam cleaning and washing in detergent solution (e.g., hexane scrub and wash).

3.3 Prepare a non-phosphate, laboratory-grade detergent solution and distilled or potable water in a clean bucket.

3.4 Disassemble the sampler, as necessary and immerse all parts and other sampling equipment in the solution.

3.5 Scrub all equipment in the bucket with a brush to remove any adhering particles.

3.6 Rinse all equipment with copious amounts of potable water followed by distilled or deionized water.

3.7 Place clean equipment on a clean plastic sheet (e.g., polyethylene)

3.8 Reassemble the cleaned sampler, as necessary.

3.9 Transfer the sampler to the driller (or helper) making sure that this individual is also wearing clean gloves, or wrap the equipment with a suitable material (e.g., plastic bag, aluminum foil.

As part of the decontamination procedure for soil-sampling equipment, state and/or federal protocols must be considered. These may require procedures above those specified as minimum for Roux, such as the use of nitric acid, acetone, etc. Furthermore, the containment and proper disposal of decontamination fluids must be considered with respect to regulatory agency(ies) requirements.

## 4.0 PROCEDURE FOR WATER-SAMPLING EQUIPMENT

The following is a decontamination procedure for water-sampling equipment (e.g., bailers, pumps). Water-sampling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

4.1 Decontamination procedures for bailers follow:

a. Wear disposable gloves while cleaning bailer to avoid cross-contamination and change gloves as needed.

b. Prepare a non-phosphate, laboratory-grade detergent solution and potable water in a bucket.

c. Disassemble bailer (if applicable) and discard cord in an appropriate manner, and scrub each part of the bailer with a brush and solution.

d. Rinse with potable water and reassemble bailer.

e. Rinse with copious amounts of distilled or deionized water.

f. Air dry.

g. Wrap equipment with a suitable material (e.g., clean plastic bag, aluminum foil).

h. Rinse bailer at least three times with distilled or deionized water before use.

4.2 Decontamination procedures for pumps follow:

a. Wear disposable gloves while cleaning pump to avoid cross-contamination and change gloves as needed.

b. Prepare a non-phosphate, laboratory-grade detergent solution and potable water in a clean bucket, clean garbage can, or clean 55-gallon drum.

c. Flush the pump and discharge hose (if not disposable) with the detergent solution, and discard disposable tubing and/or cord in an appropriate manner.

d. Flush the pump and discharge hose (if not disposable) with potable water.

e. Place the pump on clear plastic sheeting.

f. Wipe any pump-related equipment (e.g., electrical lines, cables, discharge hose) that entered the well with a clean cloth and detergent solution, and rinse or wipe with a clean cloth and potable water.

g. Air dry.

h. Wrap equipment with a suitable material (e.g., clean plastic bag).

As part of the decontamination procedure for water-sampling equipment, state and/or federal protocols must be considered. These may require procedures above those specified as minimum for Roux, such as the use of nitric acid, acetone, etc. Furthermore, the containment and proper disposal of decontamination fluids must be considered with respect to regulatory agency(ies) requirements.

Date: May 5, 2000

## 1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidelines for sample handling which will allow consistent and accurate results. Valid chemistry data are integral to investigations that characterize media-quality conditions. Thus, this SOP is designed to ensure that once samples are collected, they are preserved, packed and delivered in a manner which will maintain sample integrity to as great an extent as possible. The procedures outlined are applicable to most sampling events and any required modifications must be clearly described in the work plan.

## 2.0 CONSIDERATIONS

Sample containers, sampling equipment decontamination, quality assurance/quality control (QA/QC), sample preservation, and sample handling are all components of this SOP.

### 2.1 Sample Containers

Prior to collection of a sample, considerations must be given to the type of container that will be used to store and transport the sample. The type and number of containers selected is usually based on factors such as sample matrix, potential contaminants to be encountered, analytical methods requested, and the laboratory's internal quality assurance requirements. In most cases, the overriding considerations will be the analytical methodology, or the state or federal regulatory requirements because these regulations generally encompass the other factors. The sample container selected is usually based on some combination of the following criteria:

a. Reactivity of Container Material with Sample

Choosing the proper composition of sample containers will help to ensure that the chemical and physical integrity of the sample is maintained. For sampling potentially hazardous material, glass is the recommended container type because it is chemically inert to most substances. Plastic containers are not recommended for most hazardous wastes because the potential exists for contaminants to adsorb to the surface of the plastic or for the plasticizer to leach into the sample.

In some instances, however, the sample characteristics or analytes of interest may dictate that plastic containers be used instead of glass. Because some metals species will adhere to the sides of the glass containers in an aqueous matrix, plastic bottles (e.g., nalgene) must be used for samples collected for metals analysis. A separate, plastic container should accompany glass containers if metals analysis is to be

performed along with other analyses. Likewise, other sample characteristics may dictate that glass cannot be used. For example, in the case of a strong alkali waste or hydrofluoric solution, plastic containers may be more suitable because glass containers may be etched by these compounds and create adsorptive sites on the container's surface.

b. Volume of the Container

The volume of sample to be collected will be dictated by the analysis being performed and the sample matrix. The laboratory must supply bottles of sufficient volume to perform the required analysis. In most cases, the methodology dictates the volume of sample material required to complete the analysis. However, individual laboratories may provide larger volume containers for various analytes to ensure sufficient quantities for duplicates or other QC checks.

To facilitate transfer of the sample from the sampler into the container and to minimize spillage and sample disturbance, wide-mouth containers are recommended. Aqueous volatile organic samples must be placed into 40-milliliter (ml) glass vials with polytetrafluoroethylene (PTFE) (e.g., TeflonTM) septums. Non-aqueous volatile organic samples should be collected in the same type of vials or in 4-ounce (oz) wide-mouth jars provided by the laboratory. These jars should have PTFE-lined screw caps.

c. Color of Container

Whenever possible, amber glass containers should be used to prevent photodegradation of the sample, except when samples are being collected for metals analysis. If amber containers are not available, then containers holding samples should be protected from light (i.e., place in cooler with ice immediately after filling).

d. Container Closures

Container closures must screw on and off the containers and form a leak-proof seal. Container caps must not be removed until the container is ready to be filled with the sample, and the container cap must be replaced (securely) immediately after filling it. Closures should be constructed of a material which is inert with respect to the sampled material, such as PTFE (e.g., TeflonTM). Alternately, the closure may be separated from the sample by a closure liner that is inert to the sample material such as PTFE sheeting. If soil or sediment samples are being collected, the threads of the container must be wiped clean with a dedicated paper towel or cloth so the cap can be threaded properly.

e. Decontamination of Sample Containers

Sample containers must be laboratory cleaned by the laboratory performing the analysis. The cleaning procedure is dictated by the specific analysis to be performed on the sample. Sample containers must be carefully examined to ensure that all containers appear clean. Do not mistake the preservative as unwanted residue. The bottles should not be field cleaned. If there is any question regarding the integrity of the bottle, then the laboratory must be contacted immediately and the bottle(s) replaced.

f. Sample Bottle Storage and Transport

No matter where the sample bottles are, whether at the laboratory waiting to be packed for shipment or in the field waiting to be filled with sample, care must be taken to avoid contamination. Sample shuttles or coolers, and sample bottles must be stored and transported in clean environments. Sample bottles and clean sampling equipment must never be stored near solvents, gasoline, or other equipment that is a potential source of cross-contamination. When under chain of custody, sample bottles must be secured in locked vehicles, and custody sealed in shuttles or in the presence of authorized personnel. Information which documents that proper storage and transport procedures have been followed must be included in the field notebook and on appropriate field forms.

2.2 Decontamination of Sampling Equipment

Proper decontamination of all re-usable sampling equipment is critical for all sampling episodes. The SOP for Decontamination of Field Equipment and SOPs for method-specific or instrument-specific tasks must also be referred to for guidance for decontamination of various types of equipment.

2.3 Quality Assurance/Quality Control Samples

QA/QC samples are intended to provide control over the proper collection and tracking of environmental measurements, and subsequent review, interpretation and validation of generated analytical data. The SOPs for Collection of Quality Control Samples, for Evaluation and Validation of Data, and for Field Record Keeping and Quality Assurance/Quality Control must be referred to for detailed guidance regarding these respective procedures. SOPs for method-specific or instrument-specific tasks must also be referred to for guidance for QA/QC procedures.

2.4 Sample Preservation Requirements

Certain analytical methodologies for specific analytes require chemical additives in order to stabilize and maintain sample integrity. Generally, this is accomplished under the following two scenarios:

a. Sample bottles are preserved at the laboratory prior to shipment into the field.

b. Preservatives are added in the field immediately after the samples are collected.

Many laboratories provide pre-preserved bottles as a matter of convenience and to help ensure that samples will be preserved immediately upon collection. A problem associated with this method arises if not enough sample could be collected, resulting in too much preservative in the sample. More commonly encountered problems with this method include the possibility of insufficient preservative provided to achieve the desired pH level or the need for additional preservation due to chemical reactions caused by the addition of sample liquids to pre-preserved bottles. The use of pre-preserved bottles is acceptable; however, field sampling teams must always be prepared to add additional preservatives to samples if the aforementioned situations occur. Furthermore, care must be exercised not to overfill sample bottles containing preservatives to prevent the sample and preservative from spilling and therefore diluting the preservative (i.e., not having enough preservative for the volume of sample).

When samples are preserved after collection, special care must be taken. The transportation and handling of concentrated acids in the field requires additional preparation and adherence to appropriate preservation procedures. All preservation acids used in the field should be trace-metal or higher-grade.

2.5 Sample Handling

After the proper sample bottles have been received under chain-of-custody, properly decontaminated equipment has been used to collect the sample, and appropriate preservatives have been added to maintain sample integrity, the final step for the field personnel is checking the sample bottles prior to proper packing and delivery of the samples to the laboratory.

All samples should be organized and the labels checked for accuracy. The caps should be checked for tightness and any 40-ml volatile organic compound (VOC) bottles must be checked for bubbles. Each sample bottle must be placed in an individual "zip-lock" bag to protect the label, and placed on ice. The bottles must be carefully packed to prevent breakage during transport. When several bottles have been collected for an individual sample, they should not be placed adjacent to each other in the cooler to prevent possible breakage of all bottles for a given sample. If there are any samples which are known or suspected to be highly contaminated, these should be placed in an individual cooler under separate chain-of-custody to prevent possible cross contamination. Sufficient ice (wet or blue packs) should be placed in the cooler to maintain the temperature at 4 degrees Celsius (°C) until delivery at the laboratory. Consult the work plan to determine if a particular ice is specified as the preservation for transportation (e.g., the United States Environmental Protection Agency does not like the use of

blue packs because they claim that the samples will not hold at 4°C). If additional coolers are required, then they should be purchased. The chain-of-custody form should be properly completed, placed in a "zip-lock" bag, and placed in the cooler. One copy must be maintained for the project files. The cooler should be sealed with packing tape and a custody seal. The custody seal number should be noted in the field book. Samples collected from Monday through Friday will be delivered to the laboratory within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if certain analytes require a shorter delivery time. If overnight mail is utilized, then the shipping bill must be maintained for the files and the laboratory must be called the following day to confirm receipt.

## 3.0 EQUIPMENT AND MATERIALS

3.1 General equipment and materials may include, but not necessarily be limited to, the following:

a. Sample bottles of proper size and type with labels.

b. Cooler with ice (wet or blue pack).

c. Field notebook, appropriate field form(s), chain-of-custody form(s), custody seals.

d. Black pen and indelible marker.

e. Packing tape, "bubble wrap," and "zip-lock" bags.

f. Overnight (express) mail forms and laboratory address.

g. Health and safety plan (HASP).

h. Work plan/scope of work.

i. Pertinent SOPs for specified tasks and their respective equipment and materials.

3.2 Preservatives for specific samples/analytes as specified by the laboratory. Preservatives must be stored in secure, spillproof glass containers with their content, concentration, and date of preparation and expiration clearly labeled.

3.3 Miscellaneous equipment and materials including, but not necessarily limited to, the following:

a. Graduated pipettes.

b. Pipette bulbs.

c. Litmus paper.

d. Glass stirring rods.

e. Protective goggles.

f. Disposable gloves.

g. Lab apron.

h. First aid kit.

i. Portable eye wash station.

j. Water supply for immediate flushing of spillage, if appropriate.

k. Shovel and container for immediate containerization of spillage-impacted soils, if appropriate.

## 4.0 PROCEDURE

4.1 Examine all bottles and verify that they are clean and of the proper type, number, and volume for the sampling to be conducted.

4.2 Label bottles carefully and clearly with project name and number, site location, sample identification, date, time, and the sampler's initials using an indelible marker.

4.3 Collect samples in the proper manner (refer to specific sampling SOPs).

4.4 Conduct preservation activities as required after each sample has been collected. Field preservation must be done immediately and must not be done later than 30 minutes after sample collection.

4.5 Conduct QC sampling, as required.

4.6 Seal each container carefully and place in an individual "zip lock" bag.

4.7 Organize and carefully pack all samples in the cooler immediately after collection (e.g., bubble wrap). Insulate samples so that breakage will not occur.

4.8 Complete and place the chain-of-custody form in the cooler after all samples have been collected. Maintain one copy for the project file. If the cooler is to be transferred several times prior to shipment or delivery to the laboratory, it may be easier to tape the chain-of-custody to the exterior of the sealed cooler. When exceptionally hazardous samples are known or suspected to be present, this should be identified on the chain-of-custody as a courtesy to the laboratory personnel.

4.9 Add additional ice as necessary to ensure that it will last until receipt by the laboratory.

4.10 Seal the cooler with packing tape and a custody seal. Record the number of the custody seal in the field notebook and on the field form. If there are any exceptionally hazardous samples, then shipping regulations should be examined to ensure that the sample containers and coolers are in compliance and properly labeled.

4.11 Samples collected from Monday through Friday will be delivered to the laboratory within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if certain analytes require a shorter delivery time.

4.12 Maintain the shipping bill for the project files if overnight mail is utilized and call the laboratory the following day to confirm receipt.

END OF PROCEDURE

Date: May 5, 2000

## 1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidelines for the sampling of ground-water monitoring wells for dissolved constituents. As part of the SOP for the sampling of ground-water monitoring wells, sample collection equipment and devices must be considered, and equipment decontamination and pre-sampling procedures (e.g., measuring water levels, sounding wells, and purging wells) must be implemented. Sampling objectives must be firmly established in the work plan before considering the above.

Valid water-chemistry data are integral to a hydrogeologic investigation that characterizes ground-water quality conditions. Water-quality data are used to evaluate both current and historic aquifer chemistry conditions, as well as to estimate future conditions (e.g., trends, migration pathways). Water-quality data can be used to construct ground-water quality maps to illustrate chemical conditions within the flow system, to generate water-quality plots to depict conditions with time and trends, and to perform statistical analyses to quantify data variability, trends, and cleanup levels.

## 2.0 EQUIPMENT AND MATERIALS

2.1 In order to sample ground water from monitoring wells, specific equipment and materials are required. The equipment and materials list may include, but not necessarily be limited to, the following:

a. Bailers (Teflon™ or stainless steel).

b. Pumps (centrifugal, peristaltic, bladder, electric submersible, bilge, hand-operated diaphragm, etc.).

c. Gas-displacement device(s).

d. Air-lift device(s).

e. Teflon™ tape, electrical tape.

f. Appropriate discharge hose.

g. Appropriate discharge tubing (e.g., polypropylene, teflon, etc.) if using a peristaltic pump.

h. Appropriate compressed gas if using bladder-type or gas-displacement device.

i. Portable generator and gasoline or alternate power supply if using an electric submersible pump.

j. Non-absorbent cord (e.g., polypropylene, etc.).

k. Plastic sheeting.

l. Tape measure (stainless steel, steel, fiberglass) with 0.01-foot measurement increments and chalk (blue carpenter's).

m. Electronic water-level indicators (e.g., m-scope, etc.) or electric water-level/product level indicators.

n. Non-phosphate, laboratory-grade detergent.

o. Distilled/Deionized water.

p. Potable water.

q. Paper towels, clean rags.

r. Roux Environmental Engineering and Geology, D.P.C. field forms (e.g., daily log, well inspection checklist, sampling, etc.) and field notebook.

s. Well location and site map.

t. Well keys.

u. Stop watch, digital watch with second increments, or watch with a second hand.

v. Water Well Handbook.

w. Calculator.

x. Black pen and water-proof marker.

y. Tools (e.g., pipe wrenches, screwdrivers, hammer, pliers, flashlight, pen knife, etc.).

z. Appropriate health and safety equipment, as specified in the site health and safety plan (HASP).

aa. pH meter(s) and buffers.

bb. Conductivity meter(s) and standards.

cc. Thermometer(s).

dd. Extra batteries (meters, thermometers, flashlight).

ee. Filtration apparatus, filters, pre-filters.

ff. Plasticware (e.g., premeasured buckets, beakers, flasks, funnels).

gg. Disposable gloves.

hh. Water jugs.

ii. Laboratory-supplied sample containers with labels.

jj. Cooler(s).

kk. Ice (wet, blue packs).

ll. Masking, duct, and packing tape.

mm. Chain-of-custody form(s) and custody seal(s).

nn. Site sampling and analysis plan (SAP).

oo. Site health and safety plan (HASP).

pp. Packing material (e.g., bubble wrap)

qq. "Zip-lock" plastic bags.

rr. Overnight (express) mail forms.

## 3.0 DECONTAMINATION

3.1 Make sure all equipment is decontaminated and cleaned before use (refer to the SOP for Decontamination of Field Equipment for detailed decontamination methods, summaries for bailers and pumps are provided below). Use new, clean materials when decontamination is not appropriate (e.g., non-absorbent cord, disposable gloves). Document, and initial and date the decontamination procedures on the appropriate field form and in the field notebook.

a. Decontaminate a bailer by: 1) wearing disposable gloves, 2) disassembling (if appropriate) and scrubbing in a non-phosphate, laboratory-grade detergent and distilled/deionized water solution, and 3) rinsing first with potable water and then distilled/deionized water.

b. Decontaminate a pump by: 1) wearing disposable gloves, 2) flushing the pump and discharge hose (if not disposable) first with a non-phosphate, laboratory-grade detergent and potable water solution in an appropriate container (clean bucket, garbage can, or 55-gallon drum) and then with

distilled/deionized water or potable water, and 3) wiping pump-related equipment (e.g., electrical lines, cables, discharge hose) first with a clean cloth and detergent solution and then rinsing or wiping with a clean cloth and distilled/deionized water or potable water.

3.2 Note that the decontamination procedures for bailers and pumps are the minimum that must be performed. Check the work plan to determine if chemicals specified by individual state regulatory agencies must also be used for decontamination procedures (e.g., hexane, nitric acid, acetone, isopropanol, etc.).

## 4.0 CALIBRATION OF FIELD ANALYSIS EQUIPMENT

Calibrate field analysis equipment before use (e.g., thermometers, pH and conductivity meters, etc.). Refer to the specific SOP for field analysis for each respective piece of equipment. Document, and initial and date the calibration procedures on the appropriate field form, in the field notebook, and in the calibration log book.

## 5.0 PROCEDURE

5.1 Document, and initial and date well identification, pre-sampling information, and problems encountered on the appropriate field form and in the field notebook as needed.

5.2 Inspect the protective casing of the well and the well casing, and note any items of concern such as a missing lock, or bent or damaged casing(s).

5.3 Place plastic sheeting around the well to protect sampling equipment from potential cross contamination.

5.4 Remove the well cap or plug and, if necessary, clean the top of the well off with a clean rag. Place the cap or plug on the plastic sheeting. If the well is not vented, allow several minutes for the water level in the well to equilibrate. If fumes or gases are present, then diagnose these with the proper safety equipment. Never inhale the vapors.

5.5 Measure the depth to water (DTW) from the measuring point (MP) on the well using a steel tape and chalk or an electronic sounding device (m-scope). Refer to the specific SOPs for details regarding the use of a steel tape or a m-scope for measuring water levels. Calculate the water-level elevation. Document, and initial and date the information on the appropriate field form and in the field notebook.

5.6 Measuring the total depth of the well from the MP with a weighted steel tape. Calculate and record the volume of standing water in the well casing on the appropriate field form and in the field notebook.

5.7 Decontaminate the equipment used to measure the water level and sound the well with a non-phosphate, laboratory-grade detergent solution followed by a distilled/deionized water rinse.

5.8 Purge the well prior to sampling (refer to the SOP for Purging a Well). The well should be pumped or bailed to remove the volume of water specified in the work plan. Usually three to five casing volumes are removed if the recharge rate is adequate to accomplish this within a reasonable amount of time.

If the formation cannot produce enough water to sustain purging, then one of two options must be followed. These include: 1) pumping or bailing the well dry, or 2) pumping or bailing the well to "near-dry" conditions (i.e., leaving some water in the well). The option employed must be specified in the work plan and be in accordance with regulatory requirements.

If the well is purged dry, then all the standing water has been removed and upon recovery the well is ready for sampling. However, depending on the rate of recovery and the time needed to complete the sampling round, one of the following procedures may have to be implemented: 1) the well may have to be sampled over a period of more than one day; 2) the well may not yield enough water to collect a complete suite of samples and only select (most important) samples will be collected; or 3) the well may not recover which will preclude sampling. Regardless of the option that must be followed, the sampling procedure must be fully documented. When preparing to conduct a sampling round, review drilling, development and previous sampling information (if available) to identify low-yielding wells in order to purge them first, and potentially allow time for the well to recover for sampling.

5.9 Record the physical appearance of the water (i.e., color, turbidity, odor, etc.) on the appropriate field form and in the field notebook, as it is purged. Note any changes that occur during purging.

5.10 If a bailer is used to collect the sample, then:

a. Flush the decontaminated bailer three times with distilled/deionized water.

b. Tie the non-absorbent cord (polypropylene) to the bailer with a secure knot and then tie the free end of the bailer cord to the protective casing or, if possible, some nearby structure to prevent losing the bailer and cord down the well.

c. Lower the bailer slowly down the well and into the water column to minimize disturbance of the water surface. If a bottom-filling bailer is used, then do not submerge the top of the bailer; however, if a top-filling bailer is used, then submerge the bailer several feet below the water surface.

d. Remove and properly discard one bailer volume from the well to rinse the bailer with well water before sampling. Again, lower the bailer slowly down the well to the appropriate depth depending on the bailer type (as discussed above in 5.11 c). When removing the bailer from the well, do not allow the bailer cord to rest on the ground but coil it on the protective plastic sheeting placed around the well. Certain regulatory agencies require that the first bailer volume collected be utilized for the samples.

5.11 If a pump is used to collect the sample, then use the same pump used to purge the well and, if need be, reduce the discharge rate to facilitate filling sample containers and to avoid problems that can occur while filling sample containers (as listed in Number 5.14, below). Alternately, the purge pump may be removed and a thoroughly decontaminated bailer can be used to collect the sample.

5.12 Remove each appropriate container's cap only when ready to fill each with the water sample, and then replace and secure the cap immediately.

5.13 Fill each appropriate, pre-labeled sample container carefully and cautiously to prevent: 1) agitating or creating turbulence; 2) breaking the container; 3) entry of, or contact with, any other medium; and 4) spilling/splashing the sample and exposing the sampling team to contaminated water. Immediately place the filled sample container in a ice-filled (wet ice or blue pack) cooler for storage. If wet ice is used it is recommended that it be repackaged in zip-lock bags to help keep the cooler dry and the sample labels secure. Check the work plan as to whether wet ice or blue packs are specified for cooling the samples because certain regulatory agencies may specify the use of one and not the other.

5.14 "Top-off" containers for volatile organic compounds (VOCs) and tightly seal with Teflon™-lined septums held in place by open-top screw caps to prevent volatilization. Ensure that there are no bubbles by turning the container upside down and tapping it gently.

5.15 Filter water samples (Procedure 4.6) collected for dissolved metals analysis prior to preservation to remove the suspended sediment from the sample. If water samples are to be collected for total metals analysis, then collect a second set of samples without field filtering.

In the event that the regulatory agency(ies) want unfiltered samples for metals analysis, a second set of filtered samples should also be collected. Because unfiltered samples are indications of total metals (dissolved and suspended) they are not representative of aquifer conditions because ground water does not transport sediment (except in some rare cases). Thus, the results for dissolved metals in ground water should be based on filtered samples even if both filtered and unfiltered sets are presented in a report.

5.16 Add any necessary preservative(s) to the appropriate container(s) prior to, or after (preferred), the collection of the sample, unless the appropriate preservative(s) have already been added by the laboratory before shipment.

5.17 Collect quality control (QC) samples as required in the work plan to monitor sampling and laboratory performance. Refer to the SOP for Collection of Quality Control Samples.

5.18 Conduct field analyses after sample collection is complete by measuring and recording the temperature, conductivity, pH, etc. (as called for in the work plan). Note and record the "final" physical appearance of the water (after purging and sampling) on an appropriate field form and in the field notebook.

5.19 Wipe the well cap with a clean rag, replace the well cap and protective cover (if present). Lock the protective cover.

5.20 Verify that each sample is placed in an individual "zip-lock" bag, wrapped with "bubble wrap," placed in the cooler, and that the cooler has sufficient ice (wet ice or blue packs) to preserve the samples for transportation to the analytical laboratory.

5.21 Decontaminate bailers, hoses, and pumps as discussed in the decontamination SOP. Wrap decontaminated equipment with a suitable material (e.g., clean plastic bag or aluminum foil). Discard cords, rags, gloves, etc. in a manner consistent with site conditions.

5.22 Complete all necessary field forms, field notebook entries, and the chain-of-custody forms. Retain one copy of each chain-of-custody form. Secure the cooler with sufficient packing tape and a custody seal.

5.23 Samples collected from Monday through Friday will be delivered within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Consult the work plan to determine if any of the analytes require a shorter delivery time.

END OF PROCUDURE

# ATTACHMENT A-2

A-2. Chain of Custody Form

# ROUX CHAIN OF CUSTODY

№ 11332 Y

**ROUX ASSOCIATES, INC.**
*Environmental Consulting & Management*
209 SHAFTER STREET
ISLANDIA, NEW YORK 11749-5074
(631) 232-2600 FAX: (631) 232-9898

ANALYSES

PAGE OF

| PROJECT NAME | PROJECT NUMBER |
|---|---|
| PROJECT LOCATION | |
| PROJECT MANAGER | SAMPLER(S) |

| SAMPLE DESIGNATION / LOCATION | DATE COLLECTED | TIME COLLECTED | SAMPLE MATRIX | | | | | | TOTAL BOTTLES | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
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| | | | | | | | | | | |

| RELINQUISHED BY: (SIGNATURE) | FOR | DATE | TIME | SEAL INTACT Y OR N | RECEIVED BY: (SIGNATURE) | FOR | DATE | TIME | SEAL INTACT Y OR N |
|---|---|---|---|---|---|---|---|---|---|
| RELINQUISHED BY: (SIGNATURE) | FOR | DATE | TIME | SEAL INTACT Y OR N | RECEIVED BY: (SIGNATURE) | FOR | DATE | TIME | SEAL INTACT Y OR N |

| DELIVERY METHOD | COMMENTS |
|---|---|
| ANALYTICAL LABORATORY | |

CHAINOF CDR 12AUG98

# APPENDIX B

Quality Assurance Project Plan

# Quality Assurance Project Plan

Post Road Corridor – White Plains
77 West Pond Road
City of White Plains
County of Westchester, New York

October 5, 2018

Prepared for:

**Post Maple 77, LLC**
2309 Frederick Douglas Boulevard
New York, New York 10027-3612

Prepared by:

**Roux Environmental Engineering and Geology, D.P.C.**
209 Shafter Street
Islandia, New York 11749

2195.0001Y.130/QAPP-CV

# Table of Contents



# Table



# Attachment

# 1. Introduction

This Quality Assurance Project Plan (QAPP) has been prepared to describe the measures that will be taken to ensure that the data generated during groundwater sampling for emerging contaminants (ECs) at 77 West Post Road located in White Plains, New York (Site) are of quality sufficient to meet project-specific data quality objectives (DQOs). The QAPP was prepared in accordance with the guidance provided in New York State Department of Environmental Conservation (NYSDEC) Technical Guidance DER-10 (Technical Guidance for Site Investigation and Remediation), the Brownfield Cleanup Program Guide and the United States Environmental Protection Agency's (USEPA's) Guidance for the Data Quality Objectives Process (EPA QA/G-4).

# 2. Background, Objectives, and Scope

In order to achieve project objectives, Roux has developed a scope of work to complete sampling of groundwater for the ECs polyfluoroalkyl substances (PFAS) and 1,4-dioxane. This scope is designed to obtain the additional data necessary to achieve the NYSDEC's request for groundwater sampling for ECs and to represent the potential of the Site to be a source of ECs.

Groundwater samples will be collected from four (4) existing on-Site monitoring wells (including an upgradient and downgradient well) to analyze the presence of ECs at the Site. After gauging for potential separate-phase petroleum product and confirming that it is not present, each well will be sampled for PFAS via the USEPA Method 537 Modified and 1,4-dioxane via the USEPA Method 8270SIM. Field parameters including temperature, pH, conductivity, redox potential, dissolved oxygen, and turbidity will also be measured.

# 3. Project Organization

The overall management structure and a general summary of the responsibilities of project team members are presented below.

Project Principal

Joseph Duminuco, P.G., of Roux will serve as Project Principal. The Project Principal is responsible for defining project objectives and bears ultimate responsibility for the successful completion of the investigation.

Project Manager

Julie Moriarity of Roux will serve as Project Manager. This individual will provide overall management for the implementation of the scope of work and will coordinate all field activities. The Project Manager is also responsible for data review/interpretation and report preparation.

Field Team Leader

A Roux scientist or engineer will serve as the Field Team Leader. The Field Team Leader bears the responsibility for the successful execution of the field program, as scoped in the Groundwater Sampling of PFAS and 1,4-Dioxane Work Plan and the Field Sampling Plan (FSP). The Field Team Leader will direct the activities of all technical staff in the field. The Field Team Leader will also assist in the interpretation of data and in report preparation. The Field Team Leader reports to the Project Manager.

Laboratory Project Manager

Alpha Analytical of Westborough, Massachusetts will be the analytical laboratory responsible for sample container preparation, sample custody in the laboratory, and completion of the required analysis through oversight of the laboratory staff. The Laboratory Project Manager will ensure that quality assurance procedures are followed and that an acceptable laboratory report is prepared and submitted. The Laboratory Project Manager reports to the Field Team Leader.

Quality Assurance Officer

Julie Moriarity of Roux will serve as the Quality Assurance Officer (QAO) for this project. The QAO is responsible for conducting reviews, inspections, and audits to ensure that the data collection is conducted in accordance with the FSP and QAPP. The QAO's responsibilities range from ensuring effective field equipment decontamination procedures and proper sample collection to the review of all laboratory analytical data for completeness and usefulness. The QAO makes independent recommendations to the Field Team Leader.

# 4. Sampling Procedures

Detailed discussions of sampling, decontamination, and sample handling procedures are provided in the FSP (Appendix A).

# 5. Quality Assurance/Quality Control

The primary intended use for the EC groundwater investigation is to determine if the Site is a potential source of ECs and determine if remediation needs to be undertaken at the Site. The primary DQO of the groundwater sampling programs, therefore, is that data be accurate and precise, and hence representative of the actual Site conditions. Accuracy refers to the ability of the laboratory to obtain a true value (i.e., compared to a standard) and is assessed through the use of laboratory quality control (QC) samples, including laboratory control samples and matrix spike samples, as well as through the use of surrogates, which are compounds not typically found in the environment that are injected into the samples prior to analysis. Precision refers to the ability to replicate a value and is assessed through both field and laboratory duplicate samples.

Sensitivity is also a critical issue in generating representative data. Laboratory equipment must be of sufficient sensitivity to detect target compounds and analytes at levels below NYSDEC standards and guidelines whenever possible. Equipment sensitivity can be decreased by field or laboratory contamination of samples, and by sample matrix effects. Assessment of instrument sensitivity is performed through the analysis of reagent blanks, near-detection-limit standards, and response factors. Potential field and/or laboratory contamination is assessed through use of trip blanks, method blanks, and equipment rinse blanks (also called “field blanks”).

Table B-1 lists the field and laboratory QC samples that will be analyzed to assess data accuracy and precision, as well as to determine if equipment sensitivity has been compromised. Attachment B-1 shows the reporting limits and minimum detection limits achievable by the laboratory.

All EC analyses will be performed in accordance with the NYSDEC Analytical Services Protocol (ASP), using USEPA Method 537 Modified and 8270SIM methods. Alpha Analytical shall maintain a Environmental Laboratory Approval Program (ELAP) Contract Laboratory Protocol (CLP) certification for each of the analyses listed.

All laboratory data are to be reported in NYSDEC full Category B deliverables and will be delivered to NYSDEC in electronic data deliverable (EDD) format as described on NYSDEC’s website (http://www.dec.ny.gov/chemical/62440.html). A Data Usability Report (DUSR) will be prepared by an independent validator meeting the requirements in Section 2.2(a)1.ii and Appendix 2B of DER-10 and concurrently submitted to NYSDEC with the groundwater sampling results.

# TABLE

B-1. Field and Laboratory QC Summary

**Table B-1. Field and Laboratory QC Summary**

| QC Check Type | Minimum Frequency | Use |
|---|---|---|
| Field QC* | | |
| Duplicate | 1 per matrix per 20 samples or SDG | Precision |
| Equipment Rinse Blank | 1 per matrix per 20 samples or SDG | Sensitivity |
| Laboratory QC | | |
| Laboratory Control Sample | 1 per matrix per SDG | Accuracy |
| Matrix Spike/Matrix Spike Duplicate/Matrix Duplicat | 1 per matrix per SDG | Accuracy/Precision |
| Surrogate Spike | All organics samples | Accuracy |
| Laboratory Duplicate | 1 per matrix per SDG | Precision |
| Method Blank | 1 per matrix per SDG | Sensitivity |

**Notes:**

SDG - Sample Delivery Group - Assumes a single extraction or preparation

* Provided to lab by field sampling personnel

# ATTACHMENT

## B-1. Laboratory Reporting Limits for Emerging Contaminants Samples

**Date Created:** 05/15/17
**Created By:** Karyn Raymond
**File:** PM3580-1
**Page:** 1

**1,4-Dioxane via 8270SIM**

**Holding Time:** 7 days
**Container/Sample Preservation:** 500 mL amber glass jar/ no preservative

| Analyte | CAS # | RL | MDL | Units | LCS Criteria | LCS RPD | MS Criteria | MS RPD | Duplicate RPD | Surrogate Criteria |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 123-91-1 | 0.15 | 0.075 | ug/l | 40-140 | 30 | 40-140 | 30 | 30 | |
| *1,4-Dioxane-d8* | *17647-74-4* | | | | | | | | | *15-110* |

***Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc.***

**Date Created:** 12/06/17
**Created By:** Karyn Raymond
**File:** PM4306-1
**Page:** 1

**PFAAs via EPA 537(M)-Isotope Dilution (WATER)**

**Holding Time:** 14 days
**Container/Sample Preservation:** 1 - 3 Plastic Trizma/1 Plastic/1 H20+Trizma

| Group | Analyte | Abbreviation | CAS # | MDL | RL | Units | LCS Criteria | LCS RPD | MS Criteria | MS RPD | Duplicate RPD | Surrogate Criteria |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Perfluoroalkyl Sulfonates | **Perfluorobutanesulfonic Acid** | **PFBS** | **375-73-5** | **0.11** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **Perfluorohexanesulfonic Acid** | **PFHxS** | **355-46-4** | **0.1076** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluoroheptane Sulfonic Acid | PFHpS | 375-92-8 | 0.1552 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **Perfluorooctanesulfonic Acid** | **PFOS** | **1763-23-1** | **0.1116** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorodecanesulfonic Acid (PFDS) | PFDS | 335-77-3 | 0.2224 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| Perfluoroalkyl carboxylates | Perfluorobutanoic Acid | PFBA | 375-22-4 | 0.1312 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluoropentanoic Acid | PFPeA | 2706-90-3 | 0.0856 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorohexanoic Acid | PFHxA | 307-24-4 | 0.1264 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **Perfluoroheptanoic Acid** | **PFHpA** | **375-85-9** | **0.0924** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **Perfluorooctanoic Acid** | **PFOA** | **335-67-1** | **0.0504** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **Perfluorononanoic Acid** | **PFNA** | **375-95-1** | **0.1008** | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorodecanoic Acid | PFDA | 335-76-2 | 0.1904 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluoroundecanoic Acid | PFUnA | 2058-94-8 | 0.1912 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorododecanoic Acid | PFDoA | 307-55-1 | 0.0916 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorotridecanoic Acid | PRTrDA | 72629-94-8 | 0.0904 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | Perfluorotetradecanoic Acid (PFTA) | PFTA | 376-06-7 | 0.072 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| Fluorinated Telomer Fluorinated Telomer Sulfonates | 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) | 6:2 FTS | 27619-97-2 | 0.194 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS) | 8:2 FTS | 39108-34-4 | 0.2908 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| Perfluorooctanesulfonamides | Perfluorooctanesulfonamide | FOSA | 754-91-6 | 0.2268 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| Perfluorooctane sulfonamidoacetic acids | N-Methyl Perfluorooctanesulfonamidoacetic Acid | N-MeFOSAA | 2355-31-9 | 0.2504 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | N-Ethyl Perfluorooctanesulfonamidoacetic Acid | N-EtFOSAA | 2991-50-6 | 0.3728 | 2 | ng/l | 50-150 | 30 | 50-150 | 30 | 30 | |
| | **CORRESPONDING SURROGATES** | | | | | | | | | | | |
| Perfluoroalkyl Sulfonates | **Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)** | | NONE | | | | | | | | | 50-150 |
| | **Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)** | | NONE | | | | | | | | | 50-150 |
| Perfluoroalkyl carboxylates | **Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)** | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[13C4]Butanoic Acid (MPFBA) | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[13C5]Pentanoic Acid (M5PFPEA) | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA) | | NONE | | | | | | | | | 50-150 |
| | **Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)** | | NONE | | | | | | | | | 50-150 |
| | **Perfluoro[13C8]Octanoic Acid (M8PFOA)** | | NONE | | | | | | | | | 50-150 |
| | **Perfluoro[13C9]Nonanoic Acid (M9PFNA)** | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA) | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA) | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) | | NONE | | | | | | | | | 50-150 |
| | Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) | | NONE | | | | | | | | | 50-150 |
| Fluorinated Telomer Fluorinated Telomer Sulfonates | 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS) | | NONE | | | | | | | | | 50-150 |
| | 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS) | | NONE | | | | | | | | | 50-150 |
| Perfluorooctanesulfonamides | Perfluoro[13C8]Octanesulfonamide (M8FOSA) | | NONE | | | | | | | | | 50-150 |
| Perfluorooctane sulfonamidoacetic acids | N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | | NONE | | | | | | | | | 50-150 |
| | N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA) | | NONE | | | | | | | | | 50-150 |
| | | | | | | | | | | | | |

***Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc.***
***Bold entries depict the 6 original UCMR3 chemicals .***

# APPENDIX C

Health and Safety Plan

# Site-Specific Health and Safety Plan

Post Road Corridor – White Plains
77 West Pond Road
City of White Plains
County of Westchester, New York

October 5, 2018

Prepared for:

**Post Maple 77, LLC**
2309 Frederick Douglas Boulevard
New York, New York 10027-3612

Prepared by:

**Roux Environmental Engineering and Geology, D.P.C.**
209 Shafter Street
Islandia, New York 11749

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# Table of Contents

# Table of Contents (Continued)



# Table



# Figures



# Appendices

# Table of Contents (Continued)

# Approvals

By their signature, the undersigned certify that this Health and Safety Plan (HASP) is approved and will be utilized at the project site located at 77 West Post Road, White Plains, New York.

Levi Curnutte
Office Health and Safety Manager
Roux Environmental Engineering and Geology, D.P.C.

Date

Joseph Duminuco, P.G.
Project Principal/Executive Vice President
Roux Environmental Engineering and Geology, D.P.C.

Date

Julie Moriarity
Project Manager/Site Health and Safety Officer
Roux Environmental Engineering and Geology, D.P.C.

Date

# 1. Introduction

This Site-specific Health and Safety Plan (HASP) has been prepared by Roux Environmental Engineering and Geology, D.P.C. (Roux) in accordance with 29 CFR 1910.120 Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) and Roux (Roux) Standard Operating Procedures (SOPs). It addresses all activities described below that are associated with the property located at 77 West Post Road, White Plains, New York (Site) (Figure 1). The HASP will be implemented by the designated Site Health and Safety Officer (SSO) during work at the Site. The HASP attempts to identify all potential hazards at the Site; however, Site conditions are dynamic and new hazards may appear constantly. Personnel must remain alert to existing and potential hazards as Site conditions change and protect themselves accordingly.

Compliance with this HASP is required of all persons and subcontractors who perform fieldwork or enter the Site. The contents of this HASP may change or undergo revision based upon additional information made available to health and safety personnel, monitoring results, or changes in the technical scope of work. Any changes proposed must be reviewed and approved by the Office Health and Safety Manager (OHSM), with the SSO implementing the changes to the HASP.

Prior to performing work each task should be evaluated to determine the appropriate procedures that need to be followed.

## 1.1 Scope of Work

In general, the tasks will include the following:

- Implementation of Groundwater Sampling for Emerging Contaminants Work Plan.

Any change in scope will require a revision of this HASP to address any new hazards.

# 2. Emergency Information and Notification

Multiple emergency services may be obtained by calling 911. More specific numbers for local services are listed below.

| | |
|---|---|
| Emergency Medical Service | 911 |
| Police: White Plains Police Department | 911 |
| Fire: | 911 |
| Hospital: White Plains Hospital | 914-681-0600 |
| National Response Center | 800-424-8802 |
| Poison Control Center | 800-222-1222 |
| CHEMTREC | 800-262-8200 |
| Fire: White Plains Volunteer Fire Department | 911 |
| Center for Disease Control | 800-311-3435 |
| USEPA (Region II) | 212-637-5000 |
| NYSDEC Emergency Spill Response | 800-457-7362 |
| HealthSource Medical Services of Islandia (For non-emergency medical services) | 631-435-0110 |

Directions and maps to the White Plains Hospital are provided in Figure 3.

## 2.1 Notification

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone: (Direct contact, no phone messages).

| | | | **Office:** | **Cell:** |
|---|---|---|---|---|
| 1. | Project Manager/SSO: | Julie Moriarity | 631-232-2600 | 607-761-7849 |
| 2. | Project Principal: | Joseph Duminuco | 631-232-2600 | 631-921-6279 |
| 3. | Office Health and Safety Manager: | Levi Curnutte | 631-232-2600 | 727-743-0304 |
| 4. | Office Manager: | Michael Ritorto | 631-232-2600 | 631-445-4576 |

Accident reporting guidelines are outlined in section 13.5 of this HASP.

# 3. Health and Safety Personnel

This section briefly describes all Site personnel and their health and safety responsibilities for the groundwater sampling to be implemented at the Site. All personnel are responsible for ensuring compliance with the HASP.

**Project Principal (PP) – Joseph Duminuco, P.G. – Roux**

- Has the overall responsibility for the health and safety of Site personnel.
- Ensures that adequate resources are provided to the field health and safety staff to carry out their responsibilities as outlined below.

**Office Health and Safety Manager (OHSM) – Levi Curnutte – Roux**

- Implements the HASP.
- Performs or oversees site-specific training and approves revised or new safety protocols or field operations.
- Coordinates revisions of this HASP with Project Principal.
- Responsible for the development of new task safety protocols and procedures and resolution of any outstanding safety issues which may arise during the performance of site work.
- Review and approve all health and safety training and medical surveillance records for personnel and subcontractors.

**Site Safety and Health Officer (SSO) – Julie Moriarity – Roux**

- Directs and coordinates health and safety monitoring activities.
- Ensures that field teams utilize proper personal protective equipment.
- Conducts initial onsite specific training prior to personnel and/or subcontractors commencing work.
- Conducts and documents daily pre-job safety briefings.
- Ensures that field team members comply with this HASP.
- Completes and maintains all accident investigation and reporting forms.
- Notifies PP, PM, and OHSM of all accidents/incidents.
- Notifies PP of daily field operations and work progress, who will then communicate at the end of the day to the designated representative the following:
    1. End of day tasks completed
    2. Next day's planned activities
    3. Third party issues
    4. Change of Plans – approvals
- Determines upgrade or downgrade of personal protective equipment (PPE) based on Site conditions and/or real time monitoring results.
- Ensures that monitoring instruments are calibrated daily or as manufacturers suggested instructions determine.
- Submits and maintains health and safety field log books, daily safety logs, training logs, air monitoring result reports, weekly safety report.

**Field Personnel and Subcontractors**

- Report any unsafe or potentially hazardous conditions to the SSO.
- Maintain knowledge of the information, instructions, and emergency response actions contained in the HASP.
- Comply with rules, regulations, and procedures as set forth in this HASP and any revisions, which are instituted.
- Prevent admittance to work Site by unauthorized personnel.

In the case that there is a change in any of the above personnel, all onsite personnel will be notified of the change. The new responsible party shall review and sign that they have been given a documented verbal full HASP review by Roux and are aware of their responsibilities as outlined in this HASP.

# 4. Site Location, Description, and History

Descriptions of the Site and surrounding property usage are included in the following sections. The location of the Site is presented in Figure 1.

## 4.1 Property Location and Description

The Site consists of ten separate parcels (identified as Parcels A through D and Parcels F through K), nine of which are located between West Post Road and Maple Avenue (Figure 2). One additional parcel (Parcel K) is located at the intersection of West Post Road and South Lexington Avenue.

- **99-103 W. Post Road (Parcel A)**
  Parcel A is 0.21 acres in area and is currently vacant without improvements.

- **5 Rathbun Avenue (Parcel B)**
  Parcel B is 0.09 acres in area and is currently vacant without improvements.

- **3 Brady Place (Parcel C)**
  The Parcel is 0.06 acres in area and is currently vacant without improvements.

- **95 West Post Road (Parcel D)**
  The Parcel is 0.09 acres in area and is currently vacant. The Parcel is improved by one abandoned building previously utilized as an automobile sales office; an associated parking area is located south of the building.

- **79-83 West Post Road (Parcel F)**
  The Parcel is 0.38 acres in area and is currently vacant. The Parcel is improved by an asphalt paved parking lot; no other improvements exist.

- **77 West Post Road (Parcel G)**
  The Parcel is 0.88 acres in area, is currently vacant, and is improved by two abandoned single story buildings formerly utilized for automobile repairs and sales from the 1970's through 2008. Available documentation indicated that the Parcel was utilized for mixed commercial and residential uses up to the 1970's.

- **55 West Post Road (Parcel H)**
  The Parcel is 0.91 acres in area and is currently vacant. The Parcel is improved by one single-story building with a basement that was formerly utilized for automobile repairs and sales from the 1950's through 2008.

- **35 and 41-45 West Post Road (Parcels I and J)**
  The Parcel consists of two lots 35 West Post Road (0.28 acres in area) which is currently vacant and improved with one 14,400 square foot, two story abandoned building primarily used for automobile repair but also used as a showroom/office building and 41-45 West Post Road (0.28 acres in area) which is improved by an asphalt paved parking lot that provided parking space for 35 West Post Road; therefore, the two lots are considered and referred to as one Parcel.

- **190-192 South Lexington Avenue (Parcel K)**
  The Parcel is approximately 0.47 acres in area, is currently vacant, and is undeveloped. The Parcel is comprised of grass and small trees along a perimeter fence located adjacent to West Post Road and South Lexington Avenue.

# 5. Waste Description/Characterization

## 5.1 General

The following information is presented in order to identify the types of materials that may be encountered at the Site. The detailed information on these materials was obtained from:

- Sax's Dangerous Properties of Industrial Materials – Lewis Eight Edition
- Chemical Hazards of the Workplace – Proctor/Hughes
- Condensed Chemical Dictionary – Hawley
- Rapid Guide to Hazardous Chemical in the Workplace – Lewis 1990
- NIOSH Pocket Guide to Chemical Hazards – 2005
- ACGIH TLV Values and Biological Exposure Indices
- OSHA 29 CFR 1910.1000

## 5.2 Chemical Data Sheets

Several chemicals that may potentially be present in soils and groundwater at the Site, based on previous soil, soil vapor, and groundwater sampling results and historic operations conducted at the Site that have been identified. The Summary of Toxicological Data is found in Table 1 and is provided for review of chemicals that may be encountered. The Summary of Toxicological Data Sheets provides information such as the chemicals characteristics, health hazards, protection, and exposure limits.

### 5.2.1 Contaminants of Concern

Groundwater contaminants that may be encountered during sampling activities include both organic and inorganic compounds. Prior investigations at the site have indicated detection of Petroleum-related and Chlorinated Volatile Organic Compounds (CVOCs) in soil and groundwater. The toxicological, physical, and chemical properties of potential contaminants are presented in Table 1.

# 6. Hazard Assessment

Roux's work at the Site is expected to entail a variety of physical, chemical, and biological hazards, all of which must be sufficiently managed to allow the work to be performed safely. Some of the hazards are Site-specific, i.e., they are associated with the nature, physical characteristics, and/or routine operation of the Site itself, while others are activity-specific, i.e., they are associated with (or arise from) the particular activity being performed. The various hazards can be grouped into the following categories:

**Caught/Crushed** – the potential to become caught in, under, between, or by an object or parts of an object, such as equipment with parts that open and close or move up and down ("pinch points") or equipment that rotates, and the accompanying potential to have body parts cut, mangled, or crushed thereby.

**Contact** – the potential to be struck by or against moving or stationary objects that can cause physical injury, such as heavy machinery, overhead piping, moving vehicles, falling objects, and equipment (including tools and hand-held equipment) or infrastructure with the ability to cut or impale.

**Energy Sources** – the potential for bodily harm associated with energy sources, most notably electricity, but also including latent energy sources such as compressed air and equipment under tension (which when released could cause injurious contact or a fall).

**Ergonomics** – the potential for musculoskeletal injury associated with lifting/carrying, pushing/pulling, bending, reaching, and other physical activity attributable to poor body position/mechanics, repetitive motion, and/or vibration.

**Exposure** – the potential for injury/illness due to physical, chemical, or biological exposures in the work environment, including but not limited to temperature extremes, solar radiation, and noise (physical), chemical splashes and hazardous atmospheres (chemical), and animal/insect bites and poisonous plants (biological).

**Falls** – the potential to slip or trip and thus fall or drop a load, resulting in bodily injury to oneself or others.

The foregoing is intended to provide Roux employees with a general awareness of the hazards involved with Site work. A more detailed review of the potential hazards associated with each specific activity planned for the Site (or ongoing activity, as the case may be) is provided in the activity-specific Job Safety Analysis (JSA) forms in Appendix A. As can be seen in the JSA forms, the hazards are identified by category per the above, and specific measures designed to mitigate/manage those hazards are also identified. In preparing the JSA forms, all categories of hazards were considered, and all anticipated potential hazards were identified to the extent possible based on the experience of the personnel preparing and reviewing the JSA forms. JSAs for each task will be reviewed with onsite personnel at each morning tailgate meeting and as tasks change throughout the day. However, there is always the possibility for an unanticipated hazard to arise, potentially as condition change over the course of the workday. Roux personnel must maintain a continual awareness of potential hazards in the work zone, regardless of whether the hazard is identified in the JSA form. Particular attention should be paid to hazards associated with exposure to hazardous substances (see Table 1 for a listing of the hazardous substances most likely to be encountered in environmental media at the Site).

## 6.1 Chemical Hazards

The potential for personnel and subcontractors to come in contact with chemical hazards may occur during the following tasks:

- Gauging, bailing/purging, and sampling of monitoring wells.

For chronic and acute toxicity data, refer to Summary of Toxicological Data Sheets in Table 1 for further details on compound characteristics.

### 6.1.1 Exposure Pathways

Exposure to these compounds during ongoing activities may occur through dermal absorption and/or accidental ingestion of the contaminant by either direct or indirect cross-contamination activities.

### 6.1.2 Operational Action Levels

A decision-making protocol for an upgrade in levels of protection and/or withdrawal of personnel from an area based on exposure levels is outlined in Table 2.

### 6.1.3 Additional Precautions

Dermal absorption or skin contact with chemical compounds is possible while gauging, purging or sampling a monitoring well at the Site. The use of PPE in accordance with Section 8.2 and strict adherence to proper decontamination procedures should significantly reduce the risk of skin contact.

The potential for accidental ingestion of potentially hazardous chemicals is expected to be remote, when good hygiene practices are used.

## 6.2 Adverse Weather Conditions

In the event of adverse weather conditions, the SHSO or project principal will determine if work can continue without sacrificing the health and safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries.
- Potential for cold stress and cold-related injuries.
- Treacherous weather-related conditions.
- Limited visibility.
- Electrical storm potential.

Additional information on heat and cold stress is included in Appendix B. Site activities will be limited to daylight hours and acceptable weather conditions. Inclement working conditions include heavy rain, fog, high winds, and lightning. Observe daily weather reports and evacuate if necessary in case of inclement weather conditions.

## 6.3 Electrical Storm Guidelines

In the event that lightning and/or thunder are observed while working onsite, all onsite activities shall stop and personnel shall seek proper shelter (e.g., substantial building, enclosed vehicle, etc.). Work shall not resume until the threat of lighting has subsided and no lightning or thunder has been observed for 30 minutes. If the possibility of lightning is forecast for the day, advise the onsite personnel or the risks and proper procedure at the pre-work safety briefing. Continuously monitor for changing weather conditions and allow enough time to properly stop work if lightning is forecasted.

## 6.4 Biological Hazards

The biological hazards, which have the potential to cause adverse health effects, are from exposure to domestic flies, mosquitoes, insects, animals and animal wastes, mold and bloodborne pathogens.

### 6.4.1 Insect Stings

Stings from insects are often painful, cause swelling and can be fatal if a severe allergic reaction such as anaphylactic shock occurs. If a sting occurs, the stinger should be scraped out of the skin, opposite of the sting direction. The area should be washed with soap and water followed by application of an ice pack.

If the victim has a history of allergic reaction, he shall be taken to the nearest medical facility. If the victim has medication to reverse the effects of the sting, it should be taken immediately.

If the victim experiences a severe reaction, a constricting band should be placed between the sting and the heart. The bitten area should be kept below the heart if possible. A physician shall be contacted immediately for further instructions.

### 6.4.2 Animals and Animal Wastes

Due to the site currently being vacant, there lies the potential for various wildlife at the site, including, but not limited to, pigeons, bats, mice, rats, squirrels, raccoons, and feral cats. Certain animals can represent significant sources (vectors) of disease transmission. Precautions to avoid or minimize potential contact with (biting) animals (such as some of the above listed) or animal waste and/or deceased animals should be considered prior to all field activities. Rats, squirrels, raccoons, feral cats, and other wild animals can inflict painful bites which can also cause disease (as in the case of rabid animals). Site personnel should avoid contact with any of the above.

If contact occurs, be sure to clean the area thoroughly with soap and water as soon as possible. If a bite occurs, the area shall be cleaned thoroughly immediately with soap and water and medical attention shall be sought.

### 6.4.3 Bloodborne Pathogens

The majority of the occupational tasks onsite will not involve a significant risk of exposure to blood, blood components, or body fluids. The highest risk of acquiring any bloodborne pathogen for onsite employees will be following an injury. When administering first aid care, there are potential hazards associated with bloodborne pathogens that cause diseases such as Human Immunodeficiency Virus (HIV), Hepatitis B (HBV), Hepatitis A (HAV), Hepatitis C (HCV), or the Herpes Simplex Virus (HSV). An employee who has not received the appropriate certification should never execute first aid and/or CPR.

In order to minimize any potential pathogen exposure, all employees should use the hand washing facilities on a regular basis. Additionally, the following universal precautions shall be followed to prevent further potential risk:

- Direct skin or mucous membrane contact with blood shall be avoided.
- Open skin cuts or sores shall be covered to prevent contamination from infectious agents.
- Body parts shall be washed immediately after contact with blood or body fluids that might contain blood, even when gloves or other barriers have been used.

- Gloves and disposable materials used to clean spilled blood shall be properly disposed of in an approved hazardous waste container.
- First aid responders shall wear latex or thin mil nitrile gloves when performing any procedure risking contact with blood or body substances.
- Safety glasses with attached side shields will be worn to protect the eyes from splashing or aerosolization of body fluids.
- A CPR mask will be worn when performing CPR to avoid mouth-to-mouth contact.
- Appropriate work gloves will be worn to minimize the risk of injury to the hands and fingers when working on all equipment with sharp or rough edges.
- Never pick up broken glass or possible contaminated material with your unprotected hands.
- Never handle wildlife (living or deceased) encountered onsite.

## 6.5 Hazard Assessment

| Task | Hazards | Risk of Exposure |
|---|---|---|
| Gauging, purging and sampling of Monitoring Wells | Inhalation/Skin Contact | Moderate/High |
| | Heat Stress/Cold Stress | Moderate |
| | Physical Injury | Moderate |

# 7. Training

## 7.1 General Health and Safety Training

In accordance with Roux's corporate policies, and pursuant to 29 CFR 1910.120, hazardous waste site workers shall, at the time of the job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations. As a minimum, the training shall have consisted of instruction in the topics outlined in the above reference. Personnel who have not met the requirements for initial training will not be allowed to work in any Site activities in which they may be exposed to hazards (chemical or physical).

Completion of a 40-hour Health and Safety Training Course for Hazardous Waste Operations or an approved equivalent will fulfill the requirements of this section.

Roux's SSO has the responsibility of ensuring that personnel assigned to this project comply with these requirements.

## 7.2 Annual Eight-Hour Refresher Training

Current, annual 8-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The following topics will be reviewed; toxicology, respiratory protection, medical surveillance, decontamination procedures, and personal protective clothing. In addition, topics deemed necessary by Roux's Health and Safety Director may be added to the above list.

## 7.3 Site-Specific Training

Site personnel will receive documented training that will specifically address the activities, procedures, monitoring and equipment for Site operations. It will include Site and facility layout, hazards, first aid equipment locations and emergency services at the Site, and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

## 7.4 Onsite Safety Meetings

Daily documented pre-work safety meetings will be presented each morning to discuss the scope-of-work for that day, potential safety concerns and control measures for those identified safety hazards as per the JSAs for the upcoming activities.

The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety audits by Roux or other involved parties.

## 7.5 First Aid and CPR

The SSO will identify those individuals having first aid and CPR training in order to ensure that emergency medical treatment is available during field activities. The training will be consistent with the requirements of the American Red Cross Association and, as applicable, the American Heart Association. Certification and appropriate training documentation will be kept with the Site personnel records.

## 7.6 Additional Training / Procedures

The OHSM may require additional or specialized training throughout the project. Such training shall be in the safe operation of heavy or power tool equipment or hazard communication training or other topic deemed Site appropriate.

# 8. Medical Surveillance Procedures

## 8.1 General

A Medical Surveillance Program has been established as part of this plan and is included in Appendix C. Roux and subcontractor personnel performing field work at the Site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f). A physician's medical release for work will be confirmed by the SSO before an employee can begin Site activities. Such examinations shall include a statement as to the worker's present health status, the ability to work in a hazardous environment (including any required PPE, which may be used during temperature extremes), and the worker's ability to wear respiratory protection.

In the event that personal medical information is needed for emergency treatment, information will be made available to the treating health care professional through Roux's Human Resources Department and the OHSM.

# 9. Site Control, Personal Protective Equipment, and Communications

A modified Site control approach may be utilized since activities will be limited to site inspection and groundwater sampling. If additional work is necessary, the following four-zone approach will be used in order to prevent the spread of contamination from the disturbed areas onsite.

## 9.1 Site Control

If remedial activities are necessary, a four-zone approach will be employed. The four zones include: the Exclusion Zone (EZ), the Contamination Reduction Zone (CRZ), Contamination Reduction Corridor (CRC) and the Support Zone (SZ). A stepped remedial approach will be managed and the zones modified as the work progresses. Each of the areas will be defined through the use of control barricades and/or construction/hazard fencing. A clearly marked delineation between the SZ and the remaining three zones, the CRZ, CRC and EZ, will be maintained. The preferred method will utilize high visibility orange fencing and hand-driven metal posts, or orange cones. Signage will be posted to further identify and delineate these areas.

### 9.1.1 Support Zone

The Support Zone (SZ) is an uncontaminated area that will be the field support area for the Site operations. The SZ will contain the temporary project trailers and provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel or materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

### 9.1.2 Contamination Reduction Zone

A Contamination Reduction Zone (CRZ) is established between the exclusion zone and the support zone. The CRZ contains the Contamination Reduction Corridor (CRC) and provides an area for decontamination of personnel and equipment. The CRZ will be used for general Site entry and egress in addition to access for heavy equipment and emergency support services. Personnel are not allowed in the CRZ without:

- A buddy (co-worker)
- Appropriate PPE
- Medical authorization
- Training certification
- Requirement to be in the zone

### 9.1.3 Exclusion Zone

The area where contamination exists is the Exclusion Zone (EZ). All areas where excavation and handling of contaminated materials take place are considered the EZ. This zone will be clearly delineated by orange high visibility fencing. Safety tape may be used as a secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The SHSO may establish more than one EZ where different

levels of protection may be employed or where different hazards exist. Personnel are not allowed in the EZ without:

- A buddy (co-worker)
- Required minimum level PPE
- Medical Authorization
- Training certification
- Requirement to be in the zone

## 9.2 Personal Protective Equipment

Site safety and health hazards are eliminated or reduced to the greatest extent possible through engineering controls and work practices. Where hazards are still present, a combination of engineering controls, work practices and PPE are used to protect employees. Appropriate personal protective equipment (PPE) shall be worn by Site personnel when there is a potential exposure to chemical hazards or physical hazards (e.g., falling objects, flying particles, sharp edges, electricity and noise), as determined by the SHSO. The level of personal protection, type and kind of equipment selected will depend on the hazardous conditions and in some cases cost, availability, compatibility with other equipment, and performance. An accurate assessment of all these factors will be made before work can be safely executed.

Roux maintains a comprehensive written PPE program that addresses proper PPE selection, use, maintenance, storage, fit and inspection. PPE to be used at the Site will meet the appropriate American National Standards Institute (ANSI) standards and the following OSHA (General Industry) standards for minimum PPE requirements.

The initial level of personal protective equipment is Level D. It is not anticipated that either Level B or Level C protection will be necessary.

The Minimum level of PPE for entry onto the Site is Level D PPE. The following equipment shall be used:

- Work uniform (long pants, sleeved shirt)
- Hard hat
- Steel or composite toe work boots
- Safety Glasses (must comply with one of the following ANSI/ISEA Z87.1-2010, ANSI Z87.1-2003, ANSI Z87.1-2003)
- Boot covers (as needed)
- Hearing protection (as needed)
- High visibility clothing (shirt or vest)
- Hand Protection (e.g., minimum cut resistance meeting ANSI 105-2000 Level 2)

Note that jewelry shall be removed or appropriately secured to prevent it from becoming caught in rotating equipment or unexpectedly snagged on a fixed object. (e.g., wrist watches bracelets, rings, chains and necklaces, open earrings). Do not wear loose clothing and all shoulder length hair should be tied back.

Site specific PPE ensembles and materials are identified within task specific JSAs located within Appendix A, and any upgrades or downgrades of the level of protection (i.e., not specified in the JSA) must be immediately

communicated to all Roux personnel and subcontractors as applicable. PPE is used in accordance with manufacturer's recommendations.

### 9.2.1 Site Specific Levels of Protection

The following is the initial level of protection that shall be used for the planned field activity:

| Activity | Initial Level of PPE |
|---|---|
| Gauging, Purging and Sampling of Monitoring Wells | D |

# 10. Monitoring Procedures

## 10.1 General

Monitoring will be performed as necessary to verify the adequacy of respiratory protection, to aid in Site layout, and to document worker exposure. If real-time breathing zone air monitoring in these areas indicates the presence of potentially hazardous materials in exceedances of the Action Levels for Worker Breathing Zone (Table 2), the OHSM will be contacted and a plan for implementing appropriate control measures will be developed. A documented safety briefing to communicate the new procedures to onsite personnel will be conducted. All monitoring instruments shall be operated by qualified personnel only and will be calibrated daily prior to use or, more often, as necessary. Additional monitoring may be required if exclusion zones are employed for specific site activities. General air monitoring will be performed in accordance with the Community Air Monitoring Plan included in Appendix J during intrusive Site activities.

## 10.2 Instrumentation

The following monitoring instruments will be available for use during field operations as necessary. There will be a minimum of one of each piece of equipment on the Site at all times during intrusive activities:

- Photoionization Detector (PID) with 10.6 EV probe or Flame Ionization Detector (FID) or equivalent.
- Dust/Particulate Monitor (DM), MIE Miniram, or equivalent.

A PID will be used to monitor VOCs in active work areas during intrusive activities. VOCs shall also be measured upwind of the work areas to determine background concentrations.

A particulate monitor shall be used to measure concentrations of dust and particulate matter.

When deemed necessary, a CGI/$O_2$/CO (or equivalent) meter shall be used to monitor for combustible gases, oxygen content and/ or carbon monoxide during confined space entry or when operating in areas with poor ventilation as the HSO deems necessary.

Calibration records shall be documented and recorded daily and included in the daily air monitoring report. This report will be specific to work area monitoring. All instruments shall be calibrated before and after each daily use in accordance with manufacturer's procedures.

## 10.3 Action Levels

Below are monitoring action levels for Site-specific chemicals of concern. In the event that PID readings above the thresholds identified below are sustained for 5 minutes in the breathing zone, worker protection will require upgrading following notification to the OHSM and applicable parties (e.g., client, board of health, regulators, etc).

Action levels for the upgrading of PPE requirements in the HASP will apply to all Site work during investigation and remediation activities at the Site. Action levels are for known contaminants using direct reading instruments in the Breathing Zone (BZ) for VOCs and particulates, and at the source for combustible gases. The BZ will be determined by the SSO but is typically 4 to 5 feet above the work area surface or elevation. The action levels to be utilized for the Site are found in Table 2.

| Action Levels for Respiratory Protection | |
|---|---|
| OVM Reading in Breathing Zone (ppm) | |
| <5 | No Action |
| ≥5 - <25 | Level C |
| ≥25 | Cease Field Operations |
| Multi-gas Reading in Breathing Zone (%) | |
| LEL ≥2 | Cease Field Operations |
| $O_2$ <19.5 or >21.5 | Cease Field Operations |

# 11. Safety Considerations

## 11.1 General

In addition to the specific requirements of this HASP, common sense should be used at all times. The following general safety rules and practices will be in effect at the site.

- Ignition sources within 35 feet of potentially flammable or contaminated material are strictly prohibited.
- Movement of vehicles and equipment, and other activities will be planned and performed with consideration for the location, height, and relative position of aboveground utilities and fixtures, including signs; lights; canopies; buildings and other structures and construction; and natural features such as trees, boulders, bodies of water, and terrain.
- Approved and appropriate safety equipment (as specified in this HASP), such as eye protection, hard hats, hand protection (nitrile, leather and/or cut resistant gloves as necessary), foot protection, and respirators, must be worn in areas where required.
- No eating, chewing tobacco, gum chewing or drinking will be allowed outside the SZ.
- Contaminated tools and hands must be kept away from the face.
- Personnel must use personal hygiene safe guards (washing up via hand towelettes or potable water) at the end of the shift.
- Each sample must be treated and handled as though it were contaminated.
- Persons with long hair and/or loose-fitting clothing that could become entangled in equipment (e.g., pumps, etc.) must take adequate precautions.
- Horseplay is prohibited in the work area.
- Work while under the influence of intoxicants, narcotics, or controlled substances is strictly prohibited.

## 11.2 Sample Handling

Personnel responsible for handling of samples will wear the prescribed PPE. Samples are to be identified as to their hazard and packaged as to prevent spillage or breakage. Any unusual sample conditions shall be noted. Laboratory personnel and all field personnel shall be advised of sample hazard levels and the potential contaminants present. This can be accomplished by a phone call to the lab coordinator and/or including a written statement with the samples reviewing lab safety procedures in handling in order to assure that the practices are appropriate for the suspected contaminants in the sample.

# 12. Decontamination and Disposal Procedures

The decontamination section of the HASP describes how personnel and equipment are decontaminated when they leave the Exclusion Zone. This section also describes how residual waste from decontamination processes is disposed. The site decontamination procedures are designed to achieve an orderly, controlled removal or neutralization of contaminants that may accumulate on personnel or equipment. These procedures minimize worker contact with contaminants and protect against the transfer of contaminants to clean areas of the site and off-site. They also extend the useful life of PPE by reducing the amount of time that contaminants contact and can permeate PPE surfaces. Decontamination is facilitated within the contamination reduction zone at this Site.

## 12.1 Decontamination Procedures for Personnel and PPE

The following are general decontamination procedures established and implemented at this site.

1. Decontamination is required for all workers exiting a contaminated area. Personnel may re-enter the Support Zone only after undergoing the decontamination procedures described below in the next section.
2. Protective clothing is decontaminated, cleaned, laundered, maintained and/or replaced as needed to ensure its effectiveness.
3. PPE used at this site that requires maintenance or parts replacement is decontaminated prior to repairs or
4. PPE used at this site is decontaminated or prepared for disposal on the premises. Personnel who handle contaminated equipment have been trained in the proper means to do so to avoid hazardous exposure.
5. This site uses an off-site laundry for decontamination of PPE. The site has informed that facility of the hazards associated with contaminated PPE from this site.
6. The site requires and trains workers that if their permeable clothing is splashed or becomes wetted with a hazardous substance, they will immediately exit the work zone, perform applicable decontamination procedures, shower, and change into uncontaminated clothing.
7. Procedures for disposal of decontamination waste meet applicable local, State, and Federal regulations.

## 12.2 Decontamination Procedures for Equipment

All tools, equipment, and machinery from the Exclusion Zone or CRZ are decontaminated in the CRZ prior to removal to the Support Zone. Equipment decontamination procedures are designed to minimize the potential for hazardous skin or inhalation exposure and to avoid cross-contamination and chemical incompatibilities.

General Equipment Decontamination Procedures:

1. Decontamination is required for all equipment exiting a contaminated area. Equipment may re-enter the Support Zone only after undergoing the equipment decontamination procedures.
2. Vehicles that travel regularly between the contaminated and clean areas of the site are carefully decontaminated each time they exit the Exclusion Zone and the effectiveness of that decontamination is monitored to reduce the likelihood that contamination will be spread to other parts of the site.

3. Particular attention is given to decontaminating tires, scoops, and other parts of heavy equipment that are directly exposed to contaminants and contaminated soil.

The following items may be used to decontaminate equipment:

- Fresh water rinse;
- Non-phosphorus detergent wash (Alconox or Liquinox);
- Distilled water rinse;
- Acetone rinse; and
- Distilled water rinse.

## 12.3 Monitoring the Effectiveness of Decontamination Procedures

Visual examination and sampling are used to evaluate the effectiveness of decontamination procedures. Visual examination is used to ensure that procedures are implemented as described and that they appear to control the spread of contaminants under changing site conditions. Visual examination is also used to inspect for signs of residual contamination or for contaminant permeation of PPE.

Personnel who work in contaminated areas of the site, either the Contamination Reduction Zone (CRZ) or the Exclusion Zone, are trained in the principles and practices of decontamination described in this section of the HASP and in related SOPs. If site procedures are changed as a result of inspection and monitoring, all affected employees are notified of these changes.

## 12.4 Disposal Procedures

A system of segregating all waste will be developed by the SSO.

All discarded materials, waste materials, or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left onsite. All potentially contaminated materials (e.g., clothing, gloves, etc.,) will be bagged or drummed as necessary, labeled and segregated for disposal. All non-contaminated materials shall be collected, bagged and labeled for appropriate disposal as domestic waste. All waste materials will be staged at the site.

# 13. Emergency Plan

Should an emergency situation occur, the emergency plan, outlined in this section, shall be known by all onsite personnel prior to the start of work. The emergency plan will be available for use at all times during Site work. The plan provides the phone numbers for the fire, police, ambulance, hospital, poison control centers, and directions to the hospital from the Site. This information is to be found in Section 2 of the HASP.

Various individual Site characteristics will determine preliminary actions taken to assure that this emergency plan is successfully implemented in the event of a Site emergency. Careful consideration must be given to the proximity of neighborhood housing or places of employment, and to the relative possibility of Site release of vapors, which could affect the surrounding community.

The emergency coordinator shall implement the contingency plan whenever conditions at the Site warrant such action. The coordinator will be responsible for coordination of the evacuation, emergency treatment, and transport of Site personnel as necessary, and notification of emergency response units and the appropriate management staff.

In cases where the project principal or project manager is not available, the SSO shall serve as the alternate emergency coordinator.

The SSO during an emergency will perform air monitoring as needed, as well as lend assistance and provide health and safety information to responding emergency personnel.

Site Personnel will endeavor to keep non-essential personnel away from the incident until the appropriate emergency resources arrive. At that time the responders will take control of the Site. Site personnel may be asked to lend assistance to emergency personnel such as during evacuations, help with the injured, etc.

## 13.1 Evacuation

Evacuation procedures will be discussed prior to the start of work and periodically during safety meetings. In the event of an emergency situation, such as fire, or explosion, an air horn, automobile horn, or other appropriate device will be sounded for three (3) sharp blasts indicating the initiation of evacuation procedures. The emergency evacuation route shall be known by all site workers. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SSO or project manager must ensure that access for emergency equipment is provided and that all combustion apparatuses have been shut down once the alarm has been sounded. All Site personnel will assemble in the designated nearest safe location. Once the safety of all personnel is established, the fire department and other emergency response groups will be notified by telephone of the emergency.

## 13.2 Personnel Injury

Emergency first aid shall be applied onsite as appropriate. For non-emergency situations, treatment should be sought, if needed, through the approved occupational health clinic. If necessary, the individual shall be decontaminated, if needed, and transported to the nearest hospital. The SSO will contact the Human Resources Director and OHSM if medical information is needed.

The ambulance/rescue squad shall be contacted for transport as necessary in an emergency. However, since some situations may require transport of an injured party by other means, the injured person shall be escorted to the occupational health clinic or hospital. Maps to these facilities are shown in Figure 3.

## 13.3 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone: (Direct contact, no phone messages).

| | | | **Office:** | **Cell:** |
|---|---|---|---|---|
| 1. | Project Manager: | Julie Moriarity | 631-232-2600 | 607-761-7849 |
| 2. | Project Principal: | Joseph Duminuco | 631-232-2600 | 631-921-6279 |
| 3. | Office Health and Safety Manager: | Levi Curnutte | 631-232-2600 | 727-743-0304 |
| 4. | Office Manager: | Michael Ritorto | 631-232-2600 | 631-445-4576 |

Written confirmation of verbal reports are to be submitted within 24 hours. The report form entitled "Accident Report and Investigation Form" (Appendix D) is to be used for this purpose. All representatives contacted by telephone are to receive a copy of this report. In addition to filling out the Accident Report and Investigation Form, if a Roux employee is involved in a motor vehicle accident, the employee must also complete the Acord form (Appendix E).

For reporting purposes, the term accident refers to fatalities, lost time injuries, spill or exposure to hazardous materials (radioactive materials, toxic materials, explosive or flammable materials), fire, explosion, property damage, or potential occurrence (i.e., near miss) of the above.

Any information released from the health care provider, which is not deemed confidential patient information, is to be attached to the appropriate form. Any medical information, which is released by patient consent, is to be filed in the individual's medical record and treated as confidential.

## 13.4 Personnel Exposure

| | |
|---|---|
| Skin Contact: | Use copious amounts of soap and water. Wash/rinse affected area thoroughly, then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. |
| Ingestion: | Decontamination and transport to emergency medical facility. |
| Puncture Wound or Laceration: | Decontamination and transport to emergency medical facility. |

# 14. Logs, Reports and Record Keeping

The following is a summary of required health and safety logs, reports, and record keeping for this project.

## 14.1 Medical and Training Records

The employer keeps medical and training records. The subcontractor employer must provide verification of training and medical qualifications to the SSO. The SSO will keep a log of personnel meeting appropriate training and medical qualifications for Site work. The log will be kept in the project file. Roux will maintain medical records in accordance with 29 CFR 1910.20.

## 14.2 Onsite Log

The SSO or project manager will keep a log of onsite personnel daily in the designated field book.

## 14.3 Exposure Records

Applicable personal monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept by Roux in accordance with 29 CFR 1910.20.

## 14.4 Near Loss Reports

A near loss report must be completed following procedures given in Appendix F. The originals will be sent to Roux for maintenance. Copies will be distributed as stated. A copy of the forms will be kept in the project file.

## 14.5 Accident/Incident Reports

For any injury (OSHA Recordable or not), including “FYI” injuries (injuries where pain was felt, but not even first aid treatment was needed), and illnesses, all work on the activity where the injury/illness occurred will be stopped. An accident/incident report must be completed following procedures given in Appendix D. The originals will be sent to Roux for maintenance. Copies will be distributed as stated. A copy of the forms will be kept in the project file.

## 14.6 OSHA Form 300

An OSHA Form 300 (Log of Occupational Injuries and Illnesses) (Appendix G) will be kept at the Site. All reportable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to Roux for maintenance.

## 14.7 Daily Health and Safety Briefing

The Daily Health and Safety Briefing form in Appendix I will be completed daily by the SSO and submitted to the project manager.

# 15. Field Team Review

Each Roux employee or subcontractor shall sign this section after site-specific training is completed and before being permitted to work at the Site.

*I have read and had Roux verbally review this Health and Safety Plan prepared for this Site with me. I understand and will comply with the provisions contained therein.*

Site/Project: Post Road Corridor
77 West Post Road
White Plains, New York

| Date | Name | Signature | Company |
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# TABLE

1. Toxicological, Physical and Chemical Properties of Compounds Potentially Present at the Site

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | TWA 350 ppm<br>STEL 440 ppm<br>C 440 ppm | C 350 ppm (1900 mg/m$^3$) [15-minute] | TWA 350 ppm (1900 mg/m$^3$) | 700 ppm | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac | Eyes, skin, central nervous system, cardiovascular system, liver | Colorless liquid with a mild, chloroform-like odor.<br>BP: 165°F<br>UEL: 12.5%<br>LEL: 7.5% |
| 1,1,2-Trichloroethane | 79-00-5 | TWA 10 ppm | Ca TWA 10 ppm (45 mg/m$^3$) [skin] | TWA 10 ppm (45 mg/m$^3$) [skin] | Ca [100 ppm] | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, nose; central nervous system depression; liver, kidney damage; dermatitis; [potential occupational carcinogen] | Eyes, respiratory system, central nervous system, liver, kidneys | Colorless liquid with a sweet, chloroform-like odor.<br>BP: 237°F<br>UEL: 15.5%<br>LEL: 6% |
| 1,1-Dichloroethane | 75-34-3 | TWA 100 ppm | TWA 100 ppm (400 mg/m$^3$) | TWA 100 ppm (400 mg/m$^3$) | 3000 ppm | inhalation, ingestion, skin and/or eye contact | Irritation skin; central nervous system depression; liver, kidney, lung damage | Skin, liver, kidneys, lungs, central nervous system | Colorless, oily liquid with a chloroform-like odor.<br>BP: 135°F<br>Fl.P: 2°F<br>UEL: 11.4%<br>LEL: 5.4% |
| 1,1-Dichloroethene | 75-35-4 | TWA 5 ppm | Ca (lowest feasible concentrati | TWA 1ppm | Ca [N.D.] | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney disturbance; pneumonitis; [potential occupational carcinogen] | Eyes, skin, respiratory system, central nervous system, liver, kidneys | Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor.<br>BP: 89°F<br>Fl.P: -2°F<br>UEL: 15.5%<br>LEL: 6.5%<br>Class IA Flammable Liquid |
| 1,2,4-Trimethylbenzene | 95-63-6 | None established | TWA 25 ppm (125mg/m$^3$) | None established | N.D. | Inhalation; ingestion; skin and/or eye contact | Eye, skin, nose, and throat, resp syst irritation; bronchitis; hypochromic anemia; headache, drowsiness, weakness, dizziness, nausea, incoordination, vomit, | Eyes, skin, resp sys, CNS, blood | Clear, colorless liquid with a distinctive, aromatic odor<br>BP: 337°F<br>FL.P: 112°F<br>UEL: 6.4%<br>LEL: 0.9%<br>Class II Flammable liquid |
| 1,2,4-Trimethylbenzene | 95-63-6 | TWA 25 ppm (125 m | TWA 25 ppm (125 mg/m$^3$) | None established | N.D. | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, fatigue, dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid) | Eyes, skin, respiratory system, central nervous system, blood | Clear, colorless liquid with a distinctive, aromatic odor.<br>BP: 337°F<br>Fl.P: 112°F<br>UEL: 6.4%<br>LEL: 0.9%<br>Class II Flammable Liquid |
| 1,2-Dichlorobenzene | 95-50-1 | TWA 25 ppm<br>STEL 50 ppm | C 50 ppm (300 mg/m$^3$) | C 50 ppm (300 mg/m$^3$) | 200 ppm | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, nose; liver, kidney damage; skin blisters | Eyes, skin, respiratory system, liver, kidneys | Colorless to pale-yellow liquid with a pleasant, aromatic odor. [herbicide]<br>BP: 357°F<br>Fl.P: 151°F<br>UEL: 9.2%<br>LEL: 2.2%<br>Class IIIA Combustible Liquid |

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dichloroethane | 107-06-2 | TWA 10 ppm | Ca TWA 1 ppm (4 mg/m$^3$)<br>STEL 2 ppm (8 mg/m$^3$) | TWA 50 ppm<br>C 100 ppm<br>200 ppm [5-minute maximum peak in any 3 hours] | Ca [50 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 | Colorless liquid with a pleasant, chloroform-like odor. [Note: Decomposes slowly, becomes acidic & darkens in color.]<br>BP: 182°F<br>Fl.P: 56°F<br>UEL: 16%<br>LEL: 6.2%<br>Class IB Flammable Liquid |
| 1,2-Dichloroethene (total) | 540-59-0 | TWA 200 ppm (790 | TWA 200 ppm (790 mg/m$^3$) | TWA 200 ppm (790 mg/m$^3$) | 1000 ppm | inhalation, ingestion, skin and/or eye contact | Irritation eyes, respiratory system; central nervous system depression | Eyes, respiratory system, central nervous system | Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor<br>BP: 118-140°F<br>Fl.P: 36-39°F<br>UEL: 12.8%<br>LEL: 5.6%<br>Class IB Flammable Liquid |
| 1,3,5-Trimethylbenzene | 108-67-8 | None established | TWA 25 ppm (125mg/m$^3$) | None established | N.D. | Inhalation; ingestion; skin and/or eye contact | Eye, skin, nose, and throat, resp syst irritation; bronchitis; hypochromic anemia; headache, drowsiness, weakness, dizziness, nausea, incoordination, vomit, confusion; chemical pneumonitis | Eyes, skin, resp sys, CNS, blood | Clear, colorless liquid with a distinctive, aromatic odor<br>BP: 329°F<br>FL.P: 122°F<br>Class II Flammable liquid |
| 1,3,5-Trimethylbenzene | 108-67-8 | TWA 25 ppm (125 m | TWA 25 ppm (125 mg/m$^3$) | None established | N.D | 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 | Clear, colorless liquid with a distinctive, aromatic odor.<br>BP: 329°F<br>Fl.P: 122°F<br>Class II Flammable Liquid |
| 1,4-Dichlorobenzene | 106-46-7 | TWA 10 ppm | Ca | TWA 75 ppm (450 mg/m$^3$) | Ca [150 ppm] | inhalation, skin absorption, ingestion, skin and/or eye contact | Eye irritation, swelling periorbital (situated around the eye); profuse rhinitis; headache, anorexia, nausea, vomiting; weight loss, jaundice, cirrhosis; in animals: liver, kidney injury; [potential occupational carcinogen] | Liver, respiratory system, eyes, kidneys, skin | Colorless or white crystalline solid with a mothball-like odor. [insecticide]<br>BP: 345°F<br>Fl.P: 150°F<br>LEL: 2.5%<br>Combustible Solid |
| 2,4-Dimethylphenol | 105-67-9 | None established | None established | None established | None established | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin, respiratory system, mouth, throat, stomach; dizziness, weakness, fatigue, nausea, headache; systemic damage; moderate to severe eye injury. | Skin, CVS, eyes, CNS | Clear, colorless liquid with a faint ether or chloroform-like odor<br>BP: 178°F |

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | 78-93-3 | TWA 200 ppm (590 mg/m$^3$)<br>STEL 300 ppm (885 mg/m$^3$) | TWA 200 ppm (590 mg/m$^3$)<br>STEL 300 ppm (885 mg/m$^3$) | TWA 200 ppm (590 mg/m$^3$) | 3000 ppm | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis | Eyes, skin, respiratory system, central nervous system | Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor.<br>BP: 175°F<br>Fl.P: 16°F<br>UEL(200°F): 11.4%<br>LEL(200°F): 1.4%<br>Class IB Flammable Liquid |
| Acenaphthene | 83-32-9 | None established | None established | None established | None established | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin, respiratory system | Eyes, skin, respiratory system | Brown solid |
| Acetone | 67-64-1 | TWA 500 ppm<br>STEL 50 ppm | TWA 250 ppm (590 mg/m$^3$) | TWA 1000 ppm (2400 mg/m$^3$) | 2500 ppm [10%LEL] | inhalation, ingestion, skin and/or eye contact | Irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis | Eyes, skin, respiratory system, central nervous system | Colorless liquid with a fragrant, mint-like odor<br>BP: 133°F<br>Fl.P: 0°F<br>UEL: 12.8%<br>LEL: 2.5%<br>Class IB Flammable Liquid |
| Anthracene | 65996-93-2 | TWA 0.2 mg/m$^3$ | Ca TWA 0.1 mg/m$^3$ (cyclohexane-extractable fraction) | TWA 0.2 mg/m$^3$ (benzene-soluble fraction) | Ca [80 mg/m$^3$] | inhalation, skin and/or eye contact | Dermatitis, bronchitis, [potential occupational carcinogen] | respiratory system, skin, bladder, kidneys | Black or dark-brown amorphous residue. Combustible Solids |
| Antimony | 7440-36-0 | TWA 0.5 mg/m$^3$ | TWA 0.5 mg/m$^3$ | TWA 0.5 mg/m$^3$ | 50 mg/m$^3$ (as S | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly | Eyes, skin, respiratory system, cardiovascular system | Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder.<br>BP: 2975°F |
| Arsenic (inorganic) | 7440-38-2 (metal) | TWA 0.01 mg/m3 | Ca<br>C 0.002 mg/m3 [15-min] | TWA 0.010 mg/m3 | Ca [5 mg/m3 (as As)] | Inhalation; ingestion; skin absorption; skin and/or eye contact | Ulceration of nasal septum, dermatitis, GI disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen] | Liver, kidneys, skin, lungs, lymphatic sys | Metal: sliver-gray or tin-white, brittle, odorless solid<br>BP: sublimes |
| Asbestos | 1332-21-4 | TWA 0.1 f/cc | Ca<br>100,000 fibers/m3 | TWA 0.1 fiber/cm3 | Ca [IDLH value has not been determined] | Inhalation; ingestion; skin and/or eye contact | Asbestosis (chronic exposure), dyspnea, interstitial fibrosis, restricted pulmonary function, finger clubbing, irritation eyes, [potential occupational carcinogen] | Respiratory system, eyes, | White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite), fibrous, odorless solids.<br>BP: decomposes |
| Asphalt fumes | 8052-42-4 | TWA 0.5 mg/m$^3$(fumes) | Ca<br>C 5 mg/m3 [15 min] | None established | Ca [IDLH value has not been determined] | Skin absorption; inhalation; skin and/or eye contact | Irritation eyes, resp sys | Eyes, respiratory system | Black or dark brown cement-like substance<br>Combustible solid |
| Barium | 7440-39-3 | TWA 0.5 mg/m3 | None established | TWA 0.5 mg/m3 | None established | Inhalation, ingestion, skin contact | Irritation skin, respiratory systen | Skin, eyes, respiratory system | Yellow white powder<br>BP: 1640 C |
| Benzene | 71-43-2 | TWA 0.5 ppm<br>STEL 2.5 ppm | Ca TWA 0.1 ppm<br>STEL 1 ppm | TWA 1 ppm<br>STEL 5 ppm | Ca [500 ppm] | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen] | Eyes, skin, respiratory system, blood, central nervous system, bone marrow | Colorless to light yellow liquid with an aromatic odor [Note: Solid below 42 °F]<br>BP: 176°F<br>Fl.Pt = 12°F<br>LEL: 1.2%<br>UEL: 7.8%<br>Class B Flammable liquid |

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| Benzo[a]anthracene | 56-55-3 | None established | None established | None established | None established | Inhalation; ingestion; skin absorption; skin and/or eye contact | Irritation eyes, skin, respiratory system, CNS | Skin | Pale Yellow crystal, solid<br>BP: 438 C |
| Benzo[a]pyrene | 50-32-8 | None established | TWA 0.1 mg/m3 | TWA 0.2 mg/m3 | None established | Inhalation; ingestion; skin absorption; skin and/or eye contact | POISON. This material is an experimental carcinogen, mutagen, tumorigen, neoplastigen and teratogen. It is a probable carcinogen in humans and a known human mutagen. IARC Group 2A carcinogen. It is believed to cause bladder, skin and lung cancer. Exposure to it may damage the developing foetus. May cause reproductive damage. Skin, respiratory and eye irritant or burns. | Skin, eye, bladder, lung, reproductive | Yellow crystals or powder [found in cigarette smoke, coal tar, fuel exhaust gas and in many other sources]<br>BP: 495 C |
| Benzo[b]fluoranthene | 205-99-2 | None established | TWA 0.1 mg/m3 | TWA 0.2 mg/m3 | None established | Inhalation; ingestion; skin and/or eye contact | No data were identified on the toxicity of benzo[b]fluoranthene to humans. Based on results of studies in animals, IARC concluded that benzo[b]fluoranthene is possibly carcinogenic to humans | Respiratory system, skin, bladder, kidneys | Off-white to tan powder |
| Benzo[k]fluoranthene | 207-08-9 | None established | None established | None established | None established | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin, respiratory tract, gastrointestinal; fatal if swallowed, inhaled, absorbed through the skin; vomiting, nausea, diarrhea | Lungs, respiratory system | Yellow crystals<br>BP: 480 C |
| Beryllium | 7440-41-7 (metal) | TWA 0.002 mg/m$^3$ | Ca<br>C 0.0005 mg/m$^3$ | TWA 0.002 mg/m$^3$<br>C 0.005 mg/m$^3$ (30 minutes) with a maximum peak of 0.025 mg/m$^3$ | Ca [4 mg/m$^3$ (as Be)] | inhalation, skin and/or eye contact | Berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen] | Eyes, skin, respiratory system | Metal: A hard, brittle, gray-white solid.<br>BP: 4532°F |
| Bis(2-ethylhexyl) phthalate | 117-81-7 | TWA 5 mg/m$^3$ | TWA 5 mg/m$^3$<br>STEL 10 mg/m$^3$ (do not exceed during andy 15-minute work period) | TWA 5 mg/m$^3$ | None established | inhalation, skin and/or eye contact | Irritation eyes, skin, nose, throat; affect the nervous system and liver; damage to male reproductive glands | Eyes, skin, nose, respiratory system, nervous system, reproductive system, liver | Colorless to light colored, thick liquid with slight odor |
| Butane | 106-97-8 | TWA 1000 ppm | TWA 800 ppm (1900 mg/m$^3$) | None established | None established | inhalation, skin and/or eye contact (liquid) | Drowsiness, narcosis, asphyxia; liquid: frostbite | central nervous system | Colorless gas with a gasoline-like or natural gas odor.<br>BP: 31°F<br>UEL: 8.4%<br>LEL: 1.6%<br>Flammable Gas |

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 7440-43-9 (metal) | TWA 0.01 $mg/m^3$ | Ca | TWA 0.005 $mg/m^3$ | Ca [9 $mg/m^3$ (as Cd)] | inhalation, ingestion | Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen] | respiratory system, kidneys, prostate, blood | Metal: Silver-white, blue-tinged lustrous, odorless solid.<br>BP: 1409°F |
| Carbon Disulfide | 75-15-0 | TWA 1 ppm | TWA 1 ppm (3 $mg/m^3$)<br>STEL 10 ppm (30 $mg/m^3$) [skin] | TWA 20 ppm<br>C 30 ppm<br>100 ppm (30-minute maximum peak) | 500 ppm | inhalation, skin absorption, ingestion, skin and/or eye contact | Dizziness, headache, poor sleep, lassitude (weakness, exhaustion), anxiety, anorexia, weight loss; psychosis; polyneuropathy; Parkinson-like syndrome; ocular changes; coronary heart disease; gastritis; kidney, liver injury; eye, skin burns; dermatitis; reproductive effects | central nervous system, peripheral nervous system, cardiovascular system, eyes, kidneys, liver, skin, reproductive system | Colorless to faint-yellow liquid with a sweet ether-like odor.<br>BP: 116°F<br>Fl.P: -22°F<br>UEL: 50.0%<br>LEL: 1.3%<br>Class IB Flammable Liquid |
| Chlorobenzene | 108-90-7 | TWA 10 ppm | None established | TWA 75 ppm (350 $mg/m^3$) | 1000 ppm | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin, nose; drowsiness, incoordination; central nervous system depression; in animals: liver, lung, kidney injury | Eyes, skin, respiratory system, central nervous system, liver | Colorless liquid with an almond-like odor<br>BP: 270°F<br>Fl.P: 82°F<br>UEL: 9.6%<br>LEL: 1.3% |
| Chloroethane | 75-00-3 | TWA 100ppm | Handle with caution in the workplace | TWA 1000 ppm (2600 $mg/m^3$) | 3800 ppm [10%LEL] | inhalation, skin absorption (liquid), ingestion (liquid), skin and/or eye contact | Incoordination, inebriation; abdominal cramps; cardiac arrhythmias, cardiac arrest; liver, kidney damage | Liver, kidneys, respiratory system, cardiovascular system, central nervous system | Colorless gas or liquid (below 54°F) with a pungent, ether-like odor.<br>BP: 54°F<br>Fl.P: NA (Gas) -58°F (Liquid)<br>UEL: 15.4%<br>LEL: 3.8% |
| Chloroform | 67-66-3 | TWA 10 ppm | Ca<br>STEL 2 ppm (9.78 $mg/m^3$) [60-minute] | C 50 ppm (240 $mg/m^3$) | Ca [500 ppm] | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin; dizziness, mental dullness, nausea, confusion; headache, lassitude (weakness, exhaustion); anesthesia; enlarged liver; [potential occupational carcinogen] | Liver, kidneys, heart, eyes, skin, central nervous system | Colorless liquid with a pleasant odor<br>BP: 143°F |
| Chromium | 7440-47-3 | TWA 0.5 $mg/m^3$ (metal and Cr III compounds)<br>TWA 0.05 $mg/m^3$ (water-soluble Cr IV compounds)<br>TWA 0.01 $mg/m^3$ (insoluble Cr IV compounds) | TWA 0.5 $mg/m^3$ | TWA 1 $mg/m^3$ | 250 $mg/m^3$ (as Cr) | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin; lung fibrosis (histologic) | Eyes, skin, respiratory system | Blue-white to steel-gray, lustrous, brittle, hard, odorless solid.<br>BP: 4788°F |
| Chrysene; Phenanthrene; Pyrene; Coal tar pitch volatiles | 65996-93-2 | TWA 0.2 mg/m3 | Ca<br>TWA 0.1 $mg/m^3$ (cyclohexane-extractable fraction) | TWA 0.2 $mg/m^3$ (benzene-soluble fraction) | Ca [80 $mg/m^3$] | Inhalation, skin and/or eye contact | Dermatitis, bronchitis, [potential occupational carcinogen] | Respiratory system, skin, bladder, kidneys | Black or dark-brown amorphous residue.<br>Combustible Solids |

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| cis-1,2-Dichloroethene | 158-59-2 | TWA 200 ppm | TWA 200 ppm | TWA 200 ppm | None established | inhalation, skin absorption, ingestion | Harmful if swallowed, inhaled, or absorbed through skin. Irritant. Narcotic. Suspected carcinogen | Skin | Colorless liquid<br>BP: 60 C<br>Fl.P: 4 C<br>UEL: 12.8%<br>LEL: 9.7 % |
| Copper | 7440-50-8 | TWA 0.2mg/m$^3$ (fume)<br>1 mg/m$^3$ (dusts and mists) | TWA 1 mg/m$^3$ | TWA 1 mg/m$^3$ | 100 mg/m$^3$ (as Cu) | Inhalation, ingestion, skin and/or eye contact | Irritation eyes, respiratory system; cough, dyspnea (breathing difficulty), wheezing | Eyes, skin, respiratory system, liver, kidneys (increase(d) risk with Wilson's disease) | Noncombustible Solid in bulk form, but powdered form may ignite.<br>BP: 4703°F |
| Dibenzo[a,h]anthracene | 53-70-3 | None established | None established | None established | None established | Inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin | Eyes, skin; skin photosensitization. | Colorless crystalline powder<br>BP: 524°C |
| Diesel Fuel #2 | 68476-34-6 | None established | None established | Designated as an OSHA Select Carcinogen | None established | ingestion, skin and/or eye contact | Kidney damage; potential lung damage; suspected carcinogen; irritation of eyes, skin, respiratory tract; dizziness, headache, nausea; chemical pneumonitis (from aspiration of liquid); dry, red skin; irritant contact dermatitis; eye redness, pain. | Eyes, skin, kidneys | Clear yellow brown combustible liquid; floats on water; distinct diesel petroleum hydrocarbon odor.<br>BP: 356-716°F<br>Fl.P: 154.4-165.2°F<br>LEL: 0.6%<br>UEL: 7.0% |
| Ethylbenzene | 100-41-4 | TWA 100 ppm<br>STEL 125 ppm | TWA 100 ppm (435 mg/m$^3$)<br>STEL 125 ppm (545 mg/m$^3$) | TWA 100 ppm (435 mg/m$^3$) | 800 ppm [10%LEL] | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma | Eyes, skin, respiratory system, central nervous system | Colorless liquid with an aromatic odor.<br>BP: 277°F<br>Fl.P: 55°F<br>UEL: 6.7%<br>LEL: 0.8%<br>Class IB Flammable Liquid |
| Fluoranthene | 206-44-0 | None established | None established | None established | None established | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin; possible burns; heart and liver injury, pulmonary edema, respiratory arrest, gastrointestinal disturbances. | Heart, liver, lungs. | Yellow needles. |
| Fluorene | 86-73-7 | None established | None established | None established | None established | inhalation, ingestion, skin and/or eye contact | Irritation skin, digestive tract | Skin | White crystals<br>BP: 563°F |
| Fuel Oil #2 | 68476-30-2 | TWA 100mg/m$^3$ (aerosol and vapor, as total hydrocarbons) | None established | None established | None established | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin; CNS effects; nausea, vomiting, headache, cramping, dizziness, weakness, loss of coordination,, drowsiness; kidney, liver damage | Eyes, skin, CNS | Clear or yellow to red oily liquid, kerosene-like odor<br>BP: 347 - 689 °F<br>UEL:5-6%<br>LEL: 0.7-1.0% |
| Gasoline | 8006-61-9 | TWA 300 ppm<br>STEL 500 ppm | Carcinogen | None established | Ca [IDLH value has not been determined] | Skin absorption; inhalation; ingestion; skin and/or eye contact | Eyes and skin irritation, mucous membrane; dermatitis; headache; listlessness, blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis; possible liver, kidney damage [Potential occupational carcinogen] | Eyes, skin, respiratory system, CNS, Liver, Kidneys | Clear liquid with a characteristic odor, aromatic<br>Fl.Pt = -45°F<br>LEL = 1.4%<br>UEL = 7.6%<br>Classs 1B Flammable Liquid |

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| Hexachlorobutadiene | 87-68-3 | TWA 0.02 ppm | Ca TWA 0.02 ppm (0.24 mg/m$^3$) [skin] | None established | Ca [N.D.] | inhalation, skin absorption, ingestion, skin and/or eye contact | In animals: irritation eyes, skin, respiratory system; kidney damage; [potential occupational carcinogen] | Eyes, skin, respiratory system, kidneys | Clear, colorless liquid with a mild, turpentine-like odor.<br>BP: 419°F |
| Hydrogen Sulfide | 7783-06-4 | TWA (1 ppm) STEL (5 ppm) (adopted values for which changes are proposed in the NIC) | C 10 ppm (15 mg/m$^3$) [10-minute] | C 20 ppm 50 ppm [10-minute maximum peak] | 100 ppm | inhalation, skin and/or eye contact | Irritation eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation; dizziness, headache, lassitude (weakness, exhaustion), irritability, insomnia; gastrointestinal disturbance; liquid: frostbite | Eyes, respiratory system, central nervous system | Colorless gas with a strong odor of rotten eggs.<br>BP: -77°F<br>UEL: 44.0%<br>LEL: 4.0%<br>Flammable Gas |
| Indeno[1,2,3-cd]pyrene | 193-39-5 | None established | None established | None established | None established | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin; possible human carcinogen (skin); weakness; affect liver, lung tissue, renal tissue; impairment of blood forming tissue | Skin | Fluorescent green-yellow crystalline solid<br>BP: 536 C |
| Indeno[1,2,3-cd]pyrene | 193-39-5 | None established | None established | None established | None established | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin; possible human carcinogen (skin); weakness; affect liver, lung tissue, renal tissue; impairment of blood forming tissue | Skin | Yellowish crystal solid<br>BP: 536 C |
| Isopropylbenzene | 98-82-8 | TWA 50 ppm | TWA 50 ppm (245 mg/m$^3$) [skin] | TWA 50 ppm (245 mg/m$^3$) [skin] | 900 ppm [10%LEL] | 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 | Colorless liquid with a sharp, penetrating, aromatic odor.<br>BP: 306°F<br>Fl.P: 96°F<br>UEL: 6.5%<br>LEL: 0.9% |
| Kerosene | 8008-20-6 | TWA 200 mg/m$^3$ | TWA 100 mg/m$^3$ | None established | IDLH value has not been determined | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid) | Eyes, skin, respiratory system, central nervous system | Colorless to yellowish, oily liquid with a strong, characteristic odor.<br>BP: 347-617°F<br>Fl.P: 100-162°F<br>UEL: 5%<br>LEL: 0.7%<br>Class II Combustible Liquid |
| Lead | 7439-92-1 | TWA 0.05 mg/m$^3$ | TWA (8-hour) 0.050 mg/m$^3$ | TWA 0.050 mg/m$^3$ | 100 mg/m$^3$ (as Pb) | 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 | A heavy, ductile, soft, gray solid.<br>BP: 3164°F<br>Noncombustible Solid in bulk form |

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| Manganese | 7439-96-5 (metal) | TWA 0.2 mg/m$^3$ | TWA 1 mg/m$^3$<br>STEL 3 mg/m$^3$ | C 5 mg/m$^3$ | 500 mg/m$^3$ (as Mn) | inhalation, ingestion | Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage | respiratory system, central nervous system, blood, kidneys | A lustrous, brittle, silvery solid.<br>BP: 3564°F |
| Mercury (organo) alkyl compounds (as Hg) | 7439-97-6 | TWA 0.01 mg/m$^3$<br>STEL 0.03 mg/m$^3$ [skin] | TWA 0.01 mg/m$^3$<br>STEL 0.03 mg/m$^3$ [skin] | TWA 0.01 mg/m$^3$<br>C 0.04 mg/m$^3$ | 2 mg/m$^3$ (as Hg) | inhalation, skin absorption, ingestion, skin and/or eye contact | Paresthesia; ataxia, dysarthria; vision, hearing disturbance; spasticity, jerking limbs; dizziness; salivation; lacrimation (discharge of tears); nausea, vomiting, diarrhea, constipation; skin burns; emotional disturbance; kidney injury; possible teratogenic effects | Eyes, skin, central nervous system, peripheral nervous system, kidneys | Appearance and odor vary depending upon the specific (organo) alkyl mercury compound |
| Mercury compounds [except (organo) alkyls] (as Hg) Mercury | 7439-97-6 | TWA 0.025 mg/m$^3$ (elemental and inorganic forms) | Hg Vapor: TWA 0.05 mg/m$^3$ [skin]<br>Other: C 0.1 mg/m3 [skin] | TWA 0.1 mg/m$^3$ | 10 mg/m$^3$ (as Hg) | inhalation, skin absorption, ingestion, skin and/or 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 | Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.]<br>BP: 674°F |
| Methyl tert-butyl ether (MTBE) | 1634-04-4 | TWA 50 ppm | No established REL | None established | None established | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, mucous membrane, respiratory; dizziness, nausea, headache, intoxication | Eyes, skin, mucous membrane, respiratory system, central nervous system | Colorless liquid<br>BP: 55.2 C |
| Methylene Chloride | 75-09-2 | TWA 50 ppm, A3 - suspected human carcinogen | Ca | TWA 25 ppm<br>STEL 125 ppm | Ca [2300 ppm] | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numbness, tingle limbs; nausea; [potential occupational carcinogen] | Eyes, skin, cardiovascular system, central nervous system | Colorless liquid with a chloroform-like odor<br>BP: 104°F<br>UEL: 23%<br>LEL: 13% |
| Naphtha (coal tar) | 8030-30-6 | None established | TWA 100 ppm (400 mg/m$^3$) | TWA 100 ppm (400 mg/m$^3$) | 1000 ppm [10%LEL] | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin, nose; dizziness, drowsiness; dermatitis; in animals: liver, kidney damage | Eyes, skin, respiratory system, central nervous system, liver, kidneys | Reddish-brown, mobile liquid with an aromatic odor<br>BP: 320-428°F<br>Fl.P: 100-109°F<br>Class II Combustible Liquid |

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 91-20-3 | TWA 10 ppm<br>STEL 15 ppm | TWA 10 ppm (50 mg/m$^3$)<br>STEL 15 ppm (75 mg/m$^3$) | TWA 10 ppm (50 mg/m$^3$) | 250 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 | Colorless to brown solid with an odor of mothballs.<br>BP: 424°F<br>Fl.P: 174°F<br>UEL: 5.9%<br>LEL: 0.9% |
| n-Butylbenzene | 104-51-8 | None established | None established | None established | None established | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin; CNS depression, lung damage; nausea, vomiting, headache, dizziness, weakness, loss of coordination, blured vision, drowsiness, confusion, disorientation | Eyes, skin,repiratory system, central nervous system | Colorless liquid with a sweet odor<br>BP: 183 C<br>Fl.P: 59 C<br>UEL: 5.8%<br>LEL: 0.8% |
| Nickel | 7440-02-0 (Metal) | TWA 1.5 mg/m$^3$ (elemental)<br>TWA 0.1 mg/m$^3$ (soluble inorganic compounds)<br>TWA 0.2 mg/m$^3$ (insoluble inorganic compounds)<br>TWA 0.1 mg/m$^3$ (Nickle subsulfide) | Ca TWA 0.015 mg/m$^3$ | TWA 1 mg/m$^3$ | Ca [10 mg/m$^3$ (as Ni)] | inhalation, ingestion, skin and/or eye contact | Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen] | Nasal cavities, lungs, skin | Metal: Lustrous, silvery, odorless solid.<br>BP: 5139°F |
| Nitrobenzene | 98-95-3 | TWA 1 ppm | TWA 1 ppm (5 mg/m$^3$) [skin] | TWA 1 ppm (5 mg/m$^3$) [skin] | 200 ppm | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin; anoxia; dermatitis; anemia; methemoglobinemia; in animals: liver, kidney damage; testicular effects | Eyes, skin, blood, liver, kidneys, cardiovascular system, reproductive system | Yellow, oily liquid with a pungent odor like paste shoe polish.<br>BP: 411°F<br>Fl.P: 190°F<br>LEL(200°F): 1.8% |
| n-Propylbenzene | 103-65-1 | None established | None established | None established | None established | inhalation, ingestion, skin and/or eye contact | Harmful if swallowed, Irritation eyes, skin, digestive tract, respiratory tract, central nervous system | Eyes, skin, central nervous system, respiratory system | colorless or light yellow liquid<br>BP: 159 C<br>Fl.P: 47 C<br>UEL: 6%<br>LEL: 0.8% |
| Petroleum hydrocarbons(Petroleum distillates) | 8002-05-9 | None established | TWA 350 mg/m$^3$<br>C 1800 mg/m$^3$ [15 min] | TWA 500 ppm (2000 mg/m$^3$) | 1,100 [10% LEL] | Inhalation; ingestion; skin and/or eye contact | Irritation eyes, skin, nose, throat; dizziness, drowsiness, headache, nausea; dried/cracked skin; chemical pneumonitis | CNS, eyes, respiratory system, skin | Colorless liquid with a gasoline or kerosene-like odor<br>BP: 86-460°F<br>Fl. Pt = -40 to -86°F<br>UEL: 5.9%<br>LEL: 1.1%<br>Flammable liquid |

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

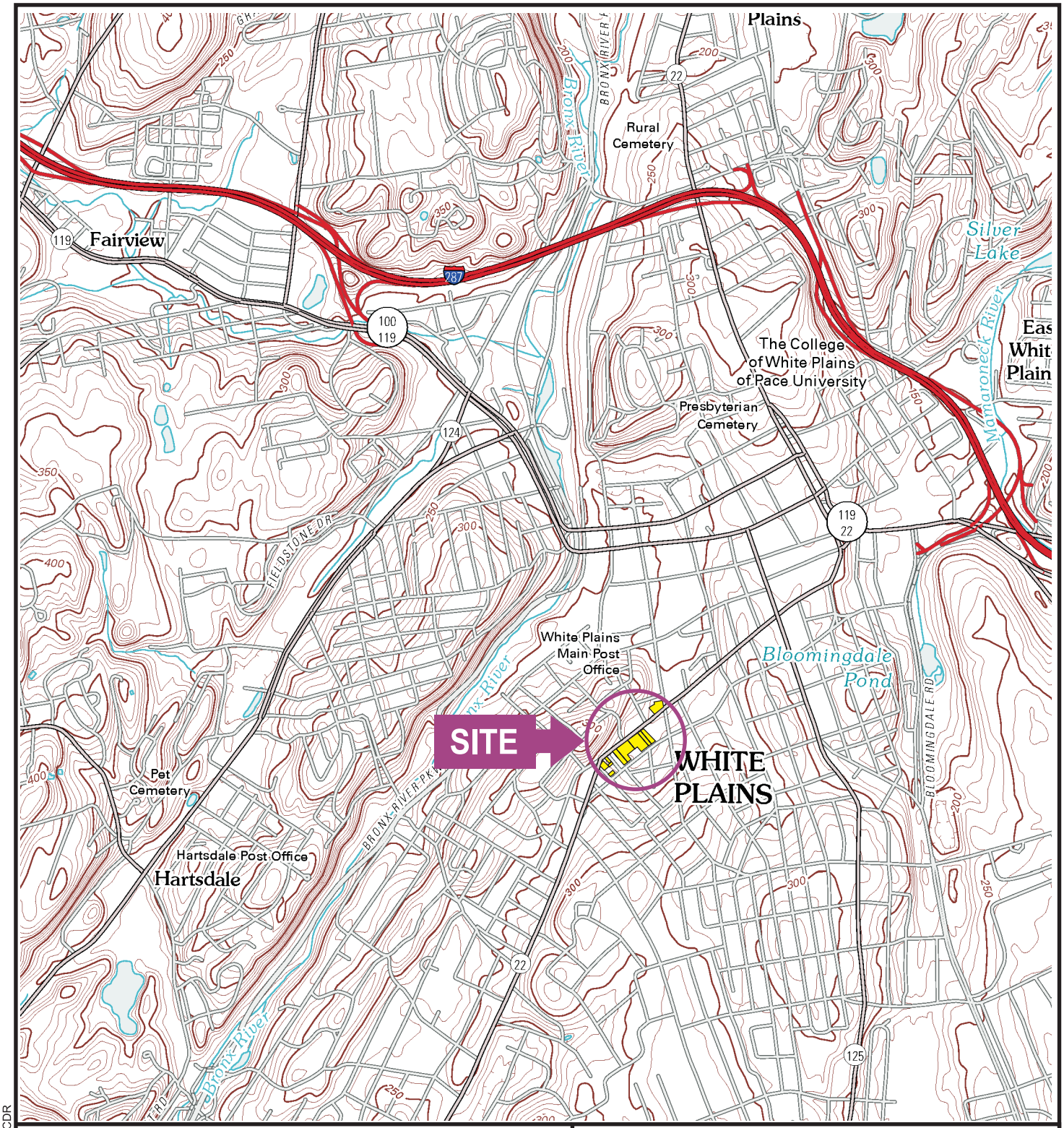
| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| Phenol | 108-95-2 | TWA 5 ppm | TWA 5 ppm (19 mg/m$^3$) C 15.6 ppm (60 mg/m$^3$) [15-minute] [skin] | TWA 5 ppm (19 mg/m$^3$) [skin] | 250 ppm | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, nose, throat; anorexia, weight loss; lassitude (weakness, exhaustion), muscle ache, pain; dark urine; cyanosis; liver, kidney damage; skin burns; dermatitis; ochronosis; tremor, convulsions, twitching | Eyes, skin, respiratory system, liver, kidneys | Colorless to light-pink, crystalline solid with a sweet, acrid odor.<br>BP: 359°F<br>UEL: 8.6%<br>LEL: 1.8% |
| p-Isopropyltoluene | 99-87-6 | None established | None established | None established | None established | inhalation, skin absorption, eye contact | Irritation skin | CNS, skin | Colorless, clear liquid, sweetish aromatic odor<br>BP: 350.8°F<br>Class III Flammable liquid |
| sec-Butylbenzene | 135-98-8 | None established | None established | None established | None established | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin, upper airway; central nervous system, headache, dizziness; gastrointestinal disturbance | Respiratory system, central nervous system, eyes, skin; | Colorless liquid<br>BP: 344°F<br>Fl.P: 126 °F<br>UEL: 6.9%<br>LEL: 0.8%<br>Combustible liquid |
| Selenium | 7782-49-2 | TWA 0.2 mg/m$^3$ | TWA 0.2 mg/m$^3$ | TWA 0.2 mg/m$^3$ | 1 mg/m$^3$ (as Se) | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage | Eyes, skin, respiratory system, liver, kidneys, blood, spleen | Amorphous or crystalline, red to gray solid. [Note: Occurs as an impurity in most sulfide ores.]<br>BP: 1265°F |
| Silver | 7440-22-4 (metal) | TWA 0.1 mg/m$^3$ (metal, dust, fumes) TWA 0.01 mg/m$^3$ (Soluble compounds, as Ag) | TWA 0.01 mg/m$^3$ | TWA 0.01 mg/m$^3$ | 10 mg/m$^3$ (as Ag) | inhalation, ingestion, skin and/or eye contact | Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance | Nasal septum, skin, eyes | Metal: White, lustrous solid<br>BP: 3632°F |
| Slop Oil | 69029-75-0 | None established | None established | None established | None established | Inhalation; ingestion | Irritation eyes, skin, gastrointestinal tract | Eyes, skin, gastrointestinal tract | Clear light to dark amber liquid, with mild hydrocarbon odor.<br>BP: >500°F<br>Fl.P : 250°F |
| Sulfuric Acid | 7664-93-9 | TWA 0.2 mg/m$^3$ | TWA 1 mg/m$^3$ | TWA 1 mg/m$^3$ | 15 mg/m$^3$ | inhalation, ingestion, skin and/or eye contact | Irritation eyes, skin, nose, throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatis; dental erosion; eye, skin burns; dermatitis | Eyes, skin, respiratory system, teeth | Colorless to dark-brown, oily, odorless liquid.<br>BP: 554°F<br>Noncombustible Liquid |
| tert-Butylbenzene | 98-06-6 | None established | None established | None established | None established | inhalation, skin absorption, ingestion, | Eye and respiratory irritant; CNS depression; liver or kidney damage | Respiratory system, central nervous system, eyes, liver, kidney | Colorless liquid with an aromatic odor<br>BP: 168 - 169 C<br>Fl.P: 34 C<br>UEL:5.6 %<br>LEL: 0.8 % |

**Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 77 West Post Road, White Plains, New York**

| Compound | CAS # | ACGIH TLV | NIOSH REL | OSHA PEL | IDLH | Routes of Exposure | Toxic Properties | Target Organs | Physical/Chemical Properties |
|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 127-18-4 | TWA 25 ppm<br>STEL 100 ppm (STEL)<br>listed as A3, animal carcinogen | Ca Minimize workplace exposure concentrations | TWA 100 ppm<br>C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm | Ca [150 ppm] | inhalation, skin absorption, ingestion, skin and/or eye contact | Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen] | Eyes, skin, respiratory system, liver, kidneys, central nervous system | Colorless liquid with a mild, chloroform-like odor.<br>BP: 250°F<br>Noncombustible Liquid |
| Toluene | 108-88-3 | TWA 20 ppm | TWA 100 ppm (375 mg/m$^3$)<br>STEL 150 ppm (560 mg/m$^3$) | TWA 200 ppm<br>C 300 ppm 500 ppm (10-minute maximum peak) | 500 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 | Colorless liquid with a sweet, pungent, benzene-like odor.<br>BP: 232°F<br>Fl.P: 40°F<br>UEL: 7.1%<br>LEL: 1.1%<br>Class IB Flammable Liquid |
| trans-1,2-Dichloroethene | 156-60-5 | TWA 200 ppm | None established | TWA 200 ppm<br>STEL 250 ppm (skin) | None established | inhalation, skin absorption, ingestion, skin and/or eye contact | Narcotic. Irritation eyes, skin, respiratory tract, mucous membrane; CNS depression. | Respiratory tract, mucous membrane, eyes, skin, CNS | Colorless liquid with a fruity pleasant odor<br>BP: 48°C<br>Fl.P 6C<br>UEL: 12.8%<br>LEL: 9.7% |
| Trichloroethene | 79-01-6 | TWA 10 ppm<br>STEL 25 ppm | Ca | TWA 100 ppm<br>C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours) | Ca [1000 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 | Colorless liquid (unless dyed blue) with a chloroform-like odor.<br>BP: 189°F<br>UEL(77°F): 10.5%<br>LEL(77°F): 8% |
| Vinyl Chloride | 75-01-4 | TWA 1 ppm | Carcinogen | TWA 1 ppm<br>C 5 ppm [15-minute] | Ca [IDLH value has not been determined] | inhalation, skin, and/or eye contact (liquid) | Lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen] | Liver, central nervous system, blood, respiratory system, lymphatic system | Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations.<br>BP: 7°F<br>UEL: 33.0%<br>LEL: 3.6%<br>Flammable Gas |
| Xylene (m, o & p isomers) | 108-38-3, 95-47-6, 106-42-3 | TWA 100 ppm (435 mg/m$^3$)<br>STEL 150 ppm | TWA 100 ppm (435 mg/m$^3$) | TWA 100 ppm (435 mg/m$^3$) | 900 ppm | Skin absorption, inhalation, ingestion, skin, and/or 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 | Colorless liquid with an aromatic odor<br>BP: 282°F, 292°F, 281°F<br>Fl. Pt. 82°F, 90°F, 81°F<br>LEL: 1.1%, 0.9%, 1.1%<br>UEL: 7.0%, 6.7%, 7.0%<br>Classs C Flammable Liquid |
| Zinc | 7440-66-6 | TWA 10 mg/m3 (Inhalable fraction) | None established | TWA 10 mg/m3 (for zinc oxide fume) | None established | skin and/or eye contact, inhalation, ingestion | Irritation eyes, skin, respiratory tract; gastrointestinal disturbances | Eyes, skin, respiratory system | Bluish gray solid<br>BP: 1664.6°F<br>Flammable |

# FIGURES

1. Site Location Map
2. Site Layout Plan
3. Hospital Route Map




QUADRANGLE LOCATION


SOURCE:
USGS; 2010, White Plains, NY
7.5 Minute Topographic Quadrangle

N

0 2000'

Title:

# SITE LOCATION MAP

SITE HASP
POST ROAD CORRIDOR - WHITE PLAINS
77 WEST POST ROAD, WHITE PLAINS, NY

Prepared for:

POST MAPLE 77, LLC

ROUX ASSOCIATES, INC.
*Environmental Consulting & Management*

| | | |
|---|---|---|
| Compiled by: R.M. | Date: 15MAY13 | FIGURE |
| Prepared by: B.H.C. | Scale: AS SHOWN | 1 |
| Project Mgr.: R.M. | Project No.: 2195.0001Y000 | |
| File: 2195.0001Y106.03.CDR | | |

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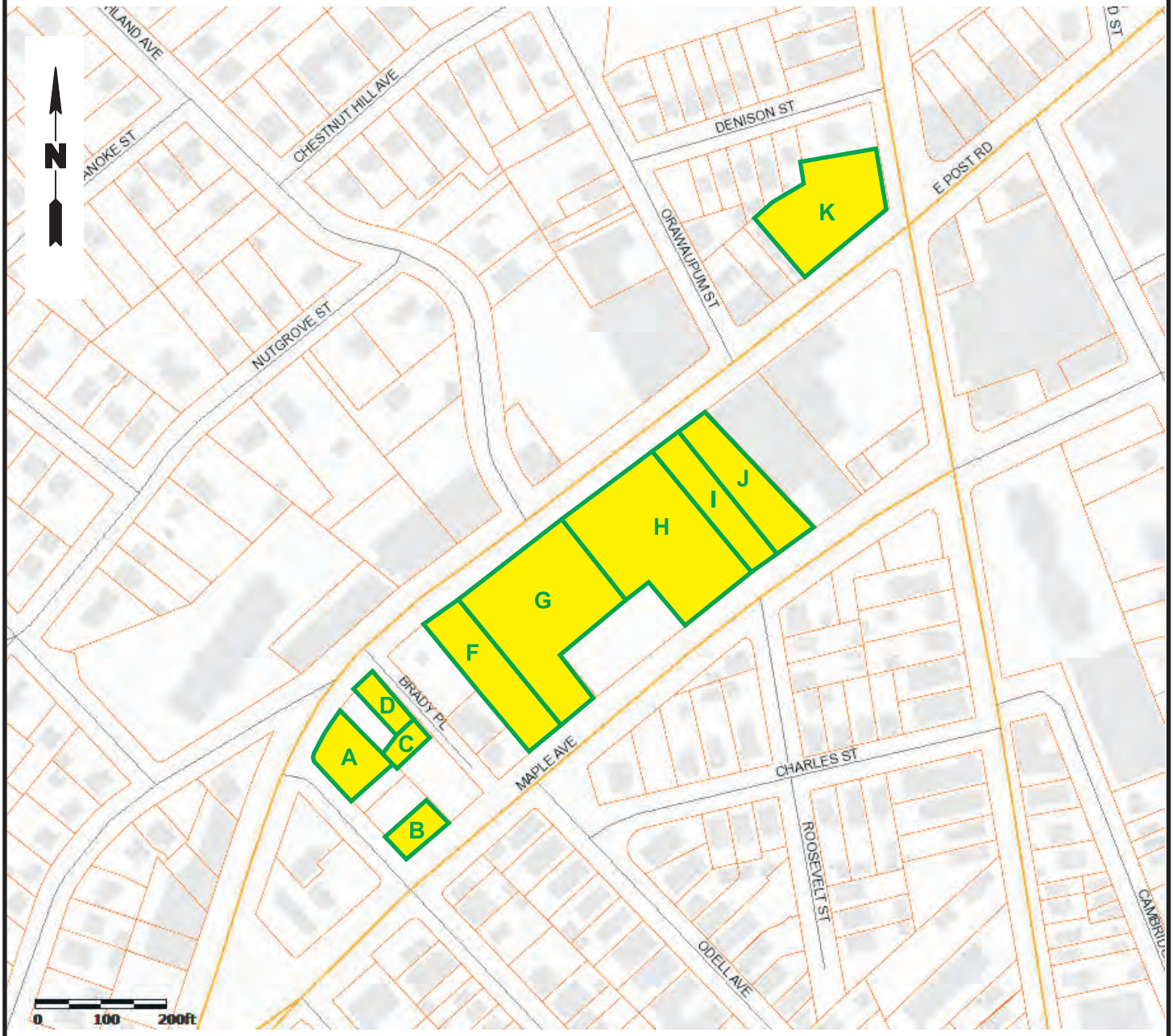


## Legend

Site Location and Tax Parcel
(See tax parcel reference list below.)

SOURCE: Westchester County Geographic Information Systems Website.

| REF. | ADDRESS | TAX I.D. |
|---|---|---|
| A | 99-103 W. Post Rd | 130.34-6-1 |
| B | 5 Rathbun Avenue | 130.34-6-6 |
| C | 3 Brady Place | 130.34-6-4 |
| D | 95 W. Post Rd | 130.34-6-3 |
| F | 79-83 W. Post Rd | 130.34-5-2 |
| G | 77 W. Post Rd | 130.34-5-3 |
| H | 55 W. Post Rd | 130.34-5-4 |
| I | 41-45 W. Post Rd | 130.34-5-5 |
| J | 35 W. Post Rd | 130.34-5-6 |
| K | 190-192 S. Lexington Ave | 130.27-8-3 |

Title:

# SITE LAYOUT

SITE HASP
POST ROAD CORRIDOR - WHITE PLAINS
77 WEST POST ROAD, WHITE PLAINS, NY

Prepared for:

POST MAPLE 77, LLC

ROUX ASSOCIATES, INC.
*Environmental Consulting & Management*

| | | |
|---|---|---|
| Compiled by: R.M. | Date: 15MAY13 | FIGURE |
| Prepared by: B.H.C. | Scale: AS SHOWN | 2 |
| Project Mgr.: R.M. | Project No.: 2195.0001Y000 | |
| File: 2195.0001Y106.03.CDR | | |

\2195Y0001Y\106\2195.0001Y106.03.CDR


## DIRECTIONS

- Exit site and head northeast on W New York Post Road/ E Post Road toward Highland Avenue. (0.3 mi.)
- Arrive at White Plains Hospital on right at 41 E Post Road, White Plains, NY.

0 400'

Title:

# HOSPITAL ROUTE MAP

SITE HASP
POST ROAD CORRIDOR - WHITE PLAINS
77 WEST POST ROAD, WHITE PLAINS, NY

Prepared for:

POST MAPLE 77, LLC

ROUX ASSOCIATES, INC.
*Environmental Consulting & Management*

| | | |
|---|---|---|
| Compiled by: R.M. | Date: 15MAY13 | FIGURE |
| Prepared by: B.H.C. | Scale: AS SHOWN | 3 |
| Project Mgr.: R.M. | Project No.: 2195.0001Y000 | |
| File: 2195.0001Y106.03.CDR | | |

\2195Y0001Y\106\2195.0001Y106.03.CDR

# APPENDICES

A. Job Safety Analysis
B. Heat and Cold Stress Guidelines
C. Medical Data Form
D. Accident Report and Investigation Form
E. Acord Automobile Loss Form
F. Near Loss Reporting Form
G. OSHA 300
H. Job Safety and Health Protection Poster
I. Health and Safety Briefing/Tailgate Meeting Form
J. Generic Community Air Monitoring Plan

# APPENDIX A

Job Safety Analysis

| **JOB SAFETY ANALYSIS** **Ctrl. No. GEN-004** | DATE 12/6/2012 | ☐ NEW ☒ REVISED | PAGE 1 of 2 |
|---|---|---|---|

| JSA TYPE CATEGORY: **Generic** | WORK TYPE: **Drilling** | WORK ACTIVITY (Description): **Direct Push Soil Borings / Well Installation** | |
|---|---|---|---|
| **DEVELOPMENT TEAM** | **POSITION / TITLE** | **REVIEWED BY:** | **POSITION / TITLE** |
| | | | |
| Jeffrey Wills | Project Hydrogeologist | Curtis Taylor | Health and Safety Officer |
| | | Michael Ritorto | Project Hydrogeologist |

**REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT**

| | | | |
|---|---|---|---|
| ☐ LIFE VEST<br>☒ HARD HAT<br>☐ LIFELINE / BODY HARNESS<br>☒ SAFETY GLASSES | ☐ GOGGLES<br>☐ FACE SHIELD<br>☒ HEARING PROTECTION: (as needed)<br>☒ SAFETY SHOES: Composite-toe or steel toe boots | ☐ AIR PURIFYING RESPIRATOR<br>☐ SUPPLIED RESPIRATOR<br>☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing, Long Sleeve Shirt | ☒ GLOVES: Leather, Nitrile and cut resistant<br>☒ OTHER: Insect Repellant, sunscreen (as needed) |

**REQUIRED AND / OR RECOMMENDED EQUIPMENT**

Geoprobe or Truck-Mounted Direct Push Drill Rig, Hand Tools, Photoionization Detector and/or Multi-Gas Meter (or equivalent), Macrocore liners, Liner Opening Tool, 42" Cones & Flags

**COMMITMENT TO LPS -** All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

**Exclusion Zone Policy –** All non-essential personnel will maintain a distance of 10' feet from drilling equipment while moving/engaged.

**"SHOW ME YOUR HANDS"**
**Driller and helper should show that hands are clear from controls and moving parts**

| Assess [1]JOB STEPS | Analyze [2]POTENTIAL HAZARDS | Act [3]CRITICAL ACTIONS |
|---|---|---|
| 1. Mobilization of drilling rig (ensure the Subsurface Clearance Protocol and Drill Rig Checklist are completed) | 1a. **CONTACT**: Equipment/property damage. | 1a. The drill rig's tower/derrick will be lowered and secured prior to mobilization.<br>1a. A spotter should be utilized while moving the drill rig. If personnel move into the path of the drill rig, the drill rig will be stopped until the path is again clear. Use a spotter for all required backing operations.<br>1a. Set-up the work area and position equipment in a manner that eliminates or reduces the need for backing of support trucks and trailers.<br>1a. When backing up truck rig with an attached trailer use a second spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver visibility.<br>1a. Inspect the driving path for uneven terrain. Level or avoid if needed.<br>1a. Drill rig should have a minimum **exclusion zone of 10 feet** for non-essential personnel (i.e., driller helper, geologist) when the rig is moving/ in operation. |
| | 1b. **FALL**: Slip/trip/fall hazards. | 1b Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment.<br>1b. Do not climb over stored materials/equipment; walk around. Practice good housekeeping.<br>1b. Use established pathways and walk on stable, secure ground. |
| 2. Raising tower/derrick of drill rig | 2a. **CONTACT**: Overhead hazards. | 2a. Prior to raising the tower/derrick, the area above the drilling rig will be inspected for wires, tree limbs, piping, or other structures, that could come in contact with the rig's tower and/or drilling rods or tools.<br>2a. Maintain a safe distance from overhead structures. |
| | 2b**. CONTACT**: Pinch Points when raising the rig and instability of rig | 2b. Inspect the equipment prior to use and avoid pinch points.<br>2b. Lower out riggers on rig to ensure stability prior to raising rig tower/derrick.<br>2b. If the rig needs to be mounted, be sure to use three points of contact. |
| 3. Advancement of drilling equipment and well installation | 3a. **CONTACT**: Flying debris | 3a. Be aware of and avoid potential lines of fire and wear required PPE such as eye, ear, and hand protection. |

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

| | | |
|---|---|---|
| 3. Advancement of drilling equipment and well installation (Continued) | 3b. **EXPOSURE**: Noise and dust. | 3b. Wet borehole area with sprayer to minimize dust.<br>3b. Stand upwind and keep body away from rig.<br>3b. Dust mask should be worn if conditions warrant.<br>3b. Wear hearing protection when the drill rig is in operation. |
| | 3c. **CAUGHT**: Limb/extremity pinching; abrasion/crushing. | 3c. Always wear leather gloves when making connections and using hand tools; wear cut-resistant (i.e., Kevlar) gloves when handling cutting tools.<br>3c. Inspect the equipment prior to use for potential pinch points. Keep hands away from being between pinch points and use of tools is preferable compared to fingers and hands.<br>3c. Inspect drill head for worn surface or missing teeth; replace if damaged or blunt.<br>3c. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body.<br>3c. All non-essential personnel should stay away from the immediate work area; position body out of the line-of-fire of equipment.<br>3c. Drillers and helpers will understand and use the "Show Me Your Hands" Policy.<br>3c. Spinning rods/casing have an **exclusion zone of 10 feet** while in operation. |
| | 3d. **CONTACT**: Equipment imbalance during advancement of drill equipment. | 3d. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and/or tip.<br>3d. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred.<br>3d. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high (**minimum exclusion zone of 10 feet**). |
| | 3e. **EXPOSURE**: Inhalation of contamination/vapors. | 3e. Air monitoring using a calibrated photoionization detector (PID) will be used to periodically to monitor the breathing zone of the work area.<br>3e. If a reading of >5ppm is recorded, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings and inform the Roux PM of the condition. The Roux PM will then recommend additional precautions in accordance with the site specific health and safety plan. |
| | 3f. **FALL**: Slip/trip/fall hazards. | 3f. Contain drill cuttings and drilling water to prevent fall hazards from developing in work area.<br>3f. See 1b. |
| | 3g. **EXERTION**: Potential for muscle strain/injury while lifting and installing well casings, lifting sand bags, and/or lifting rods. | 3g. Keep back straight and bend at the knees.<br>3g. Utilize team lifting for objects over 50lbs.<br>3g. Use mechanical lifting device for odd shaped objects. |
| 4. Decontaminate equipment. | 4a. **EXPOSURE/CONTACT**: To contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors). | 4a. Wear chemical-resistant disposable gloves and safety glasses.<br>4a. Contain decontamination water so that it does not spill.<br>4a. Use an absorbent pad to clean spills, if necessary.<br>4a. See 3b. |
| | 4b. **EXPOSURE:** To chemicals in cleaning solution including ammonia. | 4b. See 4a. Review MSDS to ensure appropriate precautions are taken and understood. |

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

| **JOB SAFETY ANALYSIS** **Ctrl. No. GEN-005** | DATE 12/10/2012 | ☐ NEW ☒ REVISED | PAGE 1 of 2 |
|---|---|---|---|

| JSA TYPE CATEGORY | WORK TYPE: | WORK ACTIVITY (Description): |
|---|---|---|
| **Generic** | **Gauging and Sampling** | **Gauging and Sampling** |

| DEVELOPMENT TEAM | POSITION / TITLE | REVIEWED BY: | POSITION / TITLE |
|---|---|---|---|
| Gina Masciello | Project Scientist | Curtis Taylor | SHSM |
| | | Michael Ritorto | Project Hydrogeologist |
| | | | |

**REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT**

| | | | |
|---|---|---|---|
| ☐ LIFE VEST | ☐ GOGGLES | ☐ AIR PURIFYING RESPIRATOR | ☒ GLOVES: Leather, Nitrile and cut resistant |
| ☒ HARD HAT | ☐ FACE SHIELD | ☐ SUPPLIED RESPIRATOR | ☒ OTHER: Knee pads, Insect Repellant, sunscreen (as needed) |
| ☐ LIFELINE / BODY HARNESS | ☐ HEARING PROTECTION | ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing | |
| ☒ SAFETY GLASSES | ☒ SAFETY SHOES: Composite-toe or steel toe boots | | |

**REQUIRED AND / OR RECOMMENDED EQUIPMENT**

42 inch Safety Cones, Caution Tape, Interface Probe and/or Water Level Meter, Buckets. Tools as needed: Socket Wrench, Screw Driver, Crow Bar, Mallet, and Wire Brush.

**Commitment to LPS** – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

| Assess<br>[1]JOB STEPS | Analyze<br>[2]POTENTIAL HAZARDS | Act<br>[3]CRITICAL ACTIONS |
|---|---|---|
| 1. Mobilization to monitoring well(s). | 1a. **FALL:** Personal injury from slip/trip/fall due to uneven terrain and/or obstructions. | 1a. Inspect pathway and plan for most suitable designated pathway prior to mobilization.<br>1a. Use established pathways, walk and/or drive on stable, secure, ground and avoid steep hills or uneven terrain. |
| | 1b. **CONTACT:** With traffic/third parties. | 1b. Identify potential traffic sources and delineate work area with 42 inch traffic safety cones. Position vehicle to protect against oncoming traffic. Use caution tape to provide a more visible delineation of the work area if necessary.<br>1b. Wear appropriate PPE including high visibility clothing or reflective vest.<br>1b. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route. |
| | 1c. **EXPOSURE:** To biological hazards. | 1c. Inspect work area for bees and insects.<br>1c. Use insect/tick repellent as necessary. |
| 2. Open/close well. | 2a. **OVEREXERTION:** Muscle strain. | 2a. Use proper lifting techniques; keep back straight, lift with legs and bend knees when reaching to open/close well. |
| | 2b. **CAUGHT:** Pinch points associated with removing/replacing manholes and working with hand tools. | 2b. Wear leather gloves or cut resistant gloves when working with well cover and hand tools.<br>2b. Use proper tools (ratchet and pry bar for well cover) and inspect before use.<br>2b. Do not put fingers under well cover. |
| | 2c. **EXPOSURE:** To potential hazardous vapors. | 2c. No open flames/heat sources.<br>2c. To minimize exposure to vapors allow well to vent after opening it and before sampling activities begin.<br>2c. Stand up-wind, if possible, to avoid vapors. |
| 3. Gauge well. | 3a. **CONTACT:** With contamination (e.g. contaminated groundwater). | 3a. Wear chemical-resistant disposable gloves and safety glasses when gauging well.<br>3a. Insert and remove probe slowly to avoid splashing.<br>3a. Use an absorbent pad to clean probe. |
| | 3b. **CONTACT:** With traffic. | 3b. See 1b. |
| 4. Purge and sample well. | 4a. **EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors) and/or sample preservatives. | 4a. Open and fill sample jars slowly to avoid splashing and contact with preservatives.<br>4a. Wear cut-resistant gloves and chemical-resistant disposable gloves when sampling.<br>4a. Fill sample containers over purge container to avoid spilling water onto the ground.<br>4a. Use an absorbent pad to clean spills. |

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

| Assess<br>[1]JOB STEPS | Analyze<br>[2]POTENTIAL HAZARDS | Act<br>[3]CRITICAL ACTIONS |
|---|---|---|
| 4. Purge and sample well (Continued). | 4b. **CONTACT:** Personal injury from cuts, abrasions, or punctures by glassware or sharp objects. | 4b. To avoid spills or breakage, place sample ware on even surface.<br>4b. Do not over tighten caps on glass sample ware.<br>4b. Wear cut-resistant (i.e., Kevlar) gloves and chemical-resistant disposable gloves when sampling and handling glassware (i.e., VOA vials) or when using cutting tools. |
| | 4c. **EXERTION:** Muscle strain while carrying equipment. | 4c. Use proper lifting techniques when handling/moving equipment; bend knees and keep back straight.<br>4c. Use mechanical assistance or team lifting techniques when equipment is 50lbs or heavier.<br>4c. Make multiple trips to carry equipment. |
| | 4d. **CONTACT:** With traffic. | 4d. See 1b. |
| 5. Management of purge water. | 5a. **EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors). | 5a. Do not overfill container and pour liquids in such a manner that they do not splash.<br>5a. Properly dispose of used materials/PPE in appropriate container in designated storage area. |
| | 5b. **EXERTION:** Muscle strain from lifting/carrying and moving containers. | 5b. Use proper lifting techniques when lifting / carrying or moving container(s) (see 4c.).<br>5b. Do not overfill container(s). |
| 6. Decontaminate equipment. | 6a. **EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors). | 6a. Work on the upwind side, where possible, of decon area.<br>6a. Wear chemical-resistant disposable gloves and safety glasses.<br>6a. Use an absorbent pad to clean spills. |

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension..

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

# APPENDIX B

Heat and Cold Stress Guidelines

**Heat Stress**

Heat stress is a significant potential hazard and can be associated with heavy physical activity and/or the use of personal protective equipment (PPE) in hot weather environments.

Heat cramps are brought on by prolonged exposure to heat. As an individual sweats, water and salts are lost by the body resulting in painful muscle cramps. The signs and symptoms of heat cramps are as follows:

- severe muscle cramps, usually in the legs and abdomen;
- exhaustion, often to the point of collapse; and
- dizziness or periods of faintness.

First aid treatment includes moving to a shaded area, rest, and fluid intake. Normally, the individual should recover within one-half hour. If the individual has not recovered within 30 minutes and the temperature has not decreased, the individual should be transported to a hospital for medical attention.

Heat exhaustion may occur in a healthy individual who has been exposed to excessive heat. The circulatory system of the individual fails as blood collects near the skin in an effort to rid the body of excess heat. The signs and symptoms of heat exhaustion are as follows:

- rapid and shallow breathing;
- weak pulse;
- cold and clammy skin with heavy perspiration;
- skin appears pale;
- fatigue and weakness;
- dizziness; and
- elevated body temperature.

First aid treatment includes cooling the victim, elevating the feet, and replacing fluids and electrolytes. If the individual has not recovered within 30 minutes and the temperature has not decreased, the individual should be transported to the hospital for medical attention.

Heat stroke occurs when an individual is exposed to excessive heat and stops sweating. This condition is classified as a **MEDICAL EMERGENCY**, requiring immediate cooling of the victim and transport to a medical facility. The signs and symptoms of heat stroke are as follows:

- dry, hot, red skin;
- body temperature approaching or above 105°F;
- large (dilated) pupils; and
- loss of consciousness – the individual may go into a coma.

First aid treatment requires immediate cooling and transportation to a medical facility.

Heat stress (heat cramps, heat exhaustion, and heat stroke) is a significant hazard if any type of protective equipment (semi-permeable or impermeable) which prevents evaporative cooling is worn in hot weather environments. Local weather conditions may require restricted work schedules in order to

adequately protect personnel. The use of work/rest cycles (including working in the cooler periods of the day or evening) and training on the signs and symptoms of heat stress should help prevent heat-related illnesses from occurring. Work/rest cycles will depend on the work load required to perform each task, type of protective equipment, temperature, and humidity. Below is a table of the recommended Threshold Limit Values for Hot Environments from the American Conference of Industrial Hygienists (ACGIH)

| Work Load | | | |
|---|---|---|---|
| ***Work-Rest Regimen*** | ***Light*** | ***Moderate*** | ***Heavy*** |
| Continuous Work | 86 °F | 80 °F | 77 °F |
| 75% Work<br>25% Rest, each hour | 87 °F | 82 °F | 78 °F |
| 50% Work<br>50% Rest, each hour | 89 °F | 85 °F | 82 °F |
| 25% Work<br>75% Rest, each hour | 90 °F | 88 °F | 86 °F |

Note: These TLV's are based on the assumption that nearly all acclimatized, fully clothed workers with adequate water and salt intake should be able to function effectively under the given working conditions without exceeding a deep body temperature of 38°C (100.4° F). They are also based on the assumption that the Wet Bulb Globe Temperature Index (WBGT) of the resting place is the same or very close to that of the workplace. Where the WBGT of the work area is different from that of the rest area, a time-weighted average should be used (consult the ACGIH 1992-1993 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices (1992).

These TLV's apply to physically fit and acclimatized individuals wearing light summer clothing. If heavier clothing that impedes sweat or has a higher insulation value is required, the permissible heat exposure TLV's must be reduced.

In addition, potable water and fluids containing electrolytes (e.g., Gatorade) will be available to replace lost body fluids.

**Cold Stress**

Cold stress is a danger at low temperatures and when the wind-chill factor is low. Prevention of cold-related illnesses is a function of whole-body protection. Adequate insulating clothing must be used when the air temperature is below 40°F. In addition, reduced work periods followed by rest in a warm area may be necessary in extreme conditions. Training on the signs and symptoms of cold stress should prevent cold-related illnesses from occurring. The signs and symptoms of cold stress include the following:

- severe shivering;
- abnormal behavior;
- slowing of body movement;
- confusion;
- weakness;

- stumbling or repeated falling;
- inability to walk;
- collapse; and/or
- unconsciousness.

First aid requires removing the victim from the cold environment and seeking medical attention immediately. Also, prevent further body heat loss by covering the victim lightly with blankets. Do not cover the victim's face. If the victim is still conscious, administer hot drinks, and encourage activity, such as walking wrapped in a blanket.

Below is a table of the recommended Threshold Limit Values for Cold Environments from the American Conference of Industrial Hygienists (ACGIH):

| **Air Temperature** | **No Wind** | | **5 mph wind** | | **10 mph wind** | | **15 mph wind** | | **20 mph wind** | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Degrees Fahrenheit °F* | *max. work period* | *# of breaks* | *max. work period* | *# of breaks* | *max. work period* | *# of breaks* | *max. work period* | *# of breaks* | *max. work period* | *# of breaks* |
| -15 to -19 °F | (normal breaks) 1 | | (normal breaks) 1 | | 75 min. | 2 | 55 min. | 3 | 40 min. | 4 |
| -20 to -24 °F | (normal breaks) 1 | | 75 min. | 2 | 55 min. | 3 | 40 min. | 4 | 30 min. | 5 |
| -25 to -29 °F | 75 min. | 2 | 55 min. | 3 | 40 min. | 4 | 30 min. | 5 | Non-emergency work should cease | |
| -30 to -34 °F | 55 min. | 3 | 40 min. | 4 | 30 min. | 5 | Non-emergency work should cease | | | |
| -35 to -39 °F | 40 min. | 4 | 30 min. | 5 | Non-emergency work should cease | | | | | |
| -40 to -44 °F | 30 min. | 5 | Non-emergency work should cease | | | | | | | |
| -45 °F and below | Non-emergency work should cease | | | | | | | | | |

Notes:

1. Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up breaks of ten (10) minutes in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour work period in a warm location. For light to moderate work (limited physical movement), apply the schedule one step lower.
2. Table applies only if workers are wearing dry clothing and doing moderate to heavy work activity. For light to moderate work activity, move down one line to decrease maximum work period and increase the number of breaks.

# APPENDIX C

Medical Data Form

# MEDICAL DATA SHEET

This form must be completed by all onsite personnel prior to the commencement of activities, and shall be kept by the Site Health and Safety Officer during site activities. This form must be delivered to any attending physician when medical assistance is needed.

***(This form should be typed or printed legibly.)***

Site: _____

Name: _____ Home Telephone: _____
(Area Code/Telephone Number)

Address: _____

Date of Birth: _____ Height: _____ Weight: _____

Emergency Contact: _____ Telephone: _____
(Area Code/Telephone Number)

Drug Allergies or Other Allergies: _____

_____

Previous Illnesses or Exposures to Hazardous Substances: _____

_____

_____

Current Medication (Prescription and Non-Prescription): _____

_____

_____

Medical Restrictions: _____

_____

Name, Address and Telephone Number of Person Physician: _____

_____

# APPENDIX D

Accident Report and Investigation Form

☐ **Roux Environmental Engineering and Geology, D.P.C.**
☐ **Roux Associates, Inc.** ☐ **Remedial Engineering, P.C.**
(Check applicable company name)

# ACCIDENT REPORT

**Brian Hobbs, Corporate Health and Safety Manager**
Cell: (631) 807-0193; Office: (631) 630-2416

## PART 1: ADMINISTRATIVE INFORMATION

**Project #:** _____
**Project Name:** _____
**Project Location** (street address/city/state)**:**
_____
_____
**Client Corporate Name / Contact / Address / Phone #:**
_____
_____
_____
_____
_____

**Immediate Verbal Notifications Given To:**

| | | |
|---|---|---|
| Corporate Health & Safety | ☐Yes | ☐No |
| Office Health & Safety | ☐Yes | ☐No |
| Office Manager | ☐Yes | ☐No |
| Project Principal | ☐Yes | ☐No |
| Project Manager | ☐Yes | ☐No |
| Client Contact | ☐Yes | ☐No |

**REPORT STATUS (time due):**
☐ Initial (24 hr) ☐ Final (5-10 days)
Date: _____ Date: _____

**Accident Report Delivered To:**

| | | |
|---|---|---|
| Corporate Health & Safety | ☐Yes | ☐No |
| Office Health & Safety | ☐Yes | ☐No |
| Office Manager | ☐Yes | ☐No |
| Project Principal | ☐Yes | ☐No |
| Project Manager | ☐Yes | ☐No |

**REPORT TYPE:** ☐ Loss ☐ Near Loss Estimated Costs: $ _____

**OSHA CASE # Assigned by Corporate Health & Safety if Applicable:**

**Corporate Health & Safety Confirmed Final Accident Report**
☐Yes ☐No

**DATE OF INCIDENT:** _____

**TIME INCIDENT OCCURRED:** _____ ☐AM ☐PM

**INCIDENT LOCATION** – City, State, and Country (If outside U.S.A.)
_____

**INCIDENT TYPES:** (Select most appropriate if Loss occurred.)
From lists below, please select the option that best categories the incident. When selecting an injury or illness, also indicate the severity level.

☐**INJURY** ☐**ILLNESS**

----------**Severity Level**----------

☐Fatality ☐First Aid ☐Medical
☐Restricted Work ☐Lost Time Treatment

**OTHER INCIDENT TYPES**

☐Spill / Release
Material involved:_____
Quantity (U.S. Gallons): _____

☐Misdirected Waste ☐Consent Order ☐NOV
☐Property Damage ☐Exceedance
☐Motor Vehicle ☐Fine / Penalty

**ACTIVITY TYPE** (Check most appropriate one.)

| | | |
|---|---|---|
| ☐Decommissioning | ☐Geoprobe | ☐Sampling |
| ☐Demolition | ☐Motor Vehicle | ☐System Start-up |
| ☐Dewatering | ☐Operations/ | ☐Trenching |
| ☐Drilling | Maintenance | ☐AST/UST Removal |
| ☐Excavation | ☐Pump/Pilot Test | ☐Other_____ |
| ☐Gauging | ☐Rigging/Lifting | |

**INJURY TYPE** (Check all applicable.)

| | |
|---|---|
| ☐Abrasion | ☐Occupational Illness |
| ☐Amputation | ☐Puncture |
| ☐Burn | ☐Rash |
| ☐Cold/Heat Stress | ☐Repetitive Motion |
| ☐Inflammation | ☐Sprain/Strain |
| ☐Laceration | ☐Other_____ |

**BODY PART AFFECTED** (Check all applicable.)

| | | |
|---|---|---|
| ☐Respiratory | ☐Shoulder | ☐Face |
| ☐Neck | ☐Arm | ☐Leg |
| ☐Chest | ☐Wrist | ☐Knee |
| ☐Abdomen | ☐Hand/Fingers | ☐Ankle |
| ☐Groin | ☐Eye | ☐Foot/Toes |
| ☐Back | ☐Head | ☐Other_____ |

**I. PERSON(S) DIRECTLY / INDIRECTLY INVOLVED IN INCIDENT** (Attach additional information as necessary/applicable.)

| Name/Phone # of Each Person Directly/Indirectly Involved in Incident: | Designate: Roux/Remedial Employee Roux/Remedial Subcontractor Client Employee Client Contractor Third Party | As applicable, Current Occupation; Yrs in Current Occupation; Current Position; and Yrs in Current Position: | As applicable, Employer Name; Address; and Phone #: | As applicable, Supervisor Name; and Phone #: |
|---|---|---|---|---|
| 1) | | | | |
| 2) | | | | |

**II. PERSONS INJURED IN INCIDENT** (Attach additional information as necessary/applicable.)

| Name/Phone # of Each Person Injured in Incident: | Designate: Roux/Remedial Employee Roux/Remedial Subcontractor Client Employee Client Contractor Third Party | As applicable, Current Occupation; Yrs in Current Occupation; Current Position; and Yrs in Current Position: | As applicable, Employer Name; Address; and Phone #: | As applicable, Supervisor Name; and Phone #: | Description of Injury: |
|---|---|---|---|---|---|
| 1) | | | | | |
| 2) | | | | | |

**III. PROPERTY DAMAGED IN INCIDENT** (Attach additional information as necessary/applicable.)

| Property Damaged: | Property Location: | Owner Name, Address & Phone #: | Description of Damage: | Estimated Cost: |
|---|---|---|---|---|
| 1) | | | | |

**No One Gets Hurt!**

| | | | | |
|---|---|---|---|---|
| 2) | | | | $ |

**IV. WITNESSES TO INCIDENT** (Attach additional information as necessary/applicable.)

| Witness Name: | Address: | Phone #: |
|---|---|---|
| 1) | | |
| 2) | | |

## PART 2: WHAT HAPPENED AND INCIDENT DETAILS

**PROVIDE FACTUAL DESCRIPTION OF INCIDENT** (e.g., describe loss/near loss, injury, response / treatment).

**I. AUTHORITIES/GOVERNMENTAL AGENCIES NOTIFIED** (Attach additional information as necessary/applicable.)

| Authority/Agency Notified: | Name/Phone #/Fax # of Person Notified: | Address of Person Notified: | Date & Time of Notification: | Exact Information Reported/Provided: |
|---|---|---|---|---|
| | | | | |

**II. PUBLIC RESPONSES TO INCIDENT (if applicable)**

| Response/Inquiry By: (check one) | Entity Name: | Name/Phone # of Respondent/ Inquirer: | Address of Entity/Person: | Date & Time of Response/Inquiry: |
|---|---|---|---|---|
| ☐Newspaper<br>☐Television<br>☐Community Group<br>☐Neighbors<br>☐Other _____ | | | | |

Describe Response/Inquiry:

Roux/Remedial Response:

(Check all that apply.) (Attach photos, drawings, etc. to help illustrate the incident.)
**ATTACHED INFORMATION:** ☐Photo ☐Sketches ☐Vehicle Acord Form ☐Police Report ☐Other

| **Name(s) of person(s) who prepared Initial and Final Report:** | **Title(s):** | **Phone number(s):** |
|---|---|---|
| | | |

## PART 3: INVESTIGATION TEAM ANALYSIS

### CONCLUSION: WHY IT HAPPENED (LIST CAUSAL FACTORS AND CORRESPONDING ROOT CAUSES)

(Root Causes: Lack of knowledge or skill, Doing the task according to procedures or acceptable practices takes more time or effort, Short-cuts or not following acceptable practices is reinforced or tolerated, Not following procedures or acceptable practices did not result in an accident, Lack of or inadequate procedures, Inadequate communications of expectations regarding procedures or acceptable practices, Inadequate tools or equipment, External Factors)

### ROOT CAUSE(S) AND SOLUTION(S): HOW TO PREVENT INCIDENT FROM RECURRING

**PERSONAL FACTORS:**

A. LACK OF SKILL OR KNOWLEDGE

B. DOING THE JOB ACCORDING TO PROCEDURES OR ACCEPTABLE PRACTICES TAKES MORE TIME OR EFFORT

C. SHORT-CUTTING PROCEDURES OR ACCEPTABLE PRACTICES IS POSITIVELY REINFORCED OR TOLERATED

D. IN PAST, DID NOT FOLLOW PROCEDURES OR ACCEPTABLE PRACTICES AND NO INCIDENT OCCURRED

**JOB FACTORS:**

E. LACK OF OR INADEQUATE PROCEDURES

F. INADEQUATE COMMUNICATION OF EXPECTATIONS REGARDING PROCEDURES OR ACCEPTABLE STANDARDS

G. INADEQUATE TOOLS OR EQUIPMENT (available, maintained, etc.)

| CAUSAL FACTOR / BEHAVIOR / CONDITION | ROOT CAUSE | SOLUTION(S) [Must Match Root Cause(s)] | | PERSON RESPONSIBLE | AGREED DUE DATE | ACTUAL COMPLETION DATE |
|---|---|---|---|---|---|---|
| | | # | Solution(s) | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**INVESTIGATION TEAM:**

| PRINT NAME | JOB POSITION | DATE | SIGNATURE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

**QUALITY REVIEW** Correct root cause(s) identified? Do root cause(s) and solution(s) match? Are solution(s) feasible / maintainable?

**Name:** **Job Title:**

## PART 4: Date Solutions were Implemented & Validated (Were Solutions Effective?)

| Date | Solution | Verifier / Validator Name and Job Title | **Details** (of I & V performed) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

# APPENDIX E

Acord Automobile Loss Form

# AUTOMOBILE LOSS NOTICE

DATE (MM/DD/YYYY)

| AGENCY | PHONE (A/C, No, Ext): | COMPANY | NAIC CODE: | MISCELLANEOUS INFO (Site & location code) |
|---|---|---|---|---|
| The Graham Company<br>The Graham Building<br>One Penn Square West<br>Philadelphia, PA 19102 | 215-567-6300 | Starr Indemnity & Liability | | |
| FAX (A/C, No): 215-599-9175 | | | | |
| E-MAIL ADDRESS: CLICK HERE TO SUBMIT TO THE GRAHAM COMPANY | | | | |
| CODE: | SUB CODE: | | | |
| AGENCY CUSTOMER ID: Mallory M. Stanko, Esquire, Claims Consultant | | | | |

| POLICY NUMBER | POLICY TYPE | REFERENCE NUMBER | CAT # |
|---|---|---|---|
| 1000198966171 (AOS) | | | |

| EFFECTIVE DATE | EXPIRATION DATE | DATE OF ACCIDENT AND TIME | | PREVIOUSLY REPORTED |
|---|---|---|---|---|
| 9/21/17 | 9/21/18 | | AM / PM | YES X NO |

## INSURED

| NAME AND ADDRESS | SOC SEC # OR FEIN: |
|---|---|
| Roux Associates, Inc.<br>209 Shafter Street<br>Islandia, NY 11749 | |

RESIDENCE PHONE (A/C, No):

BUSINESS PHONE (A/C, No, Ext):

CELL PHONE (A/C, No):

E-MAIL ADDRESS:

## CONTACT

☐ CONTACT INSURED

| NAME AND ADDRESS | WHEN TO CONTACT: 9:00 a.m. to 5:00 p.m. | WHERE TO CONTACT |
|---|---|---|
| Cindy Albanese, Paralegal | | Business |

RESIDENCE PHONE (A/C, No):

BUSINESS PHONE (A/C, No, Ext): 631-232-2376

CELL PHONE (A/C, No):

E-MAIL ADDRESS: calbanese@rouxinc.com

## LOSS

| LOCATION OF ACCIDENT (Include city & state) | AUTHORITY CONTACTED: / REPORT #: | VIOLATIONS/CITATIONS |
|---|---|---|
| | | |

DESCRIPTION OF ACCIDENT (Use separate sheet, if necessary)

## POLICY INFORMATION

| BODILY INJURY (Per Person) | BODILY INJURY (Per Accident) | PROPERTY DAMAGE | SINGLE LIMIT | MEDICAL PAYMENT | OTC DEDUCTIBLE | OTHER COVERAGE & DEDUCTIBLES (UM, no-fault, towing, etc.) |
|---|---|---|---|---|---|---|
| | | | $1,000,000 | | $1,000 | Rental Reimbursement $60 for 60 Days<br>Towing $50 PPV |
| LOSS PAYEE | | | | | COLLISION DED $1,000 | |

UMBRELLA/EXCESS ☐ UMBRELLA ☐ EXCESS CARRIER: LIMITS: AGGR PER CLAIM/OCC SIR/DED

## INSURED VEHICLE

| VEH # | YEAR | MAKE: | BODY TYPE: | PLATE NUMBER | STATE |
|---|---|---|---|---|---|
| | | MODEL: | V.I.N.: | | |

OWNER'S NAME & ADDRESS

RESIDENCE PHONE (A/C, No):

BUSINESS PHONE (A/C, No, Ext):

DRIVER'S NAME & ADDRESS

☐ (Check if same as owner)

RESIDENCE PHONE (A/C, No):

BUSINESS PHONE (A/C, No, Ext):

| RELATION TO INSURED (Employee, family, etc.) | DATE OF BIRTH | DRIVER'S LICENSE NUMBER | STATE | PURPOSE OF USE | USED WITH PERMISSION? |
|---|---|---|---|---|---|
| | | | | | ☐ YES ☐ NO |

DESCRIBE DAMAGE

| ESTIMATE AMOUNT | WHERE CAN VEHICLE BE SEEN? | WHEN CAN VEH BE SEEN? | OTHER INSURANCE ON VEHICLE |
|---|---|---|---|
| | | | |

**PROPERTY DAMAGED** **VEHICLE?** ☐ YES ☐ NO **YR:** **MAKE:** **MODEL:** **PLATE #:**

| | | |
|---|---|---|
| **DESCRIBE PROPERTY (Other Than Vehicle)** | **OTHER VEH/PROP INS?** ☐ YES ☐ NO | **COMPANY OR AGENCY NAME:** **POLICY #:** |
| **OWNER'S NAME & ADDRESS** | | **RESIDENCE PHONE (A/C, No):** **BUSINESS PHONE (A/C, No, Ext):** |
| **OTHER DRIVER'S NAME & ADDRESS** ☐ (Check if same as owner) | | **RESIDENCE PHONE (A/C, No):** **BUSINESS PHONE (A/C, No, Ext):** |
| **DESCRIBE DAMAGE** | | |
| **ESTIMATE AMOUNT** | **WHERE CAN DAMAGE BE SEEN?** | |

**INJURED**

| NAME & ADDRESS | PHONE (A/C, No) | PED | INS VEH | OTH VEH | AGE | EXTENT OF INJURY |
|---|---|---|---|---|---|---|
| | | ☐ | ☐ | ☐ | | |
| | | ☐ | ☐ | ☐ | | |
| | | ☐ | ☐ | ☐ | | |
| | | ☐ | ☐ | ☐ | | |

**WITNESSES OR PASSENGERS**

| NAME & ADDRESS | PHONE (A/C, No) | INS VEH | OTH VEH | OTHER (Specify) |
|---|---|---|---|---|
| | | ☐ | ☐ | |
| | | ☐ | ☐ | |
| | | ☐ | ☐ | |

| | | | |
|---|---|---|---|
| **REPORTED BY** | | **REPORTED TO** | |
| **SIGNATURE OF INSURED** | **DATE (MM/DD/YYYY)** | **SIGNATURE OF PRODUCER** | **DATE (MM/DD/YYYY)** |

**REMARKS (Include Adjuster Assigned)**

**ALL RESERVATIONS OF RIGHTS/DENIAL LETTERS MUST BE SENT TO THE GRAHAM COMPANY FIRST.**

**ALL FIRST PARTY DRAFTS MUST BE SENT DIRECTLY TO THE GRAHAM COMPANY.**

## Applicable in Arizona

For your protection, Arizona law requires the following statement to appear on this form. Any person who knowingly presents a false or fraudulent claim for payment of a loss is subject to criminal and civil penalties.

## Applicable in Arkansas, Delaware, District of Columbia, Kentucky, Louisiana, Maine, Michigan, New Jersey, New Mexico, North Dakota, Pennsylvania, South Dakota, Tennessee, Texas, Virginia, Washington and West Virginia

Any person who knowingly and with intent to defraud any insurance company or another person, files a statement of claim containing any materially false information, or conceals for the purpose of misleading, information concerning any fact, material thereto, commits a fraudulent insurance act, which is a crime, subject to criminal prosecution and civil penalties. In DC, LA, ME, TN, VA and WA, insurance benefits may also be denied.

## Applicable in California

For your protection, California law requires the following to appear on this form: Any person who knowingly presents a false or fraudulent claim for payment of a loss is guilty of a crime and may be subject to fines and confinement in state prison.

## Applicable in Colorado

It is unlawful to knowingly provide false, incomplete, or misleading facts or information to an insurance company for the purpose of defrauding or attempting to defraud the company. Penalties may include imprisonment, fines, denial of insurance, and civil damages. Any insurance company or agent of an insurance company who knowingly provides false, incomplete, or misleading facts or information to a policy holder or claimant for the purpose of defrauding or attempting to defraud the policy holder or claimant with regard to a settlement or award payable from insurance proceeds shall be reported to the Colorado Division of Insurance within the Department of Regulatory Agencies.

## Applicable in Florida and Idaho

Any person who knowingly and with the intent to injure, defraud, or deceive any insurance company files a statement of claim containing any false, incomplete or misleading information is guilty of a felony.*

* In Florida - Third Degree Felony

## Applicable in Hawaii

For your protection, Hawaii law requires you to be informed that presenting a fraudulent claim for payment of a loss or benefit is a crime punishable by fines or imprisonment, or both.

## Applicable in Indiana

A person who knowingly and with intent to defraud an insurer files a statement of claim containing any false, incomplete, or misleading information commits a felony.

## Applicable in Minnesota

A person who files a claim with intent to defraud or helps commit a fraud against an insurer is guilty of a crime.

## Applicable in Nevada

Pursuant to NRS 686A.291, any person who knowingly and willfully files a statement of claim that contains any false, incomplete or misleading information concerning a material fact is guilty of a felony.

## Applicable in New Hampshire

Any person who, with purpose to injure, defraud or deceive any insurance company, files a statement of claim containing any false, incomplete or misleading information is subject to prosecution and punishment for insurance fraud, as provided in RSA 638:20.

## Applicable in New York

Any person who knowingly and with intent to defraud any insurance company or other person files an application for commercial insurance or a statement of claim for any commercial or personal insurance benefits containing any materially false information, or conceals for the purpose of misleading, information concerning any fact material thereto, and any person who in connection with such application or claim knowingly makes or knowingly assists, abets, solicits or conspires with another to make a false report of the theft, destruction, damage or conversion of any motor vehicle to a law enforcement agency, the Department of Motor Vehicles or an insurance company, commits a fraudulent insurance act, which is a crime, and shall also be subject to a civil penalty not to exceed five thousand dollars and the value of the subject motor vehicle or stated claim for each violation.

## Applicable in Ohio

Any person who, with intent to defraud or knowing that he/she is facilitating a fraud against an insurer, submits an application or files a claim containing a false or deceptive statement is guilty of insurance fraud.

## Applicable in Oklahoma

WARNING: Any person who knowingly and with intent to injure, defraud or deceive any insurer, makes any claim for the proceeds of an insurance policy containing any false, incomplete or misleading information is guilty of a felony.

# APPENDIX F

Near Loss Reporting Form

# NEAR LOSS REPORT FORM

Incident ID: _____

**IMPORTANT:** Do not include any personal non-work related medical information on this form

## PART 1: ADMINISTRATIVE INFORMATION

**Project Manager :**

**Project Site Name:**

| **City:** | **State/Province:** | **Country:** |
|---|---|---|

## PART 2: NEAR LOSS DETAILS

| **Date\Time Occurred** (MM/DD/YYYY HH:MM)**:** | **Date\Time Submitted to IMPACT** (MM/DD/YYYY HH:MM)**:** |
|---|---|

**NEAR LOSS TYPE - What could have happened? - Select all that apply (1-7)**

1. ☐ Fire / Explosion
2. ☐ Injury / Illness
3. ☐ Security (e.g theft, trespassing, vandalism)
4. ☐ Environmental (spill, permit exceedance, etc.)
5. ☐ Transportation of personnel (vehicle accident)
6. ☐ Property/Equipment Damage
7. ☐ Business Interruption

| **Event Leading to Potential Injury/Illness*:** | **Activity: Remediation** | **Phase of Operation : Remediation** |
|---|---|---|
| **Job Task*:** | **Equipment Involved*:** | |

**WHAT HAPPENED?** Do not include individuals' or company names. Ensure photos, sketches, etc. are not personally identifiable unless written consent has been obtained. **(NOTE: For IMPACT entry, this information must be in English.)**

**Summary** (1-2 sentences. Provide brief description of the incident. Provide facts only, no speculation or opinion)**:**

**Near Loss Details** (Brief factual details of what, where, when; include photos, sketches, etc. as attachments)**:**

**Immediate Corrective Actions Taken:**

**NEAR LOSS INVOLVED:**

**Was a post-incident alcohol or drug test conducted?** ☐ **1. Yes** ☐ **2. No**

| **Contractor Company Name:** | **Subcontractor Company Name:** |
|---|---|

## PART 3: NEAR LOSS INVESTIGATION FINDINGS AND REPORT QUALITY REVIEW

**Date Investigation Team Assigned (mm/dd/yyyy):**

**INVESTIGATION SUMMARY:** Determine and list by number what behaviors and/or conditions may have contributed to the Near Loss. Then, use the "5-Why Technique" for each of these behaviors/conditions; provide a narrative for each that explains how the associated root cause(s) was determined. Do not include individuals' or company names. **(NOTE: For IMPACT entry, this information must be in English.)**

**ROOT CAUSE NUMBER(S) AND SOLUTION(S): HOW TO REDUCE POSSIBILITY OF INCIDENT RECURRING**

Selection of RCs and solutions reflects the analysis of investigation team and is not meant to be a legally binding conclusion as to the RC and/or solution.

| **Behavior/ Condition #** | **Root Cause # (1/line)** | **Solution(s) (must match Root Cause) (For IMPACT entry, solutions must be in English.)** | **Job Title Responsible for Completion** | **Completion Target Date** | **Completion Actual Date** |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

**QUALITY REVIEW** Were the correct root cause(s) identified? Do root cause(s) and solution(s) match? Are solution(s) feasible / maintainable?

| **Job Title :** | **Company :** |
|---|---|

## PART 4: VERIFICATION (Solutions Implemented) & VALIDATION (Solutions Effective)

| **Date** | **Solution** | **Verifier / Validator Job Title** | **Verifier / Validator Company** | **Details** (of V & V performed) |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

* Use reference lists on the back side of this form

**JOB TASK - Select the most appropriate one** (primary job associated with incident-related work activity, avoid "Other" if possible)

- ♦ 1. Carbon Change
- ♦ 2. Construction
- ♦ 3. Demolition
- ♦ 4. Dewatering
- ♦ 5. Drilling (includes well
- ♦ 6. Excavation / Trenching
- ♦ 7. Gauging
- ♦ 8. Geoprobe / Direct Push
- ♦ 9. Mobil Remediation (includes vacuum event and chemical injection)
- ♦ 10. NAPL Recovery
- ♦ 11. O&M (remediation system)
- ♦ 12. Pavement Cutting
- ♦ 13. Pump Test
- ♦ 14. Sampling
- ♦ 15. Site Visit / Survey
- ♦ 16. Subsurface Clearance
- ♦ 17. System Install
- ♦ 18. System Startup
- ♦ 19. UST Removal (includes tank exposure and backfill)
- ♦ 20. Waste Management
- ♦ 21. Well Plugging/Abandonment
- ♦ 22. Other: _____

**EVENT LEADING TO POTENTIAL INJURY/ILLNESS - Select the most appropriate one**

**Body Position/Force:**

- ♦ 1. Line of Fire
- ♦ 2. Overexertion, Strain
- ♦ 3. Struck Against Object
- ♦ 4. Struck By Object
- ♦ 5. Personal Energy
- ♦ 6. Repetitive Strain Injury (RSI)
- ♦ 7. **Buried**
- ♦ 8. **Caught In, Under, Between**

**Chemical Exposure:**

- ♦ 9. Inhalation
- ♦ 10. Ingestion
- ♦ 11. Physical Contact

**Contact By:**

- ♦ 12. Animal, Insect, Plant
- ♦ 13. Blood / Potentially Infectious Materials
- ♦ 14. Electricity
- ♦ 15. Noise
- ♦ 16. Other Physical Agents
- ♦ 17. Radiation
- ♦ 18. Temperature Extremes

- ♦ 19. **Drowning**

**Falls:**

- ♦ 20. Fall, From Elevation
- ♦ 21. Fall, Same Level
- ♦ 22. Slip or Trip Without Fall
- ♦ 23. **Food Consumption**
- ♦ 24. **Suffocate/Asphyxiate (Lack of Oxygen)**
- ♦ 25. **Transportation Incident**
- ♦ 26. **Other** (describe)**:** _____

**EQUIPMENT INVOLVED THAT CONTRIBUTED TO NEAR LOSS - Select all that apply**

- ♦ 1. Air Stripper
- ♦ 2. API Separator
- ♦ 3. Automobile
- ♦ 4. Boom Material
- ♦ 5. Bulldozer
- ♦ 6. Cable
- ♦ 7. Carbon Drum / Vessel
- ♦ 8. Chain Block
- ♦ 9. Compressor, Air
- ♦ 10. Control Panel (local)
- ♦ 11. Crane (mobile)
- ♦ 12. Drill Rig
- ♦ 13. Drilling Equipment, Vacuum
- ♦ 14. Drum, Vertical
- ♦ 15. Dump Truck
- ♦ 16. Electric Heater
- ♦ 17. Electrical Power Supply
- ♦ 18. Engine, Internal Combustion
- ♦ 19. Equipment Safety Grounding
- ♦ 20. Excavator / Power Shovel
- ♦ 21. Exclusion Zone Equipment
- ♦ 22 Fan, Centrifugal / Blower
- ♦ 23 Fencing
- ♦ 24 Filter
- ♦ 25. Fire Extinguisher
- ♦ 26. Forklift
- ♦ 27. Front End Loader
- ♦ 28. Grader
- ♦ 29. Hand Tool, Hammer
- ♦ 30. Hand Tool, Knife
- ♦ 31. Hand Tool, Non-Powered
- ♦ 32. Hand Tool, Powered
- ♦ 33. Hand Tool, Powered, Drill
- ♦ 34. Hand Tool, Powered, Grinder
- ♦ 35. Hand Tool, Powered, Hydraulic Torque
- ♦ 36. Hand Tool, Powered, Saw
- ♦ 37. Hand Tool, Powered, Wrench, Impact
- ♦ 38. Hand Tool, Saw
- ♦ 39. Hand Tool, Screwdriver
- ♦ 40. Hand Tool, Shears
- ♦ 41. Hand Tool, Shovel
- ♦ 42. Hand Tool, Snip
- ♦ 43. Hand Tool, Wrench
- ♦ 44. Hoist
- ♦ 45, Hook/Clamp/Buckle, etc.
- ♦ 46. Jack
- ♦ 47. Ladder, Extension
- ♦ 48. Ladder, Platform
- ♦ 49. Ladder, Step
- ♦ 50. Lock / Tag
- ♦ 51. Maintenance Tool, General
- ♦ 52. Manifold
- ♦ 53, Manlift/Basket/Cherry Picker
- ♦ 54. Motor, Electric
- ♦ 55. Oxidizer
- ♦ 56. Pallet
- ♦ 57. Piping
- ♦ 58. Piping, Hose
- ♦ 59. Piping, Injection/Mixing Point
- ♦ 60. Powered Tools, Hydrojet
- ♦ 61. Pump, Centrifugal
- ♦ 62. Pump, Diaphragm
- ♦ 63. Pump, Reciprocating
- ♦ 64. Pump, Regenerative
- ♦ 65. Pump, Rotary
- ♦ 66. Pumps (transfer, electrical)
- ♦ 67. Pump, Submerged
- ♦ 68. PPE, Face Shield
- ♦ 69. PPE, Fall Protection
- ♦ 70. PPE, Gloves
- ♦ 71. PPE, Hard Hat / Helmet
- ♦ 72. PPE, Hearing Protection
- ♦ 73. PPE, Respiratory, Chemical
- ♦ 74. PPE, Respiratory, Particulate
- ♦ 75. PPE, Safety Glasses
- ♦ 76. PPE, Safety Goggles
- ♦ 77. PPE, Safety Shoes / Boots
- ♦ 78. PPE, Safety Vest / Clothing
- ♦ 79. Rope
- ♦ 80. Sampling Equipment, Bailer
- ♦ 81. Sampling Equipment, Geoprobe
- ♦ 82. Sampling Equipment, Hand Auger
- ♦ 83. Sampilng Equpment, PID
- ♦ 84. Sampling Equipment, Sample Container
- ♦ 85. Sampling Equipment, Split Spoon Sampler
- ♦ 86. Sling
- ♦ 87. Snow Blower
- ♦ 88. Snow Plow
- ♦ 89. Space Heater, Electric
- ♦ 90. System, Air Sparging
- ♦ 91. System, Carbon Treatment
- ♦ 92. System, Chemical Oxidation
- ♦ 93. System, Dual Phase Product Recover
- ♦ 94. System, Groundwater Pump and Treat
- ♦ 95. System, POET
- ♦ 96. System, Shed or Trailer
- ♦ 97. System, Vapor Extraction
- ♦ 98. System, Vapor Phase Treatment
- ♦ 99. System, Other
- ♦ 100. Tank, Surge
- ♦ 101. Tank, Underground
- ♦ 102. Telemetry System
- ♦ 103. Testing Devices
- ♦ 104. Tractor Trailer
- ♦ 105. Truck, Flatbed
- ♦ 106. Truck, Pickup
- ♦ 107. Truck, Tank Truck
- ♦ 108. Truck, Vacuum
- ♦ 109. Valve, Safety
- ♦ 110. Valve, Block
- ♦ 111. Well, Extraction
- ♦ 112. Well, Monitoring
- ♦ 113. Well, Recpvery
- ♦ 114. Winch
- ♦ 115. Wire Rope
- ♦ 116. No Equipment Involved
- ♦ 117. Not in List (describe): _____

**ROOT CAUSE NUMBER(S)**

**PERSONAL FACTORS:**

(1) LACK OF SKILL OR KNOWLEDGE
(2) DOING THE JOB ACCORDING TO PROCEDURES OR ACCEPTABLE PRACTICES TAKES MORE TIME OR EFFORT
(3) SHORT-CUTTING PROCEDURES OR ACCEPTABLE PRACTICES IS POSITIVELY REINFORCED OR TOLERATED
(4) IN PAST, DID NOT FOLLOW PROCEDURES OR ACCEPTABLE PRACTICES AND NO INCIDENT OCCURRED

**JOB FACTORS**:

(5) LACK OF OR INADEQUATE PROCEDURES
(6) INADEQUATE COMMUNICATION OF EXPECTATIONS REGARDING PROCEDURES OR ACCEPTABLE STANDARDS
(7) INADEQUATE TOOLS OR EQUIPMENT (available, maintained, etc.)

# APPENDIX G

OSHA 300

# OSHA's Form 300 (Rev. 01/2004)

# Log of Work-Related Injuries and Illnesses

**Attention:** This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year _____

**U.S. Department of Labor**
Occupational Safety and Health Administration

You must record information about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an injury and illness incident report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Form approved OMB no. 1218-0176

Establishment name _____

City _____ State _____

| Identify the person | | | Describe the case | | | Classify the case | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **CHECK ONLY ONE** box for each case based on the most serious outcome for that case: | | | | Enter the number of days the injured or ill worker was: | | Check the "injury" column or choose one type of illness: | | | | | |
| (A) Case No. | (B) Employee's Name | (C) Job Title (e.g., Welder) | (D) Date of injury or onset of illness (mo./day) | (E) Where the event occurred (e.g. Loading dock north end) | (F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch) | Death | Days away from work | Remained at work | | Away From Work (days) | On job transfer or restriction (days) | (M) Injury | Skin Disorder | Respiratory Condition | Poisoning | Hearing Loss | All other illnesses |
| | | | | | | | | Job transfer or restriction | Other record-able cases | | | | | | | | |
| | | | | | | (G) | (H) | (I) | (J) | (K) | (L) | (1) | (2) | (3) | (4) | (5) | (6) |
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| | | | | | **Page totals** | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* |

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.



| Injury | Skin Disorder | Respiratory Condition | Poisoning | Hearing Loss | All other illnesses |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) |

# OSHA's Form 300A (Rev. 01/2004)

# Summary of Work-Related Injuries and Illnesses

Year _____

**U.S. Department of Labor**
**Occupational Safety and Health Administration**

Form approved OMB no. 1218-0176

*All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete*

*Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."*

*Employees former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.*

## Number of Cases

| Total number of deaths | Total number of cases with days away from work | Total number of cases with job transfer or restriction | Total number of other recordable cases |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| (G) | (H) | (I) | (J) |

## Number of Days

| Total number of days away from work | Total number of days of job transfer or restriction |
|---|---|
| 0 | 0 |
| (K) | (L) |

## Injury and Illness Types

| Total number of… | (M) | | (M) |
|---|---|---|---|
| (1) Injury | 0 | (4) Poisoning | 0 |
| (2) Skin Disorder | 0 | (5) Hearing Loss | 0 |
| (3) Respiratory Condition | 0 | (6) All Other Illnesses | 0 |

**Post this Summary page from February 1 to April 30 of the year following the year covered by the form**



## Establishment information

Your establishment name _____

Street _____

City _____ State _____ Zip _____

Industry description (e.g., Manufacture of motor truck trailers)

_____

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

____ ____ ____ ____

OR North American Industrial Classification (NAICS), if known (e.g., 336212)

____ ____ ____ ____ ____ ____

## Employment information

Annual average number of employees _____

Total hours worked by all employees last year _____

## Sign here

**Knowingly falsifying this document may result in a fine.**

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ Company executive

_____ Title

_____ Phone

_____ Date

# OSHA's Form 301
# Injuries and Illnesses Incident Report

**Attention:** This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

**U.S. Department of Labor**
**Occupational Safety and Health Administration**

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Repor* t is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone _____ Date _____

**Information about the employee**

1) Full Name _____

2) Street _____

City _____ State _____ Zip _____

3) Date of birth _____

4) Date hired _____

5) ☐ Male
☐ Female

**Information about the physician or other health care professional**

6) Name of physician or other health care professional

_____

_____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ Zip _____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

**Information about the case**

10) Case number from the Log _____ *(Transfer the case number from the Log after you record the case.)*

11) Date of injury or illness _____

12) Time employee began work _____ AM/PM

13) Time of event _____ AM/PM ☐ Check if time cannot be determined

14) **What was the employee doing just before the incident occurred?** Describe the activity, as well as the tools, equipment or material the employee was using. Be specific. Examples: "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) **What happened?** Tell us how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) **What was the injury or illness?** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt", "pain", or "sore." Examples: "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) **What object or substance directly harmed the employee?** Examples: "concrete floor"; "chlorine"; "radial arm saw." If this question does not apply to the incident, leave it blank.

18) **If the employee died, when did death occur?** Date of death

# APPENDIX H

Job Safety and Health Protection Poster

U.S. Department of Labor

OSHA®
Occupational Safety and Health Administration

# Job Safety and Health
# IT'S THE LAW!

## All workers have the right to:

- A safe workplace.
- Raise a safety or health concern with your employer or OSHA, or report a work-related injury or illness, without being retaliated against.
- Receive information and training on job hazards, including all hazardous substances in your workplace.
- Request an OSHA inspection of your workplace if you believe there are unsafe or unhealthy conditions. OSHA will keep your name confidential. You have the right to have a representative contact OSHA on your behalf.
- Participate (or have your representative participate) in an OSHA inspection and speak in private to the inspector.
- File a complaint with OSHA within 30 days (by phone, online or by mail) if you have been retaliated against for using your rights.
- See any OSHA citations issued to your employer.
- Request copies of your medical records, tests that measure hazards in the workplace, and the workplace injury and illness log.

*This poster is available free from OSHA.*

## Employers must:

- Provide employees a workplace free from recognized hazards. It is illegal to retaliate against an employee for using any of their rights under the law, including raising a health and safety concern with you or with OSHA, or reporting a work-related injury or illness.
- Comply with all applicable OSHA standards.
- Report to OSHA all work-related fatalities within 8 hours, and all inpatient hospitalizations, amputations and losses of an eye within 24 hours.
- Provide required training to all workers in a language and vocabulary they can understand.
- Prominently display this poster in the workplace.
- Post OSHA citations at or near the place of the alleged violations.

FREE ASSISTANCE to identify and correct hazards is available to small and medium-sized employers, without citation or penalty, through OSHA-supported consultation programs in every state.

***Contact OSHA. We can help.***

**1-800-321-OSHA (6742) • TTY 1-877-889-5627 • www.osha.gov**

OSHA 3165-04R 2015

# APPENDIX I

Health and Safety Briefing/Tailgate Meeting Form

# HEALTH AND SAFETY BRIEFING / TAILGATE MEETING FORM

Site Name/Location: _____

Date: _____ Weather Forecast: _____

Names of Personnel Attending Briefing

_____ _____ _____

_____ _____ _____

_____ _____ _____

Planned Work

_____

_____

_____

Instrument Calibration: Instrument/Time/Cal. Gas/Cal. Concentration/Actual Concentration

_____

_____

_____

Items Discussed

_____

_____

_____

_____

_____

Work Permit Type and Applicable Restrictions

_____

_____

_____

Signatures of Attending Personnel

_____ _____ _____

_____ _____ _____

_____ _____ _____

# APPENDIX J

## Generic Community Air Monitoring Plan

**C360129 HASP, May 2013**
**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 work day, 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/m3) 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/m3 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.

**Table A-1. Emerging Contaminants Field and Quality Control Sampling Summary**

| Sample Medium | Target Analytes | Field Samples | Replicates[1] | Field Blanks[1] | Matrix Spikes[1] | Spike Duplicates[1] | Total No. of Samples |
|---|---|---|---|---|---|---|---|
| Groundwater | PFAS | 4 | 1 | 1 | 1 | 1 | 8 |
| | 1,4-dioxane | 4 | 1 | 1 | 1 | 1 | 8 |

Totals are estimated based on scope of work as written, actual sample quantities may vary based on field conditions. QA/QC sample quantities will be adjusted accordingly.

[1] Based on 1 per 20 samples or 1 per day