September 5, 2012

REMEDIAL INVESTIGATION AMENDMENT WORK PLAN

Powers Chemco Site
a.k.a. Columbia Ribbon
and Manufacturing Company Site
71 Charles Street
Glen Cove, New York
Site No. 1-30-028

Prepared for

KONICA MINOLTA HOLDINGS U.S.A., INC.
71 Charles Street
Glen Cove, New York

ROUX ASSOCIATES, INC.

Environmental Consulting & Management

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1.0 Introduction

Roux Associates, Inc. (Roux Associates), on behalf of Konica Minolta Holdings U.S.A., Inc. (HUS), has prepared this Supplemental Pre-Design Investigation Work Plan (Work Plan) to complete the delineation of impacted soil and groundwater beneath the North Lot of the Powers Chemco, a.k.a. Columbia Ribbon and Manufacturing Company (Site Code 1-30-028) located at 71 Charles Street, Glen Cove, New York (the Site).

The proposed scope of work for this Work Plan was designed to adequately define the nature and extent of impacted soil and groundwater both onsite and offsite and to confirm the results of previous investigation conducted by Roux Associates in March 2011 and Liberty Environmental in July 2011.The data from this investigation will be used with previous sampling results to serve as the basis for a remedial action to address the source(s) of the residual impacts to groundwater.

A summary of the Site description and history is provided in Section 2.0. The proposed scope of work is provided in Section 3.0. A Site-specific Health and Safety Plan (HASP) is provided in Appendix A.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The subject Site is the Powers Chemco, a.k.a. Columbia Ribbon and Manufacturing Company located at 71 Charles Street in Glen Cove, New York and is approximately 15 acres in size. The area impacted by historical disposal of industrial wastes is approximately 1.4 acres and located in the northwest section of the Site (the North Lot) and serves as an employee parking area. The area of concern is one-third (1/3) of an acre within the north-northeast portion of the North Lot. Surrounding the property to the north and east are residential areas, to the south and west are industrial properties, including four other inactive hazardous waste disposal sites.

2.2 Site History

For an undetermined period prior to 1979, Columbia disposed of wastes from the production of blue printing inks, carbon paper, and typing ribbon in open pits behind their manufacturing buildings. Apparently, wastes from 55-gallon drums were dumped into the open pits. The drums were then crushed and added to the pits before burial. An aerial photograph taken between 1950 and 1960 showed the location of two or three of these pits.

Additionally, wastes were pumped through a two-inch galvanized pipe from the Columbia plant directly into the pits. The hazardous and industrial wastes disposed of in the area included, but were not necessarily limited to, toluene, ethylbenzene, ethyl acetate, and other residues from the formulation of printing inks.

In 1979 Powers Chemco, Inc. (Chemco) purchased a parcel of land including the disposal area from Columbia for use as a parking area. Chemco, a manufacturer of photographic equipment and supplies, was unaware that the parcel was heavily contaminated with hazardous and industrial wastes. In 1983, Chemco discovered the subsurface contamination while excavating in the area.

To determine the nature and extent of the contamination, Chemco hired Fred C. Hart Associates (FCHA) to perform a site investigation. The investigation was conducted during the period November 30, 1983 to February 3, 1984 and produced the report entitled, "Investigation and

Hydrogeologic Assessment of the Former Columbia Ribbon and Carbon Company Waste Disposal Site," dated April 1984. The report concluded that the site contained approximately 6,000 cubic yards of grossly contaminated soils, waste sludges, rags, filters, and other debris along with approximately 100 drums.

Based upon the conclusions of the report, Chemco presented to the NYSDEC an interim remedial plan for the removal and disposal of the buried wastes and heavily contaminated soils at the site. The NYSDEC approved the plan and entered into a voluntary Order on Consent with Chemco on June 8, 1984 to implement the removal action.

Chemco retained Associated Chemical and Environmental Services (ACES) as the contractor to perform the removal action in accordance with the approved interim remedial plan. FCHA acted as the project manager and coordinator. Representatives from the NYSDEC and the Nassau County Health Department witnessed the work.

Excavations began on June 19, 1984 and continued through August 1984. Fifteen overlapping trenches were excavated. The extent of the excavations was determined by the visual observation of heavily contaminated soils and wastes. A total of 4,645 tons of contaminated soils and debris along with 267 mostly empty drums were transported off-site under manifests to the Fondessy Enterprises landfill in Oregon, Ohio. The average depth of the excavations was five feet. Excavations did not extend into saturated soils.

The results of the removal action were summarized in a FCHA report dated September 28, 1984 entitled, "Engineer's Certification Report: Removal of Drums and Contaminated Soils from the Former Columbia Ribbon and Carbon Co. Site." After reviewing additional information submitted in support of the report, the NYSDEC accepted the certification in April 1985.

A second field investigation was carried out during early 1986 to more carefully assess the potential for contaminant migration from the site and define the vertical and horizontal extent of groundwater contamination. The work was carried out under a second Order on Consent with the NYSDEC dated January 16, 1986. The November 1986 report entitled, "Supplemental

Hydrogeologic Investigation of the Former Columbia Ribbon and Carbon Company Waste Disposal Site," concluded that the contaminants are confined in a shallow sand and gravel unit and are concentrated in the immediate area of the disposal site.

The initial and supplemental investigations were used along with information from the removal action as the basis for defining the nature and extent of the contamination at the site. Chemco then developed a Remedial Investigation/Feasibility Study (RI/FS) work plan to examine alternatives for remediating the site. The RI/FS work plan called for the installation of two additional groundwater monitoring wells; one to replace a damaged well and one for use in a pump test to gather information on the yield and other characteristics of the sand and gravel unit. Additionally, the work plan identified a series of remedial alternatives to be evaluated in the feasibility study.

The agreement to perform the RI/FS was incorporated into a third Order on Consent signed April 4, 1988. The work was performed over the summer of 1988 and the first draft of the RI/FS Report was submitted in September 1988. The NYSDEC disapproved the first draft in May 1989. The second draft was submitted in March 1990, which was also disapproved in May 1990. The third draft was submitted February 1, 1991. During the development of the RI/FS Report, Powers Chemco, Inc. was renamed to Chemco Technologies, Inc., which was subsequently purchased and renamed Konica Imaging U.S.A., Inc.

In 1992, the New York State Department of Environmental Conservation (NYSDEC) approved the results of the pilot study and the remediation system was constructed. System operation began in November 1994 and continued until August 1996 when the system was temporarily shut down. The system was restarted in February 1997 and continued until November 1999 when it was again temporarily shut down. Confirmatory sampling showed that permanent shutdown of the system was appropriate and in accordance with the Performance Analysis Design Modification Plan (PADMP) that had been developed for the Site.

Post-shutdown monitoring of the wells on the perimeter of the site was conducted from June 2003 until March 2004 and showed that groundwater concentrations were within the NYS Class GA Groundwater Quality Standards.

Additional groundwater sampling in the interior area of the Site (the remediation area) was requested by NYSDEC and showed that volatile organic compounds (VOCs), primarily toluene, remained in soil and groundwater beneath Konica Minolta property, North of R-SB9 & L-SB26, west of L-SB19 &20, south of R-SB2 and South East of the fence line. The offsite contamination has not yet been clearly characterized.

In 2004, NYSDEC requested that Konica develop a remedial plan to address the remaining contamination, perform a soil gas survey, and additional soil sampling in the remediation area.

In December 2004, nine soil borings were advanced and results showed that there was no vadose zone soil contamination contributing to the groundwater VOC levels. In January and April 2005, the soil gas survey was conducted by ERM. The soil gas survey results showed that concentrations of VOCs in soil gas were highest beneath the North Lot, and decreased in concentration by one to two orders of magnitude toward the perimeter of the lot adjacent to the street (The Place). The elevated concentrations of VOCs in soil gas beneath the North Parking Lot were attributed by ERM to elevated concentrations of VOCs in groundwater, and not necessarily sources in soil. Subsequent off-site soil gas sampling resulted in the conclusion that soil vapor intrusion is not taking place due to the fact that indoor air concentrations of the contaminants of concern were higher than sub-slab concentrations.

In December 2008, additional groundwater sampling from perimeter wells indicated that groundwater impacts were not migrating to the outer edges of the source area and an attempt was made to vertically delineate the VOC contamination.

In December 2009, NYSDEC notified Konica that the site classification in the NYS registry was being changed from a Class 4 to a Class 2, which represents a site that is believed to pose a risk to human health the environment and, requires active remediation to alleviate the contamination found at the site.

In March of 2011, Roux Associates performed a soil and groundwater investigation to delineate remaining VOCs impacts in the North Lot. The results of the investigation showed that residual

pockets of VOC contamination appear to be concentrated in silt lenses within the remediation area at depths up to 20 feet below land surface (bls), and groundwater VOC contamination is present along the northwest fence line, in the eastern portion of the North Lot near the building and in the western portion of the North Lot. There was also indication of an off-site source to the north of the North Lot, as evidenced by VOC contamination in a soil boring along the fence line.

3.0 SCOPE OF WORK

3.1 Task 1 –Soil Investigation

Roux Associates proposes a focused soil and groundwater investigation in the vicinity of the high concentrations of VOCs in the North Lot, where previous investigations indicated that a residual source area for VOCs in groundwater exists. In March of 2011, Roux Associates performed a soil and groundwater investigation to further delineate remaining VOC impacts in the North Lot. NYSDEC has requested confirmatory sampling in the vicinity of these sample locations, in addition to off-site sampling to evaluate soil and groundwater conditions north of the Site.

To refine the delineation of potential residual material contributing to the elevated concentrations of VOCs in groundwater and to confirm results of the Pre-Design Investigation performed in March 2011, 19 soil borings are proposed in the North Lot area (Plate 1). Each soil boring will be advanced using a rotary sonic drill rig.

The following table summarizes the proposed soil borings, depths, and rationale:

Designation	Depth (ft bls)	Rationale
R-SB-100	0 – 22	Confirmation of previous results obtained at L-SB-19 and L-SB-20 by Liberty Environmental
R-SB-101	0 - 35	Soil boring for interpretation of subsurface layering to locate screened interval for proposed Monitoring Well MW-101 (no samples to be collected for analyses)
R-SB-102	0 – 22	Confirmation of previous results obtained at L-SB-30 by Liberty Environmental
R-SB-103	0 – 22	Confirmation of previous results obtained at L-SB-29 by Liberty Environmental
R-SB-104	0 – 25	Confirmation of previous results obtained at L-SB-25 by Liberty Environmental
R-SB-105	0 – 25	Delineation of perimeter of impacted area
R-SB-106	0 – 25	Delineation of perimeter of impacted area; to obtain deep soil samples for vertical delineation of impacted soil below 15 feet depth in previous boring R-SB-5
R-SB-107	0 – 25	Delineation of perimeter of impacted area

Designation	Depth (ft bls)	Rationale
R-SB-108	0 – 25	Delineation of perimeter of impacted area / groundwater screening sample
R-SB-109	0 – 25	Delineation of perimeter of impacted area / groundwater screening sample
R-SB-110	20 - 24	To obtain deep soil samples for vertical delineation of impacted soil below 19 feet depth in previous boring R-SB-1 (requested by NYSDEC)
R-SB-111	20 – 24	To obtain deep soil samples for vertical delineation of impacted soil below 20 feet depth in previous boring R-SB-3 (requested by NYSDEC)
R-SB-112	0 – 20	Resolve discrepancy in results between R-SB-2 and L-SB-25 (requested by NYSDEC)
R-SB-113	20 – 24	To obtain deep soil samples for vertical delineation of impacted soil below 19 feet depth in previous boring R-SB-13 (requested by NYSDEC)
R-SB-114	20 – 24	To obtain deep soil samples for vertical delineation of impacted soil below 20 feet depth in previous boring R-SB-14 (requested by NYSDEC)
R-SB-115	15 – 20	To obtain deep soil samples for vertical delineation of impacted soil below 15 feet depth in previous boring R-SB-15 (requested by NYSDEC)
R-SB-116	20 – 27	To confirm previous results for VOCs in the clay and obtain deep soil samples for vertical delineation of impacted soil below 25 feet depth in previous boring R-SB-16 (requested by NYSDEC)
R-SB-117	0 – 25	Confirmation of previous results obtained at L-SB-24 by Liberty Environmental (requested by NYSDEC)
R-SB-118	0 – 25	Delineation of offsite area (requested by NYSDEC)

A geophysical survey will be conducted north of the North Lot fence line to identify utilities and aid in finalizing soil boring locations prior to intrusive activities. At the discretion of the field geologist, each location may be pre-cleared for the presence of subsurface obstructions or utilities using manual methods (i.e., post-hole digger, hand auger, and/or vacuum excavator/air knife) to at least five feet below land surface in accordance with Roux Associates standard operating procedures.

Soil will be collected in 10-foot cores from land surface to 20 feet below land surface (bls). Further sampling will proceed in two-foot increments (i.e., 20 to 22 feet bls), with each two-foot increment screened using a PID prior to advancing to the next two foot increment.

- If the PID screening of the first interval below 20 feet indicates readings below 10 ppm, then the boring will be terminated, and a sample collected for VOC analysis.
- If the PID screening indicates readings above 10 ppm, then the next two-foot interval (i.e., 22 to 24 ft bls) will be collected, screened with a PID and sampled for laboratory analysis.
- In the event that a clay, silty-clay, or clayey silt interface is observed below 15 feet in depth, under no circumstances shall borings be advanced more than four feet deeper than the interface without further evaluation of PID screening data by both HUS and Roux Associates.
- When coring through known contaminated intervals based on previous data, measures will be taken to isolate that interval or intervals using an outer casing prior to advancing the boring through the contaminated interval(s) into deeper intervals. This process will avoid cross-contaminating deeper intervals by borings through shallow contaminated intervals.

Continuous cores collected at each soil boring will be separated into approximately two-foot intervals. Each interval will be initially screened with a photoionization detector (PID) and a flame ionization detector (FID), photographed, visually characterized according to the Unified Soil Classification System (USCS) and divided in half lengthwise, with one-half of the interval placed into zip-lock plastic storage bags and homogenized. The bags will be allowed to stand for approximately 30 minutes and the bag headspace will then be monitored for organic vapors with a PID/FID. The remaining soil from each interval will be placed in sample jars on ice in a cooler while the headspace is analyzed.

A minimum of two soil samples will be collected from each boring location from intervals with the greatest PID/FID headspace reading, or intervals exhibiting evidence of significant contamination based on field screening. Soil layers containing fine-grained material (e.g., silt and clay) and/or staining will be targeted for sampling. If no soil intervals exhibit staining or a PID/FID headspace reading greater than 10 parts per million (ppm) above background, the interval spanning the water table will be analyzed, and a second sample from any silt and/or clay layers below the water table, if present, will be analyzed.

At two soil sampling locations (SB-108 and SB-109 shown on Plate 1), groundwater screening samples will be obtained. The depths of the groundwater samples will be determined based on a review of PID, FID and visual characterization of the soil cores. Groundwater screening sample depth will be targeted toward zones with either high PID/FID readings or evidence of staining or odor. In the event of lack of any of these indicators, the groundwater screening samples will be obtained from layers containing sand that may be permeable zones in which transport of impacted groundwater may occur.

Two groundwater screening samples will be obtained in each location. The groundwater screening samples will be obtained by completing new borings immediately adjacent to the borings used to obtain soil samples at locations SB-108 and SB-109.

Soil and groundwater screening samples will be placed in laboratory-supplied sample bottles, labeled with all relevant information, and immediately placed in ice-filled coolers at 4°C. Samples will be transported under chain-of-custody procedures to TestAmerica Laboratories, Inc. (TestAmerica) of Edison, New Jersey for analysis of the following:

- Target Compound List (TCL) of VOCs;
- TCL SVOCs; and
- Target Analyte List (TAL) for Metals

3.2 Task 2 – Installation of Groundwater Monitoring Wells

Two monitoring wells are proposed to be installed at the Site at the locations shown on Plate 1 as described below:

- R-MW-101 will be installed at the southern end of the parking lot south of existing well MW-3R and screened from approximately 15 to 25 feet below land surface (ft bls).
  - The justification for this well is to provide a monitoring location to replace MW-3R, because MW-3R is screened in silt and does not yield sufficient water to be a reliable monitoring location. The NYSDEC expressed this concern in their December 9, 2011 email. Based on the cross-section from the Fred C. Hart 1984 report, a location south of MW-3R in the vicinity of the water tank should allow installation of a well that is not screened in silty material. This will be confirmed during borehole installation through the use of continuous spilt-spoon sampling.

- R-MW-102 will be installed to replace well AIW-701[1] and will be screened from approximately 10 to 20 ft bls.
  - The justification for a screened interval of 10 to 20 ft bls at a location near AIW-701 is to install a well to augment the shallow (water table) data that were obtained previously by ERM in 2005 from PZ-1 and PZ-2[2] in the grass strip south of The Place. PZ-1 is screened from 6 to10 ft bls and PZ-2 from 8 to 12 ft bls, and, therefore, are shallow/water-table wells. In addition, the Pre-Design Investigation by Roux Associates in March 2011 indicated significant groundwater impacts at R-SB-16 from 15 to 20 ft bls. R-SB-16 is approximately 35 feet southeast of AIW-701.

The two proposed wells will be installed using the rotary sonic drilling method. At each proposed drilling location, the sonic drill rig will be used to advance a borehole to the target depth. Prior to well installation, pilot soil borings will be completed at the proposed well locations (Plate 2) to provide soil cores to characterize subsurface lithology. The soil cores will be used to determine the screened intervals for the proposed wells (i.e., layers of relatively permeable sand below the water table). Soil samples will be continuously collected and screened and logged as described above in Task 1. One soil sample will be selected from the two-foot interval with the greatest PID/FID headspace reading for laboratory analysis from each monitoring well pilot boring. In the event that no elevated PID/FID headspace readings are observed, no soil samples will be analyzed from the well borings.

After the target depth of the borehole has been reached, the monitoring wells will be installed. Each monitoring well will be constructed of two-inch diameter Schedule 40 polyvinyl chloride (PVC) casing and 10-feet of two-inch diameter, 20-slot (0.020 inches) PVC screen. Each proposed monitoring well will be constructed with the screened interval in the lower ten feet of the borehole.

A gravel pack consisting of #1 Morie sand or equivalent will be installed around the screen to at least one foot above the top of the screened interval followed by a one-foot bentonite pellet seal. The bentonite pellets will be hydrated and the remainder of the well annulus will be finished to

[1] Note that Roux Associates was unable to get a quality groundwater sample out of AIW-701 because of the poor yield from the well, which caused it to go dry during purging and sampling.
[2] PZ-1 is 25 feet--and PZ-02 is 38 feet--from AIW-701. AIW-701 is screened from 10 to 30 ft bls.

land surface with bentonite grout installed using the tremie method. The monitoring wells will be completed to grade with a flush-mounted monitoring well manhole and locking plug.

All cuttings generated during drilling activities will be drummed, labeled, and stored onsite for later disposal.

To ensure that a good hydraulic connection is established between the well screen and the aquifer, each well will be developed by pumping with a submersible or centrifugal pump to remove a minimum of three (3) times the standing volume of water from the well. After each volume of water is removed, pH, conductivity, temperature, and turbidity will be measured and recorded using a Horiba U-22 water quality unit. Well development (i.e., combination of surging and pumping) will continue until turbidity readings are below fifty nephelometric turbidity units (50 NTUs), or until removal of ten times the standing volume of water in the well has occurred. A minimum of 24 hours must elapse after well development before wells can be gauged or sampled.

Following well installation and development, the top of the new well casings will be surveyed. Horizontal coordinates measured will be referenced to the New York State Plane Coordinate System, Long Island Zone, North American Datum of 1983 (NAD 83). Vertical coordinates (elevations) will be measured for top-of-casing (measuring point) and grade elevations referenced to the North American Vertical Datum of 1988 (NGVD 88).

Following the survey, water-level measurements will be recorded from the surveyed measuring point for all new monitoring wells and the adjacent wells they are in clusters with. The water level measurements will subsequently be used to create a groundwater elevation map.

3.3 Task 3 – Groundwater Sampling

Prior to groundwater sampling, groundwater levels in all existing site wells, including Air Injection Wells (AIW series wells) will be recorded for the purpose of determining groundwater flow directions in both the perched zone and the deeper groundwater zone. Six monitoring wells (the two new wells and existing wells MW-1, MW-6, MW-8, and MW-12) will be sampled using low-flow sampling procedures. The data from these five wells, together with the two groundwater

screening samples, will provide delineation of both the horizontal and vertical extent of impacted groundwater downgradient of the source area. The justification for sampling of these wells is provided below:

Designation	Screened Interval (ft bls)	Rationale
MW-1	13-23	Evaluation of groundwater quality to the west of the source area
MW-6	9-14	Evaluation of groundwater quality downgradient of source area to the southwest
MW-8	9-19	Evaluation of groundwater quality downgradient of source area to the east
MW-12	13-28	Evaluation of groundwater quality offsite to the north

Groundwater will be purged from the monitoring wells using a peristaltic pump or similar. Field parameters including pH, temperature, specific conductance, and turbidity will be measured during purging, and sampling will be performed after field parameters measurements have stabilized.

The groundwater samples will be placed in laboratory-supplied sample bottles, labeled with all relevant information, and immediately placed in ice-filled coolers at 4°C. Samples will be transported under chain-of-custody procedures to TestAmerica for analysis. The groundwater samples will be analyzed for:

- Target Compound List (TCL) of VOCs;
- TCL SVOCs; and
- Target Analyte List (TAL) for Metals

3.4 Task 4 – Summary Report Preparation

The results of the focused soil and groundwater investigation will be summarized in a report to NYSDEC. The design and implementation of the recommended remedial alternative for the residual source area in the North Lot will be based on a review of the results of this and previous investigations in the area. The report will contain a summary of recommendations regarding implementation of remedial actions to address the residual impacts to soil and groundwater.

APPENDICES

APPENDIX A

Health and Safety Plan

January 14, 2011

HEALTH AND SAFETY PLAN

71 Charles Street
Glen Cove, New York 11542

Prepared for

KONICA MINOLTA HOLDINGS U.S.A., INC.
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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 71 Charles Street, Glen Cove, New York.

_____ _____

Joseph Gentile
Corporate Health and Safety Manager
Roux Associates, Inc.

Date

_____ _____

Subraham Singh
Site Health and Safety Officer
Roux Associates, Inc.

Date

_____ _____

Nathan Epler
Project Principal
Roux Associates, Inc.

Date

1.0 INTRODUCTION

This Site-specific and Safety Plan (HASP) has been prepared in accordance with 29 CFR 1910.120 Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) and Roux Associates, Inc. (Roux Associates) Standard Operating Procedures (SOPs). It addresses all activities to be performed during the implementation of Remedial Investigation (RI) activities at 71 Charles Street, Glen Cove, 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 Corporate Health and Safety Manager (CHSM), with the SSO implementing the changes to the HASP.

Upon entering the Site, all visitors are required to sign in. All visitors entering the Contamination Reduction Zone (CRZ) (defined in Section 8.1.2), the Contamination Reduction Corridor (CRC) (defined in Section 8.1.2), or the Exclusion Zone (EZ) (defined in Section 8.1.3) will be required to read and comply with the provisions of this HASP. Visitors will be required to comply with applicable OSHA requirements such as training, medical monitoring, and respiratory protection.

In the event that a visitor does not adhere to the provisions of this HASP, he or she will be required to leave the Site. Mobilization activities not requiring intrusive activities (e.g., survey, equipment staging, etc.) or exposure to potentially impacted areas may only be performed if supervised by a competent Roux Associates employee.

1.1 Scope of Work

The Scope of Work activities will include the implementation of Pre-design and Site Investigation activities.

The Scope of Work activities are as follows:

1. Obtain necessary permits and approvals.
2. Preparation and implementation of an approved Health and Safety Plan (HASP).
3. Implementation of RI activities, consisting of site inspection/reconnaissance, geophysical survey, drilling, soil boring and sampling, groundwater sampling, and soil vapor sampling.
4. Implementation of the approved Field Sampling Plan (FSP).
5. Mobilization and demobilization.
6. Maintain good site housekeeping procedures at all times.
7. Identification, protection, and/or relocation of any utilities within the work area.
8. Construct a decontamination pad with proper containment and collection system, if necessary.

1.2 Emergency Numbers

1.2.1 Emergency Phone Numbers

Emergency Medical Service 911

Police: Nassau County Police Department (NCPD).....911

Fire: 911

Hospital: Glen Cove Hospital (North Shore LIJ) .....(516) 674-7300

National Response Center.....(800) 424-8802

Poison Control Center.....(800) 222-1222

CHEMTREC.....(800) 262-8200

Fire: Glen Cove Fire Department .....(516) 676-0366

Center for Disease Control.....(800) 311-3435

USEPA (Region II).....(212) 637-5000

NYSDEC Emergency Spill Response .....(800) 457-7362

1.2.2 Project Management/Health and Safety Personnel

Title	Contact	Telephone/Cell
Roux Associates		
Project Director	Nathan Epler	(631) 232-2600 Cell – (631) 921-5675
Site Health and Safety Officer	Subraham Singh	(631) 232-2600 Cell – (631) 484-1168
Corporate Health and Safety Manager	Joe Gentile	(856) 423-8800 Cell – (610) 844-6911

1.2.3 Other Important Phone Numbers

Nassau County Emergency Response Team 911

1.2.4 Directions to Glen Cove Hospital (North Shore LIJ) – 101 St. Andrews Lane Glen Cove, New York 11542

See Figure 2 for street map.

- Start at 71 Charles Street, Glen Cove, New York, take a Left onto Herb Hill Road
- Turn Left at Brewster Street
- Continue onto Forest Avenue
- Turn Right at Walnut Avenue
- Arrive at Glen Cove Hospital on your right

2.0 HEALTH AND SAFETY STAFF

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

2.1 Project Principal (PP) – Nathan Epler – Roux Associates

- 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.

2.2 Corporate Health and Safety Manager (CHSM) – Joseph Gentile – Roux Associates

- 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 and/or Project Manager.
- Responsible for the development of new task safety protocols and procedures and resolution of any outstanding safety issues which may arise during the conduction of site work.
- Review and approve all health and safety training and medical surveillance records for personnel and subcontractors.

2.3 Site Safety and Health Officer (SSO) – Subraham Singh – Roux Associates

- 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 periodic safety briefings.
- Ensures that field team members comply with this HASP.
- Completes and maintains Accident Report and Investigation Forms.
- Notifies PP and CHSM of all accident/incidents.

- Notifies PP/PM 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
- Change in level of personal protective equipment (PPE).
- Maintains contact with Contractors.
- Determines upgrade or downgrade wind direction for personal protective equipment (PPE) based on Site conditions and/or real time monitoring results.
- Ensures that monitoring instruments are calibrated daily or as manufacturer's suggested instructions determine.
- Submits and maintains health and safety field log books, daily safety logs, training logs, air monitoring result reports, weekly safety report.

2.4 Field Personnel and Subcontractors

- Report any unsafe or potentially hazardous conditions to the SSO/PM.
- 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.

3.0 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.

3.1 Property Location and Description

The Site is located at 71 Charles Street, Glen Cove, Nassau County, New York and currently owned by Konica Minolta Graphic Imaging, U.S.A., Inc. (KM). According to the information provided by Konica Minolta Graphic Imaging, U.S.A., Inc, the Site is comprised of a 15-acre parcel located on the west side of Charles Street, between Herb Hill Road and The Place. Northeastern and southern sections of the Site contain a one and two story manufacturing, warehouse, and office buildings. The buildings are surrounded primarily by paved areas with a minimally landscaped area to the north and east of the former office building and surrounding the large parking area (North Lot) on The Place. The parking lot consists of approximately 1.5 acres in the northwestern corner of the site, a portion of which is the area known to be impacted by historical disposal of industrial wastes. This area will be the focus of investigations performed at the site, with possible monitoring of the existing groundwater monitoring well network that extends across the Site.

The buildings are constructed with concrete block and brick walls, steel frame and roof on a concrete slab. The buildings have not been in use for some time, and a security guard is stationed at the main entrance to the North Lot, which is located on The Place. A small security guard booth is present within the fence at the foot of a loading dock area. With the exception of a landscaped area which includes a small pond to the east of the former remediation treatment building, the land surrounding the building is paved with parking areas to the north and west. There are several points of access/egress available for the former office and manufacturing buildings.

The interior space of the buildings is partitioned into office, manufacturing, and warehouse areas. Interior finishes in office spaces consist primarily of carpeted and vinyl tiled floors, gypsum wallboard interior partitions, and suspended acoustical ceiling tile. Interior finishes in the manufacturing/warehouse space include concrete floors and painted walls. All unoccupied

buildings are in disrepair with leaking roofs and limited to no utility service. Only one of the onsite buildings is currently in use as a temporary office space.

4.0 WASTE DESCRIPTION/CHARACTERIZATION

4.1 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 Chemicals in the Workplace – Lewis 1990
- NIOSH Pocket Guide to Chemical Hazards – 2005
- ACGIH TLV® Values and Biological Exposure Indices
- OSHA 29 CFR 1910.1000

4.2 Chemical/Material Safety 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.

4.2.1 Contaminants of Concern

Soil and groundwater contaminants that may be encountered during drilling and sampling activities include both organic and inorganic compounds. Prior investigations at the site have indicated detection of Volatile Organic Compounds (VOCs), most notably toluene, and metals.

The toxicological, physical, and chemical properties of potential contaminants are presented in Table 1.

5.0 HAZARD ASSESSMENT

The potential to encounter chemical hazards is dependent upon the work activity performed (intrusive versus non-intrusive) and the duration and location of the work activity. Such hazards could include inhalation and/or skin contact with chemicals/gases that could cause: dermatitis, skin burns, being overcome by vapors or asphyxiation.

Physical hazards that may be encountered during Site work include: heat and cold stress, exposure to excessive noise, loss of limbs, being crushed, head injuries, punctures, cuts, falls, electrocution, bruises, structural integrity of buildings, asbestos and lead paint exposure, and other physical hazards due to motor vehicle operation, heavy equipment and power tools.

Biological hazards may exist during Site activities. These hazards include exposure to insect bites/stings, animals and animal wastes, mold and bloodborne pathogens.

Prior to the beginning of each new phase of work, an activity hazard analysis will be prepared by the SSO with assistance from the CHSM. The analysis will address the hazards for each activity performed in the phase and will present the procedures and safeguards necessary to eliminate the hazards or reduce the risk. The Job Safety Analysis Sheets are located in Appendix A.

5.1 Chemical Hazards

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

- Drilling Activities
- Decontamination Activities

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

5.1.1 Exposure Pathways

Exposure to these compounds during ongoing activities may occur through inhalation of contaminated dust particles, inhalation of VOCs and SVOCs, dermal absorption, and accidental ingestion of the contaminant by either direct or indirect cross-contamination activities.

Inhalation of contaminated dust particles (VOCs, SVOCs, and inorganics) can occur during adverse weather conditions (high or changing wind directions) or during operations that may generate airborne dust such as excavation and loading of contaminated soils. Dust control measures such as applying water to roadways and excavations will be implemented where visible dust is generated. Where dust control measures are not feasible or effective, respiratory protection will be used when necessary (see Section 9.2.2 for monitoring procedures and action levels).

5.1.2 Operational Action Levels

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

5.1.3 Additional Precautions

Dermal absorption or skin contact with chemical compounds is possible during intrusive activities 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.

5.2 Physical Hazards

A variety of physical hazards may be present during Site activities. These hazards include typical construction activities: operation of motor vehicles and heavy equipment operation, the use of power and hand tools, roping and rigging of steel sheeting, walking on objects, tripping over objects, working on surfaces which have the potential to promote falling, skin burns, crushing of fingers, toes, limbs, head injuries caused by falling objects, temporary loss of one's hearing and/or eyesight. The referenced hazards are not unique and are generally familiar to most hazardous waste site workers at construction sites. Task specific safety requirements for each phase will be covered during safety briefings. Job Safety Analysis summaries are contained in Appendix A.

5.2.1 Noise

Noise is a potential hazard associated with operation of heavy equipment, power tools, pumps, and generators. High noise equipment operations will be evaluated at the discretion of the SSO.

Employees with an 8-hour time weighted average exposure exceeding 85 dBA will be included in a hearing conservation program in accordance with 29 CFR 1910.95 and 1926.52.

It is mandated that employees working around heavy equipment or using power tools that produce noise levels exceeding 90 dBA wear hearing protection that shall consist of earplugs or protective earmuffs.

5.2.2 Heat Stress

Heat stress is a significant potential hazard associated with the use of protective equipment in a hot weather environment. The human body is designed to function at a certain internal temperature. When metabolism or external sources (fire or hot summer day) cause the body temperature to rise, the body seeks to protect itself by triggering cooling mechanisms. The SSO will monitor the air temperature (as described later in this section) to determine potential adverse affects the weather can cause onsite personnel. Excess heat is dissipated by two means:

- Changes in blood flow to dissipate heat by convection, which can be seen as "flushing" or reddening of the skin in extreme cases.
- Perspiration is the release of water through skin and sweat glands. While working in hot environments, evaporation of perspiration is the primary cooling mechanism.

Protective clothing worn to guard against chemical contact effectively stops the evaporation of perspiration. Thus the use of protective clothing increases heat stress concerns.

The major disorders due to heat stress are heat cramps, heat exhaustion, and heat stroke. Heat cramps are painful spasms, which occur in the skeletal muscles of workers who sweat profusely in the heat and drink large quantities of water, but fail to replace the bodies lost salts or electrolytes. Drinking water while continuing to lose salt tends to dilute the body's extracellular fluids. Soon water seeps by osmosis into active muscles and causes pain. Muscles fatigued from work are usually most susceptible to cramps.

Extreme weakness or fatigue, dizziness, nausea, and headache characterize heat exhaustion. In serious cases, a person may vomit or lose consciousness. The skin is clammy and moist, complexion pale or flushed, and body temperature normal or slightly higher than normal.

Treatment is rest in a cool place and replacement of body water lost by perspiration. Mild cases may recover spontaneously with this treatment; severe cases may require care for several days. There are no permanent effects.

Heat stroke is a medical emergency. It is a very serious condition caused by the breakdown of the body's regulating mechanisms. The skin is very dry and hot with red mottled or bluish appearance. Unconsciousness, mental confusion, or convulsions may occur. Without quick and adequate treatment, the result can be death or permanent brain damage. As first aid treatment, the person should be moved to a cool place. Body heat should be reduced artificially, but not too rapidly, by soaking the person's clothes in water and fanning them.

Steps that can be taken to reduce heat stress are:

- Acclimate the body. Allow a period of adjustment to make further heat exposure endurable.
- Drink more liquids to replace the body water lost during sweating.
- Rest is necessary and should be conducted under the direction of the SSO.
- Wear personal cooling devices. These are two basic designs; units with pockets for holding frozen packets and units that circulate fluid from a reservoir through tubes to different parts of the body. Both designs can be in the form of a vest, jacket, or coverall. Some circulating units also have a cap for cooling the head.
- Wear long cotton underwear under chemical protective clothing. The cotton will absorb perspiration and will hold it close to the skin. This will provide the body with the maximum cooling available from the limited evaporation that takes place beneath chemical resistant clothing. It also allows for rapid cooling of the body when the protective clothing is removed.

Heat stress is a significant hazard associated with using protective equipment in hot weather environments. Local weather conditions may produce conditions, which will require restricted work schedules in order to protect employees.

Appendix B contains procedures for heat stress; these will be used as a guideline and to provide additional information.

5.2.3 Cold Stress

Cold temperatures are a significant potential hazard. Examples of cold temperature hazards are frostbite and hypothermia.

Frostbite is the most common injury resulting from exposure to cold. The extremities of the body are most often affected. The signs of frostbite are:

- The skin turns white or grayish-yellow.
- Pain is sometimes felt early but subsides later. Often there is no pain.
- The affected parts feel intensely cold and numb.

Hypothermia is characterized by shivering, numbness, drowsiness, muscular weakness, and a low internal body temperature when the body feels extremely warm. This can lead to unconsciousness and death. With both frostbite and hypothermia, the affected areas need to be warmed quickly. Immersion in warm water is an effective means of warming the affected areas quickly. In such cases, medical assistance will be sought.

To prevent these effects from occurring, persons working in the cold should wear adequate clothing and reduce the time spent in the cold area. The field SSO is responsible for determining appropriate time personnel should spend in adverse weather conditions and will monitor this.

Appendix B, which contains the Heat and Cold Stress Guidelines, provides additional information.

5.2.4 Asbestos

Asbestos was a widely used, mineral-based material that is resistant to heat and corrosive chemicals. Depending on the chemical composition, fibers may range from coarse to silky. The properties that make asbestos fibers valuable to industry are its high-tensile strength, flexibility, heat and chemical resistance, and good frictional properties. Asbestos is a common naturally occurring group of fibrous minerals. Asbestos fibers had been used in a variety of building materials; generally, most asbestos that remains today is found in pipe insulation, doors, textured paints and plasters, structural fireproofing, roofing materials, and floor tiles. Friable asbestos (that is, material that contains more than 0.1% asbestos by weight and can be crumbled by hand) is a

potential hazard because it can release fibers into the air if disturbed. Roux Associates personnel will not disturb any suspected asbestos material.

5.2.5 Structural Integrity

The structural integrity of a building and the safety of the individuals inside depend on meeting and maintaining national and local building codes. Structural integrity can range from minor defects such as loose floorboards and roof leaks to major defects such as floors and walls sagging and collapsed roofs. Numerous other structural defects can exist with or without consequence to the occupants. If Roux Associates personnel detect a problem, they should notify their supervisor, who in turn, should seek the opinion of a qualified structural engineer to offer and opinion regarding the integrity of the building. If in the opinion of the qualified engineer it is unsafe, no work can proceed until a solution to rectify the situation has been performed.

It is presently known that the onsite buildings have been unoccupied for some time and the security guard reports vandalism and stripping/theft of equipment, spare materials, wiring, copper piping, and metals within the buildings and leaking roofs in some areas. As such, personnel will take this into consideration during the initial site visits and communicate this potential hazard during the safety tailgate meetings to all workers entering the site.

5.2.6 Lockout/Tagout

Roux Associates and all Site contractors will develop a lockout/tagout plan in the event of the repair of electrical, pneumatic, hydraulic, and/or mechanical systems, per OSHA requirements under 29 CFR 1910.147.

5.3 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, bloodborne pathogens, and poison ivy. The Job Safety Analysis (Appendix A) suggests controls for various hazards to be potentially encountered onsite.

5.3.1 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, s/he should 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 site of the sting and the heart. The site should be kept below the heart if possible. A physician should be contacted immediately for further instructions.

5.3.2 Animals and Animal Wastes

Due to most of the onsite structures being abandoned for several years, there lies the potential for various wildlife to reside within the structures, 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 (i.e. rabies, 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 should be cleaned thoroughly immediately with soap and water and medical attention should be sought.

5.3.3 Mold

The various states of disrepair of the majority of the onsite structures have led to leaking roofs and the collection of water which may have led to the growth of mold within the buildings.

Although mold affects individuals differently and to different degrees, the following are some of the most common adverse health effects:

- Respiratory problems – wheezing, difficulty breathing;
- Nasal and sinus congestion;
- Eyes – burning, watery, reddened, blurry vision, light sensitivity;
- Dry, hacking cough;
- Sore throat;
- Nose and throat irritation;
- Shortness of breath and lung disease;
- Chronic fatigue;
- Skin irritation;
- Central nervous system (headaches, loss of memory, and mood changes);
- Aches and pains;
- Fever;
- Headaches;
- Diarrhea; and
- Immune system suppression.

Decisions about removing individuals from an affected area must be based on the results of a medical evaluation and made on a case-by-case basis.

Workers that discover the visible presence of mold in excess of 10 sq. feet need to notify the SSO for consultation. If a worker smells mold and feels that he/she is experiencing symptoms of exposure, he/she should retreat and report the symptoms to the SSO.

5.3.4 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 employees onsite 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 certifications and been trained in bloodborne pathogens should never perform first aid and/or CPR.

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

- Direct skin or mucous membrane contact with blood should be avoided.
- Open skin cuts or sores should be covered to prevent contamination from infectious agents.
- Body parts should 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 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.
- 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.

5.3.5 Poison Ivy

There are vegetated areas of the site that may serve as adequate growing areas for poison ivy. If exposed to poison ivy, personnel will wash skin thoroughly with soap and water as soon as possible.

5.4 Hazard Assessment

Task	Hazards	Risk of Exposure
Decontamination	Inhalation/Skin Contact	Moderate
	Heat Stress/Cold Stress	Moderate
	Physical Injury	Moderate
	Noise	Low
Drilling/Sampling	Inhalation/Skin Contact	Moderate
	Heat Stress/Cold Stress	Moderate
	Noise	Moderate/High
	Physical Injury	Moderate

6.0 TRAINING

6.1 General Health and Safety Training

In accordance with Roux Associates' 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 (i.e., HAZWOPER) or an approved equivalent will fulfill the requirements of this section.

In addition to the required initial training, each employee shall have received 3 days of directly supervised on-the-job training. This training will address the duties the employees are expected to perform.

Roux Associates' SSO has the responsibility of ensuring that personnel (or their employers) assigned to this project supply proof of their compliance with these requirements.

6.2 Annual Eight-Hour HAZWOPER Refresher Training

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, including air purifying devices and self-contained breathing apparatus (SCBA), medical surveillance, decontamination procedures, and personal protective clothing. In addition, topics deemed necessary by Roux Associates' Health and Safety Director may be added to the above list.

6.3 Site-Specific Training

Site personnel will receive 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.

6.4 Onsite Safety Meetings

Daily safety meetings will be presented each morning to discuss potential safety concerns for the upcoming activities and to review the applicable Job Safety Analyses.

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 Associates or other involved parties.

6.5 First Aid and CPR

The SSO will identify those individuals having first aid and CPR certification 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 and/or American Heart Association. Certification and appropriate training documentation will be kept with the Site personnel records.

6.6 Additional Training

The CHSM 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 topics deemed Site appropriate.

6.7 Subcontractor Training

All subcontractor personnel working on the Site shall have completed the 40-hour training requirement and meet the medical surveillance requirements found in Section 7.1. Subcontractor training shall be performed in accordance with 29 CFR 1910.120 and HASP specifications. In certain unique situations (e.g., mechanical failure of equipment), the non-trained individual performing emergency repairs may be allowed, at the discretion of the SSO, to perform repairs when no intrusive activities are being performed, and provisions have been made to mitigate potential exposure.

7.0 MEDICAL SURVEILLANCE PROCEDURES

7.1 General

A Medical Surveillance Program has been established as part of this plan and is included in Appendix C. Roux Associates 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.

Appendix C, "Medical Data Sheet," will be completed by all permanent, onsite personnel and will be kept in Roux Associates' offices during the conduct of Site operations. Completion is required in addition to compliance with Roux Associates' Health and Safety Program. This data sheet will be available through the Roux Associates Human Resources Department if medical assistance is needed or if transport to hospital facilities is required.

8.0 SITE CONTROL, PERSONAL PROTECTIVE EQUIPMENT, AND COMMUNICATIONS

A modified Site control approach may be utilized since activities will be limited to site inspection/geophysical survey, drilling and sampling only during this phase of work. If remedial work is necessary, the following four-zone approach will be used.

8.1 Site Control

Based on the Site history and operations, a potential for the presence of hazardous material does exist. During drilling and sampling, work areas will be delineated with high visibility cones and/or caution tape, if needed. A dedicated decontamination area will be established to decontaminate all equipment used for sampling.

If remedial activities are necessary, a four-zone approach will be employed in order to prevent the spread of contamination from the disturbed areas onsite. 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 and CRC and the 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.

8.1.1 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. Meteorological conditions will be observed and noted from this zone, as well as those factors pertinent to heat and cold stress.

8.1.2 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; and
- A need to be in the zone.

8.1.3 Exclusion Zone

The area where contamination exists is considered to be 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 SSO 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);
- Appropriate PPE;
- Medical authorization;
- Training certification; and
- A need to be in the zone.

8.2 Personal Protective Equipment

8.2.1 General

The level of protection worn by field personnel will be enforced by the SSO. Levels of protection for general operations are provided below and are defined in this section. Levels of protection

may be upgraded at the discretion of the SSO. All decisions on the level of protection will be based upon a conservative interpretation by the SSO of the information provided by air monitoring results, environmental results and other appropriate information. Any changes in the level of protection shall be recorded in the health and safety field logbook.

8.2.2 Personal Protective Equipment Specifications

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.

Although not anticipated, any tasks requiring Level B personal protective equipment (PPE) will utilize the following equipment:

- Positive pressure, full facepiece, self-contained breathing apparatus (SCBA) or positive pressure, supplied air respirator with escape SCBA (NIOSH approved)
- Disposable coveralls (Tyvek, Poly-coated Tyvek, or Saranex)
- Gloves, inner: latex or nitrile
- Gloves, outer: nitrile or neoprene
- Chemical resistant boots over the work boots
- Steel or composite safety toe work boots
- Hard hat
- Hearing protection (as needed)
- Boot cover (as needed)

For tasks requiring Level C PPE, the following equipment may be used in any combination:

- Full-face, air purifying, canister-equipped respirators (NIOSH approved) utilizing Organic Vapor/Acid Gas and P-100 filters (half-face if approved by SSO)
- Disposable coveralls (Tyvek, Poly-coated Tyvek, or Saranex) as required
- Gloves, inner: latex or nitrile as required
- Gloves, outer: nitrile or neoprene as required
- Chemical resistant boots over the work boots as required

- Steel or composite safety toe work boots
- Hard hat
- Hearing protection (as needed)
- Safety glasses (if half-mask is utilized)
- Boot covers (as needed)

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

- Work uniform (long pants, long-sleeved shirt)
- Hard hat
- Steel toe work boots
- Safety glasses
- Boot covers (as needed)
- Hearing protection (as needed)
- Reflective safety vest or high-visibility clothing

Modified Level D PPE consists of the following:

- Regular Tyvek coveralls (Poly-coated Tyvek as required)
- Outer gloves: leather, cotton, neoprene or nitrile (as required)
- Inner gloves: latex or nitrile (doubled) as required
- Chemical resistant boots over work boots (as required)
- Steel toe work boots
- Hard hat
- Safety glasses
- Hearing protection as needed
- Reflective safety vest or high-visibility clothing

8.2.3 Initial Levels of Protection

Levels of protection for the proposed scope of work may be upgraded or downgraded depending on direct-reading instruments or personnel monitoring. The following are the initial levels of protection that shall be used for each planned field activity:

Activity	Initial level of PPE
Mobilization/Demobilization	D
Site Inspection/Geophysical Survey	D
Decontamination	D
Drilling	D
Groundwater Sampling	D

8.3 Communications

If working in level C/B respiratory protection is required, personnel may find that communication becomes a more difficult task and process to accomplish. Distance and space further complicate this. In order to address this problem, electronic instruments, mechanical devices, or hand signals will be used as follows:

Telephones – Mobile telephones will be carried by designated personnel for communication with emergency support services/facilities.

Radios – Two-way radios will be utilized onsite for communications between field personnel in areas where visual contact cannot be maintained and where hand signals cannot be employed.

Air Horn – Available as posted in the Site trailer or support zone to alert field personnel to an emergency situation. The emergency signal will be three sharp blasts of the air horn.

Hand Signals – This communication method will be employed by members of the field team along with use of the buddy system. Signals become especially important when in the vicinity of heavy moving equipment and when using Level B respiratory equipment. The signals shall become familiar to the entire field team before Site operations commence, and will be reinforced and reviewed during site-specific training.

Signal	Meaning
Hand gripping throat	Out of air; can't breathe
Grip partner's wrist	Leave area immediately; no debate
Hands on top of head	Need assistance
Thumbs up	OK; I'm all right; I understand
Thumbs down	No; Unable to understand you, I'm not all right

9.0 MONITORING PROCEDURES

9.1 General

Monitoring will be performed to verify the adequacy of respiratory protection, to aid in Site layout, and to document worker exposure. If air monitoring in these areas indicates the presence of potentially hazardous materials, control measures will be implemented. All monitoring instruments shall be operated by qualified personnel only and will be calibrated daily prior to use or, more often, as necessary.

9.2 Exclusion Zone Monitoring

9.2.1 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:

- 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 may be used to monitor chlorinated 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 meter shall be used to monitor for combustible gases and oxygen content during confined space entry or when the SSO deems necessary.

Calibrations 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 (Appendix D).

9.2.2 Action Levels

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.

9.2.3 Monitoring During Field Activities

Intrusive Operations – Continuous Personnel Breathing Zone Air Monitoring will be performed by the SSO during drilling activities. Real-time monitoring for all onsite activities will be accomplished as follows:

- Monitoring of VOCs in and around the work zones.
- Monitoring for particulates in and around the work zones, when necessary.

The frequency of monitoring may be modified by the SSO after consultation with the Project Manager and/or CHSM. The rationale for any modification must be documented in the HASP.

10.0 SAFETY CONSIDERATIONS

10.1 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.

- All open holes, trenches, and obstacles will be properly barricaded in accordance with local Site needs and requirements. Proximity to traffic ways, both pedestrian and vehicular, and location of the open hole, trench, or obstacle will determine these needs.
- All excavation and other Site work will be planned and performed with consideration for underground lines.
- Smoking and ignition sources in the vicinity of potentially flammable or contaminated material are strictly prohibited.
- Drilling, boring, and use of cranes and drilling rigs, erection of towers, 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.
- When working in areas where flammable vapors may be present, particular care shall be exercised with tools and equipment that may be sources of ignition. All tools and equipment provided must be properly classified for the area and bonded and/or grounded appropriately.
- 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. In addition, eye protection must be worn when sampling soil or water that may be contaminated.
- All site personnel may be called upon to use respirator protection in some situations. Fit testing will be necessary for all persons using respirators. The criteria for facial hair will be determined by the SSO. In general, the guideline is that facial hair cannot interfere with the proper fit of the respirator.
- No smoking, eating, chewing tobacco, gum chewing, eating or drinking, etc., 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) before eating, smoking, etc., and 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 power equipment 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.

10.2 Traffic Control

Traffic control methods and barricades will be used as needed when working in areas of vehicular traffic. Since the site is fenced off and the areas of investigation are not in current use, outside vehicular and pedestrian traffic is not considered to be an issue.

10.3 Sample Handling

Personnel responsible for handling of samples will wear the prescribed level of protection. 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.

11.0 DECONTAMINATION AND DISPOSAL PROCEDURES

11.1 Contamination Prevention

Contamination prevention should minimize worker exposure and help ensure valid sample results by precluding cross-contamination. Procedures for contamination avoidance include:

Personnel

- Do not walk through areas of obvious or known contamination.
- Do not directly handle or touch contaminated materials.
- Make sure that there are no cuts, tears or other signs of deterioration with PPE.
- Fasten all closures in suits; cover with tape, if necessary.
- Particular care should be taken to protect any skin injuries.
- Stay upwind of airborne contaminants.
- Do not carry cigarettes, cosmetics, gum, etc., into contaminated areas.

Sampling/Monitoring

- When required by the SSO, cover instruments with clear plastic, leaving openings for sampling ports.
- Bag sample containers prior to emplacement of sample material.

Heavy Equipment

- Care should be taken to limit the amount of contamination that comes in contact with heavy equipment (tires, contaminated augers).
- If contaminated tools are to be placed on non-contaminated equipment for transport to a decontamination area, plastic should be used to keep the equipment clean.
- Dust control measures including water misting will be used on roads inside the Site boundaries, as needed.

11.2 Personnel Decontamination

A field wash for equipment and PPE shall be set up and maintained for all persons exiting the EZ. The system will include a gross wash and rinse for all disposable clothing and boots worn in the

EZ. As necessary, equipment and facilities will be available for personnel to wash their hands, arms, neck, and face.

11.3 Equipment Decontamination

All potentially contaminated equipment used at the Site will be decontaminated to prevent contaminants from leaving the Site. The decontamination area will provide for the containment of all wastewater from the decontamination process. Respirators and any other PPE that comes in contact with contaminated materials shall pass through a field wash in the decontamination area, and a thorough decontamination at the end of the day. All decontamination rinse water will be collected and managed in accordance with all applicable regulations.

11.4 Decontamination during Medical Emergencies

If emergency life-saving first aid and/or medical treatment are required, normal decontamination procedures may need to be abbreviated or omitted. The Site SSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment, or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed, a plastic barrier between the individual and clean surfaces should be used to help prevent contaminating the inside of ambulances and/or medical personnel. Outer garments are then removed at the medical facility. No attempt will be made to wash or rinse the victim, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material, which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems (ambulatory) or injuries, the normal decontamination procedures will be followed. Note that heat stroke requires immediate treatment to prevent irreversible damage or death. Protective clothing must be promptly removed. Less serious forms of heat stress require prompt attention and removal of protective clothing immediately. Unless the victim is obviously contaminated, decontamination should be omitted or minimized, and treatment begun immediately.

11.5 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 and bagged for appropriate disposal as domestic waste.

12.0 EMERGENCY PLAN

Should an emergency situation occur, the emergency plan outlined in this section, shall be known by Roux Associates and all Subcontractors 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 1.2 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.

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

12.1 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.

12.2 Personnel Injury

Emergency first aid shall be performed onsite as appropriate. If necessary, the individual shall be decontaminated and transported to the nearest hospital. The SSO will contact the necessary individuals to supply medical data sheets to medical personnel, if requested. The SSO will complete the accident/incident reports in accordance with Section 13.4 of the HASP.

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 hospital. A map to this facility is shown in Figure 2.

12.3 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 Director:	Nathan Epler	631-232-2600	631-921-5675
2. Project Manager:	Wendy Monterosso	631-232-2600	516-250-0350
3. Office Health & Safety Manager:	Joseph Gentile	856-423-8800	610-844-6911
4. Site Health and Safety Officer:	Subrahim Singh	631-232-2600	631-484-1168

5. The employee's supervisor.

Written confirmation of verbal reports are to be submitted within 24 hours. The report forms entitled "Accident Report" and "Accident Investigation Form" (Appendix E) are to be used for this purpose. All representatives contacted by telephone are to receive a copy of these reports. If the employee involved is not a Roux Associates employee, his employer shall receive a copy of the report. In addition to filling out the Accident Report and the Accident Investigation Forms, if a Roux employee is involved in a vehicle accident, the employee must also complete the Acord form (Appendix F).

For reporting purposes, the term accident refers to fatalities, lost time, restricted duty, medical treatment and first aid injuries, spill or exposure to hazardous materials (radioactive materials, toxic materials, explosive or flammable materials), fire, explosion, property damage, and 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.

12.4 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.
Inhalation:	Move to fresh air and/or, if necessary, decontaminate/transport to hospital.
Ingestion:	Decontamination and transport to emergency medical facility.
Puncture Wound or Laceration:	Decontamination and transport to emergency medical facility.

12.5 Adverse Weather Conditions

In the event of adverse weather conditions, the SSO or project manager 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.

Site activities will be limited to daylight hours and acceptable weather conditions. Inclement working conditions include heavy rain or snow, icy conditions, fog, high winds, extreme heat/cold, and lightning. Observe daily weather reports and evacuate if necessary in case of inclement weather conditions.

13.0 LOGS, REPORTS AND RECORD KEEPING

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

13.1 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 Associates will maintain medical records in accordance with 29 CFR 1910.20.

13.2 Onsite Log

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

13.3 Exposure Records

Any 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 Associates in accordance with 29 CFR 1910.20.

13.4 Accident/Incident Reports

An accident/incident report must be completed following procedures given in Appendix E. The originals will be sent to Roux Associates for maintenance. Copies will be distributed as stated. A copy of the forms will be kept in the project file.

13.5 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 Associates for maintenance. Subcontractor employers must also meet the requirements of maintaining an OSHA 300 form.

13.6 Daily Safety Logs

The Health and Safety Briefing/Tailgate Meeting form in Appendix D will be completed daily by the SSO and submitted to the project manager.

13.7 Weekly Safety Reports

The Weekly Safety Reports in Appendix H will be completed by the SSO, if needed, and submitted to the designated Owner's representative, if requested.

13.8 Close-Out Safety Report

At the completion of the work, Roux Associates will submit a closeout Safety Report that will include all logs and reports generated during the project. The report will be signed and dated by the SSO and submitted to the Safety Manager and/or Owner's representative, if requested.

14.0 FIELD TEAM REVIEW

Each Roux Associates 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 reviewed the Site Health and Safety Plan prepared for this Site. I understand and will comply with the provisions contained therein.

Site/Project: Konica Minolta Graphic Imaging, Inc.
71 Charles Street
Glen Cove, New York

Date	Name	Signature	Company

SSO CERTIFICATION OF HOSPITAL DIRECTIONS

Name of Roux Associates SSO:

Date:_____

This is to certify that on _____, I personally drove the route to Glen Cove Hospital (North Shore LIJ) as listed in the HASP. The Map Routing and Directions were/were not as listed in the plan. Listed below were conditions that resulted in different directions.

_____

Roux Associates Site Health and Safety Officer

			and/or eye contact	arrhythmias; liver damage	system, liver	BP: 165°F UEL: 12.5% LEL: 7.5%
^{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. BP: 237°F UEL: 15.5% LEL: 6%
)	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. BP: 135°F Fl.P: 2°F UEL: 11.4% LEL: 5.4%
ration)	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. BP: 89°F Fl.P: -2°F UEL: 15.5% LEL: 6.5% Class 1A Flammable Liquid
	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 BP: 337°F FL.P: 112°F UEL: 6.4% LEL: 0.9% Class II Flammable liquid
	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. BP: 337°F Fl.P: 112°F UEL: 6.4% LEL: 0.9% Class II Flammable Liquid
	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] BP: 357°F Fl.P: 151°F UEL: 9.2% LEL: 2.2% Class IIIA Combustible Liquid
	TWA 50 ppm C 100 ppm 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.] BP: 182°F Fl.P: 56°F UEL: 16% LEL: 6.2% Class IB Flammable Liquid
)	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 BP: 118-140°F Fl.P: 36-39°F UEL: 12.8% LEL: 5.6% Class IB Flammable Liquid
	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 BP: 329°F FL.P: 122°F Class II Flammable liquid
	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. BP: 329°F Fl.P: 122°F Class II Flammable Liquid

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, resp dizziness, weakness, fati moderate to severe eye i
2-Butanone (MEK)	78-93-3	TWA 200 ppm (590 mg/m^3) STEL 300 ppm (885 mg/m^3)	TWA 200 ppm (590 mg/m^3) 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, nos
Acenaphthene	83-32-9	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, resp
Acetone	67-64-1	TWA 500 ppm 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, thr depression; dermatitis
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, [
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 Sb)	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nos nausea, vomiting, diarrh to smell properly
Arsenic (inorganic)	7440-38-2 (metal)	TWA 0.01 mg/m3	Ca 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 septu neuropathy, resp irritati occupational carcinogen
Asbestos	1332-21-4	TWA 0.1 f/cc	Ca 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 exp pulmonary function, fin occupational carcinogen
Asphalt fumes	8052-42-4	TWA 0.5 mg/m^3(fumes)	Ca 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
Barium	7440-39-3	TWA 0.5 mg/m3	None established	TWA 0.5 mg/m3	None established	Inhalation, ingestion, skin contact	Irritation skin, respirato
Benzene	71-43-2	TWA 0.5 ppm STEL 2.5 ppm	Ca TWA 0.1 ppm STEL 1 ppm	TWA 1 ppm STEL 5 ppm	Ca [500 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nos nausea, staggered gait; dermatitis; bone marrow
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, resp
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 tumorigen, neoplastigen humans and a known hu believed to cause bladd damage the developing respiratory and eye irrit
Benzo[b]fluoranthene	205-99-2	None established	TWA 0.1 mg/m3	TWA 0.2 mg/m3	None established	Inhalation; ingestion; skin	No data were identified humans. Based on resul

			and/or eye contact			
	TWA 0.002 mg/m³ C 0.005 mg/m³ (30 minutes) with a maximum peak of 0.025 mg/m³	Ca [4 mg/m³ (as Be)]	inhalation, skin and/or eye contact	Beryllosis (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. BP: 4532°F
ady 15-minute work period)	TWA 5 mg/m³	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
m³)	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. BP: 31°F UEL: 8.4% LEL: 1.6% Flammable Gas
	TWA 0.005 mg/m³	Ca [9 mg/m³ (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. BP: 1409°F
[skin]	TWA 20 ppm C 30 ppm 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. BP: 116°F FLP: -22°F UEL: 50.0% LEL: 1.3% Class IB Flammable Liquid
	TWA 75 ppm (350 mg/m³)	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 BP: 270°F FLP: 82°F UEL: 9.6% LEL: 1.3%
workplace	TWA 1000 ppm (2600 mg/m³)	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. BP: 54°F FLP: NA (Gas) -58°F (Liquid) UEL: 15.4% LEL: 3.8% Flammable Gas
[60-minute]	C 50 ppm (240 mg/m³)	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 BP: 143°F
	TWA 1 mg/m³	250 mg/m³ (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. BP: 4788°F
ane-extractable	TWA 0.2 mg/m³ (benzene-soluble fraction)	Ca [80 mg/m³]	Inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue. Combustible Solids
	TWA 200 ppm	None established	inhalation, skin absorption, ingestion	Harmful if swallowed, inhaled, or absorbed through skin. Irritant. Narcotic. Suspected carcinogen	Skin	Colorless liquid BP: 60 C FLP: 4 C UEL: 12.8% LEL: 9.7 %
	TWA 1 mg/m³	100 mg/m³ (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. BP: 4703°F
	None established	None established	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin	Eyes, skin; skin photosensitization.	Colorless crystalline powder BP: 524°C
	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. BP: 356-716°F FLP: 154.4-165.2°F LEL: 0.6%

Fluoranthene	206-44-0	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; poss edema, respiratory arrest
Fluorene	86-73-7	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Irritation skin, digestive t
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 cramping, dizziness, wea kidney, liver damage
Gasoline	8006-61-9	TWA 300 ppm 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, listlessness, blurred visio convulsions; chemical pr [Potential occupational c
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 eye [potential occupational c
Hydrogen Sulfide	7783-06-4	TWA (10 ppm) STEL (15 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, respirator conjunctivitis, eye pain, (abnormal visual intoler headache, lassitude (wea gastrointestinal disturbar
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; poss liver, lung tissue, renal ti
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; poss liver, lung tissue, renal ti
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, muc coma
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, nos nausea, lassitude (weakn confusion, drowsiness; pneumonitis (aspiration
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, ex weight loss, malnutrition gingival lead line; tremo kidney disease; irritation
Manganese	7439-96-5 (metal)	TWA 0.2 mg/m^3	TWA 1 mg/m^3 STEL 3 mg/m^3	C 5 mg/m^3	500 mg/m^3 (as Mn)	inhalation, ingestion	Manganism; asthenia, ir dry throat, cough, chest flu-like fever; low-back discomfort); lassitude (
Mercury (organo) alkyl compounds (as Hg)	7439-97-6	TWA 0.01 mg/m^3 STEL 0.03 mg/m^3 [skin]	TWA 0.01 mg/m^3 STEL 0.03 mg/m^3 [skin]	TWA 0.01 mg/m^3 C 0.04 mg/m^3	2 mg/m^3 (as Hg)	inhalation, skin absorption, ingestion, skin and/or eye contact	Paresthesia; ataxia, dysa jerking limbs; dizziness; nausea, vomiting, diarrh disturbance; kidney inju
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] Other: C 0.1 mg/m3 [skin]	TWA 0.1 mg/m^3	10 mg/m^3 (as Hg)	inhalation, skin absorption,	Irritation eyes, skin; cou bronchitis, pneumonitis;

			and/or eye contact		system	
	TWA 25 ppm 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 BP: 104°F UEL: 23% LEL: 13%
)	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 BP: 320-428°F Fl.P: 100-109°F Class II Combustible Liquid
TEL 15 ppm (75	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. BP: 424°F Fl.P: 174°F UEL: 5.9% LEL: 0.9%
	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 BP: 183 C Fl.P: 59 C UEL: 5.8% LEL: 0.8%
	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. BP: 5139°F
in]	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. BP: 411°F Fl.P: 190°F LEL(200°F): 1.8%
	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 BP: 159 C Fl.P: 47 C UEL: 6% LEL: 0.8%
	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 BP: 86-460°F Fl. Pt = -40 to -86°F UEL: 5.9% LEL: 1.1% Flammable liquid
15.6 ppm (60	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. BP: 359°F UEL: 8.6% LEL: 1.8%
	None established	None established	inhalation, skin absorption, eye contact	Irritation skin	CNS, skin	Colorless, clear liquid, sweetish aromatic odor BP: 350.8°F Class III Flammable liquid
	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 BP: 344°F Fl.P: 126 °F UEL: 6.9% LEL: 0.8% Combustible liquid
	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.] BP: 1265°F
	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 BP: 3632°F
	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.

tert-Butylbenzene	98-06-6	None established	None established	None established	None established	inhalation, skin absorption, ingestion,	Eye and respiratory irritu
Tetrachloroethene	127-18-4	TWA 25 ppm STEL 100 ppm (STEL) listed as A3, animal carcinogen	Ca Minimize workplace exposure concentrations	TWA 100 ppm 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, nos neck; dizziness, incoord (skin redness); liver dam
Toluene	108-88-3	TWA 20 ppm	TWA 100 ppm (375 mg/m^3) STEL 150 ppm (560 mg/m^3)	TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)	500 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; lass euphoria, dizziness, hea tears); anxiety, muscle fa kidney damage
trans-1,2-Dichloroethene	156-60-5	TWA 200 ppm	None established	TWA 200 ppm STEL 250 ppm (skin)	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Narcotic. Irritation eyes, depression.
Trichloroethene	79-01-6	TWA 10 ppm STEL 25 ppm	Ca	TWA 100 ppm 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; hea exhaustion), dizziness, t cardiac arrhythmias, par carcinogen]
Vinyl Chloride	75-01-4	TWA 1 ppm	Carcinogen	TWA 1 ppm C 5 ppm [15-minute]	Ca [IDLH value has not been determined]	inhalation, skin, and/or eye contact (liquid)	Lassitude (weakness, exl bleeding; enlarged liver; frostbite; [potential occu
Xylene (m, o & p isomers)	108-38-3, 95-47-6, 106-42-3	TWA 100 ppm (435 mg/m^3) 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, nos incoordination, staggerir vomiting, abdominal pai
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, resp

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Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists.
BP – boiling point at 1 atmosphere, °F
C – Ceiling, is a concentration that should not be exceeded during and part of the working exposure.
Ca - considered by NIOSH to be a potential occupational carcinogen
CAS# Chemical Abstracts Service registry number which is unique for each chemical.
Fl. Pt. – Flash point

IDLH - Immediately Dangerous to Life and Health concentrations represent the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
LEL – Lower explosive (flammable) limit in air, % by volume (at room temperature)
mg/m^3 – Milligrams of substance per cubic meter of air
NIOSH -National Institute for Occupational Safety and Health.
OSHA – Occupational Safety and Health Administration
PEL - OSHA Permissible Exposure Limit (usually) a time weighted average concentration that must not be exceeded during any 8 hour work shift of a 40 hr work week.
ppm – parts per million

TABLE 2

ACTION LEVELS FOR WORKER BREATHING ZONE

Instrument	Action Level *	Level of Respiratory Protection/Action
PID	0 to <5 ppm (one minute sustained)	Level D *
PID	>5 to <50 ppm (one minute sustained)	Utilize APR (Level C)
PID	>50 to <100 ppm (one minute sustained)	Level B
PID	>100ppm	Stop work** (ventilate, apply foam)
CGI/H_2S Meter	<5%	Level D
CGI/H_2S Meter	>5% to <25%	Level B
CGI/H_2S Meter	>25%	Stop work**
CGI/CO Meter	>25%	Level B
CGI/CO Meter	>50%	Stop work** (ventilate area)
CGI/O_2 Meter	<10% LEL, in excavation	Level D
	19.5% oxygen – 23.5%	Level D
CGI/O_2 Meter	>10% LEL, in excavation	Allow to vent, apply foam**
	>23.5% oxygen	Stop work, Oxygen Enriched ATM**
Dust Monitor	0 – 1.0 mg/m^3, 5-minutes average	Level D
Dust Monitor	>1.0 to 5.0 mg/m^3, 5-minutes average	Level D – Institute dust suppression measures
Dust Monitor	5.0 to >50 mg/m^3, 5-minute average	Level C – Institute dust suppression measures

Note: Action levels are based on above background levels.

* Instrument readings will be taken in the breathing zone (BZ) of the workers, unless otherwise indicated.

** Suspend work in immediate area. Conduct air monitoring periodically to determine when work can continue. Implement mitigative measures.

NOTE: MAP SOURCE- MAPQUEST 2011

Title:

SITE LOCATION

PRE-DESIGN INVESTIGATION

Prepared For: KONICA MINOLTA
GRAND RAPIDS, MICHIGAN

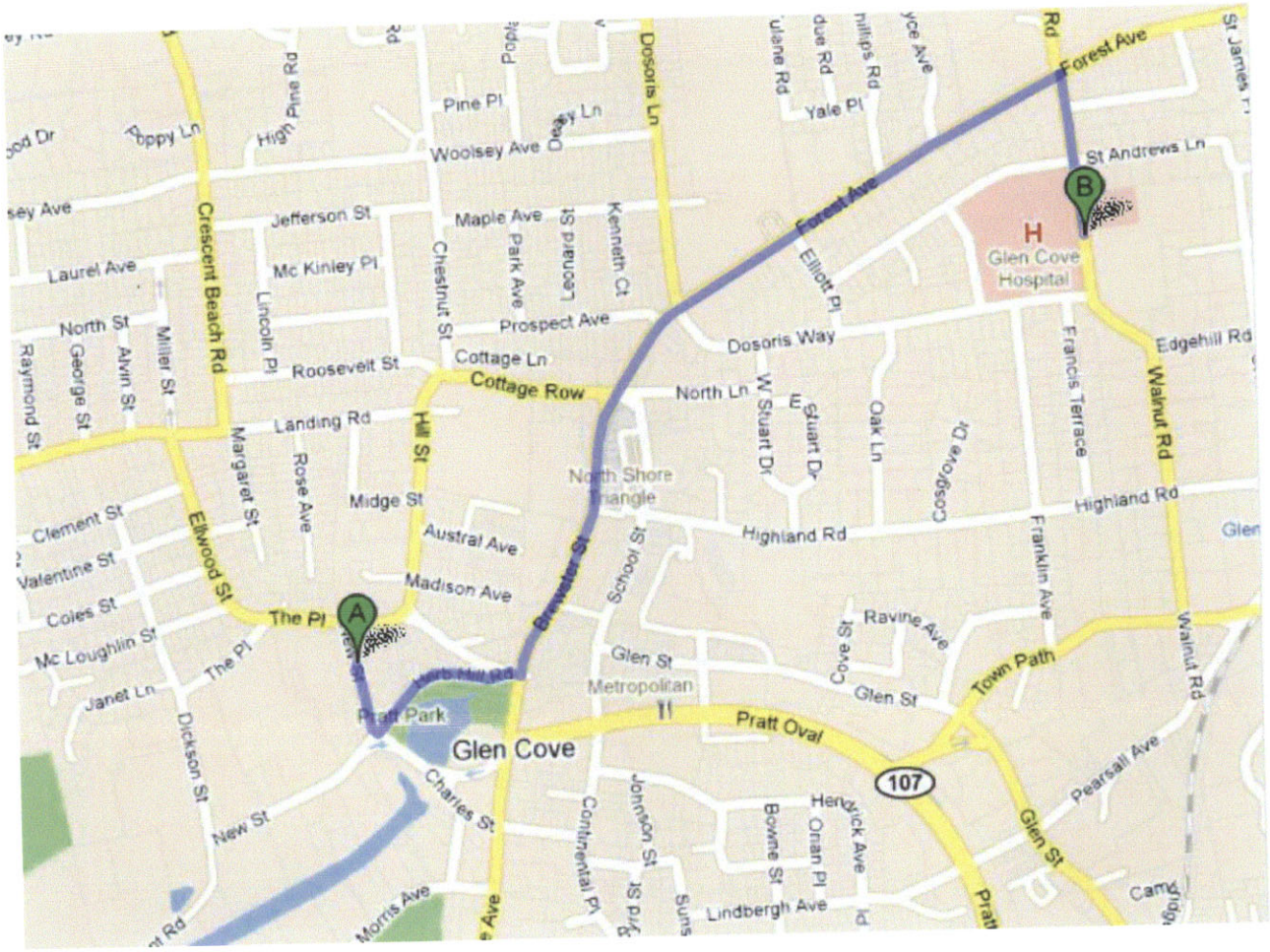
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: NE	Date: 1/14/11
Prepared by: NE	Scale: NTS
Project Mgr: NE	Office: NY
2020.0001Y102.02.pptx	Project: 2020.0001Y

FIGURE 1

FIGURE 2

Directions to Glen Cove Hospital (North Shore LIJ) – 101 St. Andrews Lane Glen Cove, New York 11542



- Start at 71 Charles Street, Glen Cove, New York, take a Left onto Herb Hill Road
- Turn Left at Brewster Street
- Continue onto Forest Avenue
- Turn Right at Walnut Avenue
- Arrive at Glen Cove Hospital on your right

APPENDIX A

Job Safety Analysis

JOB SAFETY ANALYSIS	DATE 1/11/11	☒ NEW ☐ REVISED	PAGE 1 of 1

JSA TYPE CATEGORY: KONICA MINOLTA	WORK TYPE: General	WORK ACTIVITY (Description): Site Mobilization	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Wendy Monterosso	Project Hydrogeologist	Joseph Gentile	CHSM
		Subraham Singh	OHSM

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

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

REQUIRED AND / OR RECOMMENDED EQUIPMENT

20 lb. Type ABC fire extinguisher, First Aid Kit, vehicle tire chocks, caution tape, HASP, Tailgate meeting forms, SOW/Work Plan, Site contact information, "Work Area" signs and 42 inch safety cones and flags

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Mobilize/demobilize and establish work area	1a. Fall: tripping/falling due to uneven terrain, weather conditions, and materials/equipment stored at the Site	1a. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1a. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1a. Use established pathways and walk on stable, secure ground.
	1b. Contact: with traffic (including any unintended movement of the work truck), Contact / Interference with Other Site Activities	1b. When first arriving onsite park (i.e., pull through or back) vehicles in designated parking space and/or out of the way locations. Use parking brake on all vehicles and tire chocks on work trucks and trailers. 1b. Check in with Site Manager/Supervisor to ensure proper coordination with other site activities. 1b. Identify potential traffic sources. 1b. Wear appropriate PPE including high visibility clothing or reflective vest. 1b. Use a spotter while moving work vehicles; plan ahead to avoid backing when unnecessary. 1b. Delineate work area with cones, flags, caution tape, and/or other barriers. 1b. Position "Work Area" signs at site entrances. 1b. Position largest vehicle to protect against oncoming traffic. 1b. Face traffic, maintain eye contact with oncoming vehicles, use a spotter, and establish a safe exit route. 1b. Chock wheels of work truck and other support equipment on wheels and engage parking brake if possible.
	1c. Exertion: during moving of equipment(cones and signage) into work area	1c. Use proper body positioning and lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 1c. Ensure that loads are balanced to reduce the potential for muscle strain.
	1d. Exposure: to biological hazards: ticks, bees/wasps, poison ivy, insects, etc. (ticks are most active any time the temperature is above freezing, typically from March to November)	1d. Inspect area to avoid contact with biological hazards. 1d. Wear long sleeved clothing to protect skin and apply insect repellant containing DEET when working in overgrown areas of the Site. 1d. Personnel shall examine themselves for ticks at least daily. 1d. If skin comes in contact with poison ivy, wash skin thoroughly with soap and water as soon as possible.
	1e. Exposure: to sun, possibly causing sunburn	1e. Wear sunscreen with an SPF of at least 15 whenever 30 minutes or more of exposure is expected.
	1f. Exposure: Noise hazards (certain sites operate heavy machinery)	1f. Wear hearing protection if you must raise your voice to be heard at arm's length.
	1g. Exposure: Extreme weather conditions (hot, or cold)	1g. Wear appropriate clothing, use layers if necessary, for the cold. 1g. Stay hydrated, drink fluids throughout the day, and take breaks as needed. 1g. Use hand warmers if needed. 1g. In summer, prepare with enough ice for sample storage, and extra ice for cooling beverages.

[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.

[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	DATE 1/10/11	☒ NEW ☐ REVISED	PAGE 1 of 1

JSA TYPE CATEGORY: **KONICA MINOLTA**	WORK TYPE: **Drilling**	WORK ACTIVITY (Description): **Constructing Decontamination Pad/Decontaminating Augers/Drill Rods**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Wendy Monterosso	Project Hydrogeologist	Joseph Gentile	CHSM
		Subraham Singh	OHSM

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

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

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Wood Planks, Plastic Sheeting, Power Washer with Hose Connection, Water Source, 55-gallon Drum, Non-phosphate Soap, Brushes, Absorbent Pads

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Setting up work area to construct decontamination pad-unloading materials and equipment	1a. Fall: slip/trip/fall hazards associated with materials, tools and equipment 1b. Contact: cuts from equipment 1c. Exertion: lifting	1a. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1a. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1a. Use established pathways and walk on stable, secure ground. 1b. Use proper PPE (especially hands: cut-resistant gloves) 1c. Use proper body positioning and lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 1c. Ensure that loads are balanced to reduce the potential for muscle strain. 1c. Two people or a mechanical lifting aid are required when lifting objects over 50 lbs. or when the shape makes the object difficult to lift.
2. Construct decontamination pad with 4, 2" by 4" wood planks and 4-millimeter plastic sheeting	2a. Caught: lacerations/abrasion/pinching/ Crushing 2b. Exertion: Lifting/bending/kneeling 2c. Contact: from construct decontamination pad shifting or augers rolling	2a. Use retractable utility knife to eliminate potential for cuts. 2a. Use proper PPE (especially hands: cut-resistant gloves) to prevent splinters, cuts, and abrasions 2b. See 1b; when setting the wood planks and wrapping plastic sheeting 2c. Select the most even surface area to construct the decontamination pad to eliminate the potential for the pad from shifting or the augers to roll when cleaning
3. Decontaminating Augers using power washer	3a. Exertion: loading and unloading augers onto to Bobcat for transport to the decontamination pad (if applicable) 3b. Exposure: steam and high pressure water	3a. Two people or a mechanical lifting aid are required when lifting objects over 50 lbs. or when the shape makes the object difficult to lift. 3a. Use spotter to guide driver and manage on Site traffic. 3b. Use the proper PPE (face shield). 3b. Inspect all hose connection and whip check to verify. 3b. Stay out of the line of fire and keep others away from washing operation.
4.Decontaminate field equipment (if applicable)	4a. Exposure to contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors) 4b. Exposure to chemicals in cleaning solution including ammonia	4a. Wear chemical-resistant disposable gloves and safety glasses. 4a. Use an absorbent pad to clean spills. 4b. See 4a. 4b. Review the cleaning solution MSDS for hazards and safe handling recommendations.

[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.

[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

DATE 1/10/2011 | ☒ NEW ☐ REVISED | PAGE 1 of 1

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
KONICA MINOLTA	**Drilling**	**Borehole Patching**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Supy Singh	Office Health and Safety Manager	Joe Gentile	Corporate Health and Safety Manager
Wendy Monterosso	Project Hydrogeologist		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: cut resistant and leather
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING: high visibility/safety vest	
☒ SAFETY GLASSES	☒ SAFETY SHOES		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Jack Hammer, Power Source, Hand Tools, Dust Mask, Safety Cones and Flags, if needed

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Unload, prepare, and setup materials next to the excavated borehole	**1a. FALL:** Slips/trips/falls due to uneven terrain, weather conditions, and equipment and materials stored in the immediate work area **1b. EXERTION:** Poor body positioning while lifting equipment and materials	1a. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment and materials. Equipment and materials will be stored at the lowest point of potential energy (i.e tools should not be propped against walls or nearby equipment) and out of the walkway and immediate work area in a convenient, stable, and orderly manner. Equipment and materials that are not anticipated to be used will be returned to an appropriate storage area that is out of the immediate work area. 1b. Use proper body positioning and lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. Ensure that loads are balanced to reduce the potential for muscle strain. Two people or a mechanical lifting aid are required when lifting objects over 50 lbs. or when the shape makes the object difficult to lift.
2. Preparing the concrete mixture (if applicable)	**2.a. EXPOSURE:** Inhaling dust particles during the pouring of concrete Concrete mixture coming into contact with skin **2b. EXERTION:** Poor body positioning while mixing concrete	2.a. Use the proper PPE (gloves, eye, and dust mask). Stand upwind while pouring concrete onto the mixing area. Limit the amount of dust exposed to the work area by wetting the immediate concrete work area (if concrete is being mixed on the surface). Use appropriate tools to limit the amount of direct contact with concrete mixture (trowels/shovels/etc.). 2b. Two people are required to mix concrete if plastic sheeting is used as a mixing trough. A 4 ft. by 4 ft. or larger piece of 4 millimeter thick plastic sheeting must be used to limit the amount of bending and back strain. The largest quantity of concrete that can be mixed at any given time with this method must not exceed 50 lbs. or 1 bag. Use proper body positioning techniques to mix the concrete (plant both feet firmly, lock elbows, bend knees, and square shoulders).
3. Pour the concrete mixture or asphalt over excavated borehole	**3a. EXPOSURE:** Concrete mixture or asphalt coming into contact with skin **3b. EXERTION:** Poor body positioning while spreading asphalt/concrete **3c. FALL:** Slips/trips/falls from wet surface condition	3a. Use proper PPE (gloves, eye, and dust mask). Use appropriate tools to limit the amount of direct contact with hole patch or concrete mixture (trowels/shovels/float/etc.). 3b. Use proper body positioning techniques; bend knees. 3c. Complete borehole patch to pre-existing surface grade. Complete borehole patch to surface grade and identify with cones and caution tape.
4. Clean-up the work area around the completed patch	4. **FALL:** Slip/trip/falls from wet surface condition	4. Delineate wet area with cones and caution tape. Inspect completed patch to ensure that the borehole patch is even with the surrounding surface and to ensure that the work was completed neatly.

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[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	DATE 1/10/11	☒ NEW ☐ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY: KONICA MINOLTA	WORK TYPE: Monitoring Well Gauging/Sampling	WORK ACTIVITY (Description): Groundwater Gauging and Sampling	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Wendy Monterosso	Project Hydrogeologist	Joseph Gentile	CHSM
		Subraham Singh	OHSM

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

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

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Interface probe and/or Water level meter, scissors, tubing cutter, 20 lb. Type ABC fire extinguisher
Equipment as needed: 42 inch Safety cones, Caution Tape, Peristaltic pump, appropriate power sources, tubing, master flex, bailers, poly rope, 55-gallon drums; buckets; decontamination supplies
Tools as needed: socket wrench, screw driver, crow bar, mallet

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Open/close well	1a. Exertion: muscle strain	1a. Use proper lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 1a. Ensure that loads are balanced to reduce the potential for muscle strain. 1a. Two people are required when lifting objects over 50 lbs. or when the shape makes the object difficult to lift.
	1b. Caught: pinch points associated with removing/replacing manholes and working with hand tools	1b. Wear leather gloves when working with well cover and hand tools. 1b. Use proper tools (ratchet and pry bar for well cover) and inspect before use. 1b. Do not put fingers under well cover.
	1c. Exposure: potential hazardous vapors	1c. No open flames/heat sources. 1c. Allow well to vent after opening it and before sampling activities begin to minimize exposure to vapors. 1c. Work on the upwind side of well.
	1d. Contact with traffic	1d. Identify potential traffic sources. 1d. Wear appropriate PPE including high visibility clothing or reflective vest. 1d. Delineate work area with 42 inch safety cones and/or other barriers. Position vehicle to protect against oncoming traffic. Use caution tape to provide a more visible delineation of the work area. 1d. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route.
2. Gauge well	2a. Contact with contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors)	2a. See 1c. 2a. Wear chemical-resistant disposable gloves and safety glasses when gauging well. 2a. Use an absorbent pad to clean probe.
	2b. Contact with traffic	2b. See 1d.

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3. Purge and sample well using most appropriate method	3a. Exposure: contamination (e.g., SPH, contaminated groundwater, vapors)	3a. Wear chemical-resistant disposable gloves and safety glasses when gauging well. 3a. Insert and remove tubing or bailers slowly to avoid splashing. 3a. Use an absorbent pad to clean spills (see 1c).
	3b. Exertion: muscle strain while carrying equipment	3b. Use proper lifting techniques when handling/moving equipment. 3b. Use mechanical assistance or make multiple trips to carry equipment (see 1a).
	3c. Exposure: exposure to preservatives and contaminated liquids	3c. Wear chemical-resistant disposable gloves, cut-resistant gloves and safety glasses when handling samples. 3c. Open and fill sample jars slowly to avoid splashing and contact with preservatives.
	3d. Contact: cuts by glass or sharp objects3e. C	3d. Wear cut-resistant (i.e., Kevlar) gloves under chemical-resistant gloves when handling sample jars, VOA vials or when using cutting tools.3e. See
	3f. Electrical hazards	3f. Avoid touching battery terminals. 3f. Position batteries away from water source.
4. Transfer purge water from 5-gallon buckets to 55-gallon drums (if necessary); move drums to storage area- **See Waste Disposal/Storage JSA**	4a. Exposure to contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater)	4a. Do not overfill buckets or drums and pour liquids in such a manner that they do not splash. 4a. Properly dispose of used materials/PPE in provided drums in designated drum storage area (see 3a).
	4b. Exertion: muscle strain from lifting/carrying 5-gallon buckets	4b. Use proper lifting techniques when carrying buckets. Do not overfill buckets (see 3b).
	4c. Caught: pinch points associated with handling drum lid	4c. Ensure that fingers are not placed under the lid of the drum. Wear leather gloves and use proper tools (ratchet) while sealing drum lid.
	4d. Contact with traffic 4e. Fall: spilled purge water	4d. See 1d. 4e. Clean up any spills using absorbent pads.
5. Decontaminate interface probe	5a. Exposure to contamination (e.g., SPH, contaminated groundwater, vapors)	5a. See 3a.
	5b. Exposure to chemicals in cleaning solution including ammonia	5b. See 3a.

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JSA TYPE CATEGORY: **KONICA MINOLTA**	WORK TYPE: **Soil sampling**	WORK ACTIVITY (Description): **Soil Sample Collection**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Wendy Monterosso	Project Hydrogeologist	Joseph Gentile	CSHM
		Subraham Singh	OHSM

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

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

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Hand Tools, Photoionization Detector, Ziploc Bags, Sample Jars, Clear Tape, Labels, Pens/Markers/Pencils, Drum Labels, Decontamination Supplies, Bucket with lid, 42 inch Safety Cones, 20 lb. Type ABC Fire Extinguisher, First Aid Kit, Absorbent Pads

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Verify pre-clearance protocol	1. Underground utility damage; property damage; personal injury	1. Confirm that "Call Before You Dig" and local utility companies were contacted prior to drilling. 1. Walk the Site to evaluate utility markings and review maps.
2. Soil sample extraction from split-spoon/acetate liner	2a. Exposure: cuts and abrasions 2b. 2c. Caught: pinch points associated with the equipment 2d. Exertion: personal injury from lifting and assembling split spoon	2a. Use the right tool (Geoprobe liner cutter, or retractable blade knife) when opening split-spoon/acetate liner. 2a. Cut away from the body. 2a. Leather gloves will be worn by personnel who handle the split-spoon. 2b. Personnel that handle environmental soil samples are required to wear chemically-resistant (i.e., nitrile or latex) and cut-resistant gloves when cutting or handling glassware. 2c. When closing/re-assembling the spoon, hands/fingers should be kept away from the pinch points and threads. 2c. Use leather gloves. 2d. See 2b. 2d. To the extent possible, the spoons should be reassembled on a flat surface.
3. Lithologic observation and soil sampling	3a. Caught: personal injury from pinch points, cuts, and abrasions from sampling equipment (including sample jars), tools, and material within soil sample 3b. Exposure: with contamination (impacted soil and/or lab preservatives) 3c. Exertion: muscle strain from heavy objects and repetitive motion 3d. Fall: poor housekeeping	3a. Wear cut-resistant (i.e., Kevlar) gloves under chemical-resistant disposable gloves when handling soil samples and sampling jars. 3b. Wear chemical-resistant disposable gloves to protect hands when handling samples; use containment material or plastic sheeting to protect surrounding areas. 3b. When collecting soil sample from hand auger, put large zip lock bag over entire auger to prevent spillage of soil onto the ground; 3b. Open sample jars slowly while wearing chemical and cut-resistant gloves and fill slowly and carefully to avoid contact with preservatives. 3c. See 2d. 3d. Do not climb over stored materials/equipment. Walk around. 3d. Equipment and tools will be stored at the lowest point of potential energy and out of the walkway and immediate work area (i.e., tools should not be propped against walls or nearby equipment or vehicles). 3d. Use established pathways and walk on stable, secure ground.

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4. Transfer excess soil cuttings to 55-gallon drums	4a. Contact: contaminated soil	4a. Wear chemical-resistant disposable gloves and do not overfill drums to avoid spilling soil. 4a. Properly dispose of used materials/PPE in provided drums in designated drum storage area.
	4b. Exertion: muscle strain from lifting/carrying 5-gallon buckets	4b. Use proper lifting techniques when lifting/carrying buckets (see 3d). Do not overfill buckets.
	4c. Caught: pinch points associated with handling drum lid	4c. Ensure that fingers are not placed under the lid of the drum. Wear leather gloves and use proper tools (ratchet) while opening drum and sealing drum lid.
5. Decontaminate equipment	5a. Exposure: contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors)	5a. Wear chemical-resistant disposable gloves and safety glasses. 5a. Use an absorbent pad to clean spills.
	5b. Exposure: chemicals in cleaning solution including ammonia	5b. See 5a. 5b. Review cleaning solution MSDS for hazards and proper handling.

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JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):	
KONICA MINOLTA	**Waste Disposal Oversight**	**Movement of 55-gallon Drums**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Wendy Monterosso	Project Hydrogeologist	Joseph Gentile	CHSM
		Subraham Singh	OHSM

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

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

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Drum Cart, 20 lb. Type ABC fire extinguisher, Drum labels, Marker, Clear Tape, Pertinent information to include on drum label

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
1. Inspect 55-gal drums for proper condition, labeling	1a. Exposure: if drum contains hazardous material, if the drum is damaged; or if the drum has hazardous materials on the outside of the drum	1a. If drum is not properly labeled, do not open and cease all drum transport activities. Immediately contact Project Manager and inform him/her of drum situation. Do not continue drum transport activities until further actions are determined by the Project Manager. 1a. If drum is properly labeled, but leaking, improperly sealed or in a poor condition, place drum in an over-pack drum.
	1b. Caught: drum could potentially be damaged	1b. Use proper PPE (leather gloves). 1b. If damaged, see 1a.
2. If 55-gal drum is properly labeled and in adequate condition, transfer onto a drum cart	2a. Exertion: muscle strain (handling drums)	2a Use proper body positioning and lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 2a. Ensure that loads are balanced to reduce the potential for muscle strain. 2a. Two people or a mechanical lifting aid are required when lifting objects over 50 lbs. or when the shape makes the object difficult to lift. 2a. Never move drum by picking it up. If movement is necessary, slightly lean the drum over and roll it on its edge.
	2b. Caught: pinch points associated with handling the drum	2b. Use proper PPE (leather gloves and steel-toed boots). 2b. Never put hand or foot in a position between the drum, a fixed object, the drum cart or ground.
3. Push drum cart with 55-gal drum to appropriate pre-determined drum storage area	3a. Exertion: muscle strain (pushing drum cart)	3a. See 2a. 3a. Inspect the wheels of the cart and ensure that the load is evenly distributed.
	3b. Caught: dropping of the drum	3b. Determine transport route before actually moving the drum. 3b. Remove all obstructions from transport route prior to transport. 3b. Maintain a straight route on solid, level ground, staying on paved surfaces wherever possible. 3b. Ensure that the drum is properly secured before transport.
4. Place 55-gal drum in drum storage area or on lift gate of disposal truck	4a. Exertion: muscle strain (handling drums)	4a. See 2a.
	4b. Caught: pinch points associated with handling the drum	4b. See 2b.

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JOB SAFETY ANALYSIS	DATE 1/11/11	☒ NEW ☐ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY: **KONICA MINOLTA**	WORK TYPE: **Drilling**	WORK ACTIVITY (Description): **Geoprobe Soil Borings /Well Installation**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Wendy Monterosso	Project Hydrogeologist	Joseph Gentile	CHSM
		Subraham Singh	OHSM

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

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

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Track-Mounted Drilling Rig, saw, Hand Tools, Photoionization Detector, MultiGas meter (or equivalent), Interface Probe, 20 lb. Type ABC fire extinguisher, First Aid Kit, absorbent pads, 42" Cones & Flags and "Work Area" Signs, if needed

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

[1]JOB STEPS	[2]POTENTIAL HAZARDS	[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. 1a. If personnel move into the path of the drilling rig, the drilling rig will be stopped until the path is again clear. 1a. Use a spotter. 1a. Use caution by moving the rig slowly, observing the surroundings of the rig and using a spotter if necessary, while advancing the drilling rig. 1a. Inspect the driving path for uneven terrain.
	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. 1b. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1b. Use established pathways and walk on stable, secure ground.
2. Setting up drilling rig/work area	2a. Fall: slip/trip/fall hazards associated with drilling equipment and tools	2a. See 1b. 2a. Equipment and tools will be staged in a convenient, stable, and orderly manner. 2a. Equipment and tools will be stored at the lowest point of potential energy and out of the walkway and immediate work area (i.e. tools should not be propped against walls or nearby equipment or vehicles). 2a. Equipment and tools that are not anticipated to be used will be returned to an appropriate storage area that is out of the immediate work area. 2a. Ensure power cords and water lines are grouped when used within the work area.
	2b. Exertion: lifting	2b. Use proper body positioning and lifting techniques; keep back straight, lift with legs, keep load close to body, and never reach with a load. 2b. Ensure that loads are balanced to reduce the potential for muscle strain. 2b. Two people or a mechanical lifting aid are required when lifting objects over 50 lbs. or when the shape makes the object difficult to lift.
3. Raising tower/derrick of drilling rig	3. Contact: overhead hazards	3. 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. 3. Distance requirements for raising a tower/derrick in the area of overhead wires must be reviewed prior to drilling as follows: • 50 KV or less- minimum ckearance of 10 ft/3m • 50 KV or greater – add 0.4 in/1cm for every KV over 50 KV • If voltage is unknown, maintain at least 20ft/6m of clearance 3. The tower/derrick must not be raised beneath overhead power lines unless approved by both the client's representative and Roux PMs. 3. Maintain a safe distance from overhead structures. 3. Do not move the rig while the tower/derrick is raised.
4. Drilling activity	4a. Contact: flying debris	4a. Use the proper PPE (especially hand, eye, and ear protection). 4a. Be aware of and avoid potential lines of fire.

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	4b. Exposure: noise and dust	4b. Wet borehole area with sprayer to minimize dust. 4b. Stand upwind and keep body away from rig.4b. No open flames/heat sources.
	4c. Caught: limb/extremity pinching; abrasion/crushing	4c. Use proper PPE. 4c. Always wear leather gloves when making connections and using hand tools; wear cut-resistant (i.e., Kevlar) gloves when handling cutting tools. 4c. Inspect the equipment prior to use for potential pinch points. 4c. Test all emergency shutdown devices prior to drilling. 4c. Inspect drill head for worn surface or missing teeth; replace if damaged or blunt. 4c. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 4c. All non-essential personnel should stay away from the immediate work area; position body out of the line-of-fire of equipment.
	4d. Contact: equipment imbalance during advancement drill equipment	4c. Drillers and helpers will understand and use the "Show Me Your Hands" Policy. 4d. Drillers will advance the borehole slowly and with caution to avoid causing the rig to become imbalanced and/or tip. 4d. 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. 4d. 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. For example, if the boom is ten feet high, non-essential personnel and equipment will be positioned at least ten feet away from the rig in case the rig tips over. Use cones and caution tape to demarcate the area.
	4e. Exposure: inhalation of contamination	4e. Air monitoring using a calibrated photoionization detector (PID) will be used to periodically monitor the breathing zone of the work area. 4e. The Action Level for breathing zone air is five parts per million (sustained) as detected by the PID. 4e. If a reading of >5 ppm 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 appropriate precautions in accordance with the site specific health and safety plan.
	4f. Fall: slip/trip/fall hazards	4f. See 2a.
5. Decontaminate equipment	5a. Exposure to contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors)	5a. Wear chemical-resistant disposable gloves and safety glasses. 5a. Use an absorbent pad to clean spills.
	5b. Exposure to chemicals in cleaning solution including ammonia	5b. See 5a. 5b. Review the cleaning solution MSDS for hazards and safe handling recommendations.

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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 if 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. In general, when the temperature exceeds 88°F, a 15 minute rest cycle will be initiated once every two hours. 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.

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 Human Resources Department in Roux Associates' office 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: _____

_____

Health and Safety
Briefing/Tailgate Meeting Form

HEALTH & 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 E

Accident Report and Accident Investigation Form

☐ Roux Associates, Inc. ☐ Remedial Engineering, P.C. ☐ DOMANI Sustainability Consulting, LLC
(Check applicable company name)

ACCIDENT REPORT

Joe Gentile, Corporate Health and Safety Manager
Cell: (610) 844-6911; Office: (856) 423-8800; Office FAX: (856) 423-3220; Home: (484) 373-0953

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

ACCIDENT REPORT STATUS (time due):
☐ Initial (24 hr) Date: _____
☐ Final (5-10 days) 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 as 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 Treatment
☐Restricted Work ☐Lost Time

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/ Maintenance ☐Trenching
☐Drilling ☐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/Domani Emp; Roux/Remedial/Domani Sub; 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)				
3)				
4)				

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

Name/Phone # of Each Person Injured in Incident:	Designate: Roux/Remedial/Domani Emp; Roux/Remedial/Domani Sub; 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)					
3)					

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)				$
2)				$
3)				$

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

Witness Name:	Address:	Phone #:
1)		
2)		
3)		

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:
1)				
2)				
3)				

II. PUBLIC RESPONSES TO INCIDENT (if applicable)

1) Response/Inquiry By: (check one)	Entity Name:	Name/Phone # of Respondent/ Inquirer:	Address of Entity/Person:	Date/Time of Response/Inquiry:
☐Newspaper ☐Television ☐Community Group ☐Neighbors ☐Other _____				
Describe Response/Inquiry:				
Roux/Remedial/Domani Response:				
2) Response/Inquiry By: (check one)	Entity Name:	Name/Phone # of Respondent/ Inquirer:	Address of Entity/Person:	Date/Time of Response/Inquiry:
☐Newspaper ☐Television ☐Community Group ☐Neighbors ☐Other _____				
Describe Response/Inquiry:				
Roux/Remedial/Domani 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):**

Roux Associates, Inc./Remedial Engineering, P.C./DOMANI Sustainability Consulting, LLC

ACCIDENT INVESTIGATION REPORT

(March 2008)

Project #: **Project Name:** **Project Location:** **Accident Date:**

PART 3: INVESTIGATION TEAM ANALYSIS

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

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

CAUSAL FACTOR	ROOT CAUSE		SOLUTION(S) [Must Match Root Cause(s)] #	SOLUTION(S) [Must Match Root Cause(s)] Solution(s)	PERSON RESPONSIBLE	AGREED DUE DATE	ACTUAL COMPLETION DATE
			1				
			2				
			3				
			4				
			5				
			6				

INVESTIGATION TEAM:

PRINT NAME	JOB POSITION	DATE	SIGNATURE

No One Gets Hurt!

Acord Form

ACORD™ AUTOMOBILE LOSS NOTICE

DATE

PRODUCER	PHONE (A/C, No, Ext):	COMPANY	NAIC CODE: 25224	MISCELLANEOUS INFO (Site & location code)
The Treiber Group, AJ Gallagher Risk Mgt. Svc. 377 Oak Street Garden City, NY 11530		Great Divide Insurance Company		
		POLICY NUMBER: BAP1549799-10	REFERENCE NUMBER	CAT #
CODE:	SUB CODE:	EFFECTIVE DATE: 06/01/12	EXPIRATION DATE: 06/01/13	DATE OF ACCIDENT AND TIME: AM / PM — PREVIOUSLY REPORTED: YES / NO
AGENCY CUSTOMER ID:				

INSURED

NAME AND ADDRESS	SOC SEC # OR FEIN: 11-2579482	RESIDENCE PHONE (A/C, No)	BUSINESS PHONE (A/C, No, Ext)
Roux Associates, Inc. 209 Shafter Street Islandia, NY 11749		NA	631-232-2600

CONTACT

CONTACT INSURED

NAME AND ADDRESS	RESIDENCE PHONE (A/C, No)	BUSINESS PHONE (A/C, No, Ext)	WHERE TO CONTACT / WHEN TO CONTACT
Susan Sullivan, General Counsel Roux Associates, Inc. 209 Shafter Street Islandia, NY 11749		631-232-2600	Fax Notice: 631-232-1525

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)
					COLLISION DED	

LOSS PAYEE

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

INSURED VEHICLE

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

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
Employee					

DESCRIBE DAMAGE	ESTIMATE AMOUNT	WHERE CAN VEHICLE BE SEEN?	WHEN CAN VEH BE SEEN?	OTHER INSURANCE ON VEHICLE

PROPERTY DAMAGED

DESCRIBE PROPERTY (If auto, year, make, model, plate #) — 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)

REMARKS (Include adjuster assigned)

REPORTED BY	REPORTED TO	SIGNATURE OF INSURED	SIGNATURE OF PRODUCER

NOTE: IMPORTANT STATE INFORMATION ON REVERSE SIDE

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, District of Columbia, Kentucky, Louisiana, Maine, Michigan, New Jersey, New Mexico, Pennsylvania and 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 D.C., LA, ME and VA insurance benefits may also be denied.

Applicable in California

Any person who knowingly files a statement of claim containing any false or misleading information is subject to criminal and civil penalties.

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 fraudulanet 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 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.

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

Form approved OMB no. 1218-0176

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.

Establishment name _____

City _____ State _____

Identify the person			Describe the case			Classify the 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)	CHECK ONLY ONE box for each case based on the most serious outcome for that case:						(M)					
						Death	Days away from work	Remained at work		Away From Work (days)	On job transfer or restriction (days)	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)
					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.

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)		
(1) Injury	0	(4) Poisoning	0
(2) Skin Disorder	0	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	0

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

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

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 Report* 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

Weekly Safety Report

APPENDIX H

WEEKLY SAFETY REPORT

Job Name_____ **Job#**_____

Week of: **Days Without Lost Time Injury:**

Describe any recordable incidents or accidents:

What actions were taken to prevent such incidents or accidents from occurring again?

Was training conducted addressing the incident? Y N What date?___

What level of PPE is currently in place?

Has PPE been upgraded or downgraded?

Have Perimeter Air Monitoring action limits been exceeded:

What action was taken to mitigate the exceedance?

Have personal air monitoring limits been exceeded:

What actions were taken?

List any problems with air monitoring equipment:

Write a summary of work completed during the week:

Write a summary of proposed work for the coming week:

Summarize any safety issues that are outstanding:

HSO Name: _____ **HSO Signature:** _____

APPENDIX I

Job Safety and Health Protection Poster

You Have a Right to a Safe and Healthful Workplace.

IT'S THE LAW!

- ❑ You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- ❑ You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in the inspection.
- ❑ You can file a complaint with OSHA within 30 days of discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act.*
- ❑ You have a right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violation.
- ❑ Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- ❑ You have the right to copies of your medical records or records of your exposure to toxic and harmful substances or conditions.
- ❑ Your employer must post this notice in your workplace.

The *Occupational Safety and Health Act of 1970 (OSH Act),* P.L. 91-596, assures safe and healthful working conditions for working men and women throughout the Nation. The Occupational Safety and Health Administration, in the U.S. Department of Labor, has the primary responsibility for administering the *OSH Act.* The rights listed here may vary depending on the particular circumstances. To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, visit our website at www.osha.gov or call 1-800-321-OSHA or your nearest OSHA office:

Atlanta (404) 562-2300
Boston (617) 565-9860
Chicago (312) 353-2220
Dallas (214) 767-4731
Denver (303) 844-1600
Kansas City (816) 426-5861
New York (212) 337-2378
Philadelphia (215) 861-4900
San Francisco (415) 975-4310
Seattle (206) 553-5930
Teletypewriter (TTY) 1-877-889-5627

If you work in a state operating under an OSHA-approved plan, your employer must post the required state equivalent of this poster.

1-800-321-OSHA

OSHA Occupational Safety and Health Administration

www.osha.gov U.S. Department of Labor

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1. Proposed Soil Boring Locations
2. Proposed Well Locations