From: "Stoll, Dave" <Dave.Stoll@shawgrp.com>
To: Christopher O'neill <cxoneill@gw.dec.state.ny.us>
CC: "Adams, Robert" <Robert.Adams@shawgrp.com>
Date: 6/3/2011 8:52 AM
Subject: RE: FW: Osborne Road Workplan Revised 6-2-2011 and Schedule Revised 6-2-3011, HW#401056

Sorry if that caused confusion, I included that language from your email suggesting MW5 pair went in first. We arent married to either way. I can remove that from the work plan, and leave it as a field decision. I am out on a personal matter today, but will be in on Monday.

_____
From: Christopher O'neill [cxoneill@gw.dec.state.ny.us]
Sent: Friday, June 03, 2011 7:44 AM
To: Stoll, Dave
Cc: Keith Goertz; mer10@health.state.ny.us; Adams, Robert
Subject: Re: FW: Osborne Road Workplan Revised 6-2-2011 and Schedule Revised 6-2-3011, HW#401056

Since MW1/1A are in the alley used by the bakery shop tenant routinely, we need to inform the property owner (who then can inform tenant) with as much prior notice as possible, when we are going to close off that alley.
Is there a reason for not deciding now if MW1/1A or MW5/5A are the first to get installed?

>>> "Stoll, Dave" <Dave.Stoll@shawgrp.com> 6/2/2011 3:10 PM >>>
Chris-as promised, updated work plan and schedule.

David C. Stoll, PG
Senior Project Manager
Shaw Environmental & Infrastructure Group
Commercial, State and Local Division
13 British American Boulevard
Latham, New York 12110
(518) 783-1996
(518) 785-2362(direct)
(518) 526-2322(cell)
(518) 783-8397 (fax)

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Christopher O'neill - FW: Osborne Road Workplan Revised 6-2-2011 and Schedule Revised 6-2-3011

From: "Stoll, Dave" <Dave.Stoll@shawgrp.com>
To: Christopher O'neill <cxoneill@gw.dec.state.ny.us>
Date: 6/2/2011 3:15 PM
Subject: FW: Osborne Road Workplan Revised 6-2-2011 and Schedule Revised 6-2-3011
CC: "Adams, Robert" <Robert.Adams@shawgrp.com>
Attachments: NYSDEC Osborne Road Workplan_Rev. 6-2-2011.pdf; Osborne Road Drilling June 2011 Rev. Schedule_June 2 2011.pdf

---

Chris-as promised, updated work plan and schedule.

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Senior Project Manager
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www.shawgrp.com

Shaw Environmental & Infrastructure Engineering of New York, P.C.

13 British American Boulevard
Latham, NY 12110-1405
518.783.1996
Fax 518.783.8397

WORK PLAN
OFF-SITE INVESTIGATION

253 Osborne Road Site
Loudonville, Albany County, New York

Site Number 401056
Spill Number 07-02543
Contract Work Authorization (WA) Number: D006132-19

Shaw Project No.: 134685.19

March 2011
Revised June 2, 2011

Prepared for

Mr. Christopher O'Neill, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation Region 4
1130 N. Westcott Road
Schenectady, New York 12306-2014

Prepared by

Shaw Environmental & Infrastructure Engineering of New York, P.C.
13 British American Boulevard
Latham, New York 12110-1405

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B. Project Health and Safety Plan
C. Community Air Monitoring Plan

1.0 Introduction

Shaw Environmental & Infrastructure Engineering of New York, P.C. (Shaw) has prepared this Work Plan to outline the methodologies for the collection of soil, groundwater, and soil gas samples in areas to the north (down-gradient) of 253 Osborne Road, Loudonville, Albany County, New York (site). (**Figure 1, Site Location Map**). The proposed scope of work discussed herein has been developed in accordance with Work Authorization (WA) D006132-19 provided to Shaw on December 7, 2010 and subsequent meetings, discussions, and electronic mail (email) with the New York State Department of Environmental Conservation (NYSDEC). Comments provided by the property owners consultant have also been incorporated, as appropriate.

1.1 Site Area / Down-Gradient Property Description

Site Description / Remedial History

The site consists of an approximate 0.9 acre parcel formerly containing a strip mall of retail tenants, including a dry cleaner. On-site investigative and remedial work has occurred from 2003 to 2008, under NYSDEC Spill Program oversight, and from 2008 to present under NYSDEC Remedial Program oversight via an independent Order of Consent. Tetrachloroethene (perc, PCE), a typical historical dry cleaning agent, and its degradation chemicals have been found both on-site and off-site, at the immediately down-gradient multi-use retail property.

The most recent previous owner (Osborne Road Associates, LLC, "the LLC") and the NYSDEC, in cooperation with the New York State Department of Health (NYSDOH), executed an Order on Consent in 2008, to address on-site investigative and remedial work associated with the demolition of the existing building, removal of additional perc-contaminated soils, construction of new commercial building, continued site management, and associated citizen participation. The off-site work was left to future negotiations, whereby the LLC refused to pursue off-site investigative work and could not negotiate the installation and operation of an off-site soil vapor intrusion (SVI) mitigation system on the adjacent property. (The off-site SVI mitigation was agreed to between the LLC and NYSDEC, but not formalized in an Order, as an alternative to continued off-site SVI monitoring.)

Follow up work for the down-gradient properties was detailed in the January 11, 2011 Cost Estimate / Work Authorization (WA) issued by the NYSDEC to Shaw. Supporting documents referenced in this work plan include Shaw's Field Activities Plan (FAP), Quality Assurance Project Plan (QAPP). A Site Specific Health and Safety Plan (HASP) has been included in **Appendix B** and the Community Air Monitoring Plan (CAMP) has been included as **Appendix C**. The following work plan will detail the methodologies of which additional subsurface data will be collected in order to identify and quantify the extent of impacts from the site to the off-site properties.

2.0 Scope of Work

The intent of this investigation is to further delineate the extent of off-site impacts to the soil, groundwater and soil vapor from the site, to determine the need for groundwater and/or soil vapor intrusion monitoring and/or mitigation for off-site properties (in particular the adjacent multi-use retail building). The scope of work for this investigation includes the advancement of eleven borings that will be completed as monitoring wells.

In addition to the installation of the monitoring wells a total of nine permanent soil-vapor monitoring points will be installed in the area down-gradient of the site.

The proposed locations will be approved by the NYSDEC project manager and the current property owner prior to advancement of the soil borings/soil vapor points. A figure of proposed boring locations is included as **Figure 2**.

2.1 Pre-Field Work Site Reconnaissance

The primary objectives of this task are to coordinate investigation activities with the current property owner/tenant (if necessary) and to verify the locations for all proposed soil gas and monitoring well locations. Prior to mobilization, Shaw will coordinate with the Underground Facilities Protection Organization (UFPO) and current project location personnel for clearance of subsurface utilities and services. The purpose of this coordination is to protect the health and safety of field personnel and to prevent damage to underground utilities during intrusive activities. Public and privately owned utilities will be located by contacting responsible agencies/parties to provide mark-outs of underground utilities.

NYSDEC personnel will be responsible for the initial notification and contact with the property owner/s to establish access.

2.2. Soil Sampling

Continuous soil cores will be collected to classify the geology of the off-site properties at each of the eleven proposed boring locations. Eight borings will be advanced to 25 feet bgs and the remaining three borings will be advanced to 40 feet bgs. Each boring will be installed using hollow stem auger (HSA) drilling methodologies and the soil samples collected in two-foot intervals with a split-barrel sampler. The soil borings will be logged according to the USCS

classification scheme and field screened for volatile organic compounds (VOCs) using a calibrated photoionization detector (PID).

Up to two depth discrete soil samples will be collected from within each boring at intervals exhibiting the highest PID reading, where visual impact is observed or at the groundwater interface as detailed in Shaw's December, 2008 Field Activities Plan (FAP). The determination of whether or not a second soil sample should be collected at the boring location will be made in cases where the highest PID reading does not correspond with either the groundwater interface or in a zone of visual impacts to the soil in cross section. All soil samples, including the appropriate number of Quality Assurance/Quality Control (QAQC, as detailed on **Table 1**) will be analyzed for VOCs according to United States Environmental Protection Agency (US EPA) method 8260, semi-volatile organic compounds (SVOCs) using US EPA method 8270C, total metals by US EPA method 6010A and polychlorinated biphenyls (PCBs) using US EPA method 8082. All samples will be labeled, handled, and packaged following the procedures described in the approved QAPP and analyzed by Mitkem Laboratories of Warwick, RI (an approved ELAP-certified laboratory) in accordance with NYSDEC Analytical Services Protocol.

2.3 Monitoring Well Installation

A Shaw representative will oversee the advancement of the eleven (11) borings. As mentioned earlier eight (8) of the 11 monitoring wells will be completed to a depth of 25 feet bgs with a proposed screen length of 15 feet, and the remaining three (3) may be completed to 40 feet bgs with a proposed screen length of 5 feet. Each monitoring wells will be constructed using 2-inch Schedule 40 polyvinyl chloride (PVC) 0.01-inch slotted screen and riser. The screen lengths as detailed above will have a filter pack extending from the base of the screen to approximately two feet above the top of the screen. A two foot minimum bentonite seal will be placed above the filter pack and the remaining annular space will be grouted to the surface. All monitoring wells will be completed at grade with a locking curb box and secured in place with a concrete apron. A typical monitoring well construction is depicted on **Figure 3**.

The proposed well pair construction requires a saturated thickness of at least 35 – 40 feet. A review of existing geologic data indicates that sufficient saturated thickness may not exist across the entire site. Consequently drilling will likely start at MW-5/5A to characterize the depth to till/bedrock interface (which is reportedly deepest at this location). The site geology will then be determined in the field and decisions will be made in the field whether well pairs can be installed based upon the depth to bedrock/till interface and observed saturated thickness.

2.4 Monitoring Well Development

The newly installed monitoring wells will be allowed to "rest" for a period of 24 hours prior to being developed and allowed to stabilize for two weeks prior to sample collection. Development of each monitoring well will include a combination of surging and pumping to remove groundwater and will be considered to be complete when either the turbidity is below 50 NTU's, ten calculated well volumes have been removed or if groundwater parameters (pH, specific conductivity, dissolved oxygen, turbidity, ORP, and temperature) have stabilized, whichever occurs first.

2.5 Permanent Soil Vapor Points Installation

Shaw will oversee the installation of nine (9) permanent soil gas implants. These implant points will be placed at pre-approved locations by the NYSDEC Project Manager (PM) and current property owner. Vapor points proposed near the Buildings will not be installed within 10 feet of the Buildings and will be completed in native (non-backfill) soil if possible. Each soil vapor point will be constructed using a six-inch stainless steel screen attached to a dedicated section of laboratory or food grade Teflon tubing and will be placed at least 1-foot above the groundwater interface (expected to range between 5-8 feet bgs). The borehole will be backfilled with glass beads or silica sand (filter pack) to a minimum of six inches above the screened interval and a bentonite slurry will be placed above the glass beads to the ground surface. The bentonite will be allowed to cure 24 hours prior to sample collection. Each soil vapor point will be completed at the ground surface with a small diameter road box and secured in place with a concrete apron. A typical soil vapor point construction log is presented on **Figure 4**.

2.6 Groundwater Sampling

Following monitoring well development a two week "rest" period shall elapse prior to sampling. Before sample collection at each well location the depth to water and total well depth will be measured, recorded and used to calculate the appropriate well volume. Shaw will collect a groundwater sample from each of the eleven newly installed monitoring wells and up to ten other select monitoring well locations (located on-site) as determined in consultation with the NYSDEC. Two rounds of groundwater collection are proposed, however the need for the second round will be reviewed by Shaw and the NYSDEC following receipt of the initial round of groundwater analytical results. All groundwater samples will be purged and collected using the U.S EPA Region 2 Groundwater Sampling Procedure: Low Stress (Low Flow) Purging and Sampling methodology. This methodology includes purging of the monitoring well using low flow (less than 0.5 liters/minute) until the parameters stabilize (a copy of the method is included

as **Appendix A)**. All pertinent groundwater parameter measurements will be recorded within a site dedicated field book and on appropriate field forms. These forms will be submitted in the Site Characterization report. (SCR).

All groundwater samples, including the quality control samples (MS/MSD, duplicate, rinse blank and a trip blank, 1 per 20) will be collected for VOCs according to United States Environmental Protection Agency (US EPA) method 8260, semi- SVOCs using US EPA method 8270C, total metals by US EPA method 7000 or 6010A and PCBs using US EPA method 8082. All samples will be labeled, handled, and packaged following the procedures described in the approved QAPP and analyzed by Mitkem Laboratories of Warwick, RI (an approved ELAP-certified laboratory) in accordance with NYSDEC Analytical Services Protocol. All laboratory data packages will be a "Category B" deliverable and sent to a third party for independent validation. A groundwater sample summary schedule is included as **Table 1**.

2.7 Soil Vapor Sampling

Soil gas samples will be collected to assess the potential for vapor intrusion at the off-site property area. Eleven air samples will be collected as part of this investigation (namely nine soil gas, one ambient air and one soil gas duplicate) from a depth of 5-8 feet bgs. These locations are depicted on **Figure 2** but will be confirmed in consultation with the NYSDEC and NYSDOH in the field.

Prior to the collection of the soil vapor sample at the proposed locations an inspection of the general site conditions will be performed. The inspection will include but is not limited to the following activities:

- Documentation of exterior weather conditions and outdoor temperature.
- Ambient air screening using field equipment (i.e. ppb PID or similar).

Soil vapor samples will be collected at the desired locations using the following procedures as detailed in Shaw's FAP and presented below:

- Visually assess the ground condition and select sample locations that are away from major cracks.
- Retrieve the sample line from within the road box and feed it through top of the helium leak enclosure.
- Place the helium supply line into the enclosure with the gas OFF.

- From the sample line; purge one-three volumes of air into tedlar bag at a flow rate of less than 0.2 liters/minute using a GilAir personal pump.
- Use a calibrated ppB Rae to check the concentration of air for VOCs inside the tedlar bag.
- Check the sample line with the helium leak detector to ensure that there are no interferences present in the air which might give a false positive.
- Apply the helium gas to the enclosure while the helium detector is attached to the sample line. There should be no instrument response on the helium leak detector meter, indicating that the seal is tight.
- If an instrument response is detected check the sample line for potential infiltration of helium gas and re-test.
- Record the serial number of the canister and associated regulator on the chain-of-custody (COC) form and field notebook/sample form.
- Assign sample identification on the canister identification tag and record this on COC and field notebook/sample form.
- Record the gauge pressure; the vacuum gauge pressure must read -25 in Hg or less, or the canister cannot be used and should be replaced.
- Record the sample start time on the air sampling form and take a digital photograph of canister setup and surrounding area.
- Sampling will continue until there is approximately 5 in. Hg vacuum remaining in the canister.
- Install the plug on the canister inlet fitting and place the sample container in the original box.
- Complete the sample collection log with the appropriate information, and log each sample on the COC form.
- Ship samples under proper chain of custody to an approved laboratory for analysis of VOCs by EPA method TO-15 to an accuracy of 1 $\mu g/m^3$ and 0.25$\mu g/m^3$ for Trichloroethene (TCE).

Individually certified 6-liter summa canisters with an eight hour flow regulator will be utilized for the soil vapor and ambient outdoor air samples. The ambient samples will be collected at a height within the breathing zone at pre-selected locations. One duplicate sample will be collected with the soil vapor samples. The canisters will be clearly tagged and labeled, noting that they are air samples and include Shaw's name, address and contact information.

Soil vapor samples will be shipped under proper chain of custody to Air Toxics laboratory, an approved ELAP certified laboratory, for analysis of volatile organic compounds (VOCs) by EPA method TO-15 to an accuracy of 1 $\mu g/m^3$ and 0.25$\mu g/m^3$ for TCE. All laboratory data packages

will be a "Category B" deliverable and sent to a third party for independent validation. A summary of all site sampling is included as **Table 1**.

2.8 Investigation Derived Waste Management

Shaw is responsible for the proper storage, handling, and disposal of investigative-derived waste (IDW). The IDW include personal protective equipment (PPE) and any impacted solids and liquids (either visually or indicative by field screening with the PID) generated during the well drilling, well development and sampling activities. All materials will be treated as contaminated. All drummed materials will be clearly labeled as to their contents and origin. All investigative derived waste will be managed in accordance with NYSDEC-DER Technical and Administrative Guidance Memorandum 4032 and the FAP. Accordingly, handling management and disposal will be as follows:

- Liquids generated from contaminated equipment decontamination will be collected in drums or other containers at the point of generation. They will be stored in a designated staging area as directed by the NYSDEC. A waste subcontractor will remove the drums for disposal at an approved disposal facility.
- Soil and rock cuttings from drilling operations will be staged onsite until an appropriate treatment/disposal procedure has been approved by the NYSDEC.
- Used protective clothing and equipment that is contaminated with hazardous waste will be placed in plastic bags, packed in 55-gal ring-top drums and transported to the drum staging area for proper disposal.
- Non-contaminated trash and debris and protective equipment will be placed in a trash dumpster and disposed of by a local garbage hauler as appropriate or warranted at each site. Alternative disposal arrangements will be discussed with the NYSDEC.

The IDW will be sampled for waste characterization according to the determined disposal facilities requirements.

2.9 Utilities

Shaw will contact the local "one call" agency to schedule the utility mark-outs no later than ten days prior to the start of work. On-site utility mark-out will be coordinated with the site owner, visual observations or similar utility maps as provided by the tax assessor.

Shaw field personnel and their drilling subcontractor will be prepared to hand clear or use an "air-knife" to clear all sampling locations in accordance to Shaw SOP-HS-308 (HASP). Prior to

any sub-surface penetration Shaw will review the mark out provided by the "one-call" agency and visually inspect to help determine what utilities may be within the sample collection areas. Minor field adjustments of proposed sample locations may be required (in consultation with the NYSDEC and the property owner) once the mark out is completed. If determined any necessary permits required by the local municipalities will be in-place prior to mobilization into the field.

2.10 Surveying

Upon completion an updated site map displaying all newly installed monitoring well locations, soil gas implant locations and Site building edges, road edges, ect. will be established by a New

York State Licensed Surveyor. A detailed base map of the Site and immediate vicinity will be developed. The surveyor shall tie in the new data into the North American Datum 1983 and UTM Zone 18 coordinate system with an accuracy of +/- 3 feet. Top of casing elevation, top of riser and ground elevation of newly installed monitoring wells will be collected (accuracy of 0.01 ft). These elevations will be used to develop an updated groundwater contour map which will be included within the site summary report. The property lines of the parcel will also be placed on the base map.

2.11 Decontamination

All equipment that may come in contact with the sample, interior of a borehole, or other equipment that has entered the borehole (including such items as the drill rods, bits, miscellaneous sampling equipment, and tools) will be thoroughly cleaned using an alconox rinsed and potable water rinse prior to reuse as detailed in the FAP. Additional cleaning of the equipment may be necessary under some circumstances. Decontamination fluids will be will be containerized and staged for proper disposal as outlined in the FAP.

3.0 Schedule

Field work will commence within 30 days of submission of the Final Work Plan to the NYSDEC. Upon approval of the work plan and site access by the NYSDEC, Shaw will schedule the field work with the approved drilling subcontractors and coordinate activities with the NYSDEC project manager. The following schedule is proposed:

- Shaw will include information from the earlier investigations in the final report.
- Shaw will work with the drilling subcontractors to coordinate the contractor's schedule to minimize the impact to site operations and expedite the sampling effort. The work start time will be determined by the Shaw site supervisor and may vary depending upon weather, site conditions and the NYSDEC schedule.
- Shaw will schedule a site visit within 2 weeks of the 2.11 approval.
- Shaw anticipates that the site survey, monitoring well installation, soil gas implant installation, development and sampling efforts can be completed in approximately 22 days.
- Analytical results will be received from the ELAP-approved laboratory in a Category B deliverable format within 28 days of sample receipt. Preliminary laboratory results will be provided to the NYSDEC (via email) within 14 days of sample receipt.
- All samples collected during the site investigation will be submitted to an approved third party validator. The validator will provide a data validation/usability report within 30 days of receipt of analytical results.
- The results of these investigative activities will be included in a draft summary letter format report discussing all historical data summary, site survey information, analytical data and field investigative activities. The report will include tabulated data, figures, boring logs, sample location maps, local groundwater flow direction, and "spider" maps for detection of compounds above their applicable guidance criteria. The draft report will be submitted to the NYSDEC for review and comment within 90 days after completion of field work.
- Shaw will revise the draft letter according to the comments provided by the NYSDEC and NYSDOH. The final report will be submitted in both hard copy and electronic format. In addition an electronic data deliverable (EDD) will be submitted along with the report for use by the NYSDEC. The report and EDD will be provided to the NYSDEC and NYSDOH within 30 days after receipt of comments.

A site-specific project schedule with dates and milestones will be provided to the NYSDEC upon approval and confirmation of site activities.

Tables

Table 1
Sample Schedule

Task: Soil Sampling (Monitoring Well (MW)Install & Soil Gas Implant (SGI) Install)				
Analysis:	**VOCs**	**SVOCs**	**PCBs**	**Metals**
	Number of Samples:			
Soil from MW's	22	22	22	22
* Quality control samples will be using ratio of 1 per 20 as detailed in Shaw's FAP				
Duplicates*	2*	2*	2*	2*
MS*	2*	2*	2*	2*
MSD*	2*	2*	2*	2*

Task: Monitoring Well Sampling			
Analysis:	**VOCs**	**SVOCs**	**Metals**
	Number of Samples:		
Groundwater Round 1	11	11	11
Groundwater Round 1 IF NECESSARY	10	10	10
Rinse Blank Round 1	1	1	1
* Quality control samples will be using 1 per 20 as detailed in Shaw's FAP			
Duplicates	1*	1*	1*
MS	1*	1*	1*
MSD	1*	1*	1*
Groundwater Round 2	11	11	11
Groundwater Round 1 IF NECESSARY	10	10	10
Rinse Blank Round 1	1	1	1
* Quality control samples will be using 1 per 20 as detailed in Shaw's FAP			
Duplicates	1*	1*	1*
MS	1*	1*	1*
MSD	1*	1*	1*

Task: Soil Gas Evaluation	
Analysis	**VOCs**
Air Samples	10*
(*soil gas + outside ambient)	
Duplicates	1

Task: IDW Disposal									
Analysis:	**VOCs**			**Metals**	**TCLP**	**SVOC**	**Pesticide**		**PCB**
	Number of Samples:								
Soil	1			1	1	1	1		1
Groundwater	0			1	1	1	1		1

Notes:
1. All samples shall be analyzed by an ELAP certified laboratory.
2. Analytical data will be a Category B deliverable.
3. *Soil* samples will be analyzed for VOCs by EPA method 8021B, SVOC by Epa Method 8270C, PCB by EPA Method 8082 and metals by EPA Method 7000.
4. *Groundwater* samples will be analyzed for VOC by EPA Method 8260, SVOC by EPA Method 8270C and Metals by EPA Method 7000. If Turbidity is greater than 50 NTUs, a field-filtered sample will be collected for metals analysis.
5. *Air* samples will be analyzed for VOCs by EPA Method TO-15.
6. *IDW Disposal* Samples will be run for full TCLP analysis

Figures

DRAWING NUMBER	134685-019A1
APPROVED BY	MF
CHECKED BY	MF
DRAWN BY	MJS
DESIGNED BY	MF
DATE	02/14/11
OFFICE	LATHAM, NY

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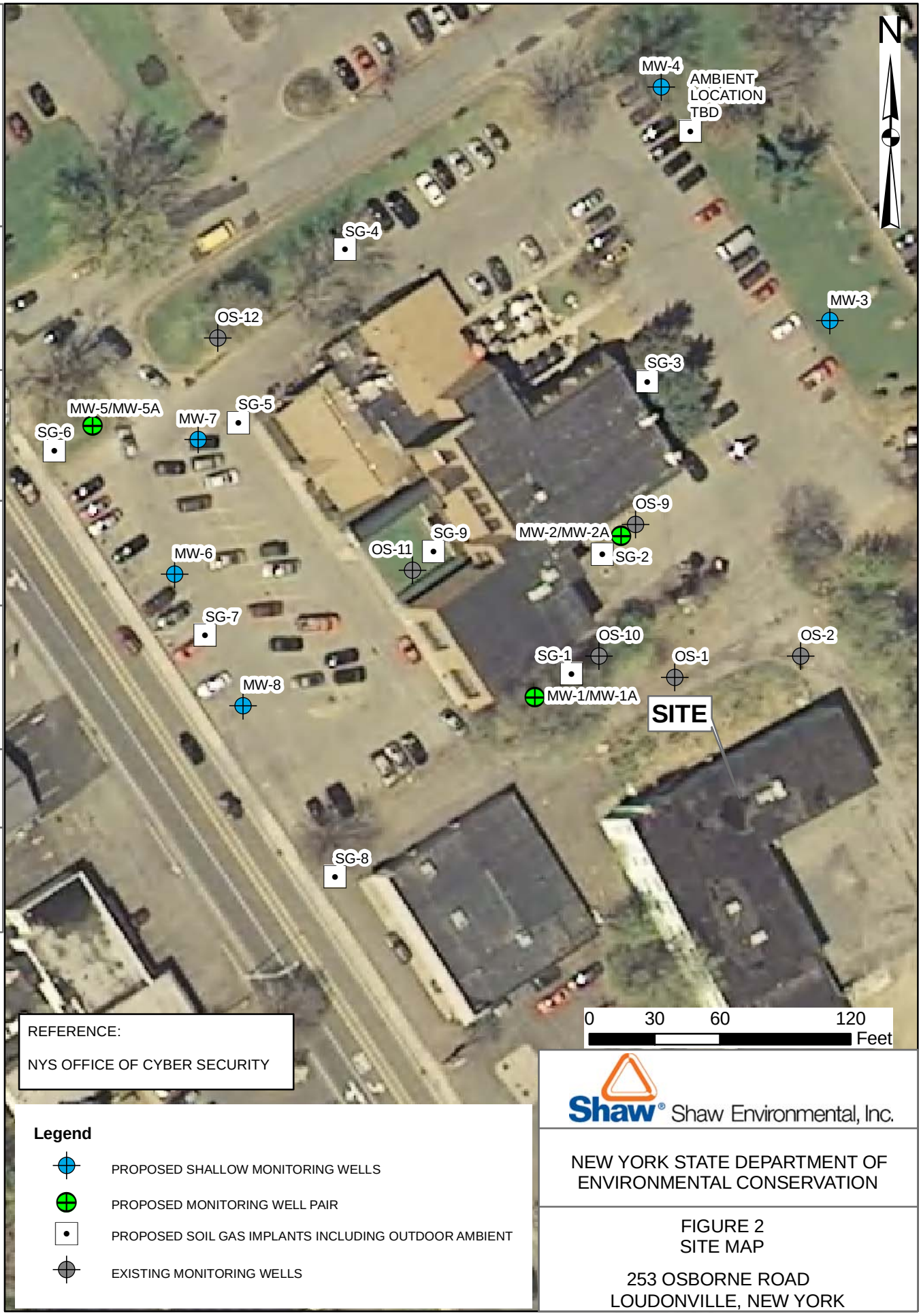
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 1
SITE LOCATION MAP

253 OSBORNE ROAD
LOUDONVILLE, NEW YORK

L:\NYSDEC 2008 Contracts\19-Osborne Road\GIS\MXD\134685-019A1.mxd



DRAWING NUMBER	APPROVED BY	CHECKED BY	DRAWN BY	DESIGNED BY	DATE	OFFICE
134685-019A2	DS	RA	MJS	MF	03/31/11	LATHAM, NY

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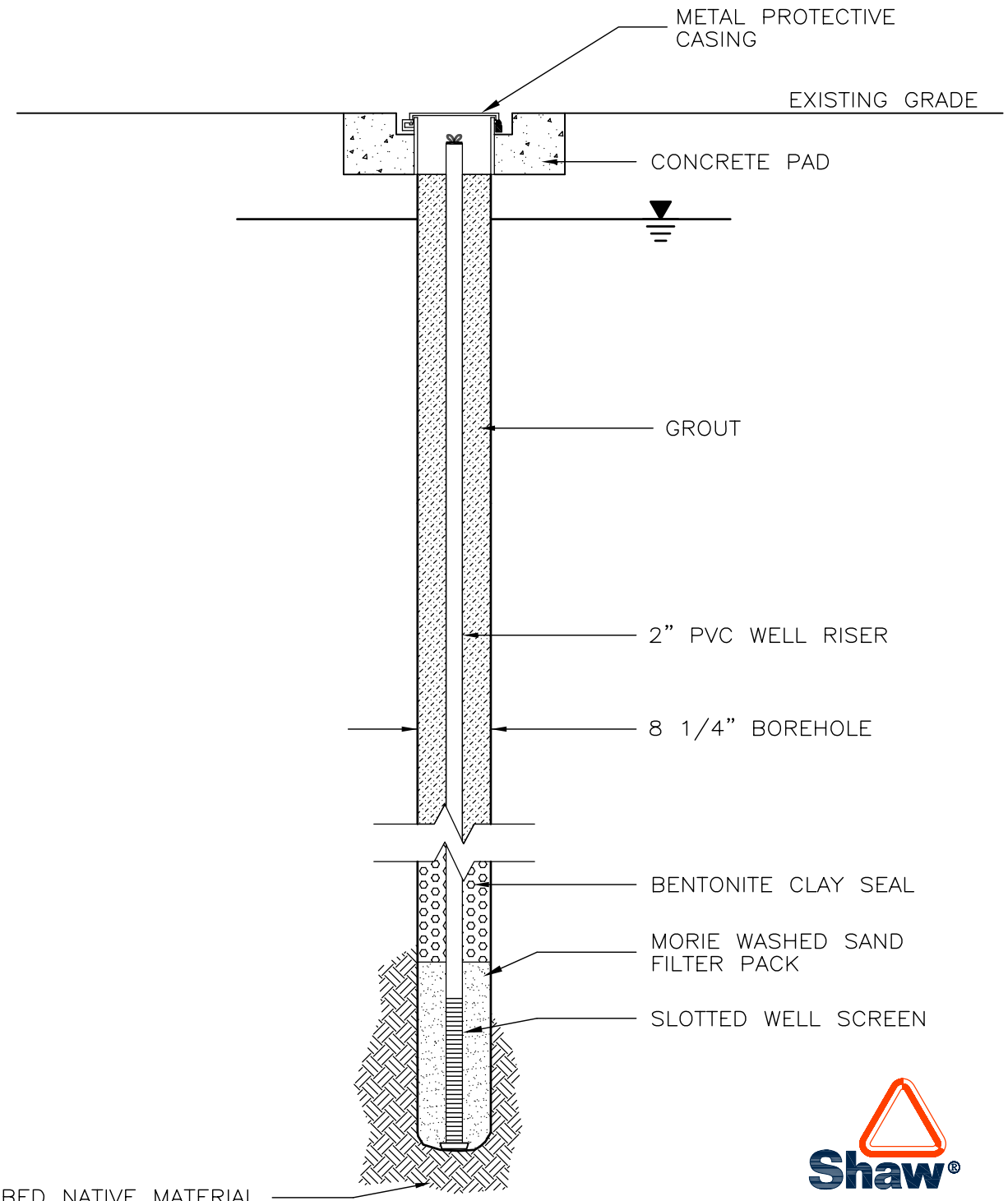
FIGURE 2
SITE MAP

253 OSBORNE ROAD
LOUDONVILLE, NEW YORK

L:\NYSDEC 2008 Contracts\19-Osborne Road\GIS\MXD\134685-019A2.mxd

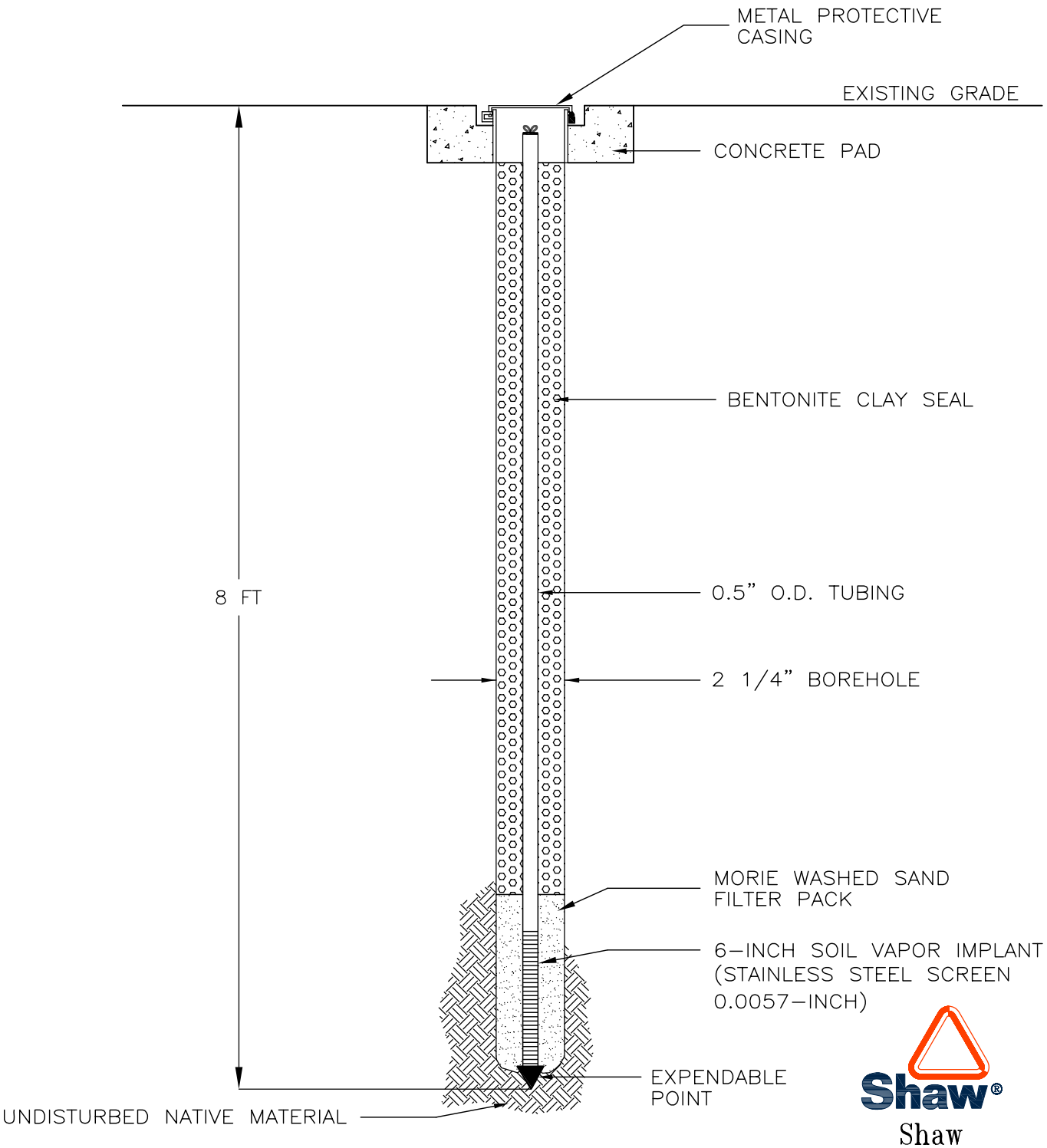
FIGURE 3
TYPICAL WELL CONSTRUCTION DETAIL



NOT TO SCALE

Shaw Environmental, Inc.

FIGURE 4
TYPICAL SOIL VAPOR POINT CONSTRUCTION DETAIL



NOT TO SCALE

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Appendix A

US EPA Region 2
Groundwater Sampling Procedure
Low Stress (Low Flow) Purging and Sampling

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION II

GROUND WATER SAMPLING PROCEDURE
LOW STRESS (Low Flow) PURGING AND SAMPLING

I. SCOPE & APPLICATION

This Low Stress (or Low-Flow) Purging and Sampling Procedure is the EPA Region II standard method for collecting low stress (low flow) ground water samples from monitoring wells. Low stress Purging and Sampling results in collection of ground water samples from monitoring wells that are representative of ground water conditions in the geological formation. This is accomplished by minimizing stress on the geological formation and minimizing disturbance of sediment that has collected in the well. The procedure applies to monitoring wells that have an inner casing with a diameter of 2.0 inches or greater, and maximum screened intervals of ten feet unless multiple intervals are sampled. The procedure is appropriate for collection of ground water samples that will be analyzed for volatile and semi-volatile organic compounds (VOCs and SVOCs), pesticides, polychlorinated biphenyls (PCBs), metals, and microbiological and other contaminants in association with all EPA programs.

This procedure does not address the collection of light or dense non-aqueous phase liquids (LNAPL or DNAPL) samples, and should be used for aqueous samples only. For sampling NAPLs, the reader is referred to the following EPA publications: DNAPL Site Evaluation (Cohen & Mercer, 1993) and the RCRA Ground-Water Monitoring: Draft Technical Guidance (EPA/530-R-93-001), and references therein.

II. METHOD SUMMARY

The purpose of the low stress purging and sampling procedure is to collect ground water samples from monitoring wells that are representative of ground water conditions in the geological formation. This is accomplished by setting the intake velocity of the sampling pump to a flow rate that limits drawdown inside the well casing.

Sampling at the prescribed (low) flow rate has three primary benefits. First, it minimizes disturbance of sediment in the bottom of the well, thereby producing a sample with low turbidity (i.e., low concentration of suspended particles). Typically, this saves time and analytical costs by eliminating the need for collecting and analyzing an additional filtered sample from the same well. Second, this procedure

minimizes aeration of the ground water during sample collection, which improves the sample quality for VOC analysis. Third, in most cases the procedure significantly reduces the volume of ground water purged from a well and the costs associated with its proper treatment and disposal.

III. ADDRESSING POTENTIAL PROBLEMS

Problems that may be encountered using this technique include a) difficulty in sampling wells with insufficient yield; b) failure of one or more key indicator parameters to stabilize; c) cascading of water and/or formation of air bubbles in the tubing; and d) cross-contamination between wells.

Insufficient Yield

Wells with insufficient yield (i.e., low recharge rate of the well) may dewater during purging. Care should be taken to avoid loss of pressure in the tubing line due to dewatering of the well below the level of the pump's intake. Purging should be interrupted before the water level in the well drops below the top of the pump, as this may induce cascading of the sand pack. Pumping the well dry should therefore be avoided to the extent possible in all cases. Sampling should commence as soon as the volume in the well has recovered sufficiently to allow collection of samples. Alternatively, ground water samples may be obtained with techniques designed for the unsaturated zone, such as lysimeters.

Failure to Stabilize Key Indicator Parameters

If one or more key indicator parameters fails to stabilize after 4 hours, one of three options should be considered: a) continue purging in an attempt to achieve stabilization; b) discontinue purging, do not collect samples, and document attempts to reach stabilization in the log book; c) discontinue purging, collect samples, and document attempts to reach stabilization in the log book; or d) Secure the well, purge and collect samples the next day (preferred). The key indicator parameter for samples to be analyzed for VOCs is dissolved oxygen. The key indicator parameter for all other samples is turbidity.

Cascading

To prevent cascading and/or air bubble formation in the tubing, care should be taken to ensure that the flow rate is sufficient to maintain pump suction. Minimize the length and diameter of tubing (i.e., 1/4

or 3/8 inch ID) to ensure that the tubing remains filled with ground water during sampling.

Cross-Contamination

To prevent cross-contamination between wells, it is strongly recommended that dedicated, in-place pumps be used. As an alternative, the potential for cross-contamination can be reduced by performing the more thorough "daily" decontamination procedures between sampling of each well in addition to the start of each sampling day (see Section VII, below).

Equipment Failure

Adequate equipment should be on-hand so that equipment failures do not adversely impact sampling activities.

IV. PLANNING DOCUMENTATION AND EQUIPMENT

- Approved site-specific Field Sampling Plan/Quality Assurance Project Plan (QAPP). This plan must specify the type of pump and other equipment to be used. The QAPP must also specify the depth to which the pump intake should be lowered in each well. Generally, the target depth will correspond to the mid-point of the most permeable zone in the screened interval. Borehole geologic and geophysical logs can be used to help select the most permeable zone. However, in some cases, other criteria may be used to select the target depth for the pump intake. In all cases, the target depth must be approved by the EPA hydrogeologist or EPA project scientist.

- Well construction data, location map, field data from last sampling event.

- Polyethylene sheeting.

- Flame Ionization Detector (FID) and Photo Ionization Detector (PID).

- Adjustable rate, positive displacement ground water sampling pump (e.g., centrifugal or bladder pumps constructed of stainless steel or Teflon). A peristaltic pump may only be used for inorganic sample collection.

- Interface probe or equivalent device for determining the presence or absence of NAPL.

- Teflon or Teflon-lined polyethylene tubing to collect samples for organic analysis. Teflon or Teflon-lined polyethylene, PVC, Tygon or polyethylene tubing to collect samples for inorganic analysis. Sufficient tubing of the appropriate material must be available so that each well has dedicated tubing.

- Water level measuring device, minimum 0.01 foot accuracy, (electronic preferred for tracking water level drawdown during all pumping operations).

- Flow measurement supplies (e.g., graduated cylinder and stop watch or in-line flow meter).

- Power source (generator, nitrogen tank, etc.).
- Monitoring instruments for indicator parameters. Eh and dissolved oxygen must be monitored in-line using an instrument with a continuous readout display. Specific conductance, pH, and temperature may be monitored either in-line or using separate probes. A nephalometer is used to measure turbidity.

- Decontamination supplies (see Section VII, below).

- Logbook (see Section VIII, below).

- Sample bottles.

- Sample preservation supplies (as required by the analytical methods).

- Sample tags or labels, chain of custody.

V. SAMPLING PROCEDURES

Pre-Sampling Activities

1. Start at the well known or believed to have the least contaminated ground water and proceed systematically to the well with the most contaminated ground water. Check the well, the lock, and the locking cap for damage or evidence of tampering. Record observations.

2. Lay out sheet of polyethylene for placement of monitoring and sampling equipment.

3. Measure VOCs at the rim of the unopened well with a PID and FID instrument and record the reading in the field log book.

4. Remove well cap.

5. Measure VOCs at the rim of the opened well with a PID and an FID instrument and record the reading in the field log book.

6. If the well casing does not have a reference point (usually a V-cut or indelible mark in the well casing), make one. Note that the reference point should be surveyed for correction of ground water elevations to the mean geodesic datum (MSL).

7. Measure and record the depth to water (to 0.01 ft) in all wells to be sampled prior to purging. Care should be taken to minimize disturbance in the water column and dislodging of any particulate matter attached to the sides or settled at the bottom of the well.

8. If desired, measure and record the depth of any NAPLs using an interface probe. Care should be taken to minimize disturbance of any sediment that has accumulated at the bottom of the well. Record the observations in the log book. If LNAPLs and/or DNAPLs are detected, install the pump at this time, as described in step 9, below. Allow the well to sit for several days between the measurement or sampling of any DNAPLs and the low-stress purging and sampling of the ground water.

Sampling Procedures

9. Install Pump: Slowly lower the pump, safety cable, tubing and electrical lines into the well to the depth specified for that well in the EPA-approved QAPP or a depth otherwise approved by the EPA hydrogeologist or EPA project scientist. The pump intake must be kept at least two (2) feet above the bottom of the well to prevent disturbance and resuspension of any sediment or NAPL present in the bottom of the well. Record the depth to which the pump is lowered.

10. Measure Water Level: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.

11. Purge Well: Start pumping the well at 200 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every five minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water

level (drawdown of 0.3 ft or less). Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. As noted above, care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.

12. Monitor Indicator Parameters: During purging of the well, monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, Eh, and DO) approximately every five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows (Puls and Barcelona, 1996):

    ±0.1 for pH
    ±3% for specific conductance (conductivity)
    ±10 mv for redox potential
    ±10% for DO and turbidity

    Dissolved oxygen and turbidity usually require the longest time to achieve stabilization. The pump must not be removed from the well between purging and sampling.

13. Collect Samples: Collect samples at a flow rate between 100 and 250 ml/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 ft. VOC samples must be collected first and directly into sample containers. All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the tubing gently down the inside of the container.

    Ground water samples to be analyzed for volatile organic compounds (VOCs) require pH adjustment. The appropriate EPA Program Guidance should be consulted to determine whether pH adjustment is necessary. If pH adjustment is necessary for VOC sample preservation, the amount of acid to be added to each sample vial prior to sampling should be determined, drop by drop, on a separate and equal volume of water (e.g., 40 ml). Ground water purged from the well prior to sampling can be used for this purpose.

14. Remove Pump and Tubing: After collection of the samples, the tubing, unless permanently installed, must be properly discarded or dedicated to the well for resampling by hanging the tubing inside the well.

15. Measure and record well depth.

16. Close and lock the well.

VI. FIELD QUALITY CONTROL SAMPLES

Quality control samples must be collected to determine if sample collection and handling procedures have adversely affected the quality of the ground water samples. The appropriate EPA Program Guidance should be consulted in preparing the field QC sample requirements of the site-specific QAPP.

All field quality control samples must be prepared exactly as regular investigation samples with regard to sample volume, containers, and preservation. The following quality control samples should be collected during the sampling event:

- Field duplicates
- Trip blanks for VOCs only
- Equipment blank (not necessary if equipment is dedicated to the well)

As noted above, ground water samples should be collected systematically from wells with the lowest level of contamination through to wells with highest level of contamination. The equipment blank should be collected after sampling from the most contaminated well.

VII. DECONTAMINATION

Non-disposable sampling equipment, including the pump and support cable and electrical wires which contact the sample, must be decontaminated thoroughly each day before use ("daily decon") and after each well is sampled ("between-well decon"). Dedicated, in-place pumps and tubing must be thoroughly decontaminated using "daily decon" procedures (see #17, below) prior to their initial use. For centrifugal pumps, it is strongly recommended that non-disposable sampling equipment, including the pump and support cable and electrical wires in contact with the sample, be decontaminated thoroughly each day before use ("daily decon").

EPA's field experience indicates that the life of centrifugal pumps may be extended by removing entrained grit. This also permits inspection and replacement of the cooling water in centrifugal pumps. All non-dedicated sampling equipment (pumps, tubing, etc.) must be

decontaminated after each well is sampled ("between-well decon," see #18 below).

17. **Daily Decon**

A) Pre-rinse: Operate pump in a deep basin containing 8 to 10 gallons of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

B) Wash: Operate pump in a deep basin containing 8 to 10 gallons of a non-phosphate detergent solution, such as Alconox, for 5 minutes and flush other equipment with fresh detergent solution for 5 minutes. Use the detergent sparingly.

C) Rinse: Operate pump in a deep basin of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

D) Disassemble pump.

E) Wash pump parts: Place the disassembled parts of the pump into a deep basin containing 8 to 10 gallons of non-phosphate detergent solution. Scrub all pump parts with a test tube brush.

F) Rinse pump parts with potable water.

G) Rinse the following pump parts with distilled/ deionized water: inlet screen, the shaft, the suction interconnector, the motor lead assembly, and the stator housing.

H) Place impeller assembly in a large glass beaker and rinse with 1% nitric acid (HNO_3).

I) Rinse impeller assembly with potable water.

J) Place impeller assembly in a large glass bleaker and rinse with isopropanol.

K) Rinse impeller assembly with distilled/deionized water.

18. **Between-Well Decon**

A) Pre-rinse: Operate pump in a deep basin containing 8 to 10 gallons of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.
B) Wash: Operate pump in a deep basin containing 8 to 10 gallons of a non-phosphate detergent solution, such as Alconox, for 5

minutes and flush other equipment with fresh detergent solution for 5 minutes. Use the detergent sparingly.

C) Rinse: Operate pump in a deep basin of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

D) Final Rinse: Operate pump in a deep basin of distilled/deionized water to pump out 1 to 2 gallons of this final rinse water.

VIII. FIELD LOG BOOK

A field log book must be kept each time ground water monitoring activities are conducted in the field. The field log book should document the following:

- Well identification number and physical condition.
- Well depth, and measurement technique.
- Static water level depth, date, time, and measurement technique.
- Presence and thickness of immiscible liquid layers and detection method.
- Collection method for immiscible liquid layers.
- Pumping rate, drawdown, indicator parameters values, and clock time, at three to five minute intervals; calculate or measure total volume pumped.
- Well sampling sequence and time of sample collection.
- Types of sample bottles used and sample identification numbers.
- Preservatives used.
- Parameters requested for analysis.
- Field observations of sampling event.
- Name of sample collector(s).
- Weather conditions.
- QA/QC data for field instruments.

IX. REFERENCES

Cohen, R.M. and J.W. Mercer, 1993, DNAPL Site Evaluation, C.K. Smoley Press, Boca Raton, Florida.

Puls, R.W. and M.J. Barcelona, 1996, Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures, EPA/540/S-95/504.

U.S. EPA, 1993, RCRA Ground-Water Monitoring: Draft Technical Guidance, EPA/530-R-93-001.

U.S. EPA Region II, 1989, CERCLA Quality Assurance Manual.

Appendix B

Project Health and Safety Plan

HEALTH AND SAFETY PLAN
253 OSBORNE ROAD SITE
New York State Department of Environmental Conservation

Shaw Project Number: 134685
Contract Number: D006132 -19

March 2011

Prepared for:

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12110

Prepared by:

Shaw Environmental, Inc.
13 British American Boulevard
Latham, NY 12110-1405

_____
Program Manager

_____
Health and Safety Manager

The information in this HASP has been designed for the methods presently contemplated by Shaw Environmental, Inc. (Shaw) for execution of the proposed work. Therefore, this HASP may not be appropriate if the work is not performed by or using the methods presently contemplated by Shaw. In addition, as the work is performed, conditions different from those anticipated may be encountered and the HASP may have to be modified. Therefore, Shaw only makes representations or warranties as to the adequacy of the HASP for currently anticipated activities and conditions.

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Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
COC	Contaminants of Concern
CRZ	Contamination Reduction Zone
DOT	Department of Transportation
ERCP	Emergency Response and Contingency Plan
EZ	Exclusion Zone
FID	Flame Ionization Detector
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HSM	Health and Safety Manager
HSR	Health and Safety Representative
IDLH	Immediately Dangerous to Life or Health
JSA	Job Safety Analysis
LO/TO	Lockout/Tagout
MHR	Maximum Heart Rate
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PE	Professional Engineer
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PM	Project Manager
PPE	Personal Protective Equipment
REL	Recommended Exposure Limits
SHSO	Site Health and Safety Officer
SM	Site Manager
SS	Site Supervisor
SSO	Site Safety Officer
SZ	Support Zone
TLV	Threshold Limit Values
WBGT	Wet Bulb Globe Temperature

Table 1
Site Emergency Form

Category	Information
Possible Contaminants of Concern	Tetrachloroethene (PCE) and Trichloroethene (TCE)
Minimum Level of Protection	Mod Level D
Hazard Determination*	Low
Office Telephone	518-785-2348
Site Location Address	253 Osborne Road, Loudonville, NY

**See Section 7.0 of the Master HASP for site emergency contingency procedures. Do not endanger your own life. Survey the situation before taking any action.*

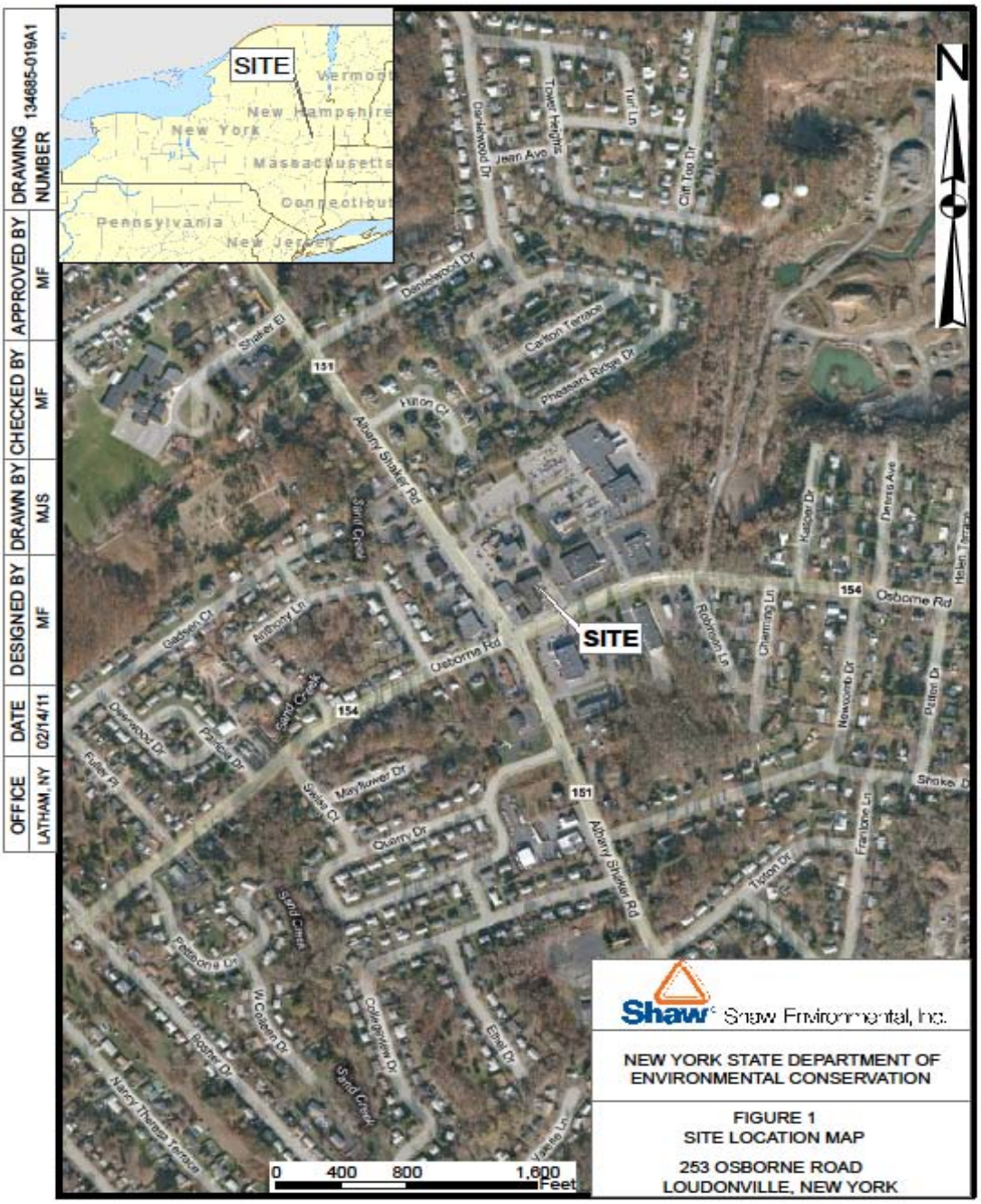
Table 2
Emergency Phone Numbers*

Contact	Phone Number
Ambulance	911
Fire	911
Police	911
Poison Control	1-800-222-1212
Local Shaw Corp. Medical Provider	See Occupational Health Clinic
Shaw, Medical Case Manager	Dr. Nassetta, MD, MPH, Consulting Medical Director CORE (877) 347-7429 (Fax) (800) 853-2641
Hospital Name	Albany Memorial Hospital, 600 Northern Blvd., Albany, NY 12204 (518) 471-3221
Occupational Clinic Name	Concentra Medical Center, 10 B Madison Ave. Ext., Albany, NY (518)-452-7030
Program Manager	David Stoll, P.G. (Office) 518-785-2362
Project Manager (PM)	Heather Fariello (Office) 518-785-2346
Site Safety & Health Officer (SSHO)	Rob Adams (Office) 518-785-2342 (Cell) 518-894-1320
Health & Safety Rep (HSR)	Greg McElroy 412-858-1542
Client Contact	Chris O'Neil (518) 357-2045
National Response Center	800-424-8802
NYCDEC State Agency	New York State Department of Environmental Conservation

	Division of Environmental Remediation (518) 402-9764
Shaw Transportation Spill Emergency Information (CHEM-TREC)	800-424-9300
Shaw (Hot Line)	866-299-3445
Owner of Osborne Plaza (Chris Dennis)	518-459-6548

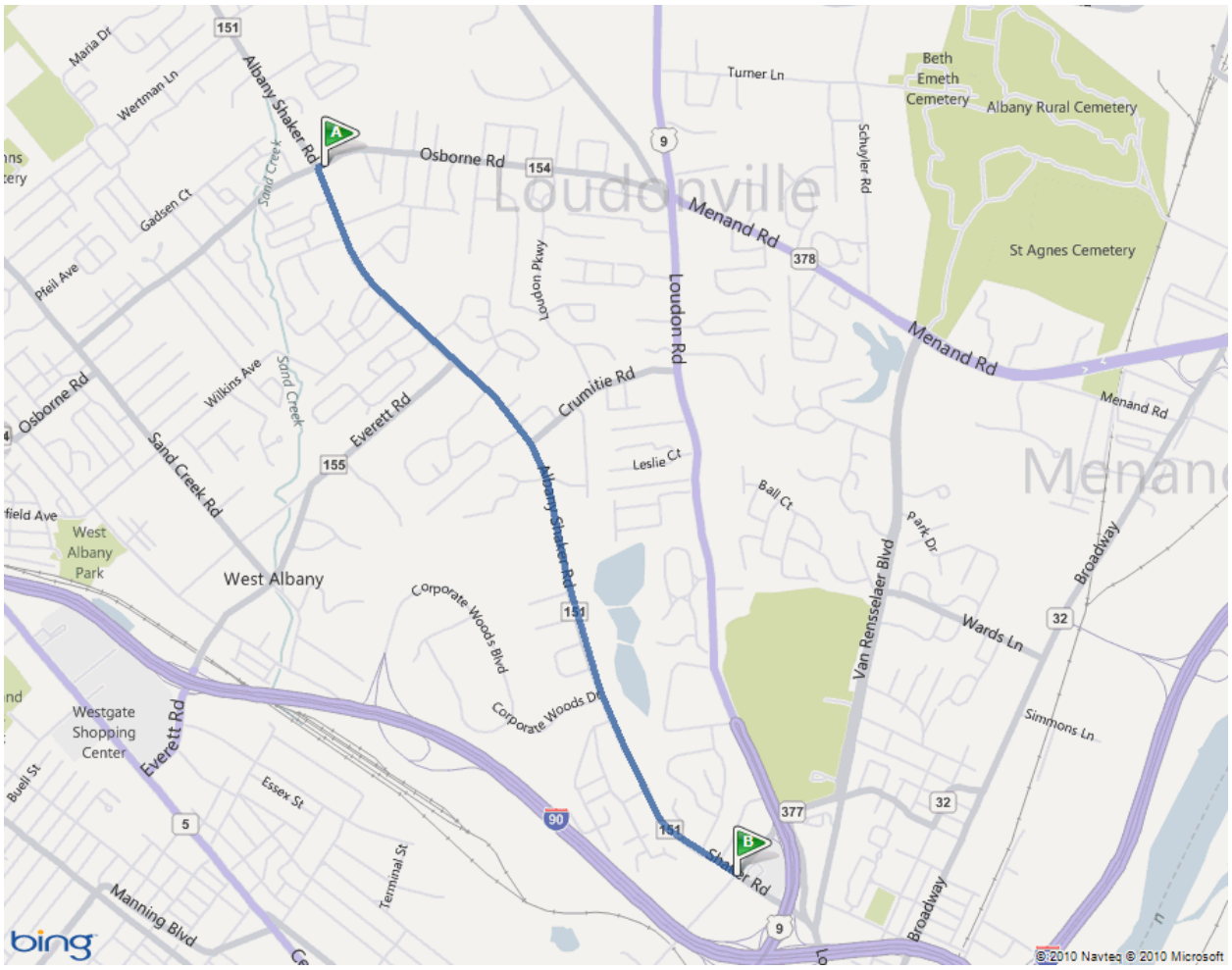
**In the event of any emergency contact Project Manager (PM) or the Health and Safety Representatives*

Figure 1
Site Location



L:\NYSDEC 2008 Contracts\19-Osborne Road\GIS\MXD\134685-019A1.mxd

Figure 2
Hospital Map



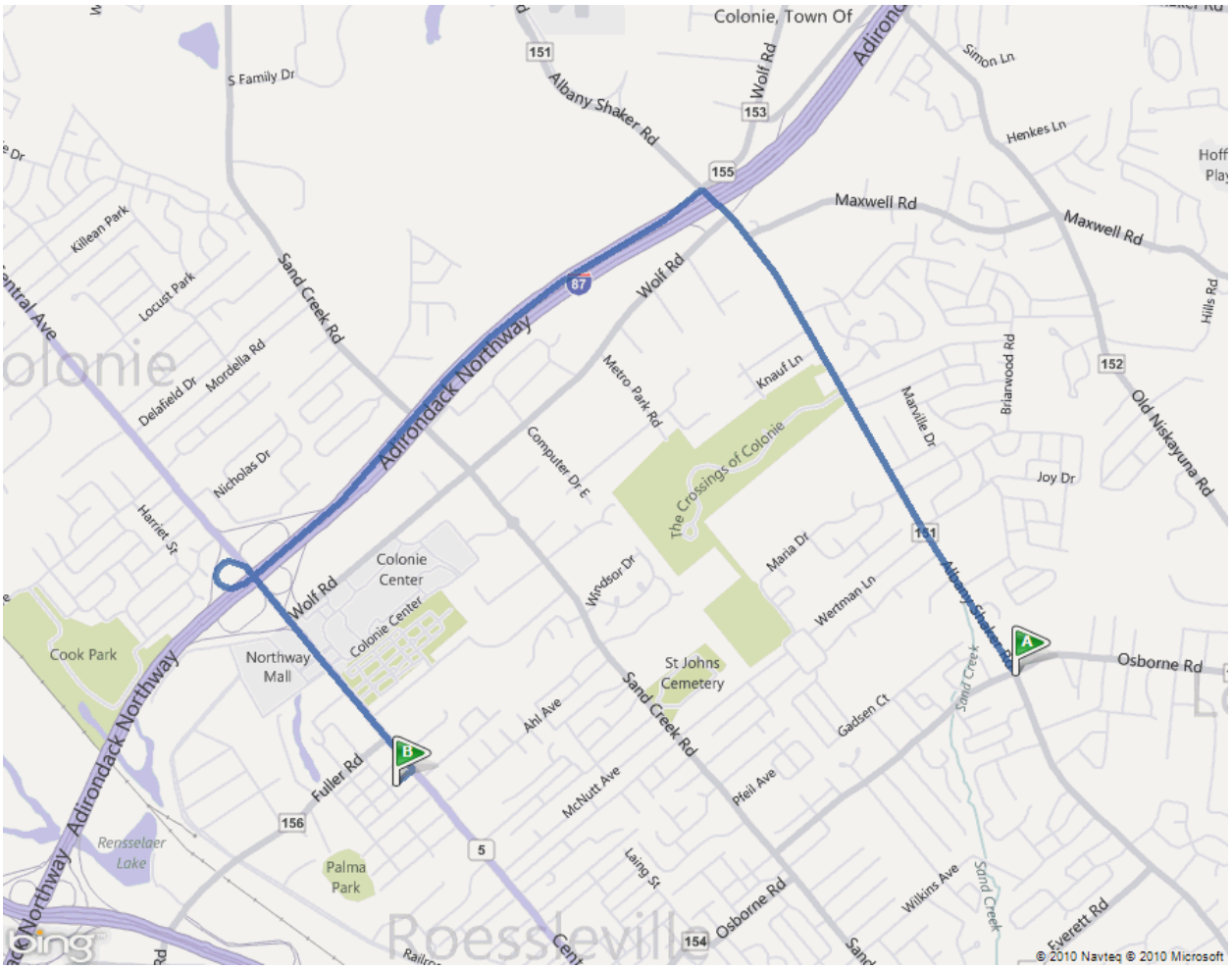
Hospital Directions:

1. Depart Osborne Rd. / (CR-154) toward Albany Shaker Rd. (CR-151) <0.1 mi.
2. Turn Left onto Albany Shaker Rd. (CR-151) 2.7 mi.
3. Turn Left onto Northern Blvd. <0.1 mi.
4. Arrive at 600 Northern Blvd. on the right.

Hospital Information:

Category	Information
Name:	Albany Memorial Hospital
Address:	600 Northern Blvd.
City, State:	Albany, NY 12204
Phone:	(518) 471-3221
Emergency Phone:	911

Figure 3
Occupational Clinic Map



Occupational Clinic Directions:

1. Depart Osborne Rd / CR-154 toward Albany Shaker Rd / CR-151. < 0.1 mi
2. Turn right onto Albany Shaker Rd / CR-15. 11.9 mi. MOBIL on the corner
3. Take ramp left and follow signs for I-87 South / Adirondack Northway. 1.9 mi
4. At exit 2E, take ramp right for SR-5 East toward Albany. 0.2 mi
5. Bear right onto SR-5 / Central Ave. 0.8 mi
6. Turn right onto Madison Ave. < 0.1 mi
7. Arrive at 10 Madison Ave, Albany, NY 12205-5211 on the left. The last intersection is SR-5 / Central Ave. If you reach Oak St, you've gone too far

Occupational Clinic Information:

Category	Information
Name:	Concentra Medical Center
Address:	10 B Madison Ave. Extension
City, State:	Albany, NY
Phone:	(718) 452-7030
Emergency Phone:	911

1.0 Introduction

The policy of Shaw Environmental, Inc. (Shaw) is to provide a safe and healthful work environment for all employees. Shaw considers no phase of operations or administration to be of greater importance than injury and illness prevention. Safety takes precedence over expediency and shortcuts. Shaw believes that all accidents and injuries are preventable. Shaw will take every reasonable step to reduce the possibility of injury, illness, or accident.

This Site Specific Health and Safety Plan's (HASP) provides the site specific information required in the Master HASP. The objective is to help establish safe working conditions at the site. Safety procedures and protective equipment are chosen according to potential hazards. Specific hazard control methods have been evaluated and selected to minimize the potential of accident or injury.

This HASP prescribes the procedures that must be followed during specific site activities. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager (PM) and the Health and Safety Manager (HSM).

The provisions of this plan and the Master HASP are mandatory for all personnel and subcontractors assigned to the project. All visitors to the work site must abide by the requirements of this plan. All project participants will attend a pre-job briefing where the contents of this HASP will be discussed. Project staff assigned to this project must sign the Agreement and Acknowledgement Sheet (see Appendix A) to confirm that they understand and agree to abide by the provisions of this plan.

All work will comply with the Occupational Safety and Health Act (OSHA) standard, "Hazardous Waste Operations and Emergency Response" (29 CFR 1910.120), Shaw Health and Safety Procedures, and other federal, state, and local procedures that require the development and implementation of a HASP. Generation of this document certifies that the workplace has been evaluated for hazards. A hazard assessment has been performed and the adequacy of the personal protective equipment (PPE) selected was evaluated as required by 29 CFR 1910.132(d), 1910.134, 1926.25, and 1926.55, and is duly noted by the signature(s) and date appearing on the cover page of this document.

1.1 Site Description/Background Information

The site is located at and around the intersection of Osborne Road and Albany-Shaker Road of in Loudonville, Albany County, New York. The investigation area is located just to the north of 253 Osborne Road.

The impacted parcel area is approximately 0.9 acres, formerly containing a strip mall of retail tenants, including a dry cleaner (Cleanerama). Site characterization will take place to the north of the area of

impact to determine if off-site migration has occurred. Currently active business (Restaurants, Jeweler) operate in this area .

The most recent previous owner (Osborne Road Associates, LLC, "the LLC") and the NYSDEC, in cooperation with the NYSDOH, executed an Order on Consent in 2008, to address on-site investigative and remedial work associated with the demolition of the existing building, removal of additional perc-contaminated soils, construction of new commercial building, continued site management, and associated citizen participation. The off-site work was left to future negotiations, whereby the LLC refused to pursue off-site investigative work and could not negotiate the installation and operation of an off-site soil vapor intrusion (SVI) mitigation system on the adjacent property.

A site characterization is planned to assess the soil, groundwater and soil vapor conditions around the site.

1.2 Scope of Work

A Shaw representative shall oversee the advancement of eleven (11) borings all which will be complete as permanent monitoring wells. Eight (8) of the eleven monitoring wells will be completed to a depth of approximately 40 feet below ground surface (ft bgs) with a proposed screen length of 15 feet. The remaining three (3) monitoring wells will be completed to a depth of 50 ft bgs (anticipated top of bedrock) each with 5 foot screens.

The monitoring well borings will be advanced via a Hollow Stem Auger (HSA) drill rig with the capability of collecting continuous split spoon or barrel samples at 2 foot intervals. The samples will be screened for Volatile Organic Compounds (VOCs) with a calibrated photoionization detector (PID) and characterized using the USCS classification scheme to their determined depth.

As mentioned earlier eight (8) of the monitoring wells shall be completed to a depth of 40 feet bgs with a proposed screen length of 15 feet, and three (3) shall be completed to 50 feet bgs with a proposed screen length of 5 feet. The monitoring wells shall be constructed with 2-inch PVC. The Screen shall be slotted PVC. Each monitoring well will have a sand pack to approximately 3 feet above the top of the screen, a two foot minimum bentonite seal above the sand pack and grout to the surface. All monitoring wells will be completed at grade with a locking curb box and a concrete apron.

One soil sample will be collected per monitoring well for off-site laboratory analysis. Samples shall be collected from the depth exhibiting the highest PID instrument response or visible staining and or the soil/ groundwater interface as detailed in Shaw's Field Activities Plan (FAP). Additionally, quality control samples will be using the ratio of 1 pre 20 as detailed in Shaw's FAP. These soil samples will be analyzed

for VOCs, semi-volatile organic compounds (SVOCs), total Metals and PCBs. They shall be sent to New York State (Environmental Laboratory Approval Program) ELAP approved Mitkem Laboratories of Warwick, RI with proper chain of custody, on ice.

After at least a 24 hour "rest" period the newly installed monitoring wells will be developed and allowed to stabilize for two weeks. Development of each monitoring well will include a combination of surging and pumping to remove groundwater and will be considered to be complete when either the turbidity is below 50 NTU's, ten calculated well volumes have been removed or if groundwater parameters (pH, specific conductivity, dissolved oxygen, turbidity, ORP, and temperature) have stabilized, whichever occurs first.

Shaw shall oversee the installation of six (6) permanent soil gas implants. These implant points shall be placed in pre-approved locations by the NYSDEC Project Manager and current property owner. The points will be installed by driving a clean stainless steel drive point adapter and expandable point to the desired depth of 8 to 10 feet below ground surface using direct push technology. The probe rod will then be retracted approximately 3-4 inches to create a void below the bottom of the drive point adapter. A clean, unused piece of laboratory or food grade tubing will be threaded to the stainless steel adapter in a manner that will create an air tight seal. The probe rod will be removed and a minimum of 3-inches of coarse sand or glass beads will be placed at the bottom of the sampling point. The remaining portion of the annual space will be backfilled with a pre-hydrated bentonite to prevent the infiltration of ambient air and dilution of the sample.

A Community Air Monitoring Plan (CAMP) will be implemented during all subsurface activites (installation of monitoring wells and soil gas points). VOCs will be continuously monitored with a PID capable of calculating 15-minute running averages placed downwind at the perimeter of the immediate work area. Upwind concentrations shall be measured at the start of each workday and periodically thereafter to establish background conditions. Instrument calibration shall be completed daily. Action levels for average 15 minute concentrations are described below.

- If ambient air concentration of total organic vapors at the downwind perimeter of the work area exceeds 5 ppm above the background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area persist at levels in excess over 5ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/ commercial structure, whichever is less – but in no case less than 20 feet, is below 5 ppm over background for the 150minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the work area at temporary particulate monitoring stations. The particulate monitoring will be performed using a audible alarming TSI DustTrak aerosol monitor capable of measuring particulate matter less than 10 micrometers in size (PM-10) while integrating data over at least a 15 minute period. In addition to monitoring dust migration should be visually assessed during all work activities. Action Levels are described below

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3)

  Greater than background (upwind perimeter) for the 15-minute period or is airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the downwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater that 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All CAMP readings shall be recorded and be available for review.

Soil gas samples will be collected to assess the potential for vapor intrusion. Six (6) soil gas samples plus one (1) Duplicate and one (1) outdoor ambient air sample will be collected from the pre-approved locations of the soil gas implants. All sample locations will be field screened for organic vapors using a PID or a parts per billion (ppb) MinieRae pursuant to the methods outlined in Shaw's FAP. A helium tracer gas leak detection test will be performed to ensure the seal is "tight", Shaw's FAP outlines the soil gas implant sampling procedures. Following the tracer gas test, utilizing a Gilian 3500 air pump or something similar, approximately one to three volumes of air will be purged at a flow rate of less than 0.2 liters/minute. When a sufficient volume is removed, a1.6 liter summa canister with a 2-hour regulator (both batch certified) will be attached to the purged tubing.

Following monitoring well development a two week "rest" period shall elapse prior to sampling. Shaw will collect a groundwater sample from each of the eleven newly installed monitoring wells and other select locations as determined in consultation with the NYSDEC. All groundwater samples will be collected via low-flow techniques until the parameters stabilize and at least one well volume has been removed.

In addition, quality control samples (MS/MSD, duplicate, rinse blank and a trip blank, 1 per 20) will be collected for analysis. All groundwater samples will be analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270C and metals by EPA Method 7000. The groundwater samples shall be sent to New York State (Environmental Laboratory Approval Program) ELAP approved Mitkem Laboratories of Warwick, RI with proper chain of custody, on ice. All laboratory data packages will be a "Category B" deliverable and sent to a third party for independent validation.

1.3 Key Safety Personnel

Shaw will oversee and act accordingly during all phases of the project. The following management structure will be instituted to successfully and safely completing this project.

The following people share responsibility for health and safety at the site.

Program Manager David Stoll	(office) 518-785-2362 (cellular) 518-526-2322
Project Manager Heather Fariello	(office) 518-785-2346 (cellular) 518-396-9834
Site Supervisor Rob Adams	(office) 518-785-2342 (cellular) 518-894-1320
Site Health and Safety Officer Rob Adams	(office) 518-785-2342 (cellular) 518-894-1320
Client Representative Chris O'Neil	(office) 518-357-2045
Health and Safety Manager Greg McElroy	(office) 412-858-1542
Director, Health & Safety Clifford Florczak	(office) 312-499-3503

2.0 Hazard Analysis

See Section 2.1 for the chemical hazards caused by groundwater contamination. See Section 2.0 for chemical handling procedures to be followed when handling corrosive materials. JSAs for specific work tasks will be developed in the field. They will be appropriate for site conditions and will be reviewed during daily tailgate safety meetings. Any JSAs developed for ongoing operations will be included in **Appendix C**. See Section 3.1 for general guide-lines that are common to most projects.

Any change in the scope of work will require an amendment to this HASP. Any task con-ducted beyond the scope of work identified in this HASP must be evaluated using the JSA process. The PM and Site Manager (SM) will be responsible for identifying conditions that are beyond the scope of work and communicating to the HSR. The HSRs will work with the PM and SM to develop JSAs or provide guidance in the development of JSAs. JSAs will be reviewed and approved by the HSR and PM by the HASP amendment prior to initiating the task. See **Appendix B** for the JSA format. The completed JSAs must accompany the HASP.

A JSA, according to Shaw policy and procedure HS045, will be completed daily of each tasks by the site supervisor or foreman responsible for the task(s). The SSO will facilitate the process and help guide the supervisor in correctly assessing each task for the proper hazards and controls. JSAs are completed in-depth at the beginning of each task identified herein, and for new tasks that develop. However, as the work progresses, the JSAs are modified each day to address changes in work practices, site conditions, process changes, or unusual occurrences. If no modifications are necessary, the JSAs must still be completed, noting such. As work changes can happen at any time, these JSAs may be necessary to be modified more than once a day per task.

The supervisor, foreman, and SSO share the responsibility to review these JSAs with the work crew each day and when JSAs are modified on such days. The JSA 045 procedure allows for signature of work crews, who must sign the bottom form of the JSA for the task that they are working on, acknowledging that they have been briefed. The JSA process is actually the same as a “safe work permit,” where the supervisor or foreman grants permission to work only after the initial assessment of hazards has been made and proper work controls or injury minimization measures have been communicated and understood by affected workers.

Although daily JSAs capture the changes that may occur throughout the project, the changes that are made shall be used to update the initial JSA (045) weekly or bi-weekly. This is important, especially for long-term projects, in that it serves to maintain an up-to-date JSA for reference and/or training/orientation purposes.

Although this HASP and the Master HASP contain the safety requirements for the identified work tasks, this process is critical to identifying changes in the hazard scenario or identifying new hazards that need

to be addressed. If there are any questions regarding this process or assistance is required, contact the local health and safety manager or Project CIH.

2.1 Contaminants of Concern Profile

See **Table 3** for a summary profile of the hazards and control measures to follow for the contaminants of concern (COC). This profile is based on recent site history and site characterization. For more detailed and specific information, always refer to the Material Safety Data Sheet (MSDS) or equivalent information for the compound (see **Appendix D**).

Table 3 Contaminants of Concern Profile

Contaminant	Physical/Chemical Characteristics (Target Organs/ Route of Entry)	OSHA PELs TWA (STEL)	ACGIH TLVs TWA (STEL)	NIOSH REL TWA (STEL)
Tetrachloroethene (PCE)	Colorless liquid with a mild chloroform-like odor. MW:165.8 VP: 14 mm Hg BP: 250°F FRZ: -2°F Sol: 0.02% UEL: Not listed FL.P Not listed LEL: Not listed IP: 9.32 eV Target organs – Eyes, skin, CNS, liver, kidneys, respiratory system Route of Entry – Inhalation and contact	100 ppm	25 ppm	Ca – Minimize workplace exposure concentrations
Trichloroethene (TCE)	Colorless to water-white liquid with an odor like carbon tetrachloride at high concentrations MW:187.4 VP: 285 mm Hg BP: 118°F FRZ: -31°F Sol: 0.02%(77°F) UEL: Not listed FL.P Not listed LEL: Not listed IP: 11.99 eV Target organs – CNS Route of Entry – Inhalation and contact	100 ppm	50 ppm	25 ppm (10 Hour TWA)

Ca – Substances that NIOSH considers to be potential occupational carcinogens
C – Ceiling
NIOSH – National Institute for Occupational Safety and Health
OSHA – Occupational Safety and Health Administration
PEL – Permissible exposure limit
REL – Recommended exposure limit
STEL – Short-term exposure limit
TWA – Time-weighted average
TLV – Threshold limit values

3.0 Hazard Identification and Control

In addition to the Task-Specific JSAs, Section 3.1 lists the general procedures and practices common to most projects. For additional information, refer to Shaw required health and safety procedures or consult with your health and safety professional. A copy of all required Shaw Health and Safety Procedures are maintained in each Shaw vehicle or can be obtained from the Shaw office managing this project. Shaw Health and Safety Procedures shall be followed at all times.

3.1 General Hazards and Controls

3.1.1 General

- Observe the following general procedures and practices:
- Legible and understandable precautionary labels shall be affixed prominently to containers of potentially contaminated soil, water, and clothing.
- No food or beverages shall be present or consumed in a Contamination Reduction Zone (CRZ) or Exclusion Zone (EZ). These are only allowed in designated areas of the support zone.
- No tobacco products shall be present or used, and cosmetics shall not be applied in a CRZ or EZ. These are only allowed in designated areas of the support zone, if areas have been designated.
- Beards, facial hair, or other facial obstructions that interfere with respirator fit will preclude admission to the EZ when respirators are required.
- An emergency eyewash unit shall be located immediately adjacent to employees who handle hazardous or corrosive materials, including decontamination fluids. All operations involving the potential for eye injury, splash, etc., must have approved eyewash units locally available capable of delivering at least 0.4 gallons per minute for at least 15 minutes.
- All on-site activities will be conducted during daylight hours. If work after dusk becomes necessary due to an emergency, adequate lighting must be provided and notification of such activity made to the location contact.
- Hazardous work, such as handling hazardous materials and heavy loads, and equipment operation, etc., should not be conducted during severe storms.
- All temporary electrical power must have a ground fault circuit interrupter (GFCI) as part of its circuit if the circuit is not part of permanent wiring. All equipment must be suitable and approved for the class of hazard present.

3.1.2 Incident Reporting

Observe the following incident reporting procedures and practices:

- All occupational injuries/illnesses, vehicle accidents, and near miss incidents must be reported promptly to the PM and HSR and investigated (See Appendix B for incident forms).
- Immediately notify the PM and HSR when an incident occurs.
- All OSHA recordable injuries/illnesses and chargeable vehicle accidents must be reviewed by an Accident Review Board report.

3.1.3 Daily Safety Meetings

Daily safety meetings make accident prevention a top priority for everyone and makes them aware of important accident prevention techniques. Observe the following daily safety meetings procedures and practices:

- Daily safety meetings will be held each morning prior to site activities
- Direct Shaw subcontractors are required to attend all tailgate meetings.
- The tailgate meeting form in Appendix B will be used to document the meeting.

3.1.4 Safety Inspections

Observe the following safety inspection procedures and practices:

- The SS, with assistance from the SHSO, will inspect the site as appropriate and interview one or two site workers regarding areas of safety concerns or ideas for safety improvement.
- Any personnel who identify safety and occupational health deficiencies and will bring them to the attention of the SS and SHSO and will suggest corrective measures.
- Formal safety review inspections will be conducted as needed and recorded and filed for reference by project management (see Appendix B for Inspection Check-list). These inspections will be shared by the PM, SS, and SHSO. Subcontractor supervisory personnel will be asked to participate in inspections.
- Any deficiencies in the effectiveness of this HASP will be immediately brought to the attention to the PM and HSR and corrected.

3.1.5 Slip/Trip/Fall

Observe the following procedures and practices to prevent slips/trips/fall:

- Inspect each work area for slip/trip/fall potential prior to each work task.
- Slip/trip/fall hazards identified must be communicated to all personnel. Hazards identified shall be corrected or labeled with warning signs to be avoided.
- All personnel must be aware of their surroundings and maintain constant communication with each other at all times.

3.1.6 Underground/Utility Line Contact

See Appendix B for Underground Utility Contact Prevention Management Plan. See **Table 3** for utility marker emergency phone numbers. Observe the following underground/utility line contact procedures and practices:

- Review HS308 regarding training requirements, completion of utility mark-out documentation and pre-drilling/boring/direct push check list and variance request.
- Contact client or facility owner to have utility lines marked prior to excavation/trenching or drilling.

- Refer to site drawings or customer interviews if on private property for utility locations.
- Hand dig, probe, post hole dig or air knife to 5 feet down and 5 feet to each side of utility marker to avoid breaking utility lines.

3.1.7 Sites Containing Fiber Optic Cables

Because of the sensitivity of fiber optic cables and the cost costs of damaging them, the following process, effective immediately, will be adopted as mandatory and as a minimum effort.

1) When a Shaw PM or staff person becomes aware that a site requiring subsurface work contains a fiber optic cable within 50 feet of the outside working boundary, he/she will immediately notify the PM/BLM. The BLM—or if no BLM is in place the PM—will immediately notify the Area Manager and the HSR. The PM and the HSR will develop a work plan capable of accomplishing site activities while guaranteeing that fiber optic cables will not be affected.
2) Any subsurface activities conducted at a site as described in item 1, will require the on-site presence of the HSR or a designee as affirmed in writing by the HSR.
3) No subsurface work will occur at a site as referred to in item 1, without the owner of the fiber optic cable being present.
4) The fiber optic cable will not be considered located unless a representative of the owner of the fiber optic cable has visited the site, confirmed the location of the cable, and signed the work plan which shall contain a site plan indicating the locations(s) of the subsurface work and location of the fiber optic cable.
5) Deviation from any of the above points, items 1 through 4, must be approved by the Area Manager.

3.1.8 Overhead Utility Line Contact

Observe the following overhead utility line contact procedures and practices:

- Maintain appropriate distance from overhead utilities:
  - Maintain at least 10 feet from overhead power lines, up to 50 kV
  - For voltages over 50 kV, add 0.4 inches per kV to obtain the safe distance between equipment and power lines.
  - If voltage is unknown, remain at least 20 feet from overhead power lines.
- Conduct a daily site inspection to determine where activities will take place and the location of overhead utilities and overhead obstructions. Once identified place-warning tape on poles and/or guy wires and attempt to plan the work so that no contact will be made with the overhead utilities or obstructions. Share the in-formation with the all site personnel.
- As a precaution, a spotter will be used at all times during the construction phase when near overhead utilities or overhead obstructions. If contact is deemed un-avoidable, consult with the plant manager and HSR to evaluate the area to deter-mine if the particular overhead utility or obstruction can be removed prior to engaging in the activity.

3.1.9 General Falls/Ladders

Observe Shaw Procedure HS302. In addition, observe the following general falls/ladders procedures and practices:

- Assess work areas for fall hazards. A fall protection system is required if work is conducted six feet or over.
- Use Type 1A rated ladders.
- Make sure ladder rungs are sturdy and free of cracks.
- Use ladders with secure safety feet.
- Pitch ladders at a 4:1 ratio.
- Secure ladders at the top or have another person at the bottom to help stabilize it.
- Ladders used to access an upper landing surface shall extend at least three feet above the upper landing surface.
- Do not use ladders for access to air stripper towers above six feet. Instead, use aerial lift.
- Use non-conductive ladders near electrical wires.
- The top step of a stepladder should not be used as a step.
- Do not carry any object or load that could cause a loss of balance or a fall.

3.1.10 Heavy Equipment Operations

Observe the following heavy equipment operations procedures and practices:

- Wear leather gloves while attaching support members to protect against pinching injuries.
- While working from elevated levels greater than six feet, ensure that all employees have 100% fall protection with full body harnesses and guardrails.
- Do not stand under loads that are being raised or lowered with cranes or aerial lifts.
- The subcontractor or Shaw Operator must conduct pre-operational inspections of all equipment. In addition, daily inspections will be conducted on the equipment prior to site activities.
- Maintain appropriate distance from overhead utilities:
  - Maintain at least 10 feet from overhead power lines, up to 50 kV
  - For voltages over 50 kV, add 0.4 inches per kV to obtain the safe distance between equipment and power lines.
  - If voltage is unknown, remain at least 20 feet from overhead power lines.
- Always stay out of the swing radius of all heavy equipment. Always use a spotter during movement of equipment. The spotter and others, as appropriate, shall maintain constant communication with the operator.
- All operators must have adequate training and be qualified to operate the particular heavy equipment unit.

- Conduct site evaluation to determine proper positioning for the unit. Make sure surface is level. Cordon off holes, drop-offs, bumps or weak ground surfaces.
- When using a crane, do not use hands when the load is being lifted or lowered. Use non-conductive tag line to help direct and position the load.
- Never climb a raised platform or stand on the mid-rail or top-rail.
- Tools should always be hung or put into a belt whenever possible.

3.1.11 Excavation and Trenching

Observe Shaw Procedure HS307. In addition, observe the following Excavation and Trenching practices and procedures:

- Ensure a competent person is assigned.
- A competent person shall inspect excavations and documents at least daily and when needed (Follow Shaw Procedure HS307).
- Check for utilities (see Underground Utility Line Contact, Appendix B).
- Have a Professional Engineer (PE) evaluate all excavations deeper than 20 feet.
- Use protective systems (sloping, shoring, shielding) for entry in trenches over five feet deep.
- Provide for rescue for cave-ins.
- Place spoils a minimum of two feet from edge.
- Monitor excavations over four feet deep for hazardous atmospheres and LEL/oxygen.
- Place ladders within 25 feet of lateral travel if the excavation is over four feet deep.
- Place barriers around excavations near pedestrian access.
- Follow work zone security procedures of Section 6.1.

3.1.12 Installing Monitoring Wells and Vapor Points / Drill Rig Operations

Observe the following practices and procedures when operating a drill rig and performing monitoring well installations:

- Training- All members of drilling crews must possess required state or local licenses necessary to perform work. Site-specific health and safety training shall take place prior to beginning work and must participate in daily tailgate safety meetings.
- Inspections – Before commencing operations the drilling equipment will be inspected by the lead driller, in accordance with the manufacturer's guidelines. Inspections shall be documented in the field activity daily log and demonstrate that all installed safety equipment is operational.

Set Up – The drill rig must be properly blocked and leveled prior to raising the derrick. The rig can only be moved after the derrick is lowered. Before drilling, the existence and location of underground utilities will be determined and marked by the appropriate underground utility identification service. All drilling should be completed a minimum of 5 feet from any known or suspected location of an underground structure or utility. A hand auger or posthole digger must be

utilized to positively identify utilities when drilling is anticipated to occur within 5 feet of an underground utility. If drilling in the vicinity of overhead powerlines at least 10 feet distance should be maintained if the lines have a voltage of 50kV or less, if greater than 50kV the clearance shall increase 4 inches for every 10kV. Work areas must be restricted from vehicular/ pedestrian traffic by utilizing temporary fencing or warning tape. If lubrication fittings are not accessible with guards in place, machinery must be stopped and LOTO procedures applied before oiling and greasing. Rigging equipment for material handling must be inspected prior to use on each shift and as often as necessary. Lifting and transporting of drums should be completed using the appropriate equipment and following sage loading and unloading practices.

- Hoisting Operations- Drillers must never engage the rotary clutch without watching the rotary table and ensuring it is clear of personnel and equipment. Unless the drawworks is equipped with an automatic feed control, the brake must not be left unattended without being first tied down. Drillers will not add or remove pipe from the drill stem without assistance of the driller's helper. Drill pipe must not be hoisted until the driller is sure that the pipe is latched and the drilling assistant has signaled that he/she may safely hoist the load. During instances of unusual loading of the derrick or mast, such as when making an unusually hard pull, only the driller will be on the rig floor and no one will be on the rig or derrick. Hoisting control stations must be kept clean and controls labeled as to their functions, Under no circumstances will personnel be permitted to ride the traveling block or elevators, nor will the cat line be used as a personnel carrier.
- Cat Line Operations – Only experienced drillers will be allowed to operate the cathead controls. The kill switch must be clearly labeled and operational prior to operation of cat line. The cathead area must be kept free of obstruction and entanglements. The operator will not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted. Employees rigging loads on cat lines must:- keep out from under the load – keep fingers and feet where they willnot be crushed – be sure to signal clearly when the load is being picked – use standard visual signals only-make sure the load is properly rigged.
- Pipe Handling – Pipe must be loaded and unloaded, layer by layer, with the bottom layer pinned or blocked securely on all four corners. Each successive layer must be effectively blocked or choked. Workers will not be permitted to top off the load during loading, unloading, or transferring of pipe or rolling stock. Employees should never try to stop rolling pipe or casing. When the pipe is being hoisted, personnel will use a sling to control the bottom end of the pipe. After the pipe is off the stockpile, personnel will control the end by hand.
- Direct Push Sampling Technology – Many subsurface sampling activities are now conducted using a direct push method. This method involves using a hydraulic hammer press to drive hollow steel rods vertically into the subsurface to obtain samples. The hazards associated with the use of this technique are somewhat similar to those of conventional drilling. The main difference is that percussion rather trhan rotational forces are used to reach sample depths.

3.1.13 Confined Spaces

Observe Shaw Procedure HS300. In addition, observe the following confined spaces procedures and practices:

- Ensure employees are trained in the hazards of confined spaces.
- Post Confined Space Entry Permits at the entrance to the space.
- Have a copy of the confined space entry procedure available.

- Establish a rescue plan. Evaluate to ensure rescuers are qualified.
- Ensure an entry supervisor is present at each permit-required entry.
- Ensure the required extraction/fall protection devices are being used properly.

3.1.14 Electric Shock

Observe Shaw Procedure HS315. In addition, observe the following procedures and practices to prevent electric shock:

- Maintain appropriate distance from overhead utilities:
  - Maintain at least 10 feet from overhead power lines, up to 50 kV.
  - For voltages over 50 kV, add 0.4 inches per kV to obtain the safe distance between equipment and power lines.
  - If voltage is unknown, remain at least 20 feet from overhead power lines.
- Use ground-fault circuit interrupters as required.
- Perform lockout/tagout LO/TO procedures in accordance with Shaw Procedure HS315.
- Use three-pronged plugs and extension cords.
- Contact your local underground utility-locating service.
- Follow code requirements for electrical installations in hazardous locations.
- Always use qualified electricians to install electrical equipment and when con-ducting troubleshooting activities within 10 feet of exposed live wires.

3.1.15 Hand and Power Tools

Observe the following procedures and practices when working with hand and power tools:

- Keep hand tools sharp, clean, oiled, dressed, and not abused.
- Worn tools are dangerous: e.g., the “teeth” in a pipe wrench can slip if worn smooth; an adjustable wrench will slip if the jaws are sprung; hammerheads can fly off loose handles.
- Tools subject to impact (chisels, star drills, and caulking irons) tend to “mush-room.” Keep them dressed to avoid flying spalls. Use tool holders.
- Don't force tools beyond their capacity. No “homemade” handles or extensions (cheaters) are permitted! Don't use tools for pry bars.
- Flying objects can result from operating almost any power tool, so always warn people in the vicinity and use proper eye protection.
- Each power tool should be examined before use for damaged parts, loose fittings, and frayed or cut electric cords. Tag and return defective tools for repairs. Inspect also for adequate lighting, proper lubrication, and abandoned tools or material that could “vibrate into trouble.”
- Air must be shut off or the electric cord unplugged before making tool adjustments. Air must be “bled down” before replacement or disconnection.

- Proper guards or shields must be installed on all power tools before issue. Do not use improper tools or tools without guards in place.
- Replace all guards before start-up. Remove cranks, key, or wrenches used in ser-vice work.

3.1.16 Physical Injury

Observe the following procedures and practices to prevent physical injuries:

- Wear hard hats and safety glasses when on site.
- Maintain visual contact with the equipment operator and wear an orange safety vest when heavy equipment is used on-site or when adjacent to or in roadways.
- Avoid loose-fitting clothing.
- Prevent slips, trips and falls—keep work area uncluttered.
- Keep your hands away from moving parts (i.e., augers).
- Test the emergency shutoff switch on the drill rig daily.

3.1.17 Vehicular Traffic

Observe the following procedures and practices regarding vehicular traffic:

- Wear traffic safety vest when vehicle hazard exists.
- Use cones, flags, barricades, and caution tape to define work area.
- Use vehicle to block work area.
- Engage police detail for high-traffic situations.
- Always use a spotter in tight or congested areas for material deliveries.
- Review Shaw Procedure HS800, Motor Vehicle Operation.

3.1.18 Noise

Observe Shaw Procedure HS402. In addition, observe the following procedures and practices regarding noise:

- Wear hearing protection when equipment such as a drill rig, jackhammer, cut saw, air compressor, blower or other heavy equipment is operating on the site.
- Wear hearing protection whenever it is necessary to speak above normal conversational speech due to loud noise—this much noise indicates the need for protection.
- Conduct noise monitoring of suspected high noise operations at the beginning of the workday or start up of new operations to verify noise control/hearing protection requirements.

3.1.19 Lifting and Material Handling

Observe the lifting and material handling procedures and practices:

- Use leather gloves when handling metal, wire rope, sharp debris, or transporting materials (wood, piping, drums, etc.).
- The size, shape, and weight of the object to be lifted must first be considered. No individual employee is permitted to lift any object that weights over 60 pounds. Multiple employees or mechanical lifting devices are required for objects over the 60-pound limit.
- Plan a lift before doing it. Bend at the knees and lift with the legs; keep the natural curves of the back; do not use back muscles.
- Check route for clearance.
- Use the buddy system when lifting heavy or awkward objects.
- Do not twist body while lifting.
- Know the capacity of any handling device (crane, forklift, chainfall, come-along) that you intend to use.
- Use tag lines to control loads.
- Ensure that your body, material, tools, and equipment are safe from such unexpected movement as falling, slipping, rolling, tripping, bowing, or any other un-controlled motion.
- Trucks (i.e., flat beds) hauling equipment or materials must not be moved once rigging has been released.
- Chock all material and equipment (such as pipe, drums, tanks, reels, trailers, and wagons) as necessary to prevent rolling.
- Tie down all light, large-surface-area material that might be moved by the wind.
- When working at heights, secure tools, equipment, and wrenches against falling.
- Do not store materials or tools on ducts, lighting fixtures, beam flanges, hung ceilings, or similar elevated locations.
- Fuel-powered tools used inside buildings or enclosures shall be vented and checked for excessive noise.

3.1.20 Fire Control

Observe the following fire control procedures and practices:

- Smoke only in designated areas.
- Keep flammable liquids in closed containers.
- Keep site clean; avoid accumulating combustible debris such as paper.
- Follow Hot Work Safety Procedures when welding or performing other activities requiring an open flame.
- Isolate flammable and combustible materials from ignition sources.
- Ensure fire safety integrity of equipment installations according to NEC specifications.

3.1.21 Static Electricity/Transfer of Flammable Liquids

Observe the following procedures and practices regarding static electricity when transferring flammable liquids:

- Do not create static discharge in flammable atmosphere.
- Electrically bond and ground pumps, transfer vessels, tanks, drums, bailers, and probes when moving flammable liquids.
- Electrically bond and ground vacuum trucks and the tanks they are emptying.
- Do not splash fill containers with flammable liquids.
- Pour flammable liquids slowly and carefully.
- Two Fire extinguishers (2A20: BC) must be available, charged, inspected, and readily accessible.

3.1.22 Wells

Observe the following procedures and practices for well installation, well development, well abandonment, well gauging, well bailing, and soil/groundwater sampling:

- Wear appropriate PPE to avoid skin, eye, and inhalation contact with contaminated groundwater and/or soil.
- Stand upwind when conducting tasks and minimize possible inhalation exposure, especially when first opening monitoring wells.
- Conduct air monitoring to determine level of respiratory protection.
- Use engineering controls such as portable air movers to draw away or blow away chemical vapors.

3.1.23 Insects/Spiders

Observe the following procedures and practices regarding insects/spiders:

- Tuck pants into socks.
- Wear long sleeves.
- Use insect repellent.
- Avoid contact by always looking ahead to where walking, standing, sitting, leaning, grabbing, lifting, or reaching into.
- Check for signs of insect/spider bites, such as redness, swelling, and flu-like symptoms.

3.1.24 Ticks

Observe the following procedures and practices regarding ticks:

- Do not detach a tick with bare fingers—bacteria from a crushed tick may be able to penetrate even unbroken skin. Use fine-tipped tweezers.

- Grip the tick as close to skin as possible and gently pull it straight away from until it releases its hold.
- Do not twist the tick as when pulling; do not squeeze its bloated body. Doing so may inject bacteria into your skin.
- Thoroughly wash hands and the bite area with soap and water. Then apply an antiseptic to the bite area.
- Save the tick in a small container with the date, the location of the bite on your body, and the probable location of initial contact with the tick.
- Notify the SSHO of any tick bites as soon as possible.

3.1.25 Poisonous Snakes

Observe the following procedures and practices regarding poisonous snakes:

- Avoid walking in areas where snakes may nest or hide. When walking, always look ahead for signs of snakes.
- Use extreme caution when moving or lifting objects that could be used by snakes as cover.
- Never reach under or behind objects or into other areas where snakes may hide.
- Poisonous snakebites are medical emergencies-seek immediate medical treatment.
- Wear sturdy leather boots.

3.1.26 Poisonous Plants

Poisonous plants include poison ivy, poison oak, and poison sumac. Observe the following procedures and practices regarding poisonous plants.

- Avoid entering areas infested with poisonous plants.
- Immediately wash any areas that come into contact with poisonous plants.
- Use PPE when there is possibility of contact with poisonous plants.

3.1.27 Heat Stress

Observe Shaw Procedure HS400. In addition, observe the following general procedures and practices regarding heat stress:

- Increase number of rest breaks and/or rotate workers in shorter work shifts.
- Watch for signs and symptoms of heat exhaustion and fatigue.
- During hot months, plan work for early morning or evening.
- Use ice vests when necessary.
- Rest in cool, dry areas.

3.1.27.1 Signs, Symptoms, and Treatment

Adverse climatic conditions are important considerations in planning and conducting site operations. High ambient temperature can result in health effects ranging from transient heat fatigue, physical discomfort, reduced efficiency, personal illness, increased accident probability, etc., to serious illness or death. Heat stress is of particular concern when chemical protective garments are worn since they prevent evaporative body cooling. Wearing personal protective equipment places employees at considerable risk of developing heat stress.

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses, regular monitoring and other preventive precautions are vital.

Heat Rash. Heat rash can be caused by continuous exposure to hot and humid air and skin abrasion from sweat soaked clothing. The condition is characterized by a localized red skin rash and reduced sweating. Aside from being a nuisance, the ability to tolerate heat is reduced. To treat, Keep skin hygienically clean and allow it to dry thoroughly after using chemical protective clothing.

Heat Cramps. Heat cramps are caused by profuse perspiration with inadequate electrolytic fluid replacement. This often robs the larger muscle groups (stomach and quadriceps) of blood which can cause painful muscle spasms and pain in the extremities and abdomen. To treat, remove employee to a cool place and give sips of water or an electrolytic drink. Watch for signs of heat exhaustion or stroke.

Heat Exhaustion. Heat exhaustion is a mild form of shock caused by increased stress on various organs to meet increased demand to cool the body. Onset is gradual and symptoms should subside within one hour. It symptoms include weak pulse; shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; fatigue. To treat, remove employee to a cool place and remove as much clothing as possible. Give sips of water or electrolytic solution and fan the person continuously to remove heat by convection. Do not allow the affected per-son to become chilled—treat for shock if necessary.

Heat Stroke. Heat stroke is the most severe form of heat stress; the body must be cooled immediately to prevent severe injury and/or death. *This is a medical emergency!* Symptoms include red, hot, dry skin; body temperature of 105◦ Fahrenheit or higher; no perspiration; nausea; dizziness and confusion; strong, rapid pulse. Since heat stroke is a true medical emergency, transport the victim to a medical facility immediately. Prior to transport, remove as much clothing as possible and wrap the victim in a sheet soaked with water. Fan vigorously while transporting to help reduce body temperature. Apply cold packs, if available; place under the arms, around the neck, or any other place where they can cool large surface blood vessels. If transportation to a medical facility is delayed, reduce body temperature by immersing victim in a cool water bath (however, be careful not to over-chill the victim once body temperature is reduced below 102o F). If this is not possible, keep victim wrapped in a sheet and continuously douse with water and fan.

3.1.27.2 Prevention

The implementation of preventative measures is the most effective way to limit the effects of heat-related illnesses. During periods of high heat, adequate liquids must be provided to re-place lost body fluids. Replacement fluids can be a 0.1 percent salt-water solution, a commercial mix such as Gatorade, or a combination of these with fresh water. The replacement fluid temperature should be kept cool, 50o F to 60o F, and should be placed close to the work area. Employees must be encouraged to drink more than the amount required to satisfy thirst. Employees should also be encouraged to salt their foods more heavily during hot times of the year.

Cooling devices such as vortex tubes or cooling vests can be worn beneath impermeable clothing. If cooling devices are worn, only physiological monitoring will be used to deter-mine work activity.
All workers are to rest when any symptoms of heat stress are noticed. Rest breaks are to be taken in a cool, shaded rest area. Employees shall remove chemical protective garments during rest periods and will not be assigned other tasks.
All employees shall be informed of the importance of adequate rest and proper diet including the harmful effects of excessive alcohol and caffeine consumption.

3.1.27.3 Monitoring

Heat stress monitoring will be required when employees are working in environments exceeding 90ºF ambient air temperature. If employees are wearing impermeable clothing, this monitoring will begin at 78ºF. There are two general types of monitoring that the health and safety representative can designate to be used: wet bulb globe temperature (WBGT) and physiological. Attachment 2 (see Appendix B) will be used to record the results of heat stress monitoring.

Wet Bulb Globe Temperature (WBGT). The WBGT index is the simplest and most suitable technique to measure the environmental factors which most nearly correlate with core body temperature and other physiological responses to heat. When WBGT exceeds 25.9oC (78oF), the work regiment in Table 1 and Figure 1 of the section Heat Stress in the latest edition of the "American Conference of Governmental Industrial Hygiene (ACGIH) Threshold Limit Value (TLV) Booklet" should be followed.

Physiological. Physiological monitoring can be used in lieu of, or in addition to, WBGT. This monitoring can be self-performed once the health and safety representative demonstrates appropriate techniques to affected employees. Since individuals vary in their susceptibility to heat, this type of monitoring has its advantages. The two parameters that are to be monitored at the beginning of each rest period are:

- **Heart Rate** – The maximum heart rate (MHR) is the amount of work (beats) per minute a healthy person's heart can be expected to safely deliver. Each individual will count his/her radial (wrist) pulse as early as possible during each rest period. If the heart rate of any individual exceeds 75 percent of their calculated maximum heart rate (MHR = 200 - age) at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. An individual is not permitted to return to work until his/her sustained heart rate is be-low 75 percent of their calculated maximum heart rate.

- **Temperature** – Each individual will measure his/her temperature with a thermometer for one minute as early as possible in the first rest period. If the temperature exceeds 99.6°F at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. An individual is not permitted to return to work if his/her temperature exceeds 100.4°F.

3.1.27.4 Training

Employees potentially exposed to heat stress conditions will be instructed on the contents of this procedure. This training can be conducted during daily tailgate safety meetings.

3.1.28 Cold Stress

Observe Shaw Procedure HS401. In addition, observe the following procedures and practices regarding cold stress:

- Take breaks in heated shelters when working in extremely cold temperatures.
- Upon entering the shelter, remove the outer layer of clothing and loosen other layers to promote evaporation of perspiration.
- Drink warm liquids to reduce the susceptibility to cold stress.
- Be aware of cold stress symptoms, including shivering, numbness in the extremities, and sluggishness.
- Follow cold stress procedures in Appendix B, per Shaw Procedure HS400.

3.1.29 Inclement Weather

Observe the following procedures and practices regarding inclement weather:

- Stop outdoor work during electrical storms, hailstorms, and other extreme weather conditions such as extreme heat or cold.
- Take cover indoors or in vehicle.
- Listen to local forecasts for warning about specific weather hazards such as tornadoes, hurricanes, and flash floods.

3.1.30 Welding, Cutting, Brazing

Observe Shaw Procedure HS314. In addition, observe the following procedures and practices when welding, cutting, or brazing:

- Conduct fire safety evaluation.
- Complete Hot Work Permit using form from Appendix B.
- Follow JSA guidelines for hot work (see Appendix C) if applicable.
- Ensure flammable materials are protected from hot work, sources of ignition.

- Ensure fire watch/fire extinguisher is on standby by hot work location.
- Follow Shaw Procedure HS304, Compressed Gas Cylinders.

3.1.31 Heavy Equipment Decontamination

Observe Shaw Procedure HS303. In addition observe the following heavy equipment decontamination procedures and practices:

- Wear modified Level D protection, including a face shield and safety goggles.
- Ensure that other personnel are out of the area prior to decontamination.
- Secure the area around the decontamination pad with cones, caution tape, or barricades.
- Ensure that safe work practices and precautions are taken to minimize the potential for physical injury from high-pressure water spray.
- The pressure washer wand must be equipped with a safety release handle.
- Follow Shaw Procedure HS303 for pressure washing.
- Ensure that the area is clean after equipment is decontaminated. Barricades, cones, or caution tape must be left in place and secured at all times.

3.1.32 Cleaning Equipment

Observe Shaw Procedure HS303. In addition, observe the following procedures and practices when cleaning equipment:

- Wear appropriate PPE to avoid skin and eye contact with isopropyl alcohol, Alconox, or other cleaning materials.
- Stand upwind to minimize any potential inhalation exposure.
- Dispose of spent cleaning solutions and rinses accordingly.
- Follow Shaw Procedure HS303 for pressure washing.

4.0 Air Monitoring/PPE

4.1 Air Monitoring

Air monitoring must be performed on all sites in accordance with Shaw Environmental & Infrastructure, Inc. practices. Organic vapor and/or concentrations are monitored in the field with either a photoionization detector (PID) or flame ionization detector (FID). Flammable vapors and/or gasses are monitored with an oxygen/combustimeter (O2/LEL) real-time instrument. Airborne dust/particulate concentrations are measured with a real-time aerosol monitor (using a scattered light photometric sensing cell) when there are visible signs of air-borne dust. Both area and personal air monitoring readings are to be taken to characterize site activities. Air monitoring results must be documented on the Air Monitoring Forms (see Appendix B) or in the field logbook.

Calibration and maintenance of air monitoring equipment must follow manufacture specifications and must be documented. Re-calibration and adjustment of air monitoring equipment must be completed as site conditions and equipment operation warrant. Record all air monitoring equipment calibration and adjustment information on forms in (see **Appendix B**) or in the field logbook.

Air monitoring action levels (see **Table 4**) have been developed that stipulate the chemical concentrations in the breathing zone that require an upgrade in level of PPE. Action levels are typically set at one-half of the OSHA Permissible Exposure Limit (PEL), National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (REL), or the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV). The rationale for establishing action levels is based on the available data that characterizes COCs in soil or water.

All on-site workers must be properly fitted with PPE (i.e., respirators) and have been trained in their use (i.e., donning and doffing). Air monitoring measurements will be taken in the breathing zone of the worker most likely to have the highest exposure. Transient peaks will not automatically trigger action. Action will be taken when levels are consistently exceeded in a 5-minute period. Similarly, if chemical odors are detected that are a nuisance, bother-some, or irritating, an upgrade in respiratory protection can provide an extra level of comfort or protection when conducting site activities. See Section 4.1.1 for guidelines for frequency of air monitoring. See **Table 6** for a description of PPE levels. See **Table 7** for task-specific protection level and task-specific air monitoring requirements.

Conduct air monitoring when the possibility of volatilization exists (e.g., new monitoring well, well containing known product).

Air movers or other engineering controls that exhaust or dilute solvent vapors emanating from monitoring wells or present when conducting intrusive activities can be used to down-grade PPE requirements.

Table 4
Air Monitoring Action Levels

Instrument*	Function	Measurement	Action
PID (11.7*eV lamp) - Measures Total Organic Vapors	Conduct air monitoring for volatile organic compounds during activities where contaminated media are present. Make sure that a background reading is taken before the start up of activities and periodically thereafter.	0 - 5 ppm above background	Modified Level D
		>5 - 25 ppm above background	Modified Level D
		>25 ppm above background	Upgrade to Level C. Coordinate with PM and HSR for guidance
		>250 ppm	Stop work required. Leave work area, contact PM and HSR for guidance
Oxygen/Combustimeter (O2/LEL) Measures oxygen level (O2) and lower explosive limit (LEL)	Conduct air monitoring for O2/LEL when conditions exist where flammable vapors/gases and/or oxygen deficiency or enrichment can occur. A decreased O2 reading of 0.1% (e.g., 20.9% to 20.8%) actually represents a change in the total air envelope of approximately 0.5% or 5,000 ppm. This represents little hazard if the displacing gas is inert; if the displacing gas is toxic/flammable/reactive, such a concentration represents a real hazard. Verify reasons for O2 depletion by conducting air monitoring with instruments that can measure suspected contaminants (PID/FID) or that can confirm presence of contaminants (detector tubes or chemical specific real-time air monitors).	O2 = 20.9 %	Acceptable
		O2 >19.5 - 20.8%	Verify reasons for O2 depletion with appropriate air monitoring instrumentation before work continues. Utilize appropriate engineering controls/PPE once atmospheric contaminants have been verified.
		O2 >20.9 % - 22 %	Verify reasons for O2 enrichment before entering area. Utilize appropriate engineering controls/PPE to control O2 enriched atmosphere.
		O2 >22 %	Leave area immediately; this atmosphere is extremely flammable. Notify PM or HSR for guidance.
		O2 <19.5%	Leave area immediately; this atmosphere is oxygen deficient. Verify reasons for O2 depletion with appropriate air monitoring instrumentation before work continues. Utilize appropriate engineering controls/PPE once atmospheric contaminants have been verified.
		LEL <10%	Acceptable conditions. Continue normal activity.
		LEL >10%	Leave area immediately. Contact PM or HSR for guidance on venting and other safety measures.

**Note: Instruments must be calibrated according to manufacturer's recommendations.*

4.1.1 Air Monitoring Frequency Guidelines

Conduct periodic monitoring when:

- It is possible that an immediately dangerous to life or health (IDLH) condition or a flammable atmosphere has developed, or
- There is an indication that exposures may have risen over established action levels, permissible exposure limits, or published exposure levels since the last monitoring. Look for a possible rise in exposures associated with these situations:
  - *Change in site area* - work begins on a different section of the site.
  - *Change in contaminants* – handling contaminants other than those first identified.
  - Visible signs of particulate exposure from intrusive activities such as drilling/boring and excavation.
  - Perceptible chemical odors or symptoms of exposure.
  - *Change in on-site activity* – one operation ends and another begins.
  - Handling leaking drums or containers.
  - Working with obvious liquid contamination (e.g., a spill or lagoon).
  - Conduct air monitoring when the possibility of volatilization exists (such as with new monitoring well or a well containing known product).

4.2 Personal Protective Equipment (PPE)

The minimum level of PPE should be selected according to the hazards that may be encountered during site activities. Only PPE that meets the following American National Standards Institute (ANSI) standards are to be worn. At a minimum, all workers will wear the following protection while working on the site:

- Eye protection - ANSI Z87.1-1989.
- Head protection - ANSI Z89.1-1986.
- Foot protection - ANSI Z41-1991.
- Traffic vest in high traffic areas and around heavy equipment.

4.2.1 Respiratory Protection

Air purifying respiratory protection may be used for protection against dust and organic vapors during the course of the project. The need for respiratory protection will be determined by air monitoring results and site conditions. However, engineering controls and administrative controls must first be evaluated for use as the primary controls for protection against site respiratory hazards. In the event engineering controls and administrative controls are deemed to not be feasible, respiratory protection will be required.

Site personnel must also understand the limitations of air purifying respirators and the End-of-Service Life cartridge change-out schedule for the particular type of respirator that will be used. Manufacturer's data has been evaluated for three types of respirators (Scott, MSA, and Survivair). See **Table 5** for a cartridge change-out schedule for Total Hydrocarbons and Benzene.

Any site personnel requiring respiratory protection must also adhere to the site-specific respiratory protection program. Personnel using a respirator that is not listed above should contact their HSR to determine the change-out schedule for the particular respirator used. Any questions regarding the site-specific respiratory protection program must be directed to the HSR or PM.

Table 5
Respirator Cartridge Change-out Schedule

Total Hydrocarbons (Toluene, Ethylbenzene, Xylenes) Air Concentration(ppm)	Change-out Schedule			
	SCOTT642 OV/Acid Gas642 OV642 MPC Cartridges	MSA Ultra Twin GME Cartridge	Survivair Organic Vapor Cartridge 100100	Survivair OV/Acid Gas Cartridge 100300/1053 (includes P-100)
< 150	8 hours	8 hours	8 hours	8 hours
> 150 – 200	8 hours	8 hours	8 hours	8 hours
> 200 – 250	8 hours	8 hours	8 hours	8 hours
> 250	Stop Work	Stop Work	Stop Work	Stop Work

** Based on data from the manufacturer, and represents the worst case conditions*

*** 10 ppm exceeds the recommended use level of 5 ppm for qualitatively fit-tested APRs.*

4.2.2 Project Specific Equipment

See **Table 6** for PPE requirements for sites; see **Table 7** for task-specific level requirements. Level D is the minimum acceptable level for sites where petroleum hydrocarbons are the COC. Upgrade to Modified Level D occurs when there is a possibility that contaminated media can contact the skin or work uniform. Upgrade to Level C occurs when the results of air monitoring reveals that action levels have been exceeded. Upgrade to Level B occurs when the results of air monitoring reveals action levels have been exceeded (site personnel must have met training requirements). Wear hearing protection when there are high noise levels. Workers must maintain proficiency in the use and care of PPE that is to be worn.

Table 6
Personal Protection Equipment

Level	Requirements
Level D	Work uniform Steel-toed boots Approved safety glasses or goggles Hard hat
Modified Level D-1	Level D Nitrile gloves.
Modified Level D-2	Level D PE-coated Tyvek suit. Nitrile outer and inner liner gloves. Latex booties or rubber overboots. Hearing protection (muffs and/or plugs). Fluorescent vest is required.
Modified Level D-3	Modified Level D-2 PE-coated Tyvek suit. Nitrile outer and inner liner gloves. Latex booties or rubber over boots. Face shield Face shield, goggles, metatarsal/leg guards for high pressure washing
Level C	Level D and Modified Level D-2. NIOSH/MSHA-approved full-face respirator with organic vapor/acid gas oil proof high efficiency (P100) cartridges.
Level B	Level D and Modified Level D NIOSH/MSHA approved full-face positive pressure demand supplied air respirator, either airline or self-contained.

Prior to using, all equipment must be inspected to ensure proper working condition.

Table 7
Task Specific Air Monitoring/PPE Summary

Job Task	PPE Level	Instrument	Frequency
Soil and Groundwater sample collection	Modified Level D-1	PID	Start up of work at each task location, then every 30 – 60 minutes based upon air monitoring results. Monitor 15 minutes to continuously if action levels have been reached.
Monitoring Well Installation.	Level D	PID and LEL	Start up of work at each task location, then every 30 – 60 minutes based upon air monitoring results. Monitor 15 minutes to continuously if action levels have been reached.
Remediation system installation	Level D or modified Level D-1	PID and LEL	Air monitoring required during any digging or drilling at start up of work at each task location, then every 30 – 60 minutes based upon air monitoring results. Monitor 15 minutes to continuously if action levels have been reached.
General site duties, system O&M, operation of equipment, etc.	Level D	N/A	N/A

Note 1: "Start up of work at each new task location" means to monitor the air quality at each new operation on the site. The breathing zone is the area inside a 1-foot radius around the head.

Note 2: A downgrade in the air monitoring program must be approved by the SHSO and HSR.

5.0 Decontamination

5.1 Decontamination Procedures

Operations conducted at this site have the potential to contaminate field equipment and PPE. See Section 5.1.1 for the procedures that must be followed to prevent the transfer of contamination to vehicles, administrative offices, and personnel.

5.1.1 Decontamination Procedures

The Sections below describe decontamination procedures for field equipment, and disposable and non-disposable PPE.

5.1.1.1 Field Equipment

Field equipment can include bailers, interface probes, hand tools, drill augers, and miscellaneous sampling equipment. Observe the following practices and procedures when decontaminating field equipment:

- Decontaminate with a solution of detergent and water; rinse with water prior to leaving the site.
- Protect from exposure by covering with disposable covers such as plastic to minimize required decontamination activities.

5.1.1.2 Disposable PPE

Disposable PPE can include Tyvek suits, inner latex gloves, respirator cartridges. Observe the following practices and procedures when decontaminating disposable PPE:

- Dispose of according to the requirements of the client and state and federal agencies.
- Change out respirator cartridges daily and dispose accordingly.

5.1.1.3 Non-disposable PPE

Non-disposable PPE can include respirators and boots and gloves. When decontaminating respirators, observe the following practices and procedures:

- Wipe out respirator with disinfecting pad prior to donning.
- Decontaminate on site at the close of each day with a solution of an approved sanitizing solution.

When decontaminating boots and gloves, observe the following practices and procedures:

- Decontaminate outside with a solution of detergent and water; rinse with water prior to leaving the site.

- Protect from exposure by covering with disposable covers such as plastic to minimize required decontamination activities.

5.2 Example Decontamination Diagram

If Level C or Level B PPE is required, a contamination reduction zone (CRZ) will be constructed in a centralized common area with a travel path from the exclusion zone (EZ) demarcated with 4-foot-high cones. The decontamination procedure for this project site is a two-stage process. See Figure 2 for a depiction of the CRZ.

Stage 1:

1. Remove gross contamination with a brush.
2. Remove outer boots and dispose of in a drum.
3. Remove Tyvek suit and dispose in a drum.
4. Removes outer gloves and dispose of in a drum.
5. Walk to Stage 2.

Stage 2:

6. Remove respirator.

Remove cartridge and dispose in a drum.

Clean respirator and insert into a bag.

Remove inner gloves and dispose.

Wipe hands with a toilette and dispose.

Walk out of decontamination area.

All water used in decontamination procedures should be stored in portable storage tanks until a sufficient amount is stockpiled for disposal treatment. Disposable sampling and PPE will be placed in plastic bags and temporarily stored in designated drums. These drums shall be disposed of according to regulatory guidelines, if necessary.

6.0 Site Control/Communications

6.1 Site Control

To prevent contamination from migrating from personnel and equipment, work areas will be clearly specified as either an EZ, CRZ, or Support Zone (SZ) prior to beginning operations. Each work area will be clearly identified using signs or physical barriers.

A log of all personnel visiting, entering, or working on the site shall be maintained by the SS or Site Safety Officer (SSO). No visitor will be allowed in the EZ without showing proof of training and medical certification, per 29 CFR 1910.120(e), (f). Visitors will attend a site orientation given by the SS/SSO and sign the HASP.

The following are standard safe work practices that apply to all site personnel; they will be discussed in the safety briefing prior to initiating work on the site:

- Eating, drinking, chewing gum or tobacco, and smoking is prohibited in the EZ/CRZs.
- Hands and face must be washed upon leaving the EZ and before eating, drinking, chewing gum or tobacco, and smoking.
- A buddy system will be used. Hand signals will be established to maintain communication.
- During site operations, each worker will consider himself as a safety backup to his partner. Off-site personnel will provide emergency assistance.
- Visual contact will be maintained between buddies on-site when performing hazardous duties.
- No personnel will be admitted to the site without the proper safety equipment, training, and medical surveillance certification.
- All personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the SS/SSO, will be immediately dismissed from the site.
- Proper decontamination procedures must be followed before leaving the EZ.

6.1.1 Site Security and Work Zone Definition

This Section contains general guidelines for developing site security measures for working in a street or roadway and excavations.

6.1.1.1 Working In Street or Roadway

Observe the following site control practices and procedures when working in streets or road-ways:

- Wear traffic vest and hardhat when vehicle hazard exists.

- Use cones, flag-mounted cones, caution tape, and/or barricades.
- Use vehicle strobe light and block area with truck.
- Develop traffic flow plan for high traffic situations (as appropriate):
  - use flag person
  - use flashing arrow sign
  - use "MEN WORKING" signs liberally
  - obtain lane closing permits
  - engage police details

6.1.1.2 Working at Excavation/Trenching Sites

Observe the following site control practices and procedures when working in streets or road-ways:

- "Competent person" is required per OSHA 29 CFR 1926 Subpart P.
- Safeguard open excavations by restricting unauthorized access.
- Highlight work area using prominent warning signs (cones, saw horses/barricades, and signage) placed a minimum of 10 feet back from excavation opening.
- Maintain zone definition along perimeter with a continuous string of yellow orange caution tape.

6.1.1.3 Excavations Left Unattended or Overnight

Use one of the following methods for excavations left unattended or overnight:

- Surround entire perimeter with plastic or cloth construction net fencing. Anchor fence to ground using steel posts driven into ground. Space out posts no greater than 8 feet apart. Fence height minimum 4 feet high. Fence material must be of a quality capable of withstanding a pressure of 200 pounds. Place fence a minimum of 10 feet back from excavation opening.
- Place 8-foot-long barricades affixed with flashing lights end to end with 4-foot high construction net fence attached to barricades.
- Use temporary curbing or concrete "jersey" barriers affixed with flashing signal lights or other effective warning signs.

6.2 Field Communications

Communications between all Shaw employees and subcontractors at the work site can be verbal and/or non-verbal. Verbal communication can be affected by the on-site background noise and various PPE. See **Table 8** for a list of the type of communication methods and equipment to use, depending on site conditions. Communication equipment must be checked daily to ensure proper operation. All project personnel must be initially briefed on the communication methods prior to starting work; communication methods should be reviewed in Daily Tailgate Safety Meetings.

Table 8
Field Communication Methods

Communication Device	Type of Communications	Signal
Telephone On-Site Or Cellular Telephone	Emergency notification	Initiate phone call using applicable emergency numbers
Two-way Radio	Emergency notification among site personnel	Initiate radio communication with Code Red message
Compressed Air Horn	Hailing site personnel for non-emergency	One long blast, one short blast
Compressed Air Horn	Hailing site personnel for emergency evacuation	Three long continuous blasts
Visual	Hailing site personnel for distress, need help	Arms waved in circle overhead
Visual	Hailing site personnel for emergency evacuation	Arms waved in criss-cross over head
Visual	Contaminated air/strong odor	Hands clutching throat
Visual	Break, lunch, end of day	Two hands together, break apart

7.0 Emergency Response and Contingency Plan

See **Section 7.1** for pre-emergency situations that warrant implementing the Emergency Response and Contingency Plan (ERCP). In the event of an emergency, immediate action must be taken by the first person to recognize the event.

When required, notify the National Response Center. The following information should be provided to the National Response Center:

- Name and telephone number.
- Name and address of facility.
- Time and type of incident.
- Name and quantity of materials involved, if known.
- Extent of injuries.
- Possible hazards to human health or the environment outside of the facility.

The emergency telephone number for the National Response Center is 800-424-8802. If hazardous waste has been released or produced through control of the incident, ensure that:

- Waste is collected and contained.
- Containers of waste are removed or isolated from the immediate site of the emergency.
- Treatment or storage of the recovered waste, contaminated soil or surface water, or any other material that results from the incident or its control is provided.
- Ensure that no waste that is incompatible with released material is treated or stored in the facility until cleanup procedures are completed.
- Ensure that all emergency equipment used is decontaminated, recharged, and fit for its intended use before operations are resumed.

7.1 Pre-Emergency Plan for Site Emergencies

The following subsections provide information for a pre-emergency plan for site emergencies.

7.1.1 Evacuation/Natural Disaster

A contingency plan for evacuation from the works site should exist for the following natural disasters:

- Any situation which can potentially cause serious injury or death.
- Notification of a facility or plant evacuation.
- A rainstorm exceeds the flash flood level.
- The facility is in a projected tornado path or a tornado has damaged facility property.

- Severe wind gusts are forecasted or have occurred and have caused damage to the facility.

7.1.2 Medical Emergency

A contingency plan should exist in the event of the following medical emergencies:

- Overexposure to hazardous materials.
- Trauma injuries (broken bones, severe lacerations/bleeding, burns).
- Eye/skin contact with hazardous materials.
- Loss of consciousness.
- Heat stress (heat stroke).
- Heart attack.
- Respiratory failure.
- Allergic reaction.

7.1.3 Fire Emergency

A contingency plan should exist for the following situations related to fire emergencies.

- The potential for human injury exists.
- Toxic fumes or vapors are released.
- The fire could spread on site or off site and possibly ignite other flammable materials or cause heat-induced explosions.
- The use of water and/or chemical fire suppressants could result in contaminated run-off.
- An imminent danger of explosion exists.

7.1.4 Spill or Release of Hazardous Materials

A contingency plan should exist for the following situations related to a spill of release of hazardous materials:

- The spill could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard.
- The spill could cause the release of toxic liquids or fumes in sufficient quantities or in a manner that is hazardous to or could endanger human health.

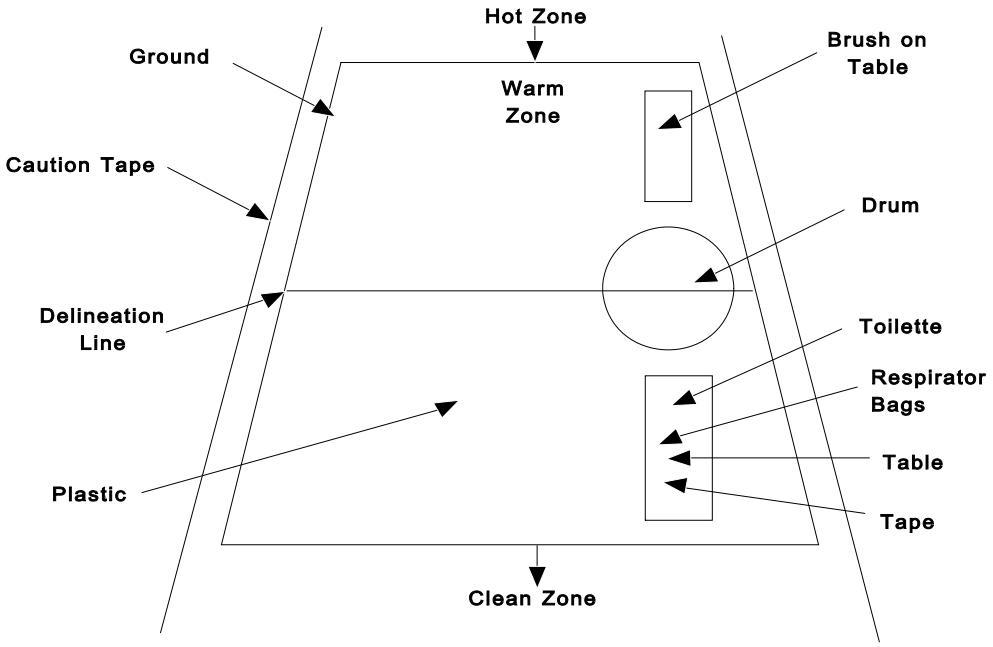
7.1.5 Spill or Release of High Temperature Liquid or Vapor

A contingency plan should exist for the following situations related to a spill or release of high temperature liquid or vapor:

- The spill can be contained on site, but the potential exists for groundwater contamination.
- The spill cannot be contained on site, resulting in off-site soil contamination and/or ground water or surface water pollution.
- The spill quantity is greater than the reportable quantity limit for the material.

FIGURES

Figure 4
Contamination Reduction Zone



APPENDICES

Appendix A
Safety Plan Acknowledgement Form

I have read the site-safety plan for this site and fully understand its contents.

Date	Name	Company

Appendix B
H&S Site Logs And Forms

SITE ENTRY LOG

Date: ______________________________ Client: ______________________________

Location: ______________________________ Job No.: ______________________________

Name	Representing	Time In	Time Out

TAILGATE SAFETY MEETING FORM

Project Name/Number:_____ Date:_____ Time: _____
Client:_____
Work Activities:_____
Hospital Name/Address:_____
Hospital Phone No.:_____ Ambulance Phone No.:_____

Safety Topics Presented

Chemical Hazards:_____
_____
Physical Hazards:_____
_____
Personal Protective Equipment:
Activity:_____ PPE Level:_____
Activity:_____ PPE Level:_____
Activity:_____ PPE Level:_____
Activity:_____ PPE Level:_____
Activity:_____ PPE Level:_____
New Equipment:_____
Other Safety Topic(s):_____

Attendees

PRINTED NAME	SIGNATURE
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
Meeting conducted by:	
_____	_____

REAL TIME AIR MONITORING LOG
(PID/FID/LEL/O2)

Project Name _____Project Location_____Project No._____

Date	Analyst	Time	Manufacturer Model/Serial No.	Concentration (Units)	Location/Activity

PID/FID DETECTOR
CALIBRATION LOG

Project Name_____ Project No._____ Date_____
Calibrated by_____ Instrument: Mfg/Model/Serial No._____

Time	Probe Type	Battery Charged (Y/N)	Calibration Standard	Calibration Standard Concentration (ppm)	Span Setting	Meter Scale Setting	Zeroed (Y/N)	Expected Meter Reading (ppm)	Actual Meter Reading (ppm)

COMBUSTIBLE GAS/OXYGEN METER CALIBRATION LOG

Project Name_____ Project No._____ Date_____
Calibrated by_____ Instrument: Mfg/Model/Serial No._____

Time	Battery Charged (Y/N)	Audible Alarm Check (Y/N)		Zero Checked (Y/N)		Calibration Standard	Calibration Standard (%)		Actual Meter Reading (%)		Ambient Air Rezero Check	
		LEL	O_2	LEL (0%)	O_2 (20.8%)		LEL	O_2	LEL	O_2	LEL (0%)	O_2 (20.8%)

COLORIMETRIC DETECTOR TUBE LOG

Project Name_____ Project No._____ Date_____
Pump Type, Mfg/Model/Serial No._____ Sampled by_____

Time	Detector Tube Type/ (Expiration Date)	Measurable Range	Pump Leak Test (Y/N)	Pump Strokes	Measured Concentration	Comments

REAL TIME AEROSOL MONITORING LOG

Project Name_____ Project No._____ Date_____

Sampled By	Instrument Type (Mfg/Model/ Serial No.)	Battery Charged (Y/N)	Zeroed (Y/N)	Sample Time		Sample Readings (mg/m^3)			Comments
				Start	Finish	TWA	Shift Average	Direct	

General Weather Conditions:_____

Equipment Services Group

VEHICLE INSPECTION

UNIT NO: _____ **DATE:** _____
MILEAGE: _____ **CURRENT PROJECT NO:** _____
VEHICLE TYPE: _____ **LICENSE NUMBER:** _____
INSPECTED BY: _____ **FUEL FRONT:** _____
EMPLOYEE NUMBER: _____ **FUEL REAR:** _____

For Authorized Repairs On Donlen Vehicles, Call 1-800-323-1483

RETAIN THIS INSPECTION DOCUMENT IN PROJECT FILES

PRE-TRIP **Yes / No** **DAILY (USACE Project)** **Yes / No**

N / A = NOT APPLICABLE **C** = COMMENTS **O** = OKAY **N** = NEEDS ATTENTION

_____	Exterior / Interior Clean	_____	Engine Oil, Oil Pressure
_____	Lights: Head-Tail-Turn-Stop-Emergency-Backup	_____	Transmission Oil & Drive Line
_____	Operating Controls / Gauges	_____	Radiator / Cooling System
_____	Battery / Starter / Horn	_____	Exhaust / Muffler
_____	Air Conditioner / Heater / Defroster	_____	Front Axle / Steering / Suspension System
_____	Back-up Alarm (Trucks)	_____	Donlen Coupon Book
_____	Windshield, Other Glass, Wipers / Washers	_____	First Aid Kit
_____	Mirrors: Inside-Outside (Convex - trucks)	_____	Fire Extinguisher (mounted/accessible/charged)
_____	Insurance Card & Accident Report Kit	_____	Emergency Flares or Reflective Markers
_____	Emergency Phone Number List	_____	Tires / Wheels / Rims
_____	Map to Urgent Care Facility & Hospital	_____	Spare Tire, Jack, Lug Wrench
_____	Current Registration, Plates	_____	Frame / Bumpers
_____	Service Brakes, Emergency/Parking Brakes	_____	Seat Belts (One for Each Passenger)
_____	Trailer Aux Brake Controller/Electrical Connection	_____	Visible Damage to Body
_____	Coupling Devices/Safety Chain Anchor Point	_____	Driver Safety Notification Sticker
_____	Wheel Chocks (When Equipped With Trailer)	_____	Other, Please Enter Comments Below

Was Unit Serviced? Y / N **DATE** **MILES**

COMMENTS: _____

I am authorized to operate this vehicle. _____ Initials

I am licensed to operate this vehicle. _____ Initials

INSPECTORS SIGNATURE: **DATE:**

REPORT ALL DEFICIENCIES TO YOUR SUPERVISOR

Unit #		**Start Date**	
Mileage		**Project #**	
Vehicle Type		**License #**	
Inspected By		**Fuel Front**	
Employee #		**Fuel Rear**	

DAILY VEHICLE INSPECTION (Weekly Log)

For Authorized repairs on Donlen Vehicles, Call 1-800-323-1483

N/A = Not Applicable C = Comments O = Okay N = Needs Attention	**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**	**FRI**
Exterior/Interior Clean							
Lights: Head-Tail-Turn-Stop-Emergency-Back Up							
Operating Controls/ Gauges							
Battery/ Starter/ Horn							
Air Conditioner/ Heater/ Defroster							
Back-up Alarm (Trucks)							
Windshield, Other Glass, Wipers/Washer							
Mirrors: Inside-Outside (Convex-Trucks)							
Insurance Card & Accident Report Kit							
Emergency Phone Number List							
Map to Urgent Care Facility & Hospital							
Current Registration, Plates							
Service Brakes, Emergency/Parking Brake							
Trailer Aux. Brake Controller/Electrical Connection							
Coupling Devices/Safety Chain Anchor Point							
Wheel Chocks (When Equipped with Trailer)							

N/A = Not Applicable C = Comments O = Okay N = Needs Attention	SAT	SUN	MON	TUE	WED	THU	FRI
Engine Oil, Oil Pressure							
Transmission Oil & Drive Line							
Radiator/Cooling System							
Exhaust/ Muffler							
Front Axle/Steering/Suspension System							
Donlen Coupon Book							
First Aid Kit							
Fire Extinguisher (mounted/accessible/charged)							
Emergency Flares or Reflective Markers							
Tires/Wheels/Rims							
Spare Tire, Jack, Lug Wrench							
Frame/Bumpers							
Seat Belts (One for Each Passenger)							
Visible Damage to Body							
Driver Safety Notification Sticker							
Other, Please Enter Comments Below							

Was Unit Serviced? Yes/ No Date Serviced Miles

Comments:

I have been authorized and I am licensed to operate this vehicle.

INSPECTORS SIGNATURE: **DATE:**

PLEASE REPORT ALL DEFICIENCIES TO YOUR SUPERVISOR

RETAIN THIS INSPECTION DOCUMENT IN PROJECT FILES

Supervisor's Employee Injury Report

EMPLOYEE INFORMATION

Employee's Social Security Number:			Claim Number:
Employee's Full Name:			Case Number from Log:
Home Address:			Home Phone Number:
Male:	Female	Date of Birth:	Hire Date:
Dependents:		Dependents Under 18:	Marital Status:
Occupation:			Department Name:
State Hired:	Currently Weekly Wage:		Hourly Wage:
Hours/Days Worked Per Week:	Days Per Week		Hours Worked Per Day:
Employment Stats:			Employee ID No.: N/A
Salaried Continued:		Paid For Date of Injury:	
Ever Injured on the Job:		Supervisor Name & Phone:	

EMPLOYER INFORMATION

Employer Name:	The Shaw Group, Inc.		
Work Location:		Project Number:	
Contact Name:	John Mollere	Telephone Number:	(800) 747-3322, Ext.572
Employer SIC:		Employer Location Code:	
Employer FED ID:		Employer Code:	N/A
Nature of Business:			
Policy Number:			

ACCIDENT INFORMATION

Date and Time of Injury:	Time Employee Began Work:
Person Accident Reported to:	Date and Time Reported to Employer:
Did the Accident Occur at the Work Location:	If no, where did the accident occur?
Accident Address:	
What was the Employee doing just before the Incident Occurred?	
Give a Full Description of the Accident: (Be as Complete As Possible)	
What object or substance directly harmed the employee?	

Are Other WC Claims Involved?

INJURY INFORMATION

Which Part of the Body Was Injured? (E.g. Head, Neck, Arm Leg)?

What Was the Nature of Injury? (E.g. Fracture, Sprain, Laceration)?

Part of Body Location: (e.g. Left, Right, Upper, Lower)?

Injury Description:

Source of Injury:	Is Employee Hospitalized?
Lost Time:	If Yes, What was First Full Day Out:
Date Last Day Worked:	Date Disability Began: N/A
Date Returned to Work:	Estimated Return Date: N/A

If the Employee Died, When did Death Occur? (Date)

MEDICAL INFORMATION

Initial Medical Treatment:	ER Treated & Released: Y or N	Hospitalized Overnight as In Patient: Y or N

Hospital - Name, Address, Phone Number:

Clinic - Name, Address, Phone Number:

Name of Physician or Health Care Professional?

WITNESS INFORMATION

Were There Any Witnesses?

If Yes, List Names and How to Contact Them:

ADDITIONAL COMMENTS & INFORMATION

REPORT PREPARED BY

Name:		Title:
Signature:	Date:	Phone:

REPORT ALL WORKER'S COMPENSATION INJURIES TO SHAW CLAIMS DEPARTMENT

FAX REPORT WITHIN 24 HOURS OF INCIDENT TO 225-932-2636.

INCIDENT INVESTIGATION REPORT

*** MUST BE COMPLETED WITHIN 72 HOURS ***

Investigation Date _____ Date of Incident _____

Employee Name _____

Supervisor Name _____

Project Number/Name _____ / _____

Location of Incident _____

Incident Classification

Injury:	☐ First Aid	Vehicle:	☐ Chargeable	DOT	☐ DOT Vehicle
	☐ OSHA Recordable		☐ Non-Chargeable		☐ DOT Reportable
	☐ Lost Workday				
	☐ Restricted Workday	Near Miss: ☐		General Liability ☐	

Description (Provide facts, describe how incident occurred, provide diagram [on back] or photos)

Analysis 1 (What unsafe acts or conditions contributed to the incident?)

Analysis 2 (What systematic or management deficiencies contributed to incident?)

Corrective Action(s) (List corrective action items, responsible person, scheduled completion date)

Witnesses (Attach statements or indicate why unavailable)

Investigated By _____ _____ _____
Print Name Signature

Project/Location Mgr. _____ _____ _____
Print Name Signature

(Attach Additional Pages if Needed)

VEHICLE ACCIDENT REPORT
Commercial Vehicles

SHAW LOCATION

SHAW SUBSIDIARY NAME | **LOCATION CODE** | **PHONE**

BUSINESS ADDRESS | **CITY** | **STATE** | **ZIP**

SHAW VEHICLE

VEHICLE YEAR, MAKE, MODEL | **VEHICLE VIN** | **LICENSE PLATE NUMBER/STATE**

TRAILER YEAR, MAKE, MODEL | **TRAILER VIN** | **LICENSE PLATE NUMBER/STATE**

DESCRIPTION OF DAMAGE TO VEHICLE

DATE, TIME, AND PLACE

DATE OF ACCIDENT

TIME ☐ **AM** ☐ **PM**

EXACT LOCATION OF ACCIDENT OR LOSS (include cross-streets, mile-markers, etc.)

DRIVER OF SHAW VEHICLE

DRIVER'S NAME AND ADDRESS | **PHONE NUMBER**

DRIVER'S LICENSE NUMBER/STATE | **SEX** | **DATE OF BIRTH** | **SOCIAL SECURITY** | **WORK PHONE**

ACCIDENT INFORMATION

DRIVER'S DESCRIPTION OF ACCIDENT

ILLUSTRATE HOW ACCIDENT OCCURRED (LABEL VEHICLES AND STREET NAMES)

WERE POLICE INVOLVED? ☐ **YES** ☐ **NO**

DEPARTMENT NAME:

CITATIONS ISSUED: ☐ **YES** ☐ **NO**

TO WHOM:

WITNESS NAME

WITNESS ADDRESS | **PHONE:**

ADDITIONAL COMMENTS

VEHICLE ACCIDENT REPORT
Commercial Vehicles
Page 2

OTHER (NON-SHAW) VEHICLES INVOLVED

VEHICLE 1

OWNER NAME | SEX

OWNER ADDRESS, CITY, STATE, ZIP

HOME PHONE | BUSINESS PHONE

DOB | AGE | SOCIAL SECURITY NUMBER

VEHICLE YEAR, MAKE, MODEL | LICENSE PLATE/STATE

TRAILER YEAR, MAKE MODEL | LICENSE PLATE/STATE

VEHICLE VIN

INSURANCE COMPANY | POLICY NUMBER

OPERATOR NAME | SEX

OPERATOR ADDRESS, CITY, STATE, ZIP

HOME PHONE | BUSINESS PHONE

DRIVER'S LICENSE NO./STATE

DOB | AGE | SOCIAL SECURITY NO.

PASSENGER NAME | INJURED? ☐ YES ☐ NO

PASSENGER NAME | INJURED? ☐ YES ☐ NO

WAS VEHICLE PARKED?

DESCRIPTION OF DAMAGE TO VEHICLE:

ANY DAMAGE TO PROPERTY OTHER THAN VEHICLES (building, fence, sign, etc.)?

PROPERTY OWNER NAME

PROPERTY OWNER ADDRESS, CITY, STATE, ZIP

HOME PHONE: | BUSINESS PHONE:

DESCRIPTION OF DAMAGE TO PROPERTY

VEHICLE 2

OWNER NAME | SEX

OWNER ADDRESS, CITY, STATE, ZIP

HOME PHONE | BUSINESS PHONE

DOB | AGE | SOCIAL SECURITY NUMBER

VEHICLE YEAR, MAKE, MODEL | LICENSE PLATE/STATE

TRAILER YEAR, MAKE MODEL | LICENSE PLATE/STATE

VEHICLE VIN

INSURANCE COMPANY | POLICY NUMBER

OPERATOR NAME | SEX

OPERATOR ADDRESS, CITY, STATE, ZIP

HOME PHONE | BUSINESS PHONE

DRIVER'S LICENSE NO./STATE

DOB | AGE | SOCIAL SECURITY NO.

PASSENGER NAME | INJURED? ☐ YES ☐ NO

PASSENGER NAME | INJURED? ☐ YES ☐ NO

WAS VEHICLE PARKED?

DESCRIPTION OF DAMAGE TO VEHICLE:

ANY DAMAGE TO PROPERTY OTHER THAN VEHICLES (building, fence, sign, etc.)?

PROPERTY OWNER NAME

PROPERTY OWNER ADDRESS, CITY , STATE, ZIP

HOME PHONE: | BUSINESS PHONE:

DESCRIPTION OF DAMAGE TO PROPERTY

GENERAL LIABILITY, PROPERTY DAMAGE, AND LOSS REPORT

PROJECT/LOCATION _____ PROJECT NO. _____ DATE _____

ADDRESS _____

HOW DID DAMAGE OR LOSS OCCUR? _____

_____

_____

DESCRIPTION AND VALUE ($) OF DAMAGED/LOST/STOLEN PROPERTY: _____

_____

LOCATION OF DAMAGED/LOST/STOLEN PROPERTY (Before Loss): _____

_____

DATE AND TIME OF DAMAGE, LOSS, OR THEFT: Date: _____ Time: _____ a.m. / p.m.

OWNER OR DAMAGED/LOST/STOLEN PROPERTY:

Name _____ Phone No. (_____) _____

Address _____ City _____

Employer and Address _____

INJURED PARTIES (Also complete a Supervisor's Employee Injury Report if a Company Employee):

1. Name _____ Phone No. (_____) _____

Address _____ City _____

Employer and Address _____

Description of Injury _____

WITNESSES:

1. Name _____ Phone No. (_____) _____

Address _____ City _____

Employer and Address _____

2. Name _____ Phone No. (_____) _____

Address _____ City _____

Employer and Address _____

WERE PICTURES TAKEN? ~ YES ~ NO

WERE POLICE NOTIFIED? ~ YES ~ NO DEPT. _____ REPORT NO. _____

COMPLETED BY:

_____ _____ _____

(Print name) (Signature) (Date)

PROJECT/LOCATION MANAGER:

_____ _____ _____

(Print name) (Signature) (Date)

REPORT MUST BE CALLED IN OR FAXED TO:
CORPORATE CLAIMS DEPARTMENT (PHONE: 225.932.2527, FAX: 225.932.2636)
WITHIN 24 HOURS, OR NOT LATER THAN NEXT BUSINESS DAY

ACCIDENT REVIEW BOARD

DATE:	LOCATION:
BOARD MEMBERS:	
ACCIDENT DATE:	EMPLOYEE(S) INVOLVED IN INCIDENT:
INVESTIGATION COMPLETE: YES ☐ NO ☐	ACCIDENT CLASSIFICATION:

THE FOLLOWING INFORMATION <u>MUST</u> BE PROVIDED BY THE REVIEW BOARD FOR THIS INCIDENT (PRINT):

SUPERVISOR:_____ **PROJECT/LOCATION MGR.:** _____

CAUSE OF ACCIDENT:

ACTION BY BOARD*:

* ALL ACTIONS BY THE ACCIDENT REVIEW BOARD ARE SUBJECT TO FINAL REVIEW BY THE HUMAN RESOURCES AND LEGAL DEPARTMENTS.

ACCEPTED:

_____ _____
(Employee Signature) (Supervisor Signature)

APPROVED: REJECTED FOR:

_____ _____

_____ _____
(Project/Location Manager)

APPROVED: REJECTED FOR:

_____ _____

_____ _____
(Business Line Health and Safety Manager or Designee)

APPROVED: REJECTED FOR:

_____ _____

_____ _____
(Business Line Vice President)

Employee Witness Statement

MUST BE COMPLETED WITHIN 24 HOURS OF THE INCIDENT

This form should be completed by every employee working in the crew of the injured employee and by every other employee with knowledge of events or circumstances involved in the incident.

This information is being solicited from you so that the company can accurately assess the reported incident to avoid similar occurrences in the future. Describe only the facts for which you have personal knowledge. If you have no knowledge of the incident, write "no knowledge".

Company _____

Exact Location of Incident/Accident _____

Name of Injured Employee _____

Date of Incident/Accident _____ Time _____ am pm

Date of this Statement _____ Time _____ am pm

Time your shift begins? Time _____ am pm Ends _____ am pm

Witness Information:

Name _____

Home Phone No. _____

Home Address _____

County _____ Zip _____

Witness' Supervisor Name _____

If not employed by Shaw, enter name of company _____

Company Phone Number _____

Did You See the Incident/Accident? _____

How Far From You (approx., in feet) Did the Incident/Accident Occur? _____

Stating Only Factual Information, Describe in Detail What Happened and Include Any Applicable Events Leading to the Incident/Accident.

_____

_____

_____

_____

_____

_____

_____

_____

I certify that, to the best of my knowledge, all of the above information is complete, accurate and factual. I acknowledge that the intentional falsification or altering of facts or making misleading statements may be grounds for disciplinary action.

_____ _____

Witness Signature/Date Print Name

Injured Employee Statement

MUST BE COMPLETED WITHIN 24 HOURS OF THE INCIDENT

This form should be completed by the injured employee involved in the incident. Describe only the facts for which you have personal knowledge. If you have no knowledge of a particular question, write "no knowledge".

Company _____

Exact Location of Incident/Accident _____

Name of Injured Employee _____

Date of Incident/Accident _____ Time _____ am pm

Date of this Statement _____ Time _____ am pm

Time your shift begins? Time _____ am pm Time your shift ends? Time _____ am pm

Name of Known Witnesses:

Name _____

Name _____

Name _____

Name _____

Your Immediate Supervisors Name _____

If not employed by Shaw, enter name of company and phone number _____

Have you had a prior injury similar to this injury? _____

Was it while you were at work? _____

What date did the prior injury occur? _____

Stating Only Factual Information, Describe in Detail What Happened and Include Any Applicable Events Leading to the Incident/Accident.

_____

_____

_____

_____

_____

_____

_____

_____

I certify that, to the best of my knowledge, all of the above information is complete, accurate and factual. I acknowledge that the intentional falsification or altering of facts or making misleading statements may be grounds for disciplinary action.

_____ _____

Signature/Date Print Name

Incident Reporting and Management Procedure – Commercial & State/Local Programs

	Action	Who? *When*?	Under what circumstances?	How?	Notes:
1.	Notify Supervisor for all incidents (no matter how minor)	Injured person, first person recognizing incident, driver/passenger, or employee causing damage Immediately	All incidents no matter how minor	In person or by telephone	
2.	For *life-threatening injuries/illnesses* - contact local emergency personnel For *non life-threatening injuries/illnesses* - transport injured person to doctor at an occupational medical facility For *vehicle accidents* – make scene safe, notify police, aid injured parties For *equipment/property damage* - make scene safe, prevent further damage or injuries	Site Supervisor Immediately (concurrently with next step if injury or illness) Site Supervisor Immediately (concurrently with next step if injury or illness) Driver/passenger Immediately Employee causing damage Immediately	– In case of serious injury or illness requiring off-site medical care	– Via ambulance – – – Via vehicle	– Site Supervisor or Site Safety Officer must immediately go to emergency care facility. – – – Site Supervisor or Site Safety Officer must transport and stay with injured person until released from care
3.	Notify CORE Heath Services (for injuries/illnesses to Shaw employees only)	Site Supervisor *Immediately, prior to transporting the injured employee, unless injuries are life threatening*	♦ Serious injury requiring off-site medical care ♦ If employee states that he/she has been exposed to any chemical or biological substance	877-347-7429	♦ Not required for temporary agency and contract labor ♦ Provide name of injured employee, name and phone # of treating medical facility, description of the incident ♦ CORE will help with medical facility coordination and follow-up care
4.	Notify Regional EHS Manager	Site Supervisor *Immediately (concurrently with providing transportation to occupational medical facility or EMS transport to hospital)*	All incidents	– See C&S/L Incident Notification and Communication Contact List (attached)	♦ Contact should be made prior to sending the individual for medical care ♦ Regional EHS Manager will notify Clifford Florczak as appropriate

Incident Reporting and Management Procedure – Commercial & State/Local (continued)

Action	Who? *When*?	Under what circumstances?	How?	Notes:
5. Contact Shaw Notification Hotline/Help Desk	Site Supervisor *As soon as possible. Prior to sending an individual for medical treatment*	♦ Illness and/or injury (doctors cases and above) ♦ Property damage (damage > $2,500.00) ♦ Vehicle accidents (All) ♦ Criminal activity (i.e. bomb threat, theft) ♦ Natural disaster (all) ♦ Explosion and/or fires (damage > $2,500.00 or result in injury) ♦ Environmental spills/releases (incidents that requires regulatory notification or have an offsite impact) ♦ Regulatory agency visit ♦ Fatalities	Shaw Notification Hotline/Help Desk Phone Number 866-299-3445 Note: Outside the Continental US call 225-215-5056	
6. Complete forms: I*njuries and illnesses* ♦ Authorization for Release of Protected Medical Information ♦ Authorization for Treatment of Occupational Injury/Illness ♦ Return-To-Work Examination Form ***and*** fax to CORE ***and*** fax to Loss Prevention Manager (Casey Parker)	Injured employee and medical facility personnel (Site Supervisor is responsible for verifying forms are completed) *Prior to leaving medical facility*	♦ Serious injury requiring off-site medical care ♦ If employee states that he/she has been exposed to any chemical or biological substance	Fax to CORE at 225-295-4846 Fax to Loss Prevention Manager (Casey Parker at 225-987-3080)	Site Supervisor or Site Safety Officer must take these forms with him/her to occupational medical facility or hospital (Contained in HS 020)
7. Call Project Manager and notify of incident	Site Supervisor *As soon as reasonably possible*		–	Project Manager will report incident to upper levels of Operations/Business Line Management

Incident Reporting and Management Procedure – Commercial & State/Local (continued)

	Action	Who? *When*?	Under what circumstances?	How?	Notes:
8.	Call back Regional EHS Manager to report on status of ***injured/ill employee***	Site Supervisor *Prior to employee leaving medical facility*	All injuries and illnesses requiring off-site medical care	– See C&S/L Incident Notification and Communication Contact List (attached)	
9.	Complete forms: *OSHA Recordable Cases* Supervisor's Employee Injury/Illness Report Form Injured Employee Statement Witness Statement Form(s) *First Aid Cases* Supervisor's Employee Injury/Illness Report Injured Employee Statement Witness Statement Form(s) Fax completed forms to Shaw Corporate Claims and Regional EHS Manager and CORE.	♦ Site Supervisor ♦ Witnesses *As soon as possible – no later than 24 hours*	All injuries, illnesses, and first aide cases	Shaw Corporate Claims Department Fax (225-932-2636) CORE Fax 225-295-4846 See C&S/L Incident Notification and Communication Contact List (attached)	Site Supervisor should have these forms with him/her at all times (Contained in HS 020)
10.	Complete forms: *Chargeable Vehicle Accidents* Vehicle Accident Report Witness Statement Form(s) Driving Record Certification (Procedure HS800) *Non-Chargeable Vehicle Accidents* Vehicle Accident Report Witness Statement Form(s) *Equipment, Property Damage and General Liability Incidents* Equipment, Property Damage and General Liability Loss Report Witness Statement Form(s) Fax completed forms to Shaw Corporate Claims and Regional EHS Manager.	♦ Site Lead / Supervisor ♦ Witnesses *As soon as possible – no later than 24 hours*	All vehicle accidents and /or all property damage	Shaw Corporate Claims Department (225-932-2636) See C&S/L Incident Notification and Communication Contact List (attached)	Supervisor should have these forms with him/her at all times (Contained in HS 020)

Incident Reporting and Management Procedure – Commercial & State/Local (continued)

Action	Who? *When?*	Under what circumstances?	How?	Notes:
11. Complete forms: *OSHA Recordable Cases* Incident Investigation Report *First Aid Cases* Incident Investigation Report *Chargeable Vehicle Accidents* Incident Investigation Report *Non-Chargeable Vehicle Accidents* Incident Investigation Report *Equipment, Property Damage and General Liability Incidents* Incident Investigation Report *Near Miss* Incident Investigation Report Fax completed forms to Regional EHS Manager	Site Supervisor *As soon as possible – no later than 72 hours of incident*		Shaw Corporate Claims Department (225-932-2636) See C&S/L Incident Notification and Communication Contact List (attached)	Supervisor should have these forms with him/her at all times (Contained in HS 020)
12. Perform "Accident Review Board" (ARB) and fax to Regional EHS Manager.	Site Supervisor/Project Manager *Within 10 days of incident*	OSHA Recordable Cases Chargeable Vehicle Accidents		ARB must include: Regional Vice President, Project Manager, Employee's Direct Supervisor, Regional EHS Manager, and Employee(s) involved in the incident. Lost time injuries will require Jeff Jenkins and Clifford Florczak

C&S/L INCIDENT NOTIFICATION AND COMMUNICATION CONTACT LIST

Project Number: _____ Project / Office / Facility Location: _____

Note: Notifications to operations chain will be verbal and as soon as reasonably possible, but no later than 24-hours following the incident

Name	Phone Number(s)	Fax Number	E-mail
Shaw Notification Hotline / Helpdesk	866-299-3445 225-215-5056 (Outside Continental US)	N/A	N/A
CORE Health Services	877-347-7429	225-295-4846	
Shaw Corporate Claims Department		225-932-2636	
EHS Manager – Barry Conaway	609-588-6394 (office) / 609-510-1134 (cell)	609-689-7771	barry.conaway@shawgrp.com
EHS Manager – Rob Elfrink	314-436-7390 ext. 225 (office) / 314-220-7980 (cell)	314-436-8587	rob.elfrink@shawgrp.com
EHS Manager – Greg McElroy	412-858-1542 (office) / 412-759-5302 (cell)	419-425-6039	greg.mcelroy@shawgrp.com
CSL EHS Director, Central & NE– Clifford Florczak	312-499-3503 (office-Chicago) 708-260-1266 (office) 708-308-6200 (cell)	312-499-3505	clifford.florczak@shawgrp.com.
CSL West/ Federal ERC EHS Director – Dave Mummert	419-425-6129 (office) / 419-348-1544 (cell)	419-425-6039	dave.mummert@shawgrp.com
CSL Gulf/Southeast Federal Infrastructure EHS Director – Andrew Johnson	513-782-4972 (office) / 859-393-4346 (cell)	N/A	andrew.johnson@shawgrp.com
Loss Prevention Manager - Casey Parker	225-932-2763 (office) / 225-405-1246 (cell)	225-987-3080	casey.parker@shawgrp.com
Shaw E&I Health & Safety Director - Mike Zustra	614-834-4819 (office) / 740-215-3431 (cell)	614-834-4819	mike.zustra@shawgrp.com
Project/Office Manager			
District/Business Line Manager (s) Tim Kemper	508-497-6162 (office) / 617-515-3004 (cell)	508-435-9641	tim.kemper@shawgrp.com

Appendix C
Job Safety Analyses (JSAs)

JOB SAFETY ANALYSIS

SUPERVISION/FOREMAN
Consider the following and check the items which apply to the job, then review with the work crew.

PERMITS
- ☐ Required
- ☐ Cold Work
- ☐ Hot Work
- ☐ Entry Permit
- ☐ All Conditions Met
- ☐ Signed Off When Complete
- ☐ Other

PERSONAL PROTECTIVE EQUIP. (PPE)
- ☐ Type of Gloves
- ☐ Composition of Gloves
- ☐ Special Purpose Gloves
- ☐ Tyvek Suit
- ☐ Acid Suit /Slicker Suit
- ☐ Rubber Boots
- ☐ Mono Goggles (vented/non-vented)
- ☐ Face Shield
- ☐ Respirator
- ☐ Fresh Air
- ☐ Ear Protection
- ☐ Safety Harness
- ☐ Burning Goggles
- ☐ Other

TOOLS
- ☐ Current Inspection
- ☐ Proper Tools for the Job
- ☐ Good Tool Condition
- ☐ Qualifications
- ☐ Other

EMERGENCY EQUIPMENT
- ☐ Fire Extinguishers
- ☐ Safety Shower
- ☐ Evacuation Route
- ☐ Other

WELDING
- ☐ Flashburns
- ☐ Combustibles
- ☐ Spark Containment
- ☐ Shields
- ☐ Grounding
- ☐ Water Hose
- ☐ Fire Extinguisher
- ☐ Fire Blanket
- ☐ Fire Watch
- ☐ Sewer Covers
- ☐ Other

OVERHEAD WORK
- ☐ Barricades
- ☐ Signs
- ☐ Hole Cover
- ☐ Handrail
- ☐ Other

ELECTRICAL
- ☐ Locked & Tagged out
- ☐ Try Start/Stop Switch
- ☐ GFCI Test
- ☐ Assured Grounding
- ☐ Extension Cord Inspection
- ☐

LIFTING
- ☐ Forklift
- ☐ Cherry Picker
- ☐ Load Chart
- ☐ Angle
- ☐ Crane
- ☐ Chainfall
- ☐ Proper Rigging Practices
- ☐ Manual Lifting
- ☐ Condition of Equipment
- ☐ Operator Certificate

HAZARDS (ENVIRONMENTAL)
- ☐ Electrical Shock
- ☐ Heat Stress
- ☐ Heavy Objects
- ☐ Hot/Cold Surf. Or Mat.
- ☐ Inadequate Lighting
- ☐ Line Breaking
- ☐ Noise
- ☐ Poor Access/Egress
- ☐ Sharp Objects
- ☐ Other

HAZARDS/CHEMICALS
- ☐ Chemical Burn Shin/Eyes
- ☐ Flammable
- ☐ Ingestion
- ☐ Inhalation
- ☐ Skin Contamination

HAZARDS/BODY
- ☐ Fall Potential
- ☐ Pinch Points
- ☐ Slip-Trip Potential
- ☐ Other

OTHER WORK IN AREA
- ☐ Others Working Overhead
- ☐ Type Work Others Doing
- ☐ PPE Due to Other Work
- ☐ Other

ACCESS
- ☐ Scaffold (properly inspected)
- ☐ Ladder (Tied off)
- ☐ Manlift
- ☐ Personnel Basket (inspected & approved)
- ☐ Operator Training
- ☐ Special Provisions
- ☐ Other

Confined Space
Know the Following:
1) Possible hazards within the confined space
2) First signs of exposure
3) How to summons help
4) How to track personnel
5) Entering and exiting the confined space
6) Maintain contact with all entrants by voice or visual
7) Do not attempt to rescue unless you are a part of a coordinated effort
8) Remain at entry point assume no duties with take you from there.

JOB SAFETY ANALYSIS

Location of Job (Unit/Location on Project):		
Required PPE:	**Safety Access/ Location**	Supervisor of Work:
	Safe Haven:	JSA Prepared By:
	Wind Direction:	Are other crews in area?
Pre-Job Preparation Fill out JSA Review JSA (EVERYONE) Sign JSA (EVERYONE)	Evacuation Route: Assembly Point:	New: / Revised:

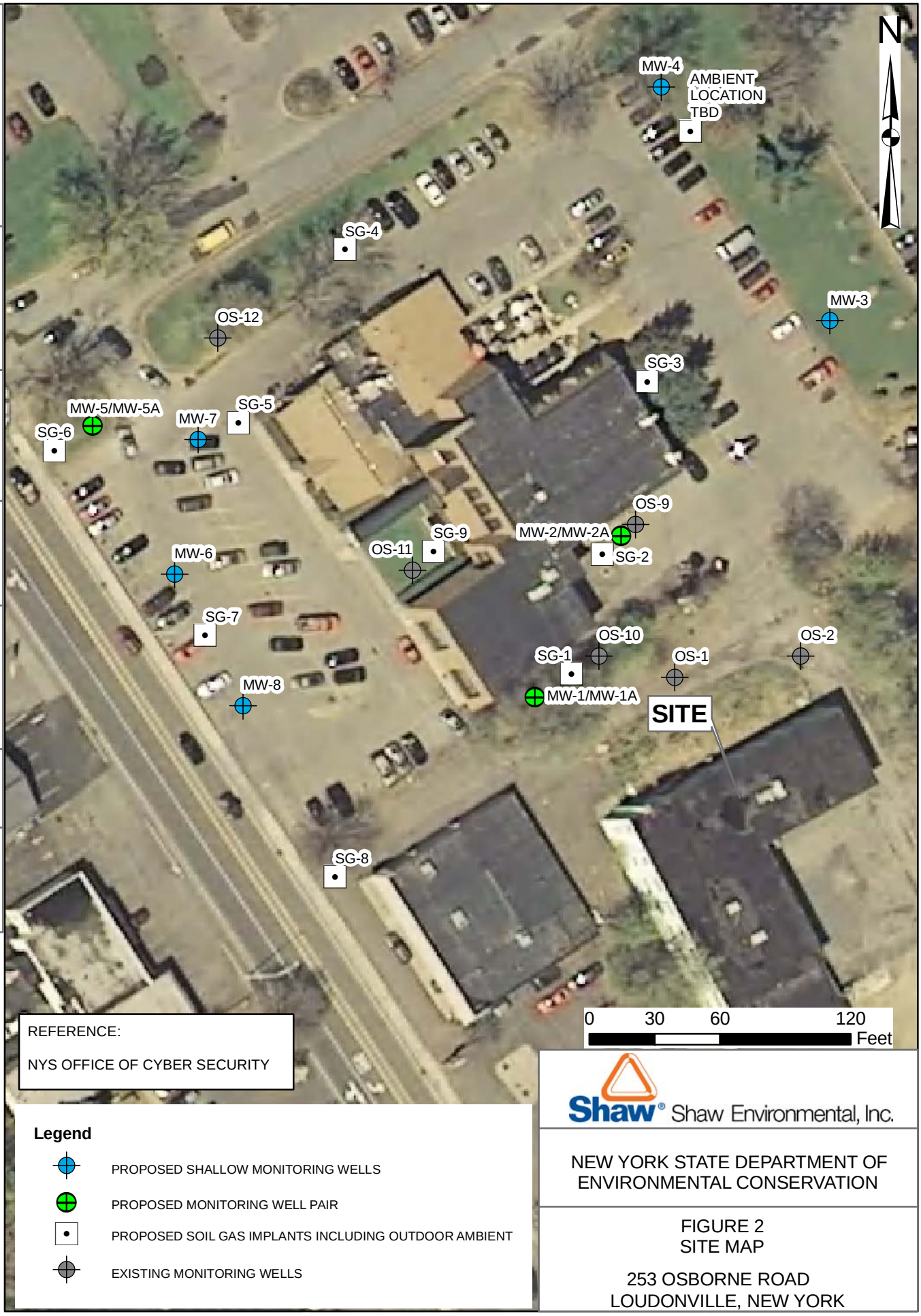
Job Task (What are You Doing)	**Audit the Job** Audit Time:
Potential Hazards	**Supervisors Comments**
Recommended Action or Procedure	**Supervisor's Initials:**

Crew Name Signatures:		

For JSA Forms, Please Refer To:
http://shawnet3.shawgrp.com/sites/eihs/Activity%20Hazard%20Analysis/Forms/AllItems.aspx

Appendix D
MSDS Definitions, Material Safety Data Sheets (MSDS)

Appendix E
Site Maps



DRAWING NUMBER	APPROVED BY	CHECKED BY	DRAWN BY	DESIGNED BY	DATE	OFFICE
134685-019A2	DS	RA	MJS	MF	03/31/11	LATHAM, NY

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 2
SITE MAP

253 OSBORNE ROAD
LOUDONVILLE, NEW YORK

L:\NYSDEC 2008 Contracts\19-Osborne Road\GIS\MXD\134685-019A2.mxd

Appendix F
Shaw H&S Procedures Required to be Onsite
(Provided on CD)

NOTE: SEI health and safety procedures along with required forms that will be utilized during the project are listed below. A copy the Health and Safety Procedures will be included with this HASP or available electronically.

P-EI-HS001	**Environmental Health and Safety Policy**	**8/27/2009**
HS003	**Philosophy for Corporate Procedures**	**7/09/2009**
HS009	**New Employee Orientation Health and Safety Checklist**	**6/11/2009**
HS010	**Employee Safety and Health Work Rules**	**6/04/2009**
HS011	**Health & Safety Rules for Contractors**	**3/30/2006**
HS012	**Chemical Hygiene Plan**	**4/24/2002**
HS013	**Health and Safety Procedure Variance**	**8/03/2009**
HS014	**Severe Weather Policies and Procedures**	**3/17/2009**
HS018	**Safety Councils**	**6/04/2009**
HS019	**Injury and Illness Prevention Program**	**6/04/2009**
HS020	**Accident Prevention Program: Reporting, Investigation and Review**	**7/16/2003**
HS021a	**Accident Prevention Program: Tier 1, Sr. Management, Leadership Safety Assessments**	**11/01/2007**
HS021b	**Accident Prevention Program: Tier 2 Management Safety Inspections**	**11/01/2007**
HS021c	**Accident Prevention Program: Management Safety Inspections**	**11/01/2007**
HS022	**Accident Prevention Program: Review of New Proposals, Projects, Operations, Construction, and Jobs by Health and Safety**	**5/06/2009**
HS023	**Accident Prevention Program: Employee Safety Incentives and Team Safety Award Program**	**9/01/2007**
HS024	**Prevention of Repetitive Motion Injuries (Applies to California Only)**	**1/05/2010**
HS025	**Workplace Anti-Violence Policy**	**4/11/2006**
HS026	**Safety Observation Program**	**3/12/2009**
HS040	**Stop Work Authority**	**3/29/2004**
HS041	**Embryo-Fetus Protection Program**	**4/24/2002**
HS045	**Job Safety Analysis (JSA)**	**1/07/2003**
HS050	**Employee and Subcontractor Training Requirements**	**2/19/2007**
HS051	**Tailgate Safety Meetings**	**3/17/2009**
HS052	**Health and Safety Plans**	**3/23/2009**
HS060	**Hazard Communication Program**	**10/27/2003**
HS061	**Hazardous Waste Operations and Emergency Response**	**2/06/2004**
HS062	**Hazardous Waste Operations (RCRA)**	**5/22/2008**
HS090	**OSHA Regulatory Inspections**	**4/24/2002**
HS091	**Reporting of Fatality or Multiple Hospitalization Incidents**	**4/24/2002**
HS100	**Medical Policies and Procedures**	**3/21/2008**
HS101	**Drug and Alcohol Testing**	**12/19/2008**
HS102	**Management of Associate Exposure and Medical Records**	**4/24/2002**

HS104	**Employee Notification of Industrial Hygiene Monitoring Results**	**4/24/2002**
HS106	**First Aid Kits**	**9/26/2002**
HS300	**Confined Spaces**	**10/31/2008**
HS301	**Fall Protection**	**9/26/2002**
HS302	**Ladder Safety**	**5/06/2009**
HS303	**Pressurized Water Cleaning and Cutting Equipment**	**5/06/2009**
HS304	**Compressed Gas Cylinders**	**4/25/2002**
HS306	**Handling Compressed Gas Cylinders with Unknown Contents**	**2/13/2004**
HS307	**Excavation and Trenching**	**2/13/2004**
HS308	**Underground/Overhead Utility Contact Prevention**	**2/20/2006**
HS309	**Underground Storage Tank Removal**	**2/13/2004**
HS312	**Electrical Safety**	**2/13/2004**
HS313	**Fire Protection**	**2/13/2004**
HS314	**Hot Work in Hazardous Locations**	**2/13/2004**
HS315	**Control of Hazardous Energy Sources**	**2/13/2004**
HS316	**Drill Rig Operations**	**2/13/2004**
HS317	**Unexploded Ordnance (UXO)**	**3/28/2008**
HS400	**Working in Hot Environments**	**5/06/2009**
HS401	**Cold Stress**	**2/11/2004**
HS402	**Hearing Conservation Program**	**4/25/2002**
HS403	**Fatigue Management**	**8/23/2010**
HS500	**OSHA Regulated Toxic and Hazardous Substances**	**2/13/2004**
HS501	**Cadmium Compliance Plan**	**2/13/2004**
HS502	**Lead Compliance Plan**	**4/25/2002**
HS503	**Benzene Compliance Plan**	**6/04/2008**
HS504	**Asbestos Compliance Plan**	**2/09/2004**
HS505	**Hexavalent Chromium Protection**	**6/09/2008**
HS512	**Handling of Blood or Other Potentially Infectious Material**	**4/25/2002**
HS600	**Personal Protective Equipment**	**3/17/2008**
HS601	**Respiratory Protection Program**	**4/25/2002**
HS700	**Policy & Guidance For Developing Radiation Protection Plans**	**4/22/2008**
HS800	**Motor Vehicle Operation: General Requirements**	**10/28/2009**
HS810	**Commercial Motor Vehicle Operation and Maintenance**	**7/12/2005**
HS811	**Compliance Requirements for DOT's Emergency Response Telephone Number**	**2/19/2007**
HS820	**Forklift Operation**	**2/13/2004**
HS822	**Crane Operations**	**4/25/2002**
HS823	**Rigging & Lifting**	**7/18/2002**

Appendix C

Community Air Monitoring Plan

Shaw Environmental & Infrastructure Engineering of New York, P.C.

13 British American Boulevard
Latham, NY 12110-1405
518.783.1996
Fax 518.783.8397

COMMUNITY AIR MONITORING PLAN (CAMP)
OFF-SITE INVESTIGATION

253 Osborne Road Site
Loudonville, Albany County, New York

Site Number 401056
Spill Number 07-02543
Contract Work Authorization (WA) Number: D006132-19

Shaw Project No.: 134685.19

March 2011

Prepared for

Mr. Christopher O'Neill, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation Region 4
1130 N. Westcott Road
Schenectady, New York 12306-2014

Prepared by

Shaw Environmental & Infrastructure Engineering of New York, P.C.
13 British American Boulevard
Latham, New York 12110-1405

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1.0 Introduction

Shaw Environmental & Infrastructure Engineering of New York, P.C. (Shaw) has prepared this site specific Community Air Monitoring Plan (CAMP) for the 253 Osborne Road site located in Loudonville, Albany County, New York (site). (**Figure 1, Site Location Map**). As discussed in the New York State Department of Health (NYSDOH) Generic CAMP (**Appendix A**), a CAMP requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection (which is addressed w/Shaw's Health & Safety Plan (HASP)). Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

1.1 Site Description / Remedial History

The site consists of an approximate 0.9 acre parcel formerly containing a strip mall of retail tenants, including a dry cleaner. On-site investigative and remedial work has occurred from 2003 to 2008, under New York State Department of Environmental Conservation (NYSDEC) Spill Program oversight, and from 2008 to present under NYSDEC Remedial Program oversight via an independent Order of Consent. Tetrachloroethene (perc, PCE), a typical historical dry cleaning agent, and its degradation chemicals have been found both on-site and off-site, at the immediately down-gradient multi-use retail property.

The most recent previous owner (Osborne Road Associates, LLC, "the LLC") and the NYSDEC, in cooperation with the NYSDOH, executed an Order on Consent in 2008, to address on-site investigative and remedial work associated with the demolition of the existing building, removal of additional perc-contaminated soils, construction of new commercial building, continued site management, and associated citizen participation. The off-site work was left to future negotiations, whereby the LLC refused to pursue off-site investigative work and could not negotiate the installation and operation of an off-site soil vapor intrusion (SVI) mitigation system on the adjacent property. (The off-site SVI mitigation was agreed to between the LLC and

NYSDEC, but not formalized in an Order, as an alternative to continued off-site SVI monitoring.)

Follow up work for the down-gradient properties was detailed in the January 11, 2011 Cost Estimate / Work Authorization (WA) issued by the NYSDEC to Shaw. Supporting documents referenced in this work plan include Shaw's Field Activities Plan (FAP), Quality Assurance Project Plan (QAPP, both submitted to the NYSDEC in December, 2008) and a Site Specific HASP.

1.2 Scope of Work

Existing sampling data indicates the presence of PCE, a typical historical dry cleaning agent, and its degradation chemicals both on-site and off-site, at the immediately down-gradient multi-use retail property at concentrations above pertinent NYSDEC regulatory guidance levels. The intent of this investigation is to further delineate the extent of off-site impacts to the soil, groundwater and soil vapor from the site as well as to determine the need for groundwater and/or soil vapor intrusion monitoring and/or mitigation for off-site properties (in particular the adjacent multi-use retail building). The scope of work for this investigation includes the advancement of 11 borings that will be completed as monitoring wells and a total of six permanent soil-vapor monitoring points installed in the area down-gradient of the site at the locations shown on the attached site map (**Figure 2**).

This site specific CAMP will be implemented during the completion of any site assessment activities involving the installation of soil borings, monitoring wells or soil vapor monitoring points. It outlines the air quality monitoring procedures that will be followed to protect the downwind community (i.e. offsite receptors, including residents and workers) from potential airborne contaminant releases that may result from the site assessment activities. It is consistent with and directly paraphrases the NYSDOH CAMP (which is included as **Appendix A**).

1.3 Project Purpose and Objectives

The principal purpose of the site specific CAMP is to monitor air quality in the vicinity of the proposed soil borings and wells. No remediation or earth moving activities are planned during this phase of work. The site specific CAMP requires the monitoring of dusts and vapors on both a periodic and continuous basis.

Continuous monitoring will be conducted for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells. Only soil borings and monitoring wells will be installed during this phase of the project.

Periodic Monitoring for VOCs is required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. " Periodic" monitoring during sample collection will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or monitoring during well baling/purging, and taking a reading prior to leaving a sample location.

Monitoring of this project will include all standard monitoring functions for environmental remediation projects including real-time air monitoring for particulate matter/dust and VOCs, observations for visible emissions and odors, inspection and monitoring of the contractor's work practices, and reporting to the NYSDEC and the NYSDOH.

VOC Monitoring, Response Levels, and Actions

VOCs will be monitored at the downwind perimeter of the immediate work area (i.e., the boring location) on a continuous basis or as otherwise specified. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations which will be compared to the levels specified below and in the NYSDOH Generic CAMP (**Appendix A)**.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work

activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less – but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shut down.
4. All 15-minute readings will be recorded on a field sheet or dedicated log book and will be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the up wind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. These locations will be determined in consultation with the NYS DEC/NYSDOH personnel. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed as detailed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
2. The dust suppression technique that will be employed during assessment activities will include wetting of the drilling equipment, cuttings and/or general work area. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind

PM-10 particulate concentration to within 150mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings will be recorded in a dedicated log book or field sheet and will be available for State (NYSDEC and NYSDOH) and County Health personnel to review.

FIGURES

DRAWING NUMBER	APPROVED BY	CHECKED BY	DRAWN BY	DESIGNED BY	DATE	OFFICE
134685-019A1	MF	MF	MJS	MF	02/14/11	LATHAM, NY

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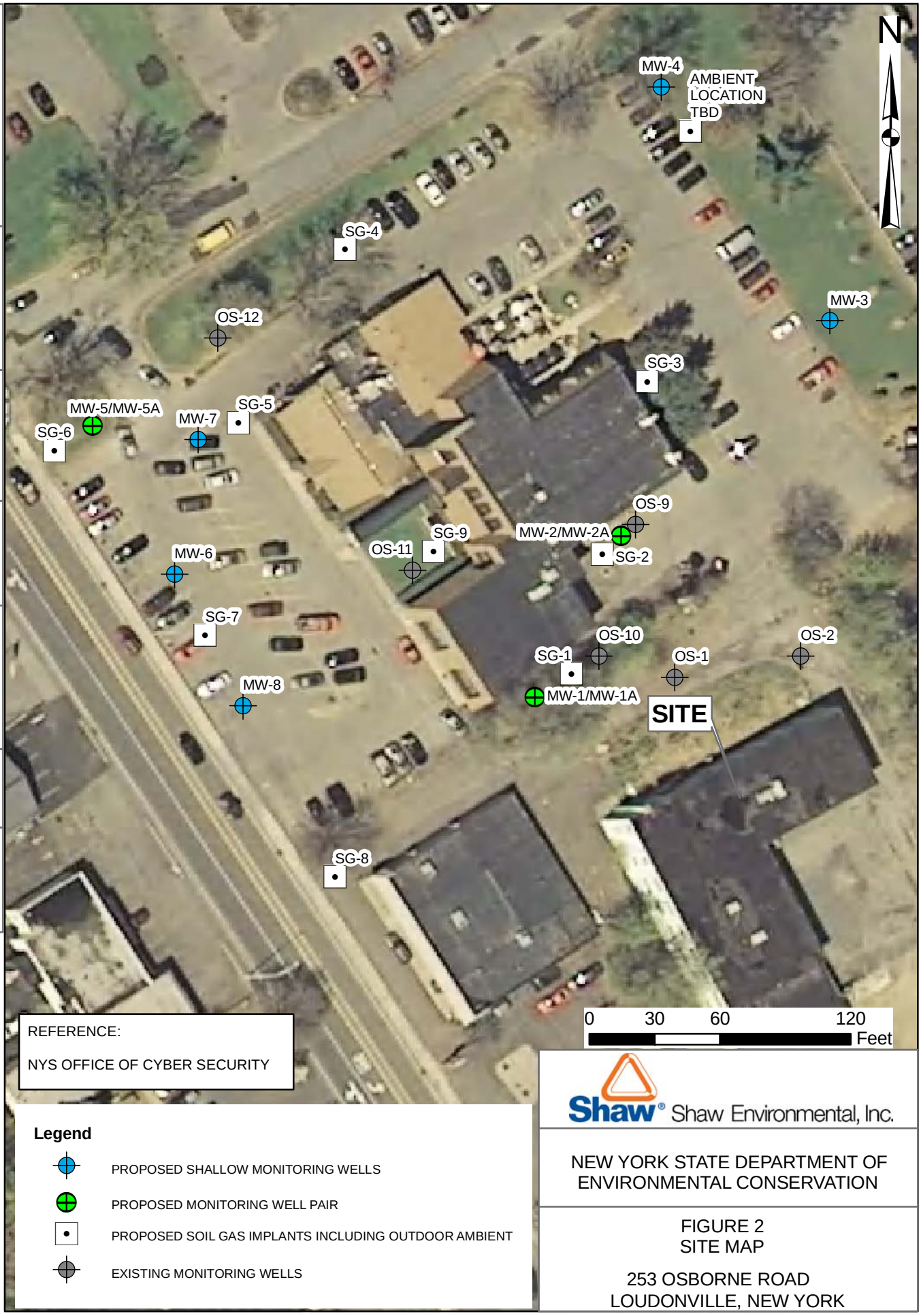
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 1
SITE LOCATION MAP

253 OSBOURNE ROAD
LOUDONVILLE, NEW YORK

L:\Matt\DEC-GIS\019 - OSBOURNE RD\134685-019A1.mxd
matt.sausville



DRAWING NUMBER	APPROVED BY	CHECKED BY	DRAWN BY	DESIGNED BY	DATE	OFFICE
134685-019A2	DS	RA	MJS	MF	03/31/11	LATHAM, NY

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 2
SITE MAP

253 OSBORNE ROAD
LOUDONVILLE, NEW YORK

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APPENDIX A

NYSDOH Generic Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50° C (14 to 122° F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

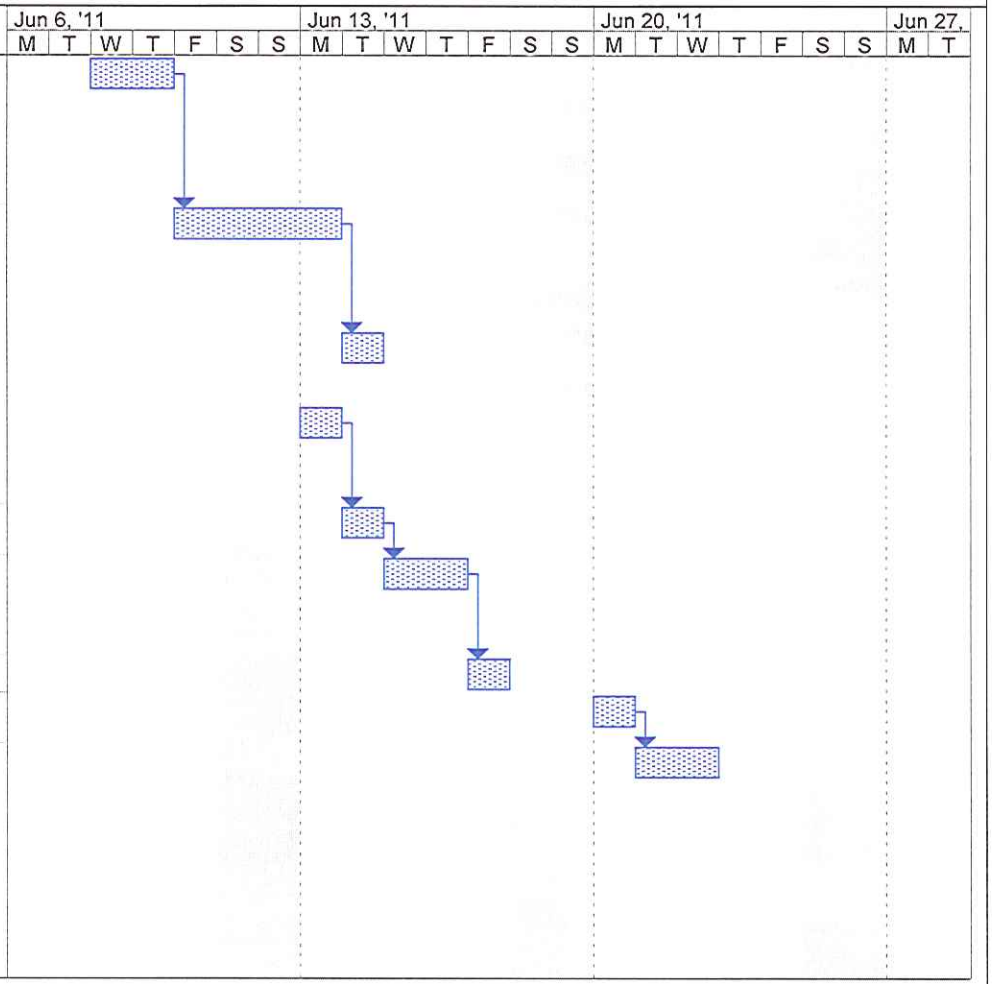
(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

253 Osborne Road Site Proposed Schedule 2011
Site No. 401056
Work Authorization (WA) D006132-19

ID	Task Name	Duration	Start	Finish
1	Site Mobilization, Hand Clearing of 20 proposed subsurface location (Monitoring Well (Pairs) and Soil Gas). Dumpster for Hand Clearing near SG-2 should be moved at this time.	2 days	Wed 6/8/11	Thu 6/9/11
2	Installation of MW-1 and MW-1A (Side of Sweet Treats in alley). **The duration will be according to subsurface conditions. The installation of well pairs remains TBD.	2 days	Fri 6/10/11	Mon 6/13/11
3	Installation of MW-2 and MW-2A (Location Near Dumpster behind Sweet Treats).	1 day	Tue 6/14/11	Tue 6/14/11
4	Installation of MW-2 and MW-2A (Location Near Dumpster behind Sweet Treats). **The duration will be according to subsurface conditions.	1 day	Mon 6/13/11	Mon 6/13/11
5	Installation of MW-3 and MW-4 (Back of property in grass).	1 day	Tue 6/14/11	Tue 6/14/11
6	Installation of MW-5 and MW-5A (Northwest portion of property, near entrance). **The duration will be according to subsurface conditions.	2 days	Wed 6/15/11	Thu 6/16/11
7	Installation of MW-7 (Front of Jeweler).	1 day	Fri 6/17/11	Fri 6/17/11
8	Installation of MW-6 and MW-8 (Front of property in parking lot).	1 day	Mon 6/20/11	Mon 6/20/11
9	Installation of 9 Soil Gas points, each point will take approx. 2 hours to be completed. SG-3, 4, 5, 9 shall be completed during the morning hours as to minimize impacts to businesses. *NOTE - Drill Rig operations to last for approx. 13 Business Days.	2 days	Tue 6/21/11	Wed 6/22/11
10				



Project: 253 Osborne Road
Date: Thu 6/2/11

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline

10

* NOTE: Review of geologic logs generated at adjacent site indicates that not all well pairs will be necessary. Drilling may begin at MW5/5A to confirm site geology.