Professional Engineer Certification

Certification

I, John V. Soderberg, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation. (DER-10)

10/4/14

John Soderberg, P.E

Signature

SEAL:

NYS P.E License No.: 049975

Dated: October 1, 2014

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October 1, 2014

Ms. Jamie Verrigni
New York State Department of Environmental Conservation
Division of Environmental Remediation Bureau C
21 South Putts Corners Road
New Paltz, New York 12561-1696

Re: **Rose Cleaners** **Supplemental Boring/Bedrock Well Work Plan**
500 Lexington Avenue Voluntary Cleanup and Remediation
Mt. Kisco, New York Supplemental Investigation

Dear Ms. Verigni:

Introduction

The following Work Plan has been developed to address comment (# 6) issued in the April 02, 2014 letter provided by the New York Department of Environmental Conservation (NYSDEC) in response to the Supplemental Remedial Investigation Report (SRIR January 2014) issued by John V. Soderberg (JVS). Based upon the Department's comment letter the following Work Plan proposes the installation of bedrock wells in order to fully delineate the nature and vertical extent of chlorinated contamination discovered during the remedial investigation (SRIWP). Additional borings are also being proposed in order to address the nature and horizontal extent of groundwater contamination within the overburden. Please see below.

Site History

Recent investigation data derived during the SRIWP has indicated the need for additional off-site vertical delineation of chlorinated contamination. A majority of the contamination discovered is located down gradient from the former source area and consists of PCE (tetrachloroethene). PCE concentrations in groundwater at 10' bgs were found as high as 350,000 ppb, approximately 100 feet down gradient of the northern property boundary. PCE concentrations in this same area are in the range of 180,000 ppb at 22' below grade. During field activities samples beyond 22' were not able to be obtained due to bedrock refusal. Minor contamination above regulatory standards was also found on the western and northeastern edge of the plume which require further delineation. The purpose of this Work Plan is to establish the vertical extent of chlorinated contamination beyond a depth of 22' bgs and further delineate the north-eastern and western edge of the plume.

Scope of Work

The following work plan proposes the installation of five (5) bedrock monitoring wells in order to delineate the nature and vertical extent of chlorinated contamination discovered down gradient (off-site) from the Rose Cleaners site. Bedrock monitoring wells will be installed in a phased approach based upon the sampling results.

An air rotary/hammer drill rig will be used to install a ten (10") diameter steel length of casing to approximately 20' bgs (top of bedrock). This extra preventative measure will be taken in order to reduce the potential for DNAPL draw down into the bedrock aquifer. The intent of the 10" outer casing is to seal the DNAPL in the overburden, preventing it from reaching the bedrock aquifer; although this can not be guaranteed. A 6" diameter steel inner casing will be installed within the 10" outer casing and grouted into the bedrock a minimum of 10 ft into competent rock (30 ft below grade). This casing will then be grouted in place and let set overnight. The following day the bottom of the grouted 6" casing will be drilled out with a 4" borehole to approximately 40 ft bgs. A two inch (2") PVC well will be installed inside the casing to 40 ft.and will consist of ten feet (10') of 2" diameter, .02" PVC slot screen. The riser portion will then be grouted inside the 4" bore hole / 6" steel casing, finishing the triple-cased well to grade. A flush mounted manhole cover will finish each well at grade surface. It should be noted that all information contained above, with regard to drilling bedrock wells, has been provided by JVS's sub-contractor (Salomone Bros.) and that Salomone Bros. has stressed to JVS that draw down of DNAPL is still possible despite the over precautionary measures to prevent such. Please see Figure-1 for the intended bedrock well locations. Figure-2 illustrates the well construction details.

Depth to water in the proposed work area is anticipated to be between 8-10' bgs. based on prior investigation activities. Groundwater extends down to the surface of the bedrock, which is approximately 20' bgs. During the installation of the bedrock wells we anticipate encountering groundwater in the shallow unconsolidated bedrock. If groundwater is not encountered from 20-40' bgs the drilling will not continue vertically as the likelihood of contamination percolating through the bedrock fractures is very minimal based on the fact that groundwater has not penetrated through the fractured rock.

Supplemental Sampling Locations

As per the findings from the Supplemental Investigation Work Plan (SIWP) additional groundwater borings (temporary monitoring wells) are proposed in order to delineate groundwater contamination discovered at the west and northeastern sides of the plume. One (1) additional boring is proposed east-northeast of the former GW-26 location along the eastern edge of the plume and three (3) additional borings on the western boundary of the plume in order to delineate the lateral contamination. See Figure-1 for the proposed boring locations.

Groundwater sampling will be conducted using a Geoprobe direct push sampling rig equipped with a mill-slotted well and/or a screen point 15 sampling tool. Based upon previous field investigations sampling depths are anticipated to be from 10-12', 15-17' and 20-22' or until bedrock is encountered. For temporary well sampling EPA low flow procedures will be executed. Low flow procedures help

to isolate the screened interval water from the overlying stagnant casing water allowing for most of the sample water to be drawn directly from the adjacent formation. Typical flow rates consist of collecting groundwater at a flow rate of 0.5- 1.0 Liters per minute. Since tetrachloroethene is a dense non-aqueous fluid, groundwater grab samples will be collected from the bottom of the mill slotted screen. JVS will lower a new poly tube through the probe rods (very slowly) to the bottom of the slotted screen in order to purge and sample groundwater using a peristaltic pump with the flow rate mentioned above. The groundwater is then extracted through the polyethylene tubing by a peristaltic pump until 3 to 5 times the approximate volume in the probe rod has been purged. The retrieved samples will be placed in laboratory supplied analyte free 40 ml vials. The samples will be stored in a cooler containing ice to maintain a temperature of 4º Celsius and delivered under strict chain-of-custody to a NYSDOH ELAP-certified laboratory providing Category B deliverables for validation. Purged development water will be contained in a DOT approved 55 gallon drum. Upon completion of the project a liquid sample from the drum(s) will be analyzed for disposal by an NYSDOH ELAP-certified laboratory.

To ensure quality control, one (1) field blank will be collected per 20 samples by rinsing the field equipment with organic-free water and submitting the rinse water in standard sample containers to a certified laboratory for analysis by TCL VOCs by EPA Method 8260C and TICs. One trip blank sample will be collected per sampling day and will be analyzed for the same parameters as the field blank sample. A Matrix Spike/Matrix Spike Duplicate (MS/MSD) will also be collected at a rate of one per 20 water samples.

Monitoring and Sampling

Development and sampling of the bedrock monitoring wells will take place a minimum of 48 hours after their completion in order to give the grout sufficient time to cure. During development activities EPA low flow sampling procedures will be followed which involves the use of a low-flow submersible pump that will be used to remove a minimum of five (5) wellbore volumes of water. Groundwater properties such as dissolved oxygen (D.O), turbidity, pH, oxygen reduction potential (ORP) and temperature will be analyzed and recorded prior to sample collection. Depth to water (DTW) and the total depth of the well will also be measured and recorded during the sampling procedure.

Initially two (2) rounds of samples will be collected in order assess groundwater conditions and the need for additional well installations and monitoring. Samples will be collected and analyzed by EPA method 8260C for the presence of Volatile Organic Compounds (VOCs). Depth to groundwater and the degradation parameters mentioned above will be recorded during each event. EPA low flow sampling procedures will be followed in order to minimize draw-down within the well. The retrieved samples will be placed in laboratory supplied analyte free 40 ml vials. The samples will be stored in a cooler containing ice to maintain a temperature of 4º Celsius and delivered under strict chain-of-custody to a NYSDOH ELAP-certified laboratory providing Category B deliverables for third party

validation. Purged development water will be contained in a DOT approved 55 gallon drum. The lab data gathered from the newly installed bedrock wells will be included in the on-going quarterly monitoring and sampling analysis report. The quarterly report will be issued to the Department to document the findings from the sampling activities. Lab data will also be tabulated into spreadsheets for review.

Health and Safety

The Health and Safety plan (HASP) employed during the conduct of the Supplemental Remedial Investigation Work Plan (SRIWP) will be used for this work plan.

Community Air Monitoring Plan

The Community Air Monitoring Plan deployed during the conduct of the SRIWP will be used for this work plan.

Project Schedule

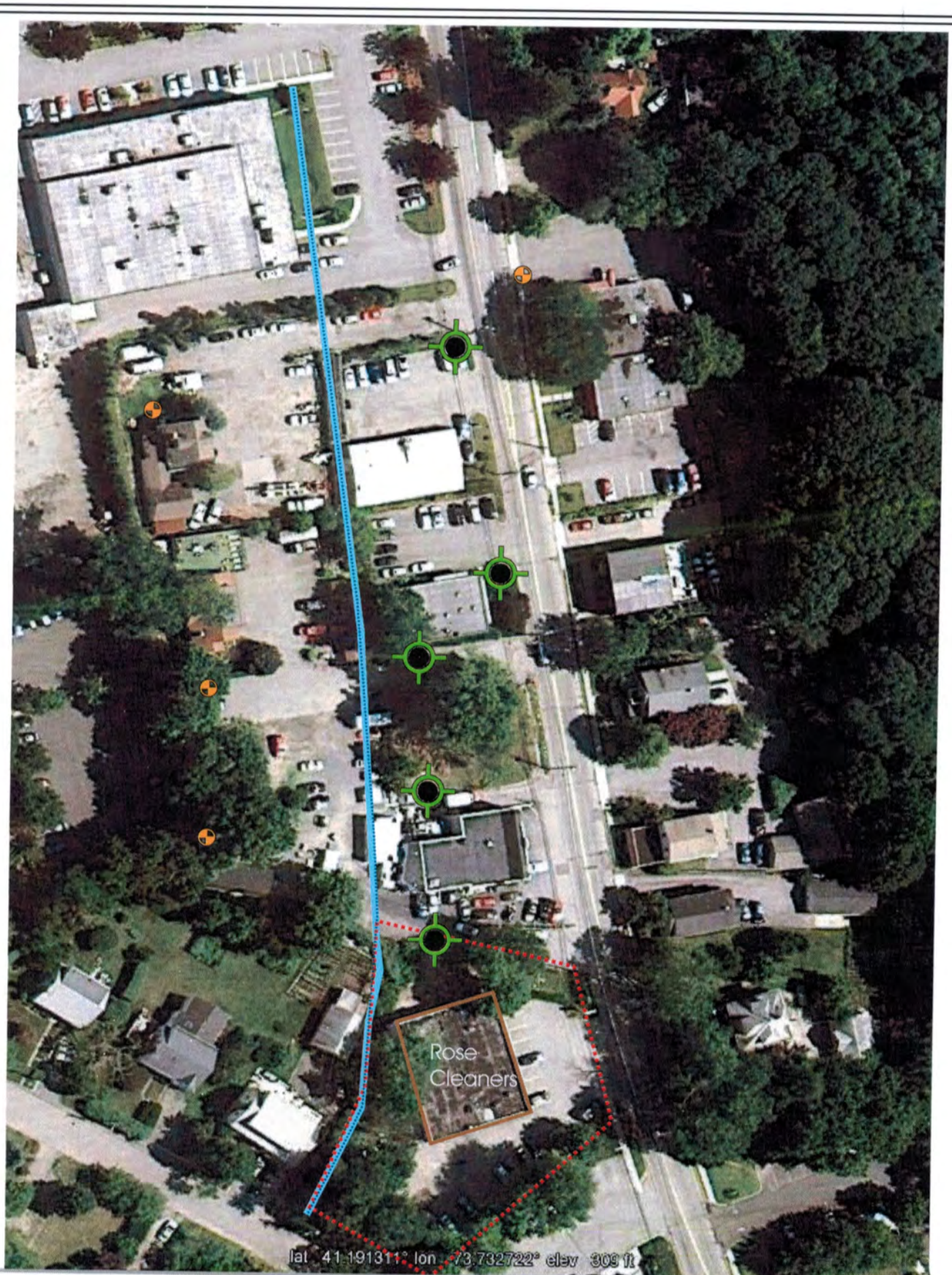
Mobilization to perform the above mentioned work will mainly depend upon access agreements. Multiple property owners will have to be contacted in order to receive permission to perform the work. Altogether as much as four (4) to five (5) properties will have to be contacted in order to gain access to perform the work. Once access agreements are achieved JVS and sub-contractors will be prepared to mobilize within two (2) weeks of approved access.

Sincerely,

John V. Soderberg P.E

cc: Walter Berninger (BEI)
Justin Halpin (BEI)

enc. Figure-1 (Well/Sample Locations)
Figure-2 (Proposed Bedrock Well Construction)



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Supplemental Boring and Bedrock Well Locations

Site: Rose Cleaners
Location: 500 Lexington Ave. Mt. Kisco, NY
Site #: 3-60-059
Index #: W3-0978-03-12

Figure-1

Color Scale estimated using limited historic GW data
>100,000ppb > 1,000ppb > 100ppb ≤ 100ppb ≤5 ppb

Proposed Bedrock Well Locations
Supplemental Sampling Locations

Scale 1"= 95'

N W E S

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Well Log

Figure-2

Project: Rose Cleaners
Client: Leonard Rose
Location: Mt. Kisco, NY
Well No: TBD **Use:** Monitoring/ Sampling
Drilling Method: Air rotary
Casing Type: Steel/PVC **Casing Dia:** 10", 6", 2" **Casing Length:** 20', 30'
Screen Type: PVC **Screen Dia:** 2" **Screen Length:** 10'
Screen Slot: .02" **Gravel Pack:** #2 Fil-pro
Casing Seal: Grout/Cement **Finish:** Cement flush

Date: TBA
Be Job No:
Driller: Salomone Bros.
Bore Hole Dia: 10"
Sample Method: N/A
Depth to Water: 4'
Total Depth: 41'
Security: Flush Mounted Manhole

Depth Below Grade	Sample Information	Well Design	Identification/Remarks
0			
			DTW
10			
	(30') of 2" PVC riser		10" steel outer casing
20	bedrock		casing grout seal
			6" steel inner casing
30			
			(10') of 2" PVC .02" slot screen
40			
			(1') DNAPL Sump