

## ROSS ENVIRONMENTAL ASSOCIATES, INC.

Hydrogeology, Water Quality, GIS Planning,  
Contaminant Fate & Transport, Remediation,  
Regulatory Compliance & Radon Mitigation



31 December 2009

Ms. Annie Robichaud  
Redhawk Environmental Consulting, Ltd.  
2845 Hale Hollow Rd.  
Bridgewater Corners, VT 05035

RE: *SVE Install Status Report and Additional Work Update*  
*Clegg Residence – Wolcott, VT (Claim # 403311430)*

Dear Ms. Robichaud:

Ross Environmental Associates (**R.E.A.**) has completed the additional work and installation of the Soil Vapor Extraction (SVE) system at the Clegg residence located in Wolcott, VT (**Figures 1 & 2**). The work is intended to evaluate and remediate the potential presence of sub-slab/sub-surface vapors in the vicinity of the basement bulkhead area and northwest corner of the concrete slab/footer wall. Additional work may be necessary to fully address site conditions and recommendations outlined in the previous site investigations and response letters from the VT DEC. The work was completed as outlined in the **R.E.A.** Revised Work Plan and Cost Estimate dated 3 September 2009. All of the work was completed in accordance with state guidelines following current industry standards. The findings of the SVE installation activities are outlined below. Photographs obtained during the SVE installation are attached.

### Findings

The findings of the most recent work activities are summarized as follows:

- On 17 September 2009, **R.E.A.** provided oversight for the installation of one sub-surface/sub-slab soils vapor extraction point in the vicinity of the bulkhead and adjacent to the concrete footer along the western side of the residence.
- On 9 October 2009, **R.E.A.** personnel used a Photo-ionization detector (PID) to screen all areas inside of the residence for the possible presence of Volatile Organic Compounds (VOC's). PID readings of ambient air within the residence were all 0.0 ppm. PID readings from within the expansion joint crack in the basement of the residence ranged from 0.5 to 71.3 ppm. PID readings of the one-inch vapor point (VP-1) were 0.0 ppm and PID readings of the two-inch vapor point (VP-2) were 2.8 ppm. PID readings of the exterior roof drain cleanouts were all 0.0 ppm.
- On 9 October 2009, **R.E.A.** personnel installed a 0.5-hp ROTRON® Regenerative Blower to the two onsite vapor points located on the western side of the residence (VP-1 and VP-2).
- On 26 October 2009, **R.E.A.** personnel turned the SVE system on. Influent PID readings immediately following system startup were 1.3 ppm. Effluent PID readings immediately following startup were 2.2 ppm. PID readings of the influent and effluent of the SVE system on each of the three subsequent O & M site visits have been below 1.0 ppm.

### Recommendations

Available information indicates that low levels of residual petroleum contamination are present in soils at the edge of the basement footer wall and beneath the northwest corner of the concrete floor. At this time, the overburden groundwater formation at the site does not appear to have been significantly impacted by petroleum contamination. Low concentrations of migrating petroleum vapors from beneath the concrete basement floor have been neutralized during the interior cleaning and Biosolve™ application, however; the

(OVER)

potential for future impacts to indoor air continue to exist while preferential pathways (expansion joint) remain open. Based on the findings of this work, **R.E.A.** recommends the following:

- All identified vapor pathways, specifically, the expansion joint crack(s) on the west and east sides of the basement floor, should be sealed with a VOC compliant, self leveling professional grade expansion joint sealant.
- The SVE system should continue to operate and **R.E.A.** personnel should continue to screen the influent and effluent of the SVE system with a PID for the possible presence of VOC's during routine bi-weekly O & M site visits. A synopsis of the PID screening results will be presented at the end of the four month period at which time continuation of the system, additional work or possible site closure will be evaluated.
- **R.E.A.** will collect a confirmatory sample of sub-surface air through the sample point installed by the effluent port of the blower. The sample will be collected by utilizing a tedlar bag. The air sample will be screened for petroleum compounds via EPA method TO-1.

### Vapor Point Installation

On 17 September 2009, **R.E.A.** provided oversight for the installation of one sub-surface/sub-slab vapor extraction point in the vicinity of the bulkhead and adjacent to the concrete footer along the western side of the residence. The approximate location of VP-2 is noted on **Figure 3** in Attachment A. The vapor point (VP-2) was extended to a depth of approximately nine feet below ground surface (bgs), which is approximately one foot below the concrete foundation footer. A hollow stem auger was used in order to prevent the potential for cave in and provide a larger hole to properly construct the vapor point. VP-2 was constructed with flush-threaded 2.0-inch-diameter schedule 40 PVC riser and the screened section of the vapor point was constructed of two-inch stainless steel V-Wire screen to enhance sub-surface air movement. The screened section extended approximately one foot below the concrete foundation footer. The vapor point screen was surrounded by a coarse sand pack extending approximately one to two feet above the top of the screened interval. A one to two foot bentonite seal was set on top of the sand pack to minimize possible infiltration of overland run-off along the PVC riser. The riser was extended above grade to accommodate connection to the Soil Vapor Extraction (SVE) system.

### Indoor Air Screening

On 9 October 2009, **R.E.A.** personnel used a Photo-ionization detector (PID) to screen all areas inside of the residence for the possible presence of Volatile Organic Compounds (VOC's). Prior to screening, the homeowner was asked to close all windows and doors to the residence in the days preceding the investigation to simulate seasonal conditions. **R.E.A.** noted that all visible openings to the home were closed. PID readings of ambient air within the residence were all 0.0 ppm. PID readings from within the expansion joint crack in the basement of the residence ranged from 0.5 to 71.3 ppm. PID readings of the one-inch vapor point (VP-1) were 0.0 ppm and PID readings of the two-inch vapor point (VP-2) were 2.8 ppm. PID readings of the exterior roof drain cleanouts were all 0.0 ppm.

Following the indoor air screening, **R.E.A.** evaluated the basement for potential preferential pathways for the risk of vapor intrusion from residual petroleum contamination located beneath the slab. Additionally, an inventory of potential VOC sources within the basement was developed and can be found in Attachment B. One new miscellaneous plastic bottle containing a small amount of what was observed to be #2 fuel oil was noted uncovered in the basement of the residence. All other items noted in the inventory were found to be sealed in good condition in appropriate storage containers.

### SVE System Installation and Start up

On 9 October 2009, **R.E.A.** personnel connected the vapor points (VP-1 and VP-2) with solid PVC piping to a 0.5-hp ROTRON® Regenerative Blower that was installed outside in the vicinity of the basement bulkhead and adjacent to the west wall of the residence. The 0.5-hp ROTRON® Regenerative Blower is equipped with a dual connection inline filter and a muffler assembly. A weatherproof outdoor storage unit was constructed to house the entire system. Baraw Electric of Newport, Vermont hardwired the SVE system to the electric system of the residence by installing a ground-fault circuit interrupter (GFCI) outlet on the exterior wall on the north side of the residence. A vapor monitoring point was installed at the influent and effluent point of the system and a sample point was installed at the effluent port of the blower for possible collection of air samples at a later date.

On 26 October 2009, **R.E.A.** personnel turned the SVE system on. Influent PID readings immediately following system startup were 1.3 ppm. Effluent PID readings immediately following startup were 2.2 ppm. PID readings of the influent and effluent of the SVE system on each of the four subsequent O & M site visits have been below 1.0 ppm. Based on an evaluation of PID readings, the need for treatment of effluent vapors via a granulated activated charcoal (GAC) drum was deemed not necessary at this time. Treatment of volatile organic compounds by carbon adsorption will continue to be evaluated during future O & M site visits.

\*\*\*\*\*

Please call me if you have any questions or concerns regarding the enclosed data.

Sincerely,

***Ross Environmental Associates, Inc.***

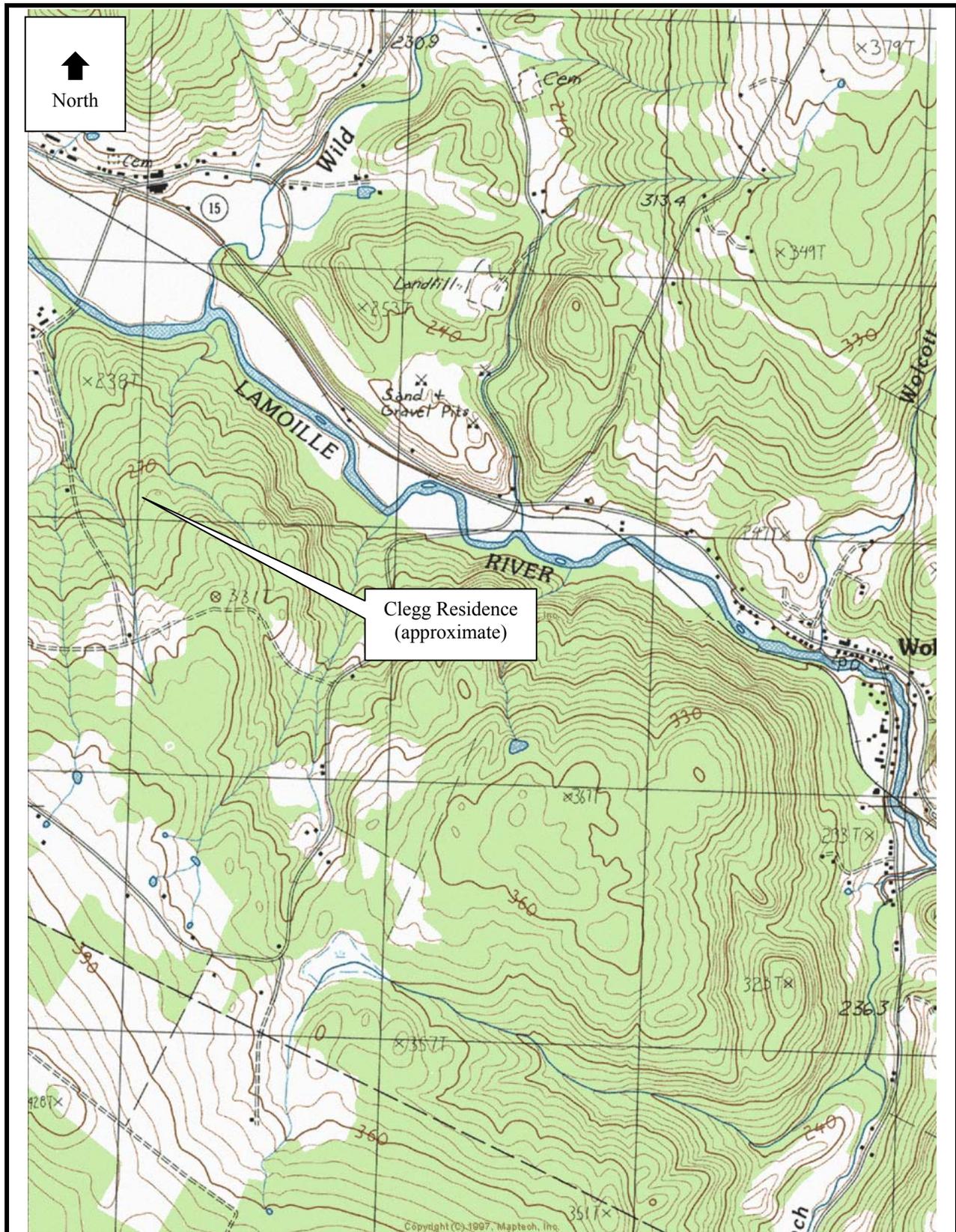
James A. Rose  
Project Scientist

Enclosures

cc. Mr. John Clegg  
Mr. John Diego - LBG, Inc. (via e-mail)  
Mr. Ashley Desmond - VT DEC (via e-mail)

Jar/ref: 28050R02

**A  
T  
T  
A  
C  
H  
M  
E  
N  
T  
A**

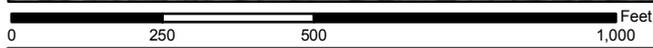


Approximate Scale: 1 inch = 1,200 feet

Site Coordinates: 44° 33' 17.55" N, 72° 29' 80.60" W

Source: USGS 1986. Wolcott Quadrangle, VT.  
 Topographic map (7.5 minute series).  
 Provisional Edition 1986. Maptech, Inc. 1998.  
 R.E.A. Project No. 28-050

**Figure 1**  
 Site Location Map  
 Clegg Residence  
 Wolcott, Vermont



Site Coordinates: 44° 33' 17.55" N 72 ° 29' 80.60" W

**Legend**

-  Private Wells
-  Roads

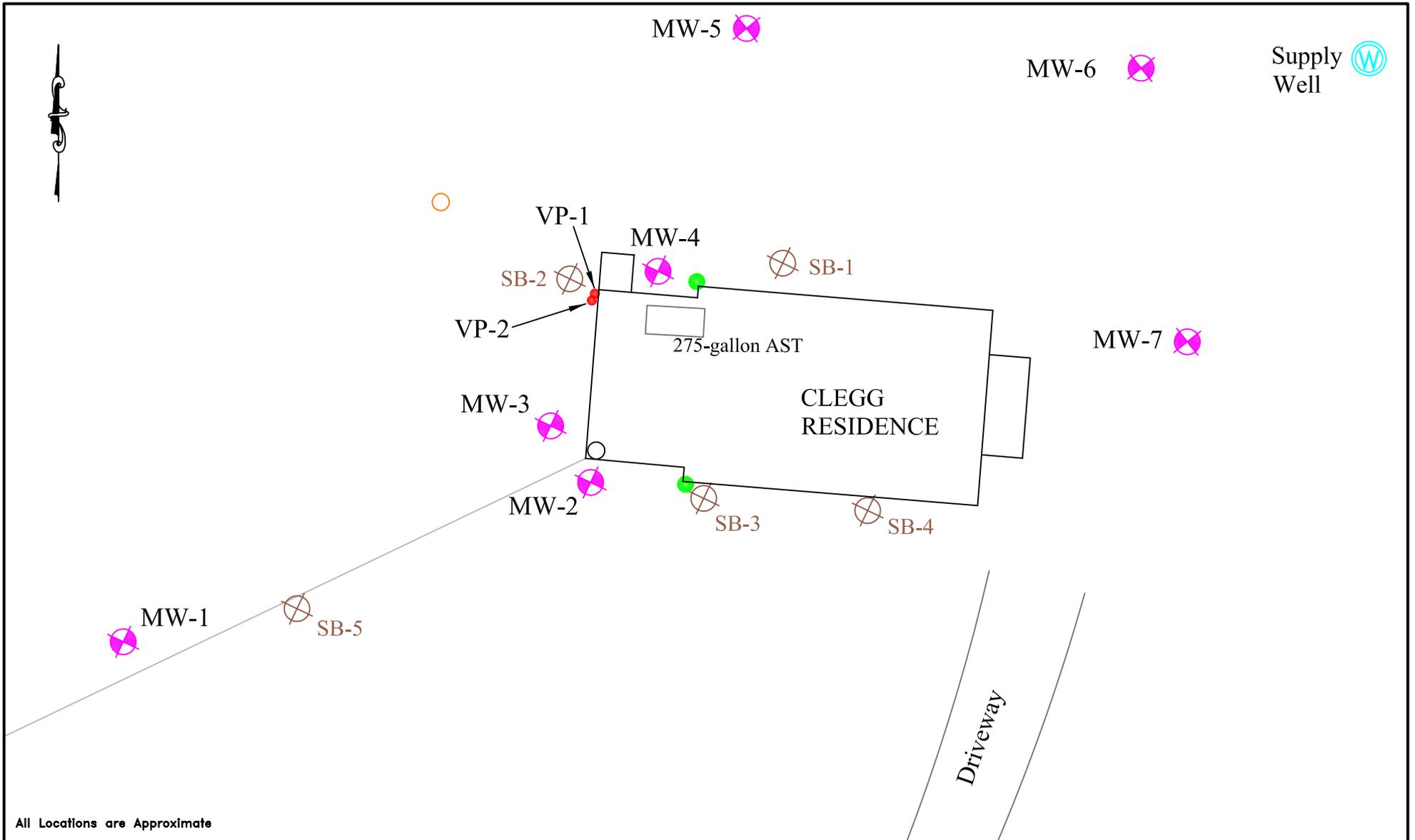
Aerial Photo: NAIP 2003

Private Well Data: Extracted and downloaded from the State of Vermont ANR Well Locator.  
[http://maps.vermont.gov/imf/sites/ANR\\_WSWelldriller/jsp/launch.jsp](http://maps.vermont.gov/imf/sites/ANR_WSWelldriller/jsp/launch.jsp)

**Figure 2**  
**Private Wells within 1,000 Foot Radius**  
**Clegg Residence**  
**Wolcott, Vermont**

F:\Projects\28050\PDFs\Figure 2.pdf  
 F:\Projects\28050\GIS\_Wells\Map.mxd





All Locations are Approximate

<b>Scale:</b> 1" = 20'	<b>Date:</b> 15 January 2009	<b>Legend:</b> <ul style="list-style-type: none"> <li> Monitoring Well Location</li> <li> Soil Boring Location</li> <li> Supply Well Location</li> <li> Septic Tank Cover</li> <li> Drainpipe Outfall</li> <li> Vapor Point</li> <li> Top of Perimeter Drainpipe</li> </ul>	<b>FIGURE 3.</b> <b>SITE PLAN</b> (with monitoring well & vapor point locations)  Clegg Residence Wolcott, Vermont
<b>File Name:</b> 28-050	<b>Drawn By:</b> MBM		
 <b>Ross Environmental Associates, Inc.</b> P.O. Box 1533 Stowe, Vt 05672 (802) 253-4280			

**A  
T  
T  
A  
C  
H  
M  
E  
N  
T  
B**

**TABLE 1**  
 Inventory of Products Containing VOCs  
 October 9, 2009  
 Clegg Residence (Basement)  
 Wolcott, Vermont

<b>Name of Product</b>	<b>Container size</b>	<b>VOC concentration</b>	<b>Quantity</b>
misc. #2 fuel oil in a open plastic bottle	12 oz.	N/A	1
latex enamel paint	8 oz.	<2.0 lbs./gal.	2
Behr satin interior latex paint	1 gal.	<150 g/L	50
VM&P Naphtha paint thinner/varnish	8 oz.	<749 g/l	1
Benjamin Moore super spec exterior primer	1 gal.	N/A	2
Krylon acrylic latex enamel	32 oz.	N/A	1
Benjamin Moore latex interior primer	1 gal.	N/A	1
Benjamin Moore (MoorGlo) acrylic exterior paint	1 gal.	N/A	1
Carlton PVC solvent cement	16 oz.	<650 g/l	1
Benjamin Moore (Moorecraft) super spec latex prin	5 gal.	N/A	2
DOW Great Stuff poyurethane insulating foam	16 oz.	N/A	2
Congoleum AD-01 adhesive	1 gal.	N/A	1
Low VOC PVC primer	4 oz.	N/A	1
Krylon acrylic spray paint	12 oz.	N/A	4
Min Wax wood finish	32. oz	N/A	1



**BORING / WELL IDENTIFICATION: VP-2**

Site Name: Clegg Residence

Site Location: Wolcott, Vermont

Well Depth: 9.0'

Boring Depth: 9.0'

Installation Date: 17-Sep-09

Depth to Water (during drilling): N/A

Job Number: 28-050

Screen Diameter: 2"

Depth: 7.0-9.0'

REA Representative: Rose

Screen Type/Size: 0.01' slotted schedule 40 PVC

Drilling Company: R.E.A.

Riser Diameter: 2"

Depth: 0-7.0'

Sampling Method:

Riser Type/Size: Schedule 40 PVC

Reference Point (RP):

Depth (ft)	Sample Depth (ft)	Blows/6" and Recovery (in)	Sample Description / Notes	PID (ppm)	Well Profile	Legend
			medium sand, gravel fill. Vapor point set at 9.0' bgs.			Concrete
						Native Material
5						Bentonite
						Filter Sand
10						Riser
						Screen
						Water Level
15						
20						
25						
PROPORTIONS USED		BLOW COUNT (COHESIVE SOILS)		BLOW COUNT (GRANULAR SOILS)		NOTES:
AND 33-50%	LITTLE 10-20%	<2 VERY SOFT	8-15 STIFF	0-4 VERY LOOSE	30-50 DENSE	Pnochek
SOME 20-33%	TRACE 0-10%	2-4 SOFT	15-30 VERY STIFF	4-10 LOOSE	>50 VERY DENSE	
		4-8 MEDIUM STIFF	>30 HARD	10-30 MEDIUM DENSE		