Received 08-30-06

Shaw Environmental, Inc.
790 Marvelle Lane
Green Bay, WI 54304
920-497-8910
FAX: 920-497-8065

Shaw® Shaw Environmental, Inc.

August 29, 2006

Mrs. Kristin DuFresne
WDNR-NER/RR
2984 Shawano Ave
P.O. Box 10448
Green Bay, WI 54607-0448

Re: Remedial Design Report
Former V&L Stripping

Dear Mrs. DuFresne:

Enclosed you will find the Remedial Design Report (RDR) prepared by Shaw Environmental, Inc. (Shaw) for the Former V&L Stripping site. This report summarizes the activities conducted to date and provides detail for the proposed Soil Vapor Extraction (SVE) remediation system.

Based on the results of the SVE pilot test conducted at the site, changes to the proposed system design included in the Remedial Activities Proposal have been made, and the details of these changes are included in this report.

Should you have any questions concerning the enclosed proposal, please contact me at (920) 497-8910.

Sincerely,
SHAW ENVIRONMENTAL , INC.

Mark O. Love
Senior Project Manager

CC: Mr. Ken Juza

Shaw® Shaw Environmental, Inc.

Remedial Design Report

Site:

Former V&L Stripping
864 Mather Street
Green Bay, Wisconsin

Prepared by:

Shaw Environmental, Inc.
Green Bay, Wisconsin

August 29, 2006

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1.0 INTRODUCTION/OVERVIEW

The following represents Shaw Environmental, Inc.'s (Shaw), Remedial Design Report for the Former V&L Stripping located at 864 Mather Street, Green Bay, Wisconsin. During the remedial action proposal development and review process a projected remedial action plan was determined for this site. The proposed remedial action plan and the associated costs were reviewed and approved by the Wisconsin Department of Natural Resources. The proposed remedial action plan included the performance of a Soil Vapor Extraction (SVE) pilot test, installation of a SVE remedial system, and groundwater monitoring. The SVE pilot test has been completed, and based on the results of this pilot test, changes to the proposed remedial plan are warranted.

The SVE pilot test was conducted at the site and indicated that an effective vapor extraction zone of influence that encompasses the area of soil contamination exceeding EPA Soil Screening Levels for non-industrial sites can be achieved with the use of four soil vapor extraction wells operating at a flow rate of 40 to 50 scfm. However, during the performance of the pilot test, groundwater was drawn up the extraction well and into the SVE pilot test unit. It was not anticipated during development of the projected remedial action plan that groundwater would need to be handled by the remedial system. In order for the SVE system to be functional, changes to the SVE remedial system equipment will need to be made. These changes include the addition of equipment and controls that will allow the system to manage groundwater that is drawn into the system.

The proposed design of the remedial activities at the site is based on the degree and extent of contamination and the magnitude of potential threats to human health and the environment. All remedial activities are designed to comply with present WDNR guidelines.

1.1 Summary of Site Investigation Activities

Site investigation activities began in October 1997 with a limited Phase II Environmental Site Assessment and were completed in June 2003 with a completed NR 700 Site Investigation. During this investigation soil and groundwater contamination were encountered across the site.

In order to assess the extent of soil contamination, soil samples were collected from various depths in and around the site and were analyzed for volatile organic compounds (VOCs) via Method 8021 along with toxicity characteristic leaching procedure (TCLP) for tetrachloroethene (PCE). Soil samples were also described and classified using the Unified Soil Classification System (USCS). Some

of the borings were then converted into either permanent or temporary groundwater monitoring wells or piezometers. Groundwater samples were collected and analyzed for VOCs and various natural attenuation parameters. Soil vapor samples and ambient air samples were collected and analyzed for VOCs via EPA Method TO14.

Results of the site investigation indicated that, at depth, a clay and silty clay are overlain by a sand and silty sand. Laboratory analysis of the soil samples collected indicated the presence of PCE in soil samples from borings onsite as well as from a boring on the property to the east of the site. Laboratory analysis of groundwater samples indicated the presence of PCE, trichloroethene (TCE), 1,2 dichloroethene (1,2 DCE) and vinyl chloride in groundwater samples from the onsite monitoring wells and the piezometer. Laboratory analysis of vapor samples indicated low-level concentrations of PCE.

2.0 SUMMARY OF PILOT TEST ACTIVITIES

The SVE pilot test was conducted on July 21 and 22, 2004. The pilot test was performed on two separate SVE wells that were installed at the site for the purpose of the pilot test and subsequent incorporation into the remedial system. One well was installed on the west side of the subject property in the vicinity of MW-200 and the second well was installed on the south central portion of the property in the vicinity of MW-100. The wells were set at a depth of 13 feet below ground surface (bgs). The SVE wells were constructed with 10-foot long 0.010" slotted screen, filter sand, bentonite seal, 3-foot riser pipe, expandable locking cap, and a flush-mounted well cover. Figure 1 illustrates the site plan view showing the locations of these SVE wells.

Prior to conducting the pilot test, Shaw coordinated the installation of an asphalt surface seal. The purpose of the seal was to maximize the efficiency of the soil vapor extraction system. The sealed asphalt surface helped minimize short-circuiting of the SVE system.

The pilot test was conducted in a "stepped" fashion with a beginning flow rate of 30 standard cubic feet per minute (scfm). For well SVE-1, the test was then stepped to 50 scfm, 70 scfm, and 90 scfm. Each stepped test was allowed to run for approximately an hour and fifteen minutes. During the pilot test performed on SVE-2, a high vacuum pressure was experience during the 70 scfm test and the SVE system would overheat and shutdown. Due to this high vacuum pressure, a change in the stepped flow rates was made. For SVE-2, the test was stepped from 30 scfm to 50 scfm and than back to 40 scfm. During each of the step tests, every 15 minutes soil vacuum measurements were collected in each of the on-site monitoring wells using magnehelic pressure gauges to monitor the soil vacuum influence from that SVE well at each specific flow rate and vacuum pressure. Table 1 provides a summary of the vacuum and flow rates for each of the tests along with the corresponding monitoring well vacuum measurement data collected during each test. Appendix A contains the air sample laboratory analytical report and chain-of-custody form.

The monitoring well vacuum data in Table 1 shows that a system operating flow rate of 40 to 50 scfm at a vacuum pressure of 6 to 7 in/Hg creates a sufficient zone of soil vacuum influence. Figure 2 illustrates the zone of vacuum influence using the SVE-1/Step Test 2 and SVE-2/Step Test 3 pilot test data. Also illustrated in Figure 2 is the estimated extent of PCE impacted soil in excess of EPA soil screening levels for direct contact for non-industrial sites. As this figure shows the zone of influence from SVE-1 and SVE-2 operating at a flow rate of 40 to 50 scfm at 6 to 7 in/Hg vacuum creates a zone of influence that almost entirely encompasses the estimated extent of PCE contamination. This figure also shows that an area of PCE contamination that is not contained within this zone of influence will exist along the northern extent of the estimated PCE contaminant plume

that exceeds direct contact levels.

To address this specifically, and to increase the soil vacuum/flow rates of the area that was contained within the zone of vacuum influence, two additional SVE wells have been installed at the site to be part of the SVE remedial system. These wells were installed to the north and east/northeast of SVE-2, and were of the same construction as SVE -1 and SVE-2. Figure 3 – SVE well configuration, illustrates the locations of these wells along with the proposed vacuum distribution piping configuration.

3.0 AIR EMISSIONS

An air sample was collected near the conclusion of the pilot test each day and analyzed for total VOCs, PCE, TCE, 1,2 DCE, and vinyl chloride. Both samples showed detectable concentrations of VOC's, PCE, TCE and 1,2-DCE to be present. Table 2 provides a summary of these results.

The pilot test data was used to calculate emission rates for each of the analyzed constituents. The emission rate for each contaminant was calculated using the highest detected concentration from the two samples. These emission rate calculations were based on an assumed flow rate of 50 scfm for each extraction well (4 wells = 200 scfm combined total). The emission rate calculations showed that each constituent would be considerably below its WDNR Air Management requirement as detailed below:

CHEMICAL	EMISSION LIMIT
VOC's	216 lbs/day
PCE	27.9 lbs/hr
TCE	22.48 lbs/hr
1,2- DCE	65.79 lbs/hr
Vinyl Chloride	300 lbs/yr

As detailed in the Remedial Action Proposal submitted for the site, the SVE system will include a vacuum blower with a knockout vessel for water drainage. The SVE blower will also be equipped with a muffler/silencer to reduce system operation noise. The vacuum blower will have a manifold to pull vapors from each of the four SVE wells along with a fresh air bleed. The SVE system will be enclosed inside of a remedial equipment building.

As previously indicated, while conducting the pilot test, water was pulled from the SVE wells and into the vacuum blower of the pilot test unit. It is anticipated that this will also be a problem when the permanent remedial system is constructed. To allow the SVE system to be able to handle this water changes to the originally proposed system are required. These changes include the addition of water level floats to the knockout tank, installation of a transfer pump, water storage containers, and a system control panel.

The water level floats installed in the knockout tank will consist of a low level float and a high level float. The water level floats in conjunction with the control panel will tell the SVE system when the knockout tank is full and or empty. A high level float alarm when activated will shutoff the SVE system and turn on the transfer pump. When the water has been pumped out of the knockout tank the low level float will tell the SVE system to turn back on. The transfer pump will pump the water from the knockout tank to the water storage containers. At this time it is proposed that the water storage containers are stored inside of the onsite building (Former V&L Stripping). Because this building is heated it will allow for the system to be operated all year, and not require seasonal shutdown during the winter months. The proposed water storage containers consist of three 150-gallon poly-tanks that will be connected in series. Due to space limitations inside of the building, individual tanks of larger size connect be used. A high level float that will shut the SVE system off if triggered will be placed in the last storage container in the series. This will insure that the SVE system and transfer pump will not continue to operate if the storage tanks are full. Additionally, each water storage container will be vented to the outside atmosphere to eliminate the potential for vapors to escape to the interior of the building.

The SVE system will include four separate extraction wells. The SVE wells will each be connected to the SVE vacuum blower through a manifold. The manifold will allow adjustment of flow rates from each well to balance the system or provide more vacuum to a specific SVE well. Each SVE well will be connected to the system individually via 2" PVC distribution piping. The vacuum distribution piping running from the remedial building to each individual well will be located within a common trench where possible.

The exhaust stack from the SVE system will consist of 4" schedule 40 PVC piping and will extend out of the remedial equipment building and run along the exterior of the onsite building. The exhaust stack will terminate above the roofline of the onsite building.

5.0 SYSTEM OPERATION AND MONITORING

As per WDNR Air Management requirements, air samples will be collected from the exhaust stack of the SVE remedial system and submitted for VOC analysis. The sampling schedule is daily for the first three days of operation, weekly for the next three weeks, and monthly thereafter. If the air sample results show that contaminant concentrations and emission rates are significantly below allowable emission rates a reduction in sampling frequency will be requested.

The water that is collected from the SVE system and containerized will require sampling for VOC analysis prior to the initial disposal event. This analysis will provide a contaminant characterization of the water that is drawn into the system and will facilitate disposal. It is anticipated that the containerized water will be able to be disposed of as a non-hazardous waste. The water will be pumped from the on-site containers and hauled offsite for disposal by a licensed waste hauler. Because there is no way to determine the rate of which the water will be drawn into the SVE system, the frequency of which the water will need to be disposed of is not known at this time. For the purposes of determining a revised operational cost, it is assumed to be monthly for the first three months and then bi-monthly thereafter.

Following system installation and prior to system startup, a baseline groundwater sample will be obtained from each of the monitoring wells and piezometer and analyzed for VOCs via EPA Method 8021. Following six months of SVE system operation, quarterly groundwater monitoring will be implemented on 11 monitoring wells with the remaining wells and piezometer being sampled on a semi-annual basis. Groundwater samples will be obtained via low-flow sampling methods and submitted to a state certified laboratory for analysis of VOCs. Following system shutdown, one to two years of groundwater natural attenuation monitoring will commence. Eleven wells will be sampled quarterly and analyzed for temperature, pH, specific conductance oxidation-reduction potential, dissolved oxygen, manganese, ferrous iron, nitrates, sulfates, total organic carbon, carbon dioxide, alkalinity, ethane, ethene, methane, and VOCs. The remaining wells will be sampled semi-annually and analyzed for VOCs. Once the groundwater monitoring results indicate a stable or decreasing trend, a closure report will be submitted to the WDNR for the Former V&L Stripping site. If after the first three sampling events a stable or decreasing groundwater contaminant trend is not observed, additional groundwater control/treatment will be considered.

System operation and maintenance will be conducted monthly at a minimum in conjunction with air emissions testing. Air emissions will be analyzed for PCE, TCE, 1,2 DCE, and total VOCs. SVE system air flow rates and pressures will be recorded during each O&M visit and the vacuum blower/motor will be maintained in accordance with manufacturer's recommendations.

Once the SVE system emissions have 'flat-lined' system operation will cease and natural attenuation monitoring will commence. A concise closure request will be prepared and submitted to the WDNR as soon as site data suggests that the site may qualify for closure under the WDNR's closure flexibility rules. The closure documentation will be submitted to the WDNR and will utilize the entire site data collected as support for a request for "no further action". The request for closure may use GIS Registry and/or institutional controls to promote flexible closure of the site with residual contaminants left in place.

6.0 REVISED COST PROPOSAL

Due to the required changes to the remedial system equipment and necessity for wastewater sampling and disposal a revised cost proposal was generated. Based on these changes the revised Remedial Cost Proposal is $111,311.00. The previous cost proposal which was reviewed and approved by the department was $106,974.00.

As required by the DERF program, a detailed cost breakdown is provided in Appendix B

7.0 CERTIFICATIONS

Shaw will comply with the applicable requirements under Chapters NR 169, NR 140, and NR chapters 700-728. Shaw will also make available to the Wisconsin Department of Natural Resources upon request, all of our documents and records related to this project.

Conditions

Shaw will contact "Digger's Hotline" to locate underground utilities on the site. If the locations of underground utilities cannot be determined, the extent of the subsurface investigations will be limited. Client shall be responsible for private utilities locations.

Additionally, should the discovery of unanticipated hazardous materials at the site dictate a change in personal protective equipment above Level D, this discovery will constitute a changed condition mandating a renegotiated work scope of services.

This proposal has been prepared, in part, as an underground exploration evaluation for the referenced site. The evaluations and recommendations presented in this proposal were developed from a consideration of the project characteristics and an interpretation of available geologic, hydrogeologic and boring data. Shaw's interpretations of the subsurface conditions is based on normally accepted geological/hydrogeological practices and reasonable engineering judgement. Although boring and monitoring well data are considered to be representative of the subsurface conditions at the precise locations on the dates shown, they are not necessarily indicative of the subsurface conditions at other locations and/or at other times of the year.

Hydrogeologic representations and chemical distributions are approximate. They were generalized from and interpolated between the sample locations. Information on actual hydrogeologic conditions and chemical concentrations exist only at the specific sample locations and it is possible that conditions between sample locations may vary from those indicated. Variations in soil and groundwater conditions typically exist at most sites between sampling locations and at different times; the extent of which may not become evident without further exploration or excavation.

Shaw's analysis and recommendations in this proposal have been prepared in accordance with generally accepted engineering and hydrogeologic principles and practices. This warranty is in lieu of all other warranties either implied or expressed. Shaw assumes no responsibility for data or interpretations made by others. This proposal may be unsuitable for other uses and reliance on its

contents by anyone other than the client is done at the sole risk of the user. Shaw accepts no responsibility for application or interpretation of the results by anyone other than the client.
The recommendations and conclusions presented herein have been developed from consideration of the project characteristics and interpretation of limited available information. Because only limited information is available, Shaw reserves the right to modify actual site activities based on sequential findings.

Mark A. Bergeon, PG
Senior Consultant
Report Reviewer

Mark O. Love
Senior Project Manager
Report Preparer

APPENDIX A

Air Sample Laboratory Analytical Report

EN CHEM INC.

Corporate Office & Laboratory
1241 Bellevue Street, Suite 9, Green Bay, WI 54302
920-469-2436, Fax: 920-469-8827
www.enchem.com

Analytical Report Number: 849138

Client: SHAW E & I - GREEN BAY
Project Name: FORMER V & L STRIPPING
Project Number: 108495

Lab Contact: Laurie Woelfel

Lab Sample Number	Field ID	Matrix	Collection Date
849138-001	PT-EFFLUENT ST. 7/21	CHAR	07/21/04
849138-002	PT-EFFLUENT ST. 7/22	CHAR	07/22/04

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. Reported results shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested.

E B Ward

Approval Signature

8/10/04

Date

En Chem Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 849138

Client : SHAW E & I - GREEN BAY
Project Name : FORMER V & L STRIPPING
Project Number : 108495
Field ID : PT-EFFLUENT ST. 7/21

Matrix Type : CHARCOAL
Collection Date : 07/21/04
Report Date : 08/04/04
Lab Sample Number : 849138-001

TOTAL VOC'S AS GASOLINE RANGE ORGANICS

Prep Date: 08/03/04

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Gasoline Range Organics		11			7.5	50	ug		08/03/04	WI MOD GRO	WI MOD GRO
GRO Blank	<	50			50	1	ug		08/03/04	WI MOD GRO	WI MOD GRO
GRO Blank Spike		91			1.0	1	%Recov		08/03/04	WI MOD GRO	WI MOD GRO
GRO Blank Spike Duplicate		87			1.0	1	%Recov		08/03/04	WI MOD GRO	WI MOD GRO

VOLATILES - SPECIAL LIST

Prep Date: 07/28/04

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
cis-1,2-Dichloroethene	<	0.060	0.060	0.20		50	ug		07/28/04	SW846 5030B	SW846 8260B
Tetrachloroethene		2.4	0.050	0.16		50	ug		07/28/04	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene		0.095	0.044	0.14		50	ug	Q	07/28/04	SW846 5030B	SW846 8260B
Trichloroethene		0.086	0.060	0.20		50	ug	Q	07/28/04	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.044	0.044	0.14		50	ug		07/28/04	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		68				50	%Recov		07/28/04	SW846 5030B	SW846 8260B
Toluene-d8		94				50	%Recov		07/28/04	SW846 5030B	SW846 8260B
Dibromofluoromethane		104				50	%Recov		07/28/04	SW846 5030B	SW846 8260B

En Chem Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 849138

Client : SHAW E & I - GREEN BAY
Project Name : FORMER V & L STRIPPING
Project Number : 108495
Field ID : PT-EFFLUENT ST. 7/22

Matrix Type : CHARCOAL
Collection Date : 07/22/04
Report Date : 08/04/04
Lab Sample Number : 849138-002

TOTAL VOC'S AS GASOLINE RANGE ORGANICS

Prep Date: 08/03/04

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Gasoline Range Organics		17			7.5	50	ug		08/03/04	WI MOD GRO	WI MOD GRO
GRO Blank	<	50			50	1	ug		08/03/04	WI MOD GRO	WI MOD GRO
GRO Blank Spike		91			1.0	1	%Recov		08/03/04	WI MOD GRO	WI MOD GRO
GRO Blank Spike Duplicate		87			1.0	1	%Recov		08/03/04	WI MOD GRO	WI MOD GRO

VOLATILES - SPECIAL LIST

Prep Date: 07/28/04

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
cis-1,2-Dichloroethene		0.16	0.060	0.20		50	ug	Q	07/28/04	SW846 5030B	SW846 8260B
Tetrachloroethene		30	0.050	0.16		50	ug		07/28/04	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene		0.045	0.044	0.14		50	ug	Q	07/28/04	SW846 5030B	SW846 8260B
Trichloroethene		0.63	0.060	0.20		50	ug		07/28/04	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.044	0.044	0.14		50	ug		07/28/04	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		74				50	%Recov		07/28/04	SW846 5030B	SW846 8260B
Toluene-d8		96				50	%Recov		07/28/04	SW846 5030B	SW846 8260B
Dibromofluoromethane		109				50	%Recov		07/28/04	SW846 5030B	SW846 8260B

En Chem Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436
Fax: 920-469-8827

Lab Number	TestGroupID	Field ID	Comment
849138-001	GRO-C	PT-EFFLUENT	Approximately 3.9 mg/Kg of GRO value is due to the addition of 8260 surrogate standards.
849138-002	GRO-C	PT-EFFLUENT	Approximately 3.9 mg/Kg of GRO value is due to the addition of 8260 surrogate standards.

Qualifier Codes

Flag	Applies To	Explanation
A	Inorganic	Analyte is detected in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
B	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
B	Organic	Analyte is present in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
C	All	Elevated detection limit.
D	All	Analyte value from diluted analysis or surrogate result not applicable due to sample dilution.
E	Inorganic	Estimated concentration due to matrix interferences. During the metals analysis the serial dilution failed to meet the established control limits of 0-10%. The sample concentration is greater than 50 times the IDL for analysis done on the ICP or 100 times the IDL for analysis done on the ICP-MS. The result was flagged with the E qualifier to indicate that a physical interference was observed.
E	Organic	Analyte concentration exceeds calibration range.
F	Inorganic	Due to potential interferences for this analysis by Inductively Coupled Plasma techniques (SW-846 Method 6010), this analyte has been confirmed by and reported from an alternate method.
F	Organic	Surrogate results outside control criteria.
H	All	Preservation, extraction or analysis performed past holding time.
HF	Inorganic	This test is considered a field parameter, and the recommended holding time is 15 minutes from collection. The analysis was performed in the laboratory beyond the recommended holding time.
J	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
J	Organic	Concentration detected is greater than the method detection limit but less than the reporting limit.
K	Inorganic	Sample received unpreserved. Sample was either preserved at the time of receipt or at the time of sample preparation.
K	Organic	Detection limit may be elevated due to the presence of an unrequested analyte.
L	All	Elevated detection limit due to low sample volume.
M	Organic	Sample pH was greater than 2
N	All	Spiked sample recovery not within control limits.
O	Organic	Sample received overweight.
P	Organic	The relative percent difference between the two columns for detected concentrations was greater than 40%.
Q	All	The analyte has been detected between the limit of detection (LOD) and limit of quantitation (LOQ). The results are qualified due to the uncertainty of analyte concentrations within this range.
S	Organic	The relative percent difference between quantitation and confirmation columns exceeds internal quality control criteria. Because the result is unconfirmed, it has been reported as a non-detect with an elevated detection limit.
U	All	The analyte was not detected at or above the reporting limit.
V	All	Sample received with headspace.
W	All	A second aliquot of sample was analyzed from a container with headspace.
X	All	See Sample Narrative.
&	All	Laboratory Control Spike recovery not within control limits.
*	All	Precision not within control limits.
<	All	The analyte was not detected at or above the reporting limit.
1	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses passed QC based on precision criteria.
2	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses failed QC based on precision criteria.
3	Inorganic	BOD result is estimated due to the BOD blank exceeding the allowable oxygen depletion.
4	Inorganic	BOD duplicate precision not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
5	Inorganic	BOD result is estimated due to insufficient oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
6	Inorganic	BOD laboratory control sample not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
7	Inorganic	BOD result is estimated due to complete oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.

En Chem Inc.

Analysis Summary by Laboratory

1241 Bellevue Street
Green Bay, WI 54302

1090 Kennedy Avenue
Kimberly, WI 54136

Test Group Name	849138-001	849138-002
TOTAL VOC'S AS GASOLINE RANGE	G	G
VOLATILES - SPECIAL LIST	G	G

Wisconsin Certification	
G = En Chem Green Bay	405132750 / DATCP: 105 000444
K = En Chem Kimberly	445134030
S = En Chem Superior	Not Applicable
C = Subcontracted Analysis	

En Chem, Inc. Cooler Receipt Log

Batch No. 849138

Project Name or ID 108495 No. of Coolers: 1 Temps: ROI

A. Receipt Phase: Date cooler was opened: 7-23-04 By: 60

1: Were samples received on ice? (Must be ≤ 6 C)	(YES)	NO[2]	NA
2: Was there a Temperature Blank?	YES	(NO)	
3: Were custody seals present and intact on cooler? (Record on COC)	YES	(NO)	
4: Are COC documents present?	(YES)	NO[2]	
5: Does this Project require quick turn around analysis?	YES	(NO)	
6: Is there any sub-work?	YES	(NO)	
7: Are there any short hold time tests?	YES	(NO)	
8: Are any samples nearing expiration of hold-time? (Within 2 days)	YES[1]	(NO)	Contacted by/Who_____
9: Do any samples need to be Filtered or Preserved in the lab?	YES[1]	(NO)	Contacted by/Who_____

B. Check-in Phase: Date samples were Checked-in: 7-23-04 By: 60

1: Were all sample containers listed on the COC received and intact?	(YES)	NO[2]	NA
2: Sign the COC as received by En Chem. Completed	(YES)	NO	
3: Do sample labels match the COC?	(YES)	NO[2]	
4: Completed pH check on preserved samples.. *(This statement does not apply to water: VOC, O&G, TOC, DRO, Total Rec. Phenolics)*	YES	NO	(NA)
5: Do samples have correct chemical preservation? *(This statement does not apply to water: VOC, O&G, TOC, DRO, Total Rec. Phenolics)*	YES	NO[2]	(NA)
6: Are dissolved parameters field filtered?	YES	NO[2]	(NA)
7: Are sample volumes adequate for tests requested?	(YES)	NO[2]	
8: Are VOC samples free of bubbles >6mm	YES	NO[2]	(NA)
9: Enter samples into logbook. Completed	(YES)	NO	
10: Place laboratory sample number on all containers and COC. Completed	(YES)	NO	
11: Complete Laboratory Tracking Sheet (LTS). Completed	YES	NO	(NA)
12: Start Nonconformance form.	YES	NO	(NA)
13: Initiate Subcontracting procedure. Completed	YES	NO	(NA)
14: Check laboratory sample number on all containers and COC. SF	(YES)	NO	NA

Short Hold-time tests:

24 Hours or less	48 Hours	7 days	Footnotes
Coliform	BOD	Ash	1 Notify proper lab group immediately.
Corrosivity = pH	Color	Aqueous Extractable Organics- ALL	2 Complete nonconformance memo.
Dissolved Oxygen	Nitrite or Nitrate	Flashpoint	
Hexavalent Chromium	Ortho Phosphorus	Free Liquids	
HPC	Surfactants	Sulfide	
Ferrous Iron	Turbidity	TDS	
Eh	En Core Preservation	TSS	
Odor	Power stop preservation	Total Solids	
Residual Chlorine		TVS	
Sulfite		TVSS	
		Unpreserved VOC's	

Rev. 2/05/04, Attachment to 1-REC-5.
Subject to QA Audit.

Reviewed by/date W 7/27/04

(Please Print Legibly)
Company Name: Shaw E&I
Branch or Location: Green Bay
Project Contact: Brian Bartoszek
Telephone: 920-497-8910
Project Number: 108495
Project Name: Former VPC Stripping
Project State: WI
Sampled By (Print): Mark Love
PO #:

EN CHEM INC.
...chemistry for the environment.
1241 Bellevue St., Suite 9
Green Bay, WI 54302
920-469-2436
Fax 920-469-8827

CHAIN OF CUSTODY

No. 120232

Quote #:
Mail Report To: B. Bartoszek
Company: Shaw E&I
Address: 590 Morrelle Lane, Green Bay, WI 54304
Invoice To: Same
Company:
Address:
Mail Invoice To:

Data Package Options - (please circle if requested)
Sample Results Only (no QC)
EPA Level II (Subject to Surcharge)
EPA Level III (Subject to Surcharge)
EPA Level IV (Subject to Surcharge)

Regulatory Program: UST, RCRA, SDWA, NPDES, CERCLA

Matrix Codes: W=Water, S=Soil, A=Air, C=Charcoal, B=Biota, Sl=Sludge

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=EnCore F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

LABORATORY ID (Lab Use Only)	FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO)	PRESERVATION (CODE)*	ANALYSES REQUESTED: Total VOC	PCE	TCE	1,2 DCE (Cis & Trans)	Vinyl Chloride	TOTAL # OF BOTTLES SENT	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)
					NO	NO								
001	PT-effluent St.	7/16/04	13:15	A			X	X	X	X	X	1	Frontend only	1-CTube
002	PT-effluent St.	7/16/04	4:30	A			X	X	X	X	X	1	Frontend only	1-CTube

Rush Turnaround Time Requested (TAT) - Prelim
(Rush TAT subject to approval/surcharge)
Date Needed:
Transmit Prelim Rush Results by (circle):
Phone Fax E-Mail
Phone #:
Fax #:
E-Mail Address:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
[signature]	7/23/04 8:40	B Kemper	7/23/04 0840
B Kemper	7/23/04 1410	[signature]	7/23/04 1410

En Chem Project No. 849138
Sample Receipt Temp. ROI
Sample Receipt pH (Wet/Metals) NA
Cooler Custody Seal
Present / Not Present
Intact / Not Intact

Version 4.0: 07/03

APPENDIX B

Detailed Cost Breakdown

CONSULTING COSTS

Task	Personnel	Unit Rates	Hours	Costs
1) Pilot Test	Engineer III	$91.00	16	$1,456.00
	Scientist I	$60.00	16	$960.00
	Technician II	$45.00	4	$180.00
		Task 1 Total Costs		**$2,596.00**
2) Remedial Design Report	Project Scientist V	$98.00	3	$294.00
	Administrative II	$41.00	8	$328.00
		Task 2 Total Costs		**$3,061.00**
Changes/Additions	Project Scientist V	$98.00	1	$98.00
	Scientist I	$60.00	9	$540.00
		Revised Total Costs		**$3,699.00**
3) System Const./ Startup/Baseline Water Sample	Technician II	$45.00	45	$2,025.00
	Engineer III	$91.00	18	$1,638.00
	Scientist I	$60.00	50	$3,000.00
	Field Equipment:			
	Peristaltic Pump	$40.00 day	4	$160.00
	YSI-556	$29.00 day	5	$145.00
	Water Level	$21.00	1	$21.00
		Task 3 Total Costs		**$6,989.00**
Changes/Additions	Scientist III	$84.00	5	$420.00
	Scientist I	$60.00	10	$600.00
		Revised Total Costs		**$8,009.00**
4) Operation & Maintenance	Engineer III	$91.00	48	$4,368.00
	Technician II	$45.00	28	$1,260.00
		Task 4 Total Costs		**$5,628.00**
Changes/Additions	Scientist III	$84.00	8	$672.00
	Scientist I	$60.00	20	$1,200.00

		Revised Total Costs		**$7,500.00**
5) Quarterly GW Sampling	Technician II	$45.00	189	$8,505.00
	Field Equipment:			
	Peristaltic Pump	$40.00 day	24	$960.00
	YSI-556	$29.00 day	30	$870.00
	Water Level	$21.00	6	$126.00
		Task 5 Total Costs		**$10,461.00**
6) Natural Atten. Sampling (1 yr)	Technician II	$45.00	126	$5,670.00
	Field Equipment:			
	Water Level	$21.00 day	4	$84.00
	Peristaltic Pump	$40.00 day	16	$640.00
	YSI Meter	$29.00 day	20	$580.00
		Task 6 Total Costs		**$6,974.00**
7) Quarterly Report (10 qtrs. Total)	Technician III	$45.00	60	$2,700.00
	Engineer III	$91.00	10	$910.00
	Administrative II	$41.00	20	$820.00
		Task 7 Total Costs		**$4,430.00**
8) Project Mgmt/ Data Evaluation	Engineer III	$91.00	7	$637.00
	Technician II	$45.00	6	$270.00
	Administrative II	$41.00	16	$656.00
		Task 8 Total Costs		**$1,563.00**
9) Closure Report	Project Scientist V	$98.00	3	$294.00
	Engineer III	$91.00	6	$546.00
	Scientist I	$60.00	27	$1,620.00
	Technician II	$45.00	9	$405.00
	Administrative II	$41.00	8	$328.00
		Task 9 Total Costs		**$3,193.00**
10) Post Remedial	Technician II	$45.00	6	$270.00
		Task 10 Total Costs		**$270.00**

Total Consulting Costs	**$45,165.00**
Revised Total Consulting Costs	**$48,695.00**

3530

DRILLING SUBCONTRACTOR COSTS ESTIMATE

Task	Units	Quantity	Unit Rate	Costs
HSA sampling/drilling	ft	104	$11.00	$1,144.00
Monitoring well constr.	ft	104	$14.00	$1,456.00
Protective casing	ea.	8	$85.00	$680.00
55 gallon drums	ea.	8	$35.00	$280.00
Decon equip.	Lump	2	$100.00	$200.00
Mobilization	ea.	2	$250.00	$500.00
Drum Disposal	ea.	8	$200.00	$1,600.00

Total Drilling Costs **$5,860.00**

GEOPROBE COST ESTIMATE

Task	Units	Quantity	Unit Rate	Costs
Geoprobe	Lump	.5	$1,500	$750.00

Total Geoprobe Costs **$750.00**

PURGE WATER DISPOSAL COST ESTIMATE

Task	Units	Quantity	Unit Rate	Costs
Drum Disposal	ea.	14	$145.00	$2030.00

Total Purge Water Disposal Costs **$2,030.00**

LABORATORY SUBCONTRACTOR COSTS ESTIMATE

AIR

Analysis	Units	Quantity	Unit Rate	Costs
VOC	sample	23	$75.00	$1,725.00
SUMMA Canister	sample	7	$285.00	$1,995.00

WATER

Analysis	Units	Quantity	Unit Rate	Costs
VOC	sample	157	$53.00	$8,321.00
Nitrate	sample	56	$7.50	$420.00
Sulfate	sample	56	$7.50	$420.00
Iron	sample	56	$7.00	$392.00
Manganese	sample	56	$7.00	$392.00
Alkalinity	sample	56	$7.00	$392.00
Ethane/ethene/methane	sample	56	$65.00	$3,640.00
TOC	sample	56	$25.00	$1,400.00
Carbon Dioxide	sample	56	$110.00	$6,160.00

SOIL

Analysis	Units	Quantity	Unit Rate	Costs
VOC	sample	4	$53.00	$212.00

Total Laboratory Costs **$25,469.00**

Changes/Additions

VOC (wastewater)	sample	1	$53.00	$53.00

Revised Total Laboratory Costs **$25,522.00**

SYSTEM CONSTRUCTION SUBCONTRACTOR COSTS ESTIMATE

Task	Units	Quantity	Unit Rate	Costs
Depressurization Syst.	Lump	1	$875.00	$0.00
Asphalt Seal	Lump	1	$960.00	$960.00
Plumbing	Lump	1	$1,500.00	$1,500.00
Trenching	Lump	1	$4,000.00	$4,000.00
Electrical Drop	Lump	1	$3,500.00	$3,500.00
Control Panel	Lump	1	$1,750.00	$1,750.00

Total System Construction Subcontractor Costs $11,710.00

Changes/Additions

Control Panel (modifications)	Lump	1	$1,200.00	$1,200.00
Plumbing (modifications)	Lump	1	$1,000.00	$1,000.00

Revised Total System Construction Contractor Costs **$13,910.00**

Total Subcontractor Costs **$45,819.00**

Revised Total Subcontractor Costs **$48,072.00**

SYSTEM UTILITY/EQUIPMENT COSTS ESTIMATE

Task	Units	Quantity	Unit Rate	Costs
Electrical (assume 5 hp 230V single phase motor)	kwh	36,147	$0.07	$2,530.00
SVE Blower	Lump	1	$1,500.00	$1,500.00
Equipment Bldg.	Lump	1	$1,500.00	$1,500.00
Pilot Test Unit	Lump	1	$1,000.00	$1,000.00

Total Utility/Equipment Costs **$6,530.00**

Changes/Additions

Water Level Floats	Each	3	$250.00	$750.00
Transfer Pump	Each	1	$1,750.00	$1,750.00
Water Storage tanks	Each	3	$100.00	$300.00
Waste Water Disposal	Each	10	$450.00	$4,500.00

Revised Total System Utility/Equipment Costs **$13,830.00**

FIELD SUPPLIES COSTS ESTIMATE

Task	Units	Quantity	Unit Rate	Costs
Tubing	Lump	1	$450.00	$450.00
Zip-Lock Bags	Box	4	$3.25	$13.00
Bentonite/Concrete	Lump	1	$251.00	$251.00

Total Field Supplies Costs **$714.00**

REVISED SUMMARY OF COSTS

CONSULTING	$48,695.00
SUBCONTRACTORS	$48,072.00
UTILITY/EQUIPMENT	$13,830.00
FIELD SUPPLIES	$714.00

REVISED TOTAL **$111,311.00**

Previous Remedial Action Total **$106,974.00**

4337 Change Order

TABLES

TABLE 1
PILOT TEST DATA SUMMARY
FORMER V&L STRIPPING

SVE WELL	TIME	FLOW (CFM)	VACUUM (in Hg)
SVE - 1 STEP TEST - 1	10:00	30	4
	10:15	30	4
	10:30	30	4
	10:45	30	4
	11:00	30	4
	11:15	30	4

Bold values indicate acceptable vacuum inlfuence present at monitoring well (vucuum level > 0.1)

VACUUM READINGS (in H20)			
WELL	10:15	10:45	11:15
MW-100	0	0	0
MW-200	**1.7**	**1.5**	**1.6**
MW-300	**0.15**	**0.14**	**0.14**
MW-400	0.01	0	0
TW-800	0.08	0.07	0.07
TW-900	0	0	0
TW-1100	0	0	0
TW-1300	0	0	0
TW-1400	0	0	0
TW-1500	0.02	0.02	0.02

SVE WELL	TIME	FLOW (CFM)	VACUUM (in Hg)
SVE - 1 STEP TEST - 2	11:20	50	6
	11:45	50	6
	12:00	50	6
	12:15	50	6
	12:30	50	6
	12:45	50	6

Bold values indicate acceptable vacuum inlfuence present at monitoring well (vucuum level > 0.1)

VACUUM READINGS (in H20)			
WELL	11:45	12:15	12:45
MW-100	0	0	0
MW-200	**2**	**2**	**2**
MW-300	**0.2**	**0.2**	**0.19**
MW-400	0	0	0
TW-800	0.01	0.01	0.01
TW-900	0.02	0.05	0.03
TW-1100	**0.1**	**0.1**	**0.1**
TW-1300	0	0	0
TW-1400	0.01	0.01	0.02
TW-1500	0.04	0.03	0.03

SVE WELL	TIME	FLOW (CFM)	VACUUM (in Hg)
SVE - 1 STEP TEST - 3	1:00	70	9.5
	1:15	70	9.5
	1:30	70	9.5
	1:45	70	9.5
	2:00	70	9.5
	2:15	70	9.5

Bold values indicate acceptable vacuum inlfuence present at monitoring well (vucuum level > 0.1)

VACUUM READINGS (in H20)			
WELL	1:15	1:45	2:15
MW-100	0	0.01	0
MW-200	**3**	**3**	**3**
MW-300	**0.34**	**0.35**	**0.32**
MW-400	0.01	0	0
TW-800	0.05	0.03	0.01
TW-900	0.04	0.04	0.03
TW-1100	**0.16**	**0.15**	**0.15**
TW-1300	0.02	0	0
TW-1400	0.02	0.02	0.01
TW-1500	0.05	0.04	0.04

SVE WELL	TIME	FLOW (CFM)	VACUUM (in Hg)
SVE - 1 STEP TEST - 4	2:30	90	11
	2:45	90	11
	3:00	90	11
	3:15	90	11
	3:30	90	11
	3:45	90	11

Bold values indicate acceptable vacuum inlfuence present at monitoring well (vucuum level > 0.1)

VACUUM READINGS (in H20)			
WELL	2:45	3:15	3:45
MW-100	0.01	0	0.01
MW-200	**3.5**	**3.5**	**3.5**
MW-300	**0.4**	**0.42**	**0.42**
MW-400	0	0	0
TW-800	0.02	0.02	0.03
TW-900	0.03	0.05	0.04
TW-1100	**0.21**	**0.19**	**0.18**
TW-1300	0.01	0.01	0.02
TW-1400	0.02	0.02	0.02
TW-1500	0.05	0.06	0.04

TABLE 1 (continued)
PILOT TEST DATA SUMMARY
FORMER V&L STRIPPING

SVE WELL	TIME	FLOW (CFM)	VACUUM (in Hg)
SVE - 2 STEP TEST - 1	10:00	30	7
	10:15	30	7
	10:30	30	7
	10:45	30	7
	11:00	30	7
	11:15	30	7

Bold values indicate acceptable vacuum inlfuence present at monitoring well (vucuum level > 0.1)

VACUUM READINGS (in H20)			
WELL	10:15	10:45	11:15
MW-100	**2**	**2**	**2**
MW-200	0	0	0
MW-300	0.03	0.04	0.04
MW-400	**0.1**	**0.11**	**0.13**
TW-800	**0.8**	**0.85**	**0.85**
TW-900	0.08	0.05	0.05
TW-1100	0	0	0
TW-1300	**0.35**	**0.35**	**0.38**
TW-1400	**0.1**	**0.1**	**0.1**
TW-1500	0	0	0
MW-2000	0	0	0

SVE WELL	TIME	FLOW (CFM)	VACUUM (in Hg)
SVE - 2 STEP TEST - 2	11:30	50	10
	11:45	50	10
	12:00	50	10
	12:15	50	10
	12:30	50	10
	12:45	50	10

Bold values indicate acceptable vacuum inlfuence present at monitoring well (vucuum level > 0.1)

VACUUM READINGS (in H20)			
WELL	11:45	12:15	12:45
MW-100	**4**	**4**	**4**
MW-200	0	0	0
MW-300	0.07	0.07	0.07
MW-400	**0.23**	**0.2**	**0.22**
TW-800	**1.5**	**1.45**	**1.55**
TW-900	**0.1**	0.08	0.05
TW-1100	0	0	0
TW-1300	**0.6**	**0.65**	**0.65**
TW-1400	**0.2**	**0.17**	**0.2**
TW-1500	0	0	0
MW-2000	0	0	0

SVE WELL	TIME	FLOW (CFM)	VACUUM (in Hg)
SVE - 2 STEP TEST - 3	2:15	40	7
	2:30	40	7
	2:45	40	7
	3:00	40	7
	3:15	40	7
	3:30	40	7

Bold values indicate acceptable vacuum inlfuence present at monitoring well (vucuum level > 0.1)

VACUUM READINGS (in H20)			
WELL	2:30	3:00	3:30
MW-100	**3**	**3**	**3**
MW-200	0	0	0
MW-300	0.07	0.07	0.06
MW-400	**0.2**	**0.2**	**0.2**
TW-800	**1.25**	**1.2**	**1.25**
TW-900	0.05	0.05	0.07
TW-1100	0	0	0
TW-1300	**0.5**	**0.5**	**0.5**
TW-1400	**0.15**	**0.15**	**0.17**
TW-1500	0	0	0
MW-2000	0	0	0

TABLE 2

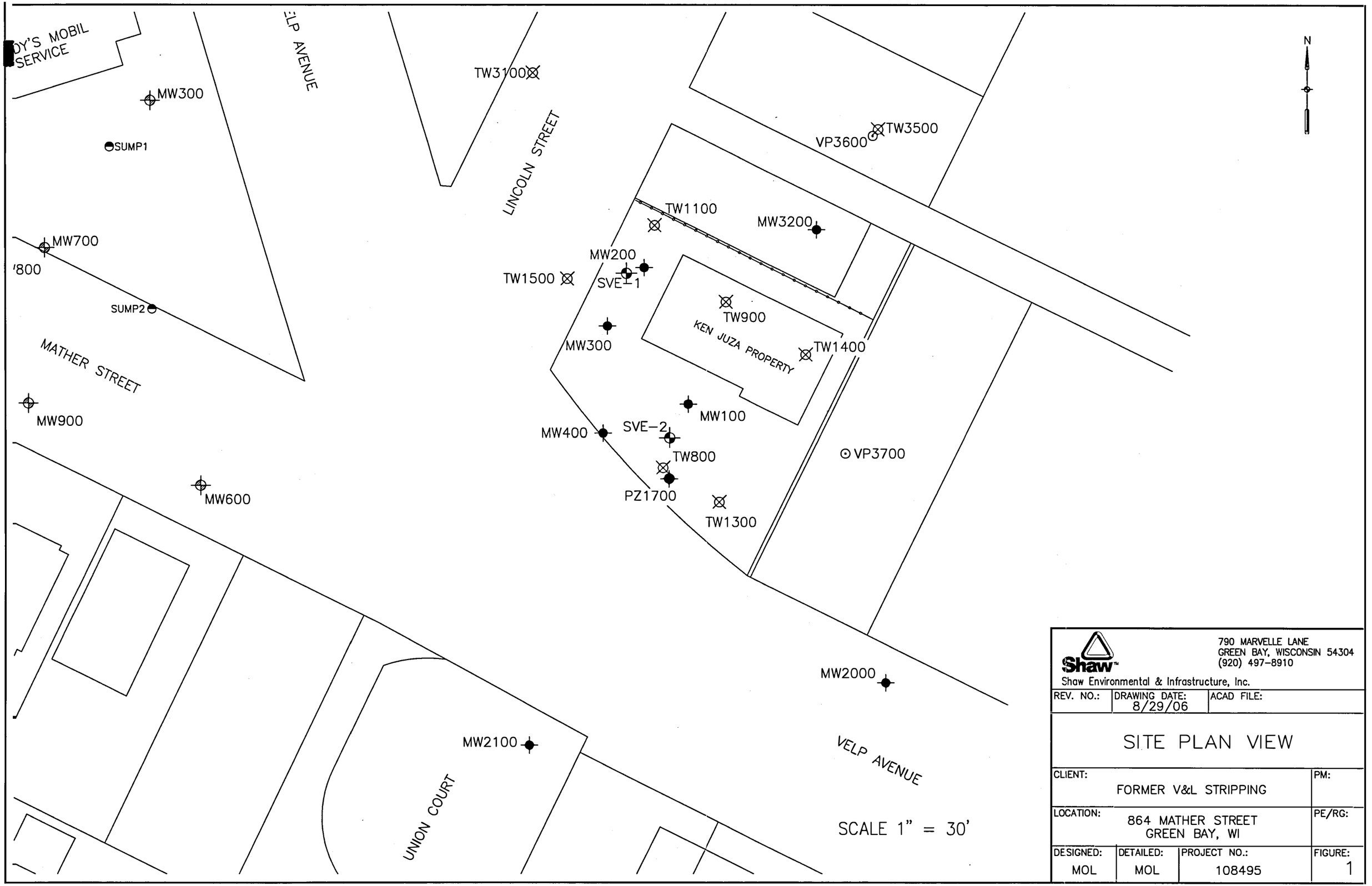
Pilot Test Air Sample Laboratory Analytical Results
Former V&L Stripping

Sample	Date	SVE Well	Flow (SCFM)	Vacuum (in/Hg)	Total VOC's	PCE	TCE	1,2-DCE	Vinyl Chloride
PT-Effluent 7/21	7/21/2004	SVE-1	90	11	**11**	2.4	0.086	0.095	<0.044
PT-Effluent 7/22	7/22/2004	SVE-2	40	7	17	30	0.63	0.17	<0.044

Notes: All results are reported in ppb, unless otherwise noted

VOC Volatile Organic Compounds
PCE Tetrachloroethene
TCE Trichloroethene
DCE Dichloroethene

FIGURES

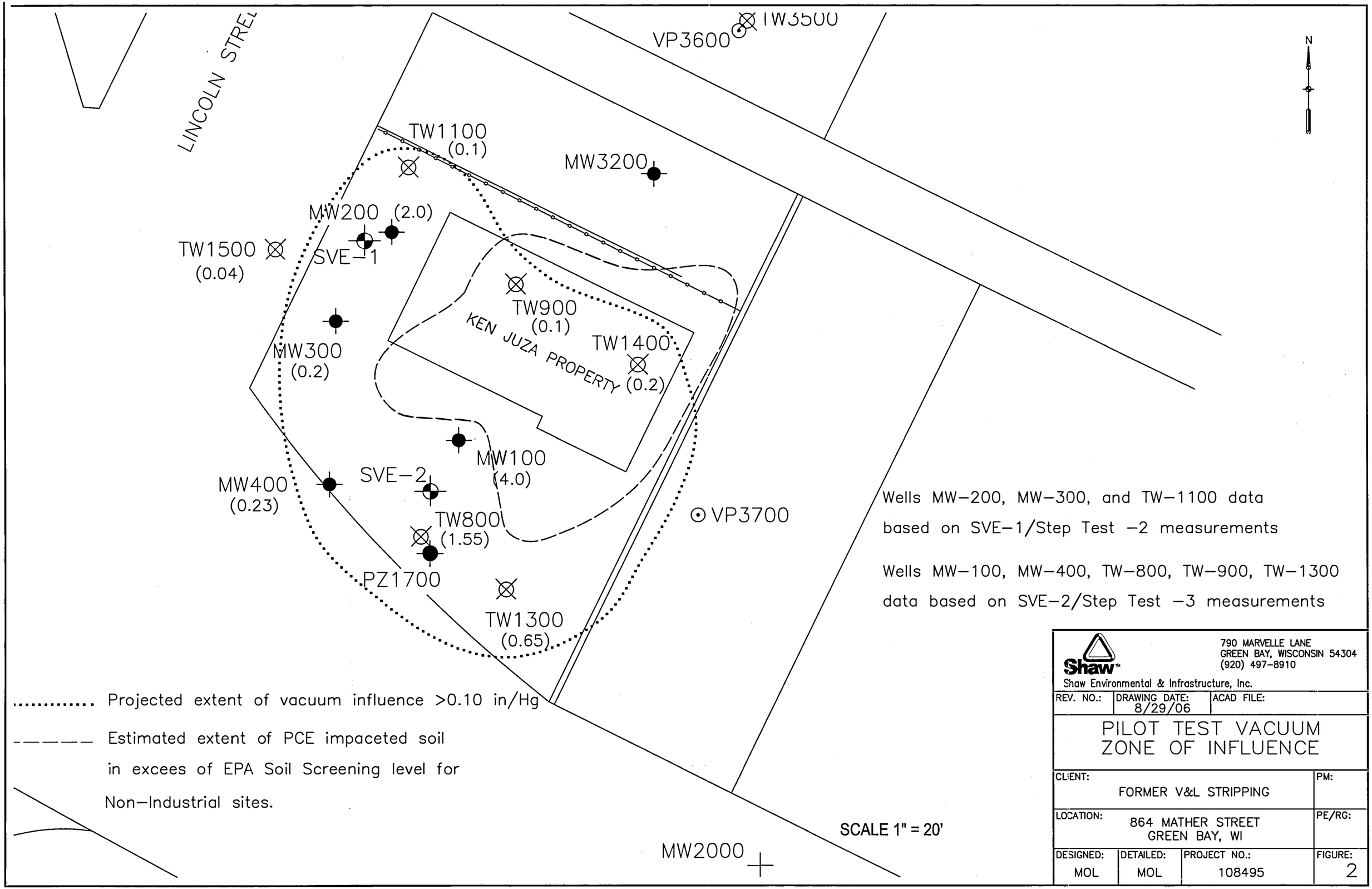


Shaw™
790 MARVELLE LANE
GREEN BAY, WISCONSIN 54304
(920) 497-8910
Shaw Environmental & Infrastructure, Inc.

REV. NO.:	DRAWING DATE:	ACAD FILE:
	8/29/06	

SITE PLAN VIEW

CLIENT:			PM:
FORMER V&L STRIPPING			
LOCATION: 864 MATHER STREET GREEN BAY, WI			PE/RG:
DESIGNED: MOL	DETAILED: MOL	PROJECT NO.: 108495	FIGURE: 1



Wells MW-200, MW-300, and TW-1100 data based on SVE-1/Step Test -2 measurements

Wells MW-100, MW-400, TW-800, TW-900, TW-1300 data based on SVE-2/Step Test -3 measurements

..... Projected extent of vacuum influence >0.10 in/Hg

_ _ _ _ _ Estimated extent of PCE impaceted soil in excees of EPA Soil Screening level for Non-Industrial sites.

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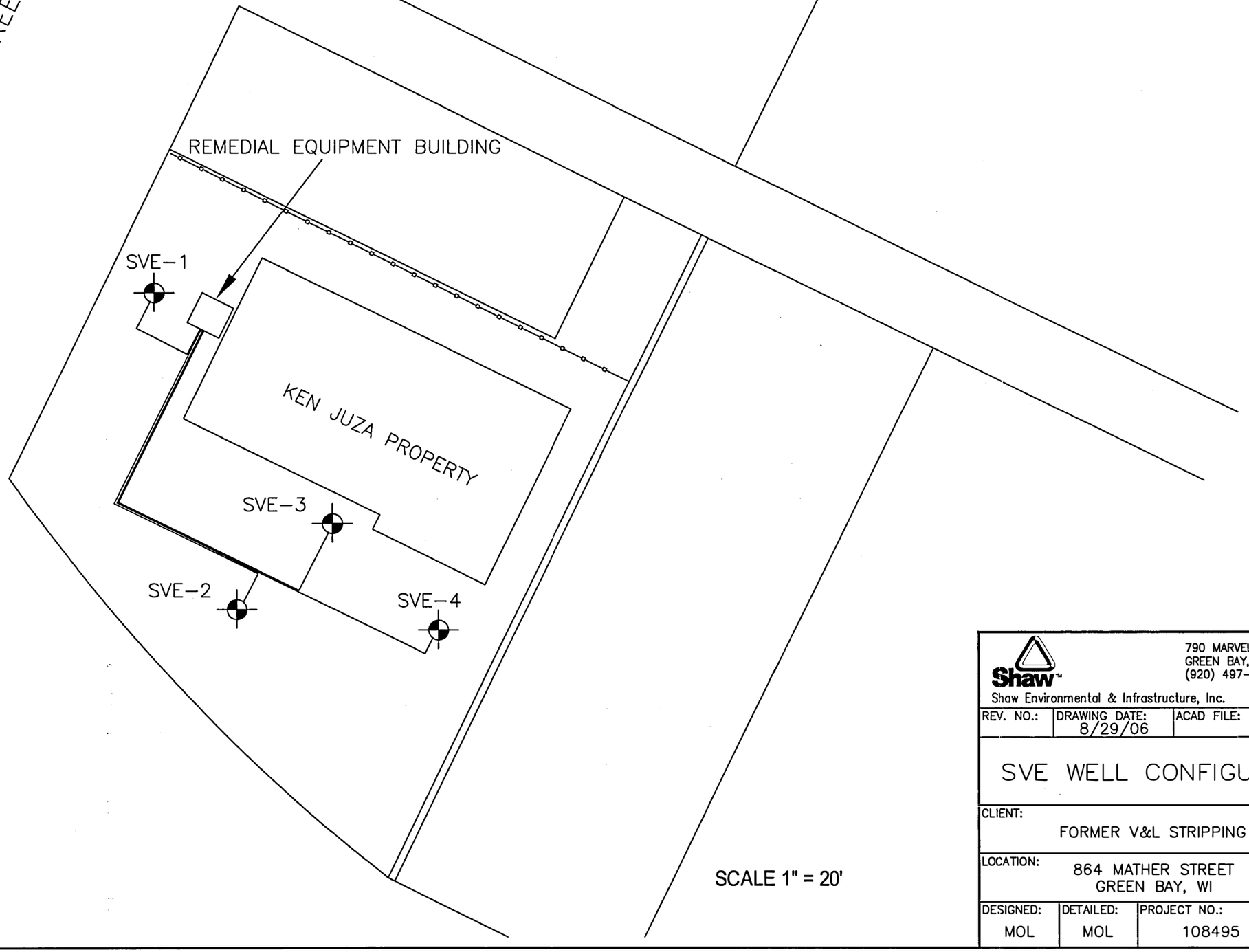
(920) 497-8910

REV. NO.:	DRAWING DATE:	ACAD FILE:
	8/29/06	

PILOT TEST VACUUM ZONE OF INFLUENCE

CLIENT:			PM:
FORMER V&L STRIPPING			
LOCATION: 864 MATHER STREET GREEN BAY, WI			PE/RG:
DESIGNED: MOL	DETAILED: MOL	PROJECT NO.: 108495	FIGURE: 2



SCALE 1" = 20'

Shaw™
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790 MARVELLE LANE
GREEN BAY, WISCONSIN 54304
(920) 497–8910

REV. NO.:	DRAWING DATE:	ACAD FILE:
	8/29/06	

SVE WELL CONFIGURATION

CLIENT:			PM:
FORMER V&L STRIPPING			
LOCATION: 864 MATHER STREET GREEN BAY, WI			PE/RG:
DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
MOL	MOL	108495	3