

**REMEDIATION SYSTEM EVALUATION REPORT
OCTOBER THROUGH DECEMBER 2008
HARMAN BECKER AUTOMOTIVE SYSTEMS, INC.
1201 SOUTH OHIO STREET
MARTINSVILLE, INDIANA 46151
KERAMIDA PROJECT NO. 11913**

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ENVIRONMENTAL MANAGEMENT
OFFICE OF LAND QUALITY

Submitted to: **INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**

Mr. Jeffrey J. Kavanaugh, Project Manager
State Cleanup Program
Office of Land Quality
100 North Senate Avenue
Indianapolis, Indiana 46204

Submitted for: **HARMAN BECKER AUTOMOTIVE SYSTEMS, INC.**

Mr. Jeremy Lindsey
Manager Safety & Environmental – North America
3100 Bowling Green Road
Franklin, Kentucky 42134

Submitted by: **KERAMIDA INC.**
401 North College Avenue
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Senior Engineer/Project Manager

Reviewed by:



Perre E. Burns, Ph.D.
Vice President of Remediation Services

June 14, 2009

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EXECUTIVE SUMMARY

KERAMIDA, Inc. was contracted by Harman Becker Automotive Systems, Inc. to design and implement a groundwater remediation system to mitigate identified volatile organic compound (VOC) groundwater contamination along the western property boundary to reduce concentrations leaving their facility located in Martinsville, Indiana (Site). This report documents information collected during remediation activities from October through December 2008 and evaluates remediation performance.

An existing remediation system consisting of air sparging (AS) and soil vapor extraction (SVE) at the Site was modified to mitigate VOC groundwater contamination along the western property boundary. This effort is the second part of a two-part remediation strategy involving (1) treatment of the VOC source area in the eastern parking lot (currently on-going and documented separately), and (2) treatment of the downgradient portion of the on-Site groundwater plume to reduce VOCs leaving the Site and impact to sensitive receptors. Therefore, a modified SVE/AS system was designed and subsequently installed in June and July 2006 and became fully operational in July 2007.

Soil and Groundwater

Quarterly groundwater sampling is recommended in select monitoring wells west of the plant and in the adjacent neighborhood to evaluate system performance and off-Site vapor intrusion pathway. Additional soil and groundwater sampling in the vicinity of MW-17 is recommended to investigate the extent of elevated groundwater concentrations in this well.

Remediation System

The remediation system was not operational from early June 2008 through August 21, 2008 due to high water levels caused by flooding within the City of Martinsville. The AS/SVE system was restarted on August 21, 2008, once groundwater levels had receded to pre-flood levels. At this time, KERAMIDA began to conduct more frequent visits than the normally scheduled two visits per month in order to monitor the AS/SVE system's operation. The more frequent visits were necessitated based on KERAMIDA's concerns over the impact of the flood to the AS/SVE system and the observed lower, as well as higher, ROIs seen in comparison to the ROIs obtained prior to the flood. KERAMIDA concluded that the operational problems experienced during that period were rather systemic, indicating potential damage to the AS/SVE system and/or short-

circuiting impacts to the area of the system from the flood. As a result, diagnostic testing was performed in March 2009 in order to evaluate the performance of the Site's AS/SVE system, and determine the overall integrity of the system's subsurface infrastructure. Based on KERAMIDA's evaluation, the following are recommended:

- The replacement of the SVE wells in the remediation corridor with a horizontal SVE trench, as part of an expanded SVE system.
- The replacement air sparge points AS-9, AS-10 and AS-18R, as part of an expansion and rehabilitation of the AS/SVE system.

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FIGURES

1. Site Location Map
2. As-Built Site Plan
3. As-Built Site Plan with AS/SVE Influence (4th Quarter 2008)

ATTACHMENTS

1. Groundwater Sample Information Sheet and Laboratory Analytical Report
2. Field Notes and Operation and Maintenance Logs
3. Operational Data Logs
4. Performance Data Logs and Review
5. Vapor Analytical Reports and Discharge Calculations

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1.0 INTRODUCTION

KERAMIDA Inc. was contracted by Harman Becker Automotive Systems, Inc. (Harman) to design and implement a groundwater remediation system to mitigate identified volatile organic compound (VOC) groundwater contamination along the western property boundary to reduce concentrations leaving their facility located in Martinsville, Indiana (Site). The Site is located at 1201 South Ohio Street, Martinsville, Morgan County, Indiana (see Figure 1). The Site is being administered through the Indiana Department of Environmental Management (IDEM) State Cleanup Program.

The purpose of this report is to document and evaluate the progress of the implemented remedial system at the Site. The remedial system consists of air sparging (AS) combined with soil vapor extraction (SVE). This report summarizes the following information:

- Contaminants of concern
- Design, installation and startup of the remediation system
- Operation and Maintenance of the remediation system
- Performance evaluation of the remediation system
- Conclusions and recommendations

2.0 CONTAMINANTS OF CONCERN

Identified contaminants of concern (COC) include VOCs such as tetrachloroethene (PCE), trichloroethene (TCE) and daughter products. VOC contamination along the western (downgradient) property boundary have been detected in groundwater at concentrations greater than the IDEM Risk Integrated System of Closure (RISC) default residential and industrial/commercial closure levels.

3.0 REMEDIATION SYSTEM OVERVIEW

The focus of the remediation system is to mitigate off-Site migration of contamination along the western property boundary where VOCs have been detected in groundwater at concentrations greater than the IDEM RISC default residential and industrial/commercial closure levels. This effort is the second part of a two-part remediation strategy involving (1) treatment of the VOC source area in the eastern parking lot (currently on-going), and (2) treatment of the downgradient portion of the on-Site groundwater plume to reduce VOCs leaving the Site and impact to sensitive receptors. The progress of treatment of the VOC source is being documented in separate reports.

To reduce VOC concentrations leaving the Site, the existing AS/SVE System was modified. The current AS/SVE System consists of a total of 7 AS points and 10 SVE wells outside the Harman facility building along the western property line. SVE wells are equipped with control valves and vacuum gauges, while the AS wells are equipped the control valves and pressure gauges. Subsurface vapor extraction and compressed air piping connect these wells to the existing above-grade piping and remedial equipment located inside the Harman facility. The remedial equipment includes both vapor extraction and compressed air systems. The vapor extraction system includes an SVE blower unit, vacuum relief valve, dilution air valve with filter, air/water separator, water discharge pump and associated piping, instrumentation and controls. The compressed air system includes a manifold connected to the facility's existing air compressor system (process air for facility) that compressed air is directed to the remedial effort and associated piping, instrumentation and controls. The remediation system was started mid-July and August 2007. A layout of the modified system can be found on Figure 2 - As-Built Site Plan.

A complete summary of the design, permitting, installation, startup and initial operation and maintenance (O&M) of the remediation system was documented in the Remediation System Startup & Evaluation Report, July 2007 through March 2008, dated May 2, 2008.

4.0 GROUNDWATER MONITORING

As documented in Section 4.3.2 of the Remediation System Evaluation Report, July through September 2008 dated June 12, 2009, the most recent groundwater data from wells in the vicinity of the AS/SVE system show significant reduction in concentrations in all of the wells, with the exception of PCE and TCE in MW-17. There may be various reasons for these increases, however, KERAMIDA re-sampled MW-17, on December 30, 2008, to verify the data. The groundwater sample was analyzed by Heritage Environmental Services, LLC. of Indianapolis, Indiana. The Groundwater Sample Information Sheet and laboratory analytical report from the re-sampling of MW-17 is provided in Attachment 1. Select laboratory data is tabulated below.

Sample ID.	MW-17		
Date	1/10/07*	10/7/08	12/30/08
cDCE	480	62	22
tDCE	10	5.8	1.9
PCE	130	970	1,100
TCE	46	69	52
VC	97	<1.0	<1.0

* Results prior to active remediation

Data from the re-sampling of groundwater at MW-17 verifies groundwater concentrations from this well's October 2008 sampling event. Significant concentrations of PCE and TCE remain in this area of the Site. High PCE concentrations (3,730,000 ug/m³) detected in an air sample from beneath the warehouse floor just east of MW-17 suggests a potential additional source in the area.

5.0 REMEDIATION SYSTEM O&M AND PERFORMANCE

Operations, maintenance, performance and liquid waste management are detailed below. O&M Logs are provided as Attachment 2, Operational Logs used to document applied vacuum/pressure levels are provided as Attachment 3, Performance Data Logs that document induced levels used in determining radii of influence (ROIs) are provided in Attachment 4, ROIs are depicted on Figure 3 – As-Built Site Plan with AS/SVE Influence (Post-June 2008) and vapor sampling analytical/discharge calculations are provided as Attachment 5.

5.1 OPERATIONS

The remediation system was started in July 2007 and went through an adjustment and calibration period, prior to being fully operational in January 2008. Through December 30, 2008 it has operated for a total of 8,648.75 hours. The remedial system operated 86% of the time from October through December 2008. Various operational and performance data were collected during O&M visits. Tasks completed during the O&M visits are as follows:

- Bi-weekly operational measurements from AS and SVE systems.
- Monthly collection of effluent vapor samples for VOC analysis.
- Monthly collection of an effluent condensate water sample, if necessary, for VOC and pH analysis.
- Monthly balancing of applied vacuum and pressures at SVE and AS wells to optimize performance.
- Performance data collection events to collect observed, applied, and induced vacuum, pressure, groundwater (mounding), DO and ORP levels. These performance data were collected at various SVE, AS and monitoring points to verify ROIs.

5.2 MAINTENANCE

Various maintenance items were completed during the operation of the remediation system. This included an attempt to establish a connection between the SVE flow meter and the programmable logic controller (PLC) and various system restarts. The oil was also changed in the SVE blower.

EOS Research who manufactures the PLC unit aided in the attempt to establish a connection between the SVE flow meter and the PLC. A connection could not be established, therefore the SVE flow meter was removed and shipped to the manufacturer for further testing. The SVE flow meter's electronics were damaged beyond repair by an electrical surge. Multiple attempts to install and operate a flow meter that can be monitored through the PLC have been made and have been unsuccessful. Therefore, a pitot tube and magnahelic gauge calibrated to directly read air flow will be installed. SVE air flow will not be accessible through the PLC, but this will not affect the operation of the system.

The system shut down twice in early December 2008 while Harman personnel conducted maintenance on their compressed air systems. The remediation system was restarted by KERAMIDA following each shut down event.

The AS/SVE system was restarted on August 21, 2008, following the June 2008 flood as discussed in Section 5.2 of the Remediation System Evaluation Report, July through September 2008, dated June 12, 2009. At this time, KERAMIDA began to conduct more frequent visits than the normally scheduled two visits per month in order to monitor the AS/SVE system's operation. The more frequent visits were necessitated based on KERAMIDA's concerns over the impact of the flood to the AS/SVE system and the observed lower, as well as higher, ROIs seen in comparison to the ROIs obtained prior to the flood. KERAMIDA concluded that the operational problems experienced during that period were rather systemic, indicating potential damage to the AS/SVE system and/or short-circuiting impacts to the area of the system from the flood. As a result, KERAMIDA recommended diagnostic testing of the AS/SVE system be conducted. Diagnostic testing was then performed in March 2009 as summarized below in Section 6.0 and documented in the Remediation System Diagnostics Report dated June 12, 2009.

5.3 PERFORMANCE

To verify the effectiveness of the SVE portion of the system in capturing vapors liberated by the AS portion of the system and the effectiveness of the AS portion of the system to liberate vapors, current ROIs and VOC vapor discharge rates must be determined and compared to design and startup conditions. Methodology for determining ROIs using collected performance data for both portions of the remediation system are detailed within the Performance Data Review document in Attachment 3.

The following table summarizes design, start-up and current operating conditions and associated system performance information.

Parameter	Design Conditions and Performance	Start-up Conditions and Performance	Current Conditions and Performance
SVE Wells	45-50"H ₂ O at 35cfm 25-foot ROI	6-16"H ₂ O at 35cfm 20-27-foot ROI	14-20"H ₂ O at 28cfm 23-foot ROI (Average)
AS Wells	35psi at 10cfm 30-foot ROI	25psi at 16-26cfm 32-foot ROI	25psi at 21cfm 25-foot ROI

Differences between the designed, start-up and current conditions and performance of the SVE portion of system are evident as depicted above. The design indicated an applied vacuum per well of 45-50"H₂O would induce an ROI of approximately 25 feet. Start-up conditions indicated a significantly lower applied vacuum/well of 6-16"H₂O, resulting in an ROI of approximately 20-27 feet, while current conditions result in an ROI of 23-feet (average) using an applied vacuum of approximately 14-20"H₂O. The spacing between SVE wells is approximately 40 feet.

As detailed in Section 5.3 of the Remediation System Evaluation Report, July through September 2008, dated June 12, 2009, a decrease in the SVE ROI (18-feet) was observed in the 3rd quarter of 2008 as compared to the SVE ROI (25-feet) seen in the 2nd quarter of 2008. The 2nd and 3rd quarter's SVE ROIs were determined using data collected from a single event. The 4th quarter SVE ROI of 23-feet is based on multiple data collection events during all three months of the quarter. Based on this information, the SVE ROI for both the 3rd and 4th quarters of 2008 is 23-feet (Figure 3).

Differences also are evident between the design, start-up and current conditions and performance of the AS portion as depicted above. The design calls for an injection of 10 cfm of air at pressure of 35 psi to achieve an ROI of approximately 30 feet. Startup conditions indicate air injection at 25 psi can achieve an ROI of approximately 30 feet. However, current conditions indicate an ROI of approximately 25-feet is achieved at an injection rate of 25 psi. The spacing between AS wells is approximately 50 feet.

During the reporting period, total SVE airflow was approximately 280 cfm (28 cfm/well x 10 wells) while AS airflow was approximately 150 cfm (21 cfm/well x 7 wells). Therefore, approximately twice as much air is being removed from the subsurface than is being injected. Currently (2009), the SVE portion of the system is removing air at 335-360 cfm compared to the injection of 150 cfm air by the AS portion.

Vapor discharge rates, for each vapor sampling event, were determined by using vapor sampling analytical data and flow measurements taken from the SVE blower's effluent stack. Time periods were determined based on the occurrence of vapor sampling events with associated operational hours. Using these data, KERAMIDA estimates approximately 0.99 pounds of VOC vapors have been removed from the subsurface by the remediation system during the current

monitoring period. An estimated total of 31.3 pounds of VOC vapors have been removed from the subsurface since startup in July 2007.

5.4 LIQUID WASTE MANAGEMENT

Liquid wastes were generated by the drainage of condensate from the SVE's air/water separator and in-line condensate sumps. During Site visits, any accumulated condensate is pumped from the air/water separator and sumps to the City of Martinsville sewer system. From July 2007 through December 2008, a total of 1,279-gallons of condensate waters were generated and discharged. Monthly discharge reports are generated and submitted to the Martinsville City Engineer and Utility Office.

6.0 CONCLUSIONS AND RECOMENDATIONS

Groundwater

Quarterly groundwater sampling is also recommended in select monitoring wells west of the plant (MW-9, MW-10, MW-17) and in the adjacent neighborhood (MW-22, MW-23, MW-27) to evaluate system performance and off-Site vapor intrusion pathway. Data from the re-sampling of groundwater at MW-17 verified high groundwater concentrations from this well's October 2008 sampling event. High PCE concentrations (3,730,000 ug/m³) detected in an air sample from beneath the warehouse floor just east of MW-17 suggests a potential additional source in the area. Additional soil and groundwater sampling in the vicinity of MW-17 is recommended.

Remediation System

Due to operational changes observed subsequent to the June 2008 flooding event, KERAMIDA performed diagnostic testing in March 2009. Testing was performed in order to evaluate the performance of the Site's AS/SVE system, and determine the overall integrity of the system's subsurface infrastructure. KERAMIDA's findings from this evaluation, as documented in the Remediation System Diagnostics Report dated June 12, 2009, include the following:

Air Sparge System

- Air sparge points AS-9 and AS-10 were incapable of holding pressure during the March 2009 diagnostic testing and went to zero pressure shortly after their pressurization at 26 psi. The loss of pressure from the sparge points is indicative of leakage that most likely was caused by shifting forces due to the flood's impact. The leakage is expected to result in lower

performance of these points. KERAMIDA recommends replacement of these wells as part of an expansion and rehabilitation of the AS/SVE system. Air sparge point AS-18R, while it did not lose pressure as quickly as the other two points, was also incapable of holding pressure and went eventually to zero pressure. KERAMIDA recommends replacement of this well as part of an expansion and rehabilitation of the AS/SVE system. All three problematic AS wells are old Heritage wells installed in 1996. The functioning AS wells were placed by KERAMIDA in 2006.

Soil Vapor Extraction System

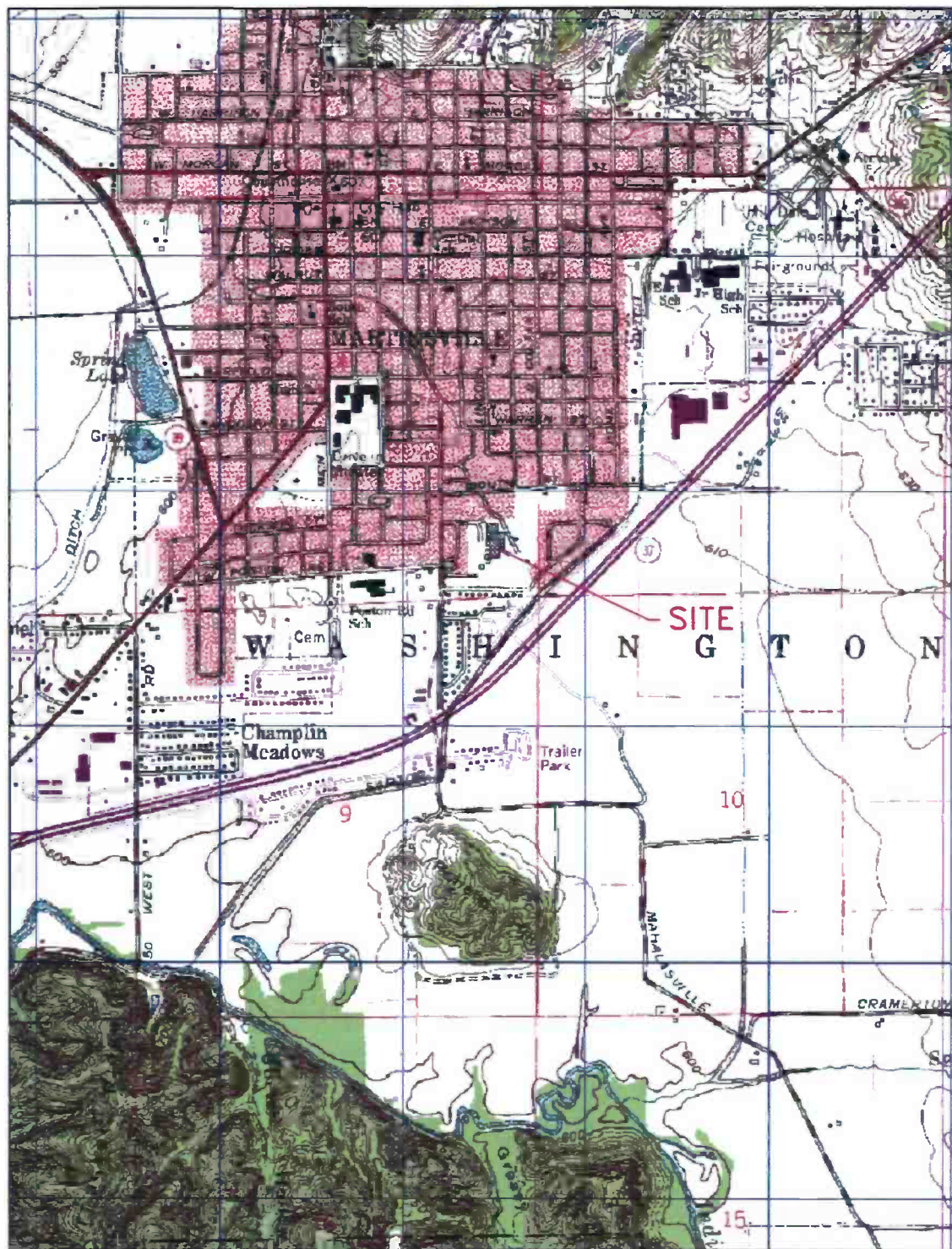
- The vapor extraction radius of influence around SVE-D was found to range between approximately 22 and 32 feet under the two operating scenarios tested. These observations are consistent with those historically reported at this well.
- The radii of influence for the SVE wells, in general, have been found to be somewhat variable, which is believed to be a function of preferential flow paths resulting from the close proximity of utility conduits to the SVE wells, and the impact of the 2008 flood to the fill materials of the utility line trenches.
- The variability in the resulting airflow observed at the SVE wells under steady-state applied vacuum, is believed to be due to the presence of preferential flow paths resulting from the close proximity of utility conduits to the SVE wells and the impact of the 2008 flood to the fill materials of the utility line trenches.
- KERAMIDA recommends the replacement of the SVE wells in the remediation corridor with a horizontal SVE trench, as part of an expanded SVE system.

7.0 USE OF REPORT

This report has been prepared for the exclusive use of the Client and persons or organizations to whom the Client wishes to make this report available. This report and the findings, conclusions and recommendations contained herein shall not, in whole or in part, be disseminated or conveyed to any other party, or used by or relied upon by any other party, without the prior written consent of KERAMIDA.

8.0 LIMITATIONS

This report was prepared in accordance with KERAMIDA contractual guidelines set forth for remediation services. KERAMIDA's professional opinions contained herein are based upon the operation, maintenance, and monitoring/sampling conducted by KERAMIDA personnel during the operation of the remediation system. No other warranty is given or implied by this report.



NORTH



SCALE: 1" = 2000'



REF: USGS 7.5 MINUTE SERIES
INDIANA-MARTINSVILLE QUADRANGLE

Project: Harman Becker Automotive Systems, Inc.
Martinsville, Indiana

Figure 1

Site Location Map

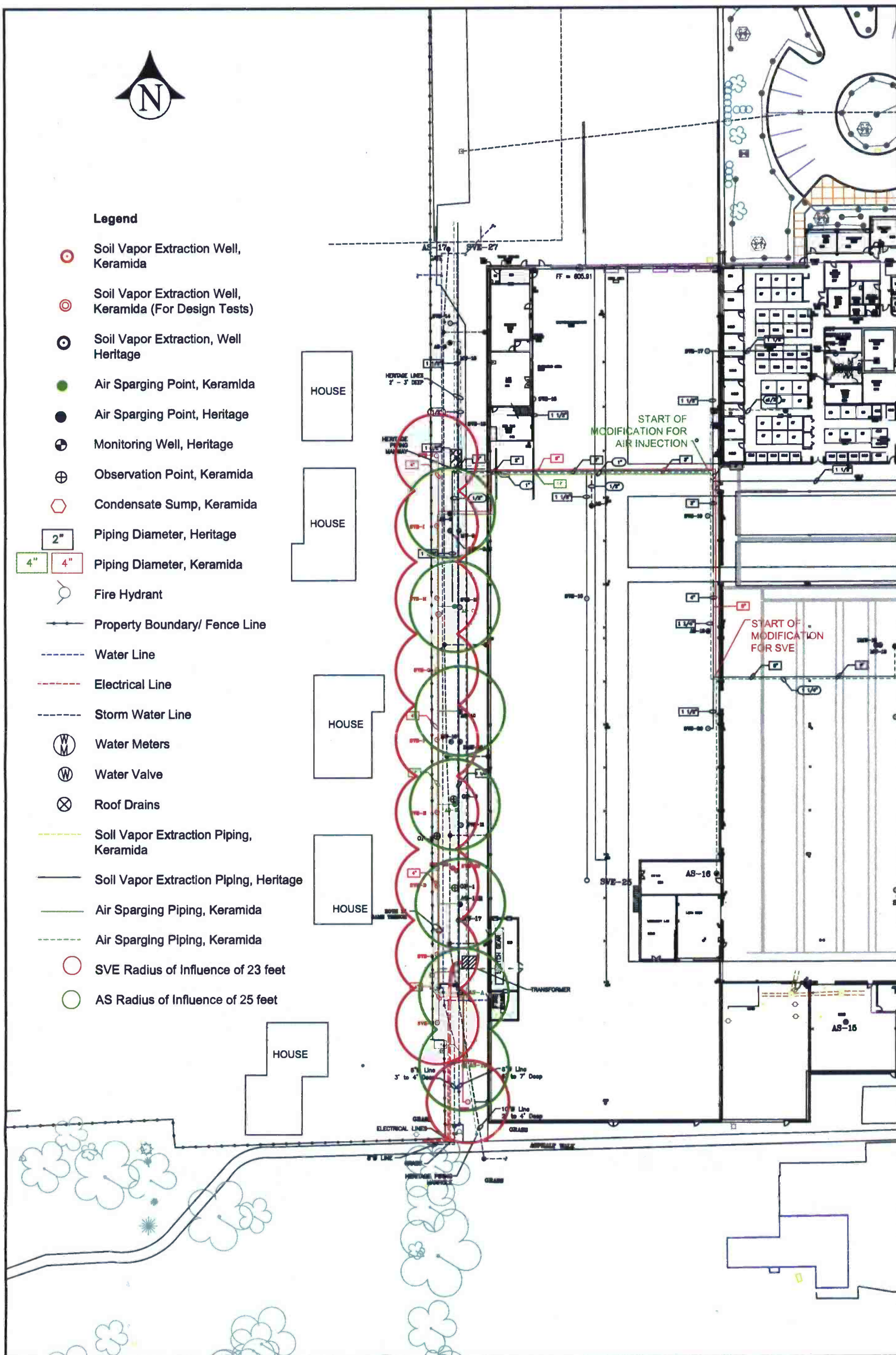


Project Number: 11913	Drawn By: J.CLARK
Date: June 10, 2009	Approved By: FW
	File No. 10300DFig1



Legend

- Soil Vapor Extraction Well, Keramida
- Soil Vapor Extraction Well, Keramida (For Design Tests)
- Soil Vapor Extraction, Well Heritage
- Air Sparging Point, Keramida
- Air Sparging Point, Heritage
- Monitoring Well, Heritage
- Observation Point, Keramida
- Condensate Sump, Keramida
-



SCALE: 1" = 50'



KERAMIDA
A Global EHS Services Provider

Project: Harman Becker
Automotive Systems, Inc.
Martinsville, Indiana

Project Number: 11913
Date: June 11, 2009

Drawn By: J.CLARK

Approved By: RSF

File No. 11151FigsAB-1

Figure 3
As-Built Site Plan with
AS/SVE Influence
4th Quarter 2008

KERAMIDA ENVIRONMENTAL, INC.
GROUNDWATER SAMPLE INFORMATION SHEET

Facility Name: <u>Whiskey Products - HBAS</u>	KEI Project #: 12327
Sample I.D.: MW- <u>17</u>	Well Location:

Monitoring Well Data	
Well Material	<u>(PVC/SS/Teflon)</u>
Inside Diameter, in.	<u>(2.46)</u>
Stick up or stick down height	ft
Total depth of well (TD)	<u>16.12</u> ft
Depth to product	ft
Depth to water (DTW)	<u>9.73</u> ft

Sample Types (circle all applicable)	
<u>Monitoring Well</u>	
<u>Grab Composite</u>	
Split Sample	
Duplicate (Duplicate ID: _____)	
MS/MSD	
Other _____	

Conventional sampling	
Height of water column (H = TD - DTW)	ft
Conversion value (CV)*	x
1 Well volume = H x CV	= gal
3 Well volumes =	= gal
Purge method (B = bailer, P = pump)	B <u>(P)</u>

⇐OR⇒

Micropurge sampling	
Depth of pump placement (place mid-screen)	<u>12.92</u> ft
Bubbles purged from flow cell?	<u>(Y)N</u>
Is drawdown >0.3 feet	<u>Y(N)</u>
Was passive sampling used?	<u>Y(N)</u>
Flowrate =	<u>9.0</u> mL/min
ID number from controller console	# _____

*Conversion values (gal/ft): 1" dia = 0.04, 2" dia = 0.16, 4" dia = 0.65, 6" dia = 1.47

Field Test(s)	Stability	Result	Result	Result	Result	Result	Result	Result
	Range	(3 min)	(6 min)	(9 min)	(12 min)	(15 min)	(18 min)	(21 min)
<u>formed</u>								
Temperature (°C)	+/- 3%	<u>17.07</u>	<u>17.07</u>	<u>17.08</u>				
Spec. Cond (µmhos)	+/- 3%	<u>627</u>	<u>628</u>	<u>628</u>				
D.O. (mg/L)	+/- 10%**	<u>9.43</u>	<u>9.42</u>	<u>9.43</u>				
pH	+/- 0.1	<u>9.15</u>	<u>9.15</u>	<u>9.15</u>				
ORP (mV)	+/- 10 mV**	<u>83.4</u>	<u>83.5</u>	<u>83.5</u>				
Turbidity (NTU)	+/- 10%**							
H ₂ S (mg/L)								
Fe ²⁺ (mg/L)								

Check stability after three readings and every reading thereafter until achieved.

**Only one of these parameters must reach stability.

Observations:

Volume of water purged from well: 1.5 gallons

Sample Date: 12/30/08 Sample Time: 13:00 (military time)

Was metals sample filtered prior to preservation? YES NO method: 0.45 µm cartridge / other: _____

Color of water before filtration: N/A After filtration: N/A

Reaction upon addition of preservatives? YES NO explain: _____

Appearance of Water: (Clear/Slightly Turbid/Turbid/Very Turbid)

Well condition: Good

Signature: Alan Thompson Date: 12-30-08



Quality Assurance Report Package # 57935

KERAMIDA ENVIRONMENTAL, INC.

FRANK WEST
401 NORTH COLLEGE AVENUE
INDIANAPOLIS, IN 46202

Project : KERAMIDA ENVIRONMENTAL
HARMAN BECKER

Sampled : 30-DEC-08

Sample Range : A836116

Karen A. Fullmer

Approved by: KAREN FULLMER - Project Manager

Heritage Environmental Services, LLC
Commercial Laboratory Operations
7901 West Morris Street
Indianapolis, Indiana 46231
Phone: (317) 243-8304
Fax : (317) 486-5095



page 2

57935



CERTIFICATE OF ANALYSIS

Service Location HERITAGE ENVIRONMENTAL SERVICES, LLC COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	Received 30-DEC-08	Project 5035	Lab ID A836116
	Completed 09-JAN-09	PO Number 11913	
	Printed 13-JAN-09	Sampled 30-DEC-08 13:00	

Report To FRANK WEST KERAMIDA ENVIRONMENTAL, INC. 401 NORTH COLLEGE AVENUE INDIANAPOLIS, IN 46202	Bill To ACCOUNTS PAYABLE KERAMIDA ENVIRONMENTAL, INC. 401 N. COLLEGE AVENUE INDIANAPOLIS, IN 46202
--	---

Sample Description

CLIENT ID: MW-17
MATRIX TYPE: NON-SPECIFIC WATER
SUBMITTER CODE: 1618

VOLATILE ORGANICS, CAPILLARY COLUMN TECHNIQUE SW846-8260B			NELAC:Y
Analyst: H. WILLIAMS	Analysis Date: 05-JAN-09 15:46	Instrument: GC/MS VOA	Test: O510.5.0
Parameter	Result	Det. Limit	Units
ACETONE (2-PROPANONE)	BDL	10	ug/L
ACROLEIN	BDL	50	ug/L
ACRYLONITRILE	BDL	10	ug/L
BENZENE	BDL	1.0	ug/L
BROMOBENZENE	BDL	1.0	ug/L
BROMOCHLOROMETHANE	BDL	1.0	ug/L
BROMODICHLOROMETHANE	BDL	1.0	ug/L
BROMOFORM	BDL	1.0	ug/L
BROMOMETHANE	BDL	1.0	ug/L
N-BUTYLBENZENE	BDL	1.0	ug/L
SEC-BUTYLBENZENE	BDL	1.0	ug/L
TERT-BUTYLBENZENE	BDL	1.0	ug/L
CARBON DISULFIDE	BDL	1.0	ug/L
CARBON TETRACHLORIDE	BDL	1.0	ug/L
CHLOROBENZENE	BDL	1.0	ug/L
DIBROMOCHLOROMETHANE	BDL	1.0	ug/L
CHLOROETHANE	BDL	1.0	ug/L
CHLOROFORM	BDL	1.0	ug/L
CHLOROMETHANE	BDL	1.0	ug/L
2-CHLOROTOLUENE (O-CHLOROTOLUENE)	BDL	1.0	ug/L
4-CHLOROTOLUENE (P-CHLOROTOLUENE)	BDL	1.0	ug/L
1-CHLOROETHYLVINYLETHER	BDL	1.0	ug/L
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	BDL	1.0	ug/L



HERITAGE ENVIRONMENTAL SERVICES, LLC

Sample ID: A836116 MW-17

1,2-DIBROMOETHANE (EDB)	BDL	1.0	ug/L
DIBROMOMETHANE	BDL	1.0	ug/L
1,2-DICHLOROBENZENE (O-DICHLOROBENZENE)	BDL	1.0	ug/L
1,3-DICHLOROBENZENE (M-DICHLOROBENZENE)	BDL	1.0	ug/L
1,4-DICHLOROBENZENE (P-DICHLOROBENZENE)	BDL	1.0	ug/L
DICHLORODIFLUOROMETHANE	BDL	1.0	ug/L
TRANS-1,4-DICHLORO-2-BUTENE	BDL	2.0	ug/L
1,1-DICHLOROETHANE	BDL	1.0	ug/L
1,2-DICHLOROETHANE	BDL	1.0	ug/L
1,1-DICHLOROETHENE	BDL	1.0	ug/L
CIS-1,2-DICHLOROETHENE	22	1.0	ug/L
TRANS-1,2-DICHLOROETHENE	1.9	1.0	ug/L
1,2-DICHLOROPROPANE	BDL	1.0	ug/L
1,3-DICHLOROPROPANE	BDL	1.0	ug/L
2,2-DICHLOROPROPANE	BDL	1.0	ug/L
1,1-DICHLOROPROPENE	BDL	1.0	ug/L
CIS-1,3-DICHLOROPROPENE	BDL	1.0	ug/L
TRANS-1,3-DICHLOROPROPENE	BDL	1.0	ug/L
ETHYL BENZENE	BDL	1.0	ug/L
ETHYL METHACRYLATE	BDL	10	ug/L
2-HEXANONE	BDL	10	ug/L
HEXACHLOROBUTADIENE	BDL	1.0	ug/L
IODOMETHANE	BDL	1.0	ug/L
ISOPROPYLBENZENE (CUMENE)	BDL	1.0	ug/L
4-ISOPROPYLTOLUENE (P-ISOPROPYLTOLUENE)	BDL	1.0	ug/L
DICHLOROMETHANE (METHYLENE CHLORIDE)	BDL	1.0	ug/L
METHYL ETHYL KETONE	BDL	10	ug/L
METHYL-T-BUTYL ETHER (MTBE)	BDL	1.0	ug/L
METHYL ISOBUTYL KETONE	BDL	10	ug/L
NAPHTHALENE	BDL	1.0	ug/L
N-PROPYLBENZENE	BDL	1.0	ug/L
STYRENE	BDL	1.0	ug/L
1,1,1,2-TETRACHLOROETHANE	BDL	1.0	ug/L
1,1,2,2-TETRACHLOROETHANE	BDL	1.0	ug/L
TETRACHLOROETHENE	EX	1.0	ug/L
TOLUENE	BDL	1.0	ug/L
1,2,3-TRICHLOROBENZENE	BDL	1.0	ug/L
1,2,4-TRICHLOROBENZENE	BDL	1.0	ug/L
1,1,1-TRICHLOROETHANE	BDL	1.0	ug/L
1,1,2-TRICHLOROETHANE	BDL	1.0	ug/L
TRICHLOROETHENE	52	1.0	ug/L



HERITAGE ENVIRONMENTAL SERVICES, LLC

Sample ID: A836116 MW-17

TRICHLOROFLUOROMETHANE	BDL	1.0 ug/L
1,2,3-TRICHLOROPROPANE	BDL	1.0 ug/L
1,2,4-TRIMETHYLBENZENE	BDL	1.0 ug/L
1,3,5-TRIMETHYLBENZENE	BDL	1.0 ug/L
VINYL ACETATE	BDL	1.0 ug/L
VINYL CHLORIDE	BDL	1.0 ug/L
XYLENES (O/M/P-XYLENE)	BDL	2.0 ug/L
...		
SURROGATE RECOVERY		
DICHLOROETHANE-D4	103	% Rec
TOLUENE-D8	91	% Rec
4-BROMOFLUOROBENZENE	100	% Rec
DIBROMOFLUOROMETHANE	101	% Rec

Dilution necessary due to high concentration of target analytes.

Prep Method SW846-5030B Purge and Trap

VOLATILE ORGANICS, CAPILLARY COLUMN TECHNIQUE SW846-8260B			NELAC:Y
Analyst: H. WILLIAMS	Analysis Date: 08-JAN-09 07:13	Instrument: GC/MS VOA	Test: O510.5.1
Parameter	Result	Det. Limit	Units
TETRACHLOROETHENE	1100	20	ug/L
...			
SURROGATE RECOVERY			
DICHLOROETHANE-D4	101		% Rec
TOLUENE-D8	97		% Rec
4-BROMOFLUOROBENZENE	105		% Rec
DIBROMOFLUOROMETHANE	99		% Rec

1:20 Dilution

Prep Method SW846-5030B Purge and Trap

Sample Comments

BDL Below Detection Limit

EX Exceeds calibration range. See Replicate

Sample was received on ice at temperature 2.4 C.
Sample chain of custody number 6312.This Certificate 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
or to the sample as received by the lab.

Heritage Environmental Services, LLC certifies that the test results



HERITAGE ENVIRONMENTAL SERVICES, LLC

Sample ID: A836116 MW-17

Sample Comments

indicated as NELAC (National Environmental Laboratory Accreditation Conference) accredited (Yes for NELAC) meet all requirements of NELAC and Illinois EPA Part 186 unless otherwise explained or justified as to the the exact nature of the deviations.

Heritage Environmental Services, LLC is accredited under Illinois NELAC accreditation number 100401.

Indiana SDWA Lab Accred. No. C-49-01

A handwritten signature in cursive script that reads "Scott A. Bryan".

Approved by: SCOTT BRYAN 09-JAN-09



Quality Assurance Report

page 7

JBJ57935

12-JAN-09

Service Location

Heritage Environmental Services, LLC
Commercial Laboratory Operations
7901 West Morris Street
Indianapolis, IN 46231
(317) 243-8304

Submitter

FRANK WEST
KERAMIDA ENVIRONMENTAL, INC.
401 NORTH COLLEGE AVENUE
INDIANAPOLIS, IN 46202

Sample ID	Client ID	Date/Time Sampled	Date Received	Date Complete
A836116	MW-17.....	30-Dec-08 13:00	30-Dec-08	09-Jan-09



JBJ57935

VOLATILE ORGANICS, CAPILLARY COLUMN TECHNIQUE SW846-8260B

0510.5

R545534 Analytical	Analyst: H WILLIAMS Reviewer: R SHAMP		Run Date: 05-Jan-09 Review Date: 07-Jan-09		Instrument: GC/MS VOA					
QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
CAL01	Q2153119		Analysis Date/Time: 31-Dec-08 11:48							
CAL01	Q2153119		ACETONE (2-PROPANONE)	0.1608						9.7
CAL01	Q2153119		ACROLEIN	0.0280						4.4
CAL01	Q2153119		ACRYLONITRILE	0.0679						5.2
CAL01	Q2153119		BENZENE	0.8863						3.4
CAL01	Q2153119		BROMOBENZENE	1.2322						3.9
CAL01	Q2153119		BROMOCHLOROMETHANE	0.1169						6.6
CAL01	Q2153119		BROMODICHLOROMETHANE	0.3065						4
CAL01	Q2153119		BROMOFORM	0.4492						3.3
CAL01	Q2153119		BROMOMETHANE	0.1326						12.6
CAL01	Q2153119		N-BUTYLBENZENE	1.6875						3
CAL01	Q2153119		SEC-BUTYLBENZENE	3.7644						3.3
CAL01	Q2153119		TERT-BUTYLBENZENE	1.6265						2.4
CAL01	Q2153119		CARBON DISULFIDE	0.7263						3.9
CAL01	Q2153119		CARBON TETRACHLORIDE	0.3407						4.7
CAL01	Q2153119		CHLOROBENZENE	1.6031						1.8
CAL01	Q2153119		DIBROMOCHLOROMETHANE	0.6021						2.9
CAL01	Q2153119		CHLOROETHANE	0.1926						13.9
CAL01	Q2153119		CHLOROFORM	0.4371						13.8
CAL01	Q2153119		CHLOROMETHANE	0.3537						9.4
CAL01	Q2153119		2-CHLOROTOLUENE (O- CHLOROTOLUENE)	0.7463						4.5
CAL01	Q2153119		4-CHLOROTOLUENE (P- CHLOROTOLUENE)	0.7365						4
CAL01	Q2153119		2-CHLOROETHYL VINYLETHER	0.1977						5.1
CAL01	Q2153119		1,2-DIBROMO-3- CHLOROPROPANE (DBCP)	0.2581						5.6
CAL01	Q2153119		1,2-DIBROMOETHANE (EDB)	0.1926						4.1
CAL01	Q2153119		DIBROMOMETHANE	0.1357						8.6
CAL01	Q2153119		1,2-DICHLOROBENZENE (O- DICHLOROBENZENE)	1.6291						4.2
CAL01	Q2153119		1,3-DICHLOROBENZENE (M- DICHLOROBENZENE)	1.6052						4.2
CAL01	Q2153119		1,4-DICHLOROBENZENE (P- DICHLOROBENZENE)	1.6498						4.1
CAL01	Q2153119		DICHLORODIFLUOROMETHANE	0.2076						6.4
CAL01	Q2153119		TRANS-1,4-DICHLORO-2-BUTENE	0.4912						3.5
CAL01	Q2153119		1,1-DICHLOROETHANE	0.5523						3.8
CAL01	Q2153119		1,2-DICHLOROETHANE	0.4496						4.1
CAL01	Q2153119		1,1-DICHLOROETHENE	0.2047						6.1
CAL01	Q2153119		CIS-1,2-DICHLOROETHENE	0.2529						4.7
CAL01	Q2153119		TRANS-1,2-DICHLOROETHENE	0.2298						5.8
CAL01	Q2153119		1,2-DICHLOROPROPANE	0.2778						3.3
CAL01	Q2153119		1,3-DICHLOROPROPANE	0.8984						2.4
CAL01	Q2153119		1,1-DICHLOROPROPENE	0.1152						4.7
CAL01	Q2153119		CIS-1,3-DICHLOROPROPENE	0.3362						6.1
CAL01	Q2153119		TRANS-1,3-DICHLOROPROPENE	0.2898						6
CAL01	Q2153119		ETHYL BENZENE	0.9362						2.2
CAL01	Q2153119		ETHYL METHACRYLATE	0.8114						2.6
CAL01	Q2153119		2-HEXANONE	0.8738						6.7



JB57935

VOLATILE ORGANICS, CAPILLARY COLUMN TECHNIQUE SW846-8260B

0510.5

R545534
AnalyticalAnalyst: H WILLIAMS
Reviewer: R SHAMPRun Date: 05-Jan-09
Review Date: 07-Jan-09

Continued

QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
CAL01	Q2153119		HEXACHLOROBUTADIENE	0.6037						5.3
CAL01	Q2153119		IODOMETHANE	0.3715						3.7
CAL01	Q2153119		ISOPROPYLBENZENE (CUMENE)	2.9126						2.2
CAL01	Q2153119		4-ISOPROPYLTOLUENE (P- ISOPROPYLTOLUENE)	3.2544						2.5
CAL01	Q2153119		DICHLOROMETHANE (METHYLENE CHLORIDE)			LIN				0.999
CAL01	Q2153119		METHYL ETHYL KETONE	0.0367						3.7
CAL01	Q2153119		METHYL-T-BUTYL ETHER (MTBE)	0.9193						3.6
CAL01	Q2153119		METHYL ISOBUTYL KETONE	0.4907						4.9
CAL01	Q2153119		NAPHTHALENE	3.3377						2.7
CAL01	Q2153119		N-PROPYLBENZENE	0.3889						3.3
CAL01	Q2153119		STYRENE	1.9282						2.4
CAL01	Q2153119		1,1,1,2-TETRACHLOROETHANE	0.6674						4.1
CAL01	Q2153119		1,1,2,2-TETRACHLOROETHANE	0.8764						7.7
CAL01	Q2153119		TETRACHLOROETHENE	0.7167						3.6
CAL01	Q2153119		TOLUENE	0.8695						5.2
CAL01	Q2153119		1,2,3-TRICHLOROBENZENE	1.1337						3.9
CAL01	Q2153119		1,2,4-TRICHLOROBENZENE	1.2188						3.4
CAL01	Q2153119		1,1,1-TRICHLOROETHANE	0.3792						4.4
CAL01	Q2153119		1,1,2-TRICHLOROETHANE	0.1822						6.2
CAL01	Q2153119		TRICHLOROETHENE	0.2419						3.7
CAL01	Q2153119		TRICHLOROFLUOROMETHANE	0.3231						7
CAL01	Q2153119		1,2,3-TRICHLOROPROPANE	0.3100						10.8
CAL01	Q2153119		1,2,4-TRIMETHYLBENZENE	3.0483						2.5
CAL01	Q2153119		1,3,5-TRIMETHYLBENZENE	2.8922						2.4
CAL01	Q2153119		VINYL ACETATE	0.9966						3.7
CAL01	Q2153119		VINYL CHLORIDE	0.4032						4.1
CAL01	Q2153119		DICHLOROETHANE-D4	0.3910						2.8
CAL01	Q2153119		TOLUENE-D8	0.9033						2.5
CAL01	Q2153119		4-BROMOFLUOROBENZENE	0.8503						3.1
CAL01	Q2153119		DIBROMOFLUOROMETHANE	0.2486						2.2
CCVD	Q2154442		Analysis Date/Time: 05-Jan-09 05:56							
CCVD	Q2154442		ACETONE (2-PROPANONE)	0.1608			0.3571			122.1
CCVD	Q2154442		ACROLEIN	0.0280			0.0568			102.9
CCVD	Q2154442		ACRYLONITRILE	0.0679			0.1565			130.5
CCVD	Q2154442		BENZENE	0.8863			0.9615			8.5
CCVD	Q2154442		BROMOBENZENE	1.2322			1.2453			1.1
CCVD	Q2154442		BROMOCHLOROMETHANE	0.1169			0.1277			9.2
CCVD	Q2154442		BROMODICHLOROMETHANE	0.3065			0.3238			5.6
CCVD	Q2154442		BROMOFORM	0.4492			0.4653			3.6
CCVD	Q2154442		BROMOMETHANE	0.1326			0.1434			8.1
CCVD	Q2154442		N-BUTYLBENZENE	1.6875			1.7242			2.2
CCVD	Q2154442		SEC-BUTYLBENZENE	3.7644			3.9284			4.4
CCVD	Q2154442		TERT-BUTYLBENZENE	1.6265			1.7096			5.1
CCVD	Q2154442		CARBON DISULFIDE	0.7263			0.9084			25.1
CCVD	Q2154442		CARBON TETRACHLORIDE	0.3407			0.3814			11.9
CCVD	Q2154442		CHLOROBENZENE	1.6031			1.6805			4.8



JBJ57935

VOLATILE ORGANICS, CAPILLARY COLUMN TECHNIQUE SW846-8260B

O510.5

R545534 Analytical	Analyst: H WILLIAMS Reviewer: R SHAMP		Run Date: 05-Jan-09 Review Date: 07-Jan-09		Continued					
QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
CCVD	Q2154442		DIBROMOCHLOROMETHANE	0.6021			0.6005			0.3
CCVD	Q2154442		CHLOROETHANE	0.1926			0.2360			22.5
CCVD	Q2154442		CHLOROFORM	0.4371			0.4529			3.6
CCVD	Q2154442		CHLOROMETHANE	0.3537			0.4292			21.3
CCVD	Q2154442		2-CHLOROTOLUENE (O- CHLOROTOLUENE)	0.7463			0.7890			5.7
CCVD	Q2154442		4-CHLOROTOLUENE (P- CHLOROTOLUENE)	0.7365			0.7665			4.1
CCVD	Q2154442		2-CHLOROETHYL VINYLETHER	0.1977			0.2107			6.6
CCVD	Q2154442		1,2-DIBROMO-3- CHLOROPROPANE (DBCP)	0.2581			0.2464			4.5
CCVD	Q2154442		1,2-DIBROMOETHANE (EDB)	0.1926			0.2002			3.9
CCVD	Q2154442		DIBROMOMETHANE	0.1357			0.1432			5.5
CCVD	Q2154442		1,2-DICHLOROBENZENE (O- DICHLOROBENZENE)	1.6291			1.6830			3.3
CCVD	Q2154442		1,3-DICHLOROBENZENE (M- DICHLOROBENZENE)	1.6052			1.7002			5.9
CCVD	Q2154442		1,4-DICHLOROBENZENE (P- DICHLOROBENZENE)	1.6498			1.7367			5.3
CCVD	Q2154442		DICHLORODIFLUOROMETHANE	0.2076			0.1869			10
CCVD	Q2154442		TRANS-1,4-DICHLORO-2-BUTENE	0.4912			0.5329			8.5
CCVD	Q2154442		1,1-DICHLOROETHANE	0.5523			0.5987			8.4
CCVD	Q2154442		1,2-DICHLOROETHANE	0.4496			0.4864			8.2
CCVD	Q2154442		1,1-DICHLOROETHENE	0.2047			0.2171			6.1
CCVD	Q2154442		CIS-1,2-DICHLOROETHENE	0.2529			0.2737			8.2
CCVD	Q2154442		TRANS-1,2-DICHLOROETHENE	0.2298			0.2471			7.5
CCVD	Q2154442		1,2-DICHLOROPROPANE	0.2778			0.2998			7.9
CCVD	Q2154442		1,3-DICHLOROPROPANE	0.8984			0.9232			2.8
CCVD	Q2154442		1,1-DICHLOROPROPENE	0.1152			0.1219			5.8
CCVD	Q2154442		CIS-1,3-DICHLOROPROPENE	0.3362			0.3609			7.3
CCVD	Q2154442		TRANS-1,3-DICHLOROPROPENE	0.2898			0.3210			10.8
CCVD	Q2154442		ETHYL BENZENE	0.9362			0.9887			5.6
CCVD	Q2154442		ETHYL METHACRYLATE	0.8114			0.7198			11.3
CCVD	Q2154442		2-HEXANONE	0.8738			0.9102			4.2
CCVD	Q2154442		HEXACHLOROBUTADIENE	0.6037			0.6131			1.6
CCVD	Q2154442		IODOMETHANE	0.3715			0.4191			12.8
CCVD	Q2154442		ISOPROPYLBENZENE (CUMENE)	2.9126			3.0796			5.7
CCVD	Q2154442		4-ISOPROPYLTOLUENE (P- ISOPROPYLTOLUENE)	3.2544			3.3686			3.5
CCVD	Q2154442		DICHLOROMETHANE (METHYLENE CHLORIDE)	10.0		LIN	14.6			46
CCVD	Q2154442		METHYL ETHYL KETONE	0.0367			0.0453			23.4
CCVD	Q2154442		METHYL-T-BUTYL ETHER (MTBE)	0.9193			1.0226			11.2
CCVD	Q2154442		METHYL ISOBUTYL KETONE	0.4907			0.5510			12.3
CCVD	Q2154442		NAPHTHALENE	3.3377			3.3457			0.2
CCVD	Q2154442		N-PROPYLBENZENE	0.3889			0.4303			10.6
CCVD	Q2154442		STYRENE	1.9282			1.9949			3.5
CCVD	Q2154442		1,1,1,2-TETRACHLOROETHANE	0.6674			0.6808			2
CCVD	Q2154442		1,1,2,2-TETRACHLOROETHANE	0.8764			0.9014			2.9
CCVD	Q2154442		TETRACHLOROETHENE	0.7167			0.7106			0.9
CCVD	Q2154442		TOLUENE	0.8695			0.9559			9.9



JBJS57935

VOLATILE ORGANICS, CAPILLARY COLUMN TECHNIQUE SW846-8260B

O510.5

R545534
AnalyticalAnalyst: H WILLIAMS
Reviewer: R SHAMPRun Date: 05-Jan-09
Review Date: 07-Jan-09

Continued

QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
CCVD	Q2154442		1,2,3-TRICHLOROBENZENE	1.1337			1.1313			0.2
CCVD	Q2154442		1,2,4-TRICHLOROBENZENE	1.2188			1.2367			1.5
CCVD	Q2154442		1,1,1-TRICHLOROETHANE	0.3792			0.4161			9.7
CCVD	Q2154442		1,1,2-TRICHLOROETHANE	0.1822			0.1911			4.9
CCVD	Q2154442		TRICHLOROETHENE	0.2419			0.2516			4
CCVD	Q2154442		TRICHLOROFLUOROMETHANE	0.3231			0.3664			13.4
CCVD	Q2154442		1,2,3-TRICHLOROPROPANE	0.3100			0.3105			0.2
CCVD	Q2154442		1,2,4-TRIMETHYLBENZENE	3.0483			3.1667			3.9
CCVD	Q2154442		1,3,5-TRIMETHYLBENZENE	2.8922			2.9813			3.1
CCVD	Q2154442		VINYL ACETATE	0.9966			1.1639			16.8
CCVD	Q2154442		VINYL CHLORIDE	0.4032			0.4289			6.4
CCVD	Q2154442		DICHLOROETHANE-D4	0.3910			0.4070			4.1
CCVD	Q2154442		TOLUENE-D8	0.9033			0.9264			2.6
CCVD	Q2154442		4-BROMOFLUOROBENZENE	0.8503			0.8366			1.6
CCVD	Q2154442		DIBROMOFLUOROMETHANE	0.2486			0.2527			1.6
BLA01	Q2154445		Analysis Date/Time: 05-Jan-09 06:29							
BLA01	Q2154445		ACETONE (2-PROPANONE)			BDL	10.	ug/L		
BLA01	Q2154445		ACROLEIN			BDL	25.	ug/L		
BLA01	Q2154445		ACRYLONITRILE			BDL	5.0	ug/L		
BLA01	Q2154445		BENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		BROMOBENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		BROMOCHLOROMETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		BROMODICHLOROMETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		BROMOFORM			BDL	1.0	ug/L		
BLA01	Q2154445		BROMOMETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		N-BUTYLBENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		SEC-BUTYLBENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		TERT-BUTYLBENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		CARBON DISULFIDE			BDL	1.0	ug/L		
BLA01	Q2154445		CARBON TETRACHLORIDE			BDL	1.0	ug/L		
BLA01	Q2154445		CHLOROBENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		DIBROMOCHLOROMETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		CHLOROETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		CHLOROFORM			BDL	1.0	ug/L		
BLA01	Q2154445		CHLOROMETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		2-CHLOROTOLUENE (O-CHLOROTOLUENE)			BDL	1.0	ug/L		
BLA01	Q2154445		4-CHLOROTOLUENE (P-CHLOROTOLUENE)			BDL	1.0	ug/L		
BLA01	Q2154445		2-CHLOROETHYL VINYLETHER			BDL	1.0	ug/L		
BLA01	Q2154445		1,2-DIBROMO-3-CHLOROPROPANE (DBCP)			BDL	1.0	ug/L		
BLA01	Q2154445		1,2-DIBROMOETHANE (EDB)			BDL	1.0	ug/L		
BLA01	Q2154445		DIBROMOMETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		1,2-DICHLOROBENZENE (O-DICHLOROBENZENE)			BDL	1.0	ug/L		
BLA01	Q2154445		1,3-DICHLOROBENZENE (M-DICHLOROBENZENE)			BDL	1.0	ug/L		
BLA01	Q2154445		1,4-DICHLOROBENZENE (P-DICHLOROBENZENE)			BDL	1.0	ug/L		



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R545534 Analytical	Analyst: H WILLIAMS Reviewer: R SHAMP		Run Date: 05-Jan-09 Review Date: 07-Jan-09		Continued					
QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
BLA01	Q2154445		DICHLORODIFLUOROMETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		TRANS-1,4-DICHLORO-2-BUTENE			BDL	2.0	ug/L		
BLA01	Q2154445		1,1-DICHLOROETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		1,2-DICHLOROETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		1,1-DICHLOROETHENE			BDL	1.0	ug/L		
BLA01	Q2154445		CIS-1,2-DICHLOROETHENE			BDL	1.0	ug/L		
BLA01	Q2154445		TRANS-1,2-DICHLOROETHENE			BDL	1.0	ug/L		
BLA01	Q2154445		1,2-DICHLOROPROPANE			BDL	1.0	ug/L		
BLA01	Q2154445		1,3-DICHLOROPROPANE			BDL	1.0	ug/L		
BLA01	Q2154445		2,2-DICHLOROPROPANE			BDL	1.0	ug/L		
BLA01	Q2154445		1,1-DICHLOROPROPENE			BDL	1.0	ug/L		
BLA01	Q2154445		CIS-1,3-DICHLOROPROPENE			BDL	1.0	ug/L		
BLA01	Q2154445		TRANS-1,3-DICHLOROPROPENE			BDL	1.0	ug/L		
BLA01	Q2154445		ETHYL BENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		ETHYL METHACRYLATE			BDL	1.0	ug/L		
BLA01	Q2154445		2-HEXANONE			BDL	5.0	ug/L		
BLA01	Q2154445		HEXACHLOROBUTADIENE			BDL	1.0	ug/L		
BLA01	Q2154445		IODOMETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		ISOPROPYLBENZENE (CUMENE)			BDL	1.0	ug/L		
BLA01	Q2154445		4-ISOPROPYLTOLUENE (P- ISOPROPYLTOLUENE)			BDL	1.0	ug/L		
BLA01	Q2154445		DICHLOROMETHANE (METHYLENE CHLORIDE)			BDL	1.0	ug/L		
BLA01	Q2154445		METHYL ETHYL KETONE			BDL	5.0	ug/L		
BLA01	Q2154445		METHYL-T-BUTYL ETHER (MTBE)			BDL	1.0	ug/L		
BLA01	Q2154445		METHYL ISOBUTYL KETONE			BDL	5.0	ug/L		
BLA01	Q2154445		NAPHTHALENE			BDL	1.0	ug/L		
BLA01	Q2154445		N-PROPYLBENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		STYRENE			BDL	1.0	ug/L		
BLA01	Q2154445		1,1,1,2-TETRACHLOROETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		1,1,2,2-TETRACHLOROETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		TETRACHLOROETHENE			BDL	1.0	ug/L		
BLA01	Q2154445		TOLUENE			BDL	1.0	ug/L		
BLA01	Q2154445		1,2,3-TRICHLOROBENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		1,2,4-TRICHLOROBENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		1,1,1-TRICHLOROETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		1,1,2-TRICHLOROETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		TRICHLOROETHENE			BDL	1.0	ug/L		
BLA01	Q2154445		TRICHLOROFLUOROMETHANE			BDL	1.0	ug/L		
BLA01	Q2154445		1,2,3-TRICHLOROPROPANE			BDL	1.0	ug/L		
BLA01	Q2154445		1,2,4-TRIMETHYLBENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		1,3,5-TRIMETHYLBENZENE			BDL	1.0	ug/L		
BLA01	Q2154445		VINYL ACETATE			BDL	1.0	ug/L		
BLA01	Q2154445		VINYL CHLORIDE			BDL	1.0	ug/L		
BLA01	Q2154445		DICHLOROETHANE-D4							103
BLA01	Q2154445		TOLUENE-D8							103
BLA01	Q2154445		4-BROMOFLUOROBENZENE							99
BLA01	Q2154445		DIBROMOFLUOROMETHANE							100



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R545534 Analytical	Analyst: H WILLIAMS Reviewer: R SHAMP		Run Date: 05-Jan-09 Review Date: 07-Jan-09		Continued					
QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
LCS01	Q2154446	METHOD 826	Analysis Date/Time: 05-Jan-09 07:03							
LCS01	Q2154446	METHOD 826	ACETONE (2-PROPANONE)	50			49.7	ug/L	99.4	
LCS01	Q2154446	METHOD 826	ACROLEIN	100			188	ug/L	188	
LCS01	Q2154446	METHOD 826	ACRYLONITRILE	100			233	ug/L	233	
LCS01	Q2154446	METHOD 826	BENZENE	10			10.6	ug/L	106	
LCS01	Q2154446	METHOD 826	BROMOBENZENE	10			10.1	ug/L	101	
LCS01	Q2154446	METHOD 826	BROMOCHLOROMETHANE	10			11	ug/L	110	
LCS01	Q2154446	METHOD 826	BROMODICHLOROMETHANE	10			9.83	ug/L	98.3	
LCS01	Q2154446	METHOD 826	BROMOFORM	10			9.86	ug/L	98.6	
LCS01	Q2154446	METHOD 826	BROMOMETHANE	10			12.2	ug/L	122	
LCS01	Q2154446	METHOD 826	N-BUTYLBENZENE	10			10.1	ug/L	101	
LCS01	Q2154446	METHOD 826	SEC-BUTYLBENZENE	10			11	ug/L	110	
LCS01	Q2154446	METHOD 826	TERT-BUTYLBENZENE	10			10.9	ug/L	109	
LCS01	Q2154446	METHOD 826	CARBON DISULFIDE	10			9.32	ug/L	93.2	
LCS01	Q2154446	METHOD 826	CARBON TETRACHLORIDE	10			10.9	ug/L	109	
LCS01	Q2154446	METHOD 826	CHLOROBENZENE	10			11.2	ug/L	112	
LCS01	Q2154446	METHOD 826	DIBROMOCHLOROMETHANE	10			9.4	ug/L	94	
LCS01	Q2154446	METHOD 826	CHLOROETHANE	10			13	ug/L	130	
LCS01	Q2154446	METHOD 826	CHLOROFORM	10			10.2	ug/L	102	
LCS01	Q2154446	METHOD 826	CHLOROMETHANE	10			13.2	ug/L	132	
LCS01	Q2154446	METHOD 826	2-CHLOROTOLUENE (O- CHLOROTOLUENE)	10			11.1	ug/L	111	
LCS01	Q2154446	METHOD 826	4-CHLOROTOLUENE (P- CHLOROTOLUENE)	10			11.1	ug/L	111	
LCS01	Q2154446	METHOD 826	2-CHLOROETHYLVINYLETHER	10			9.5	ug/L	95	
LCS01	Q2154446	METHOD 826	1,2-DIBROMO-3- CHLOROPROPANE (DBCP)	10			9.01	ug/L	90.1	
LCS01	Q2154446	METHOD 826	1,2-DIBROMOETHANE (EDB)	10			10	ug/L	100	
LCS01	Q2154446	METHOD 826	DIBROMOMETHANE	10			10.2	ug/L	102	
LCS01	Q2154446	METHOD 826	1,2-DICHLOROBENZENE (O- DICHLOROBENZENE)	10			11.3	ug/L	113	
LCS01	Q2154446	METHOD 826	1,3-DICHLOROBENZENE (M- DICHLOROBENZENE)	10			11.2	ug/L	112	
LCS01	Q2154446	METHOD 826	1,4-DICHLOROBENZENE (P- DICHLOROBENZENE)	10			11	ug/L	110	
LCS01	Q2154446	METHOD 826	DICHLORODIFLUOROMETHANE	10			9.49	ug/L	94.9	
LCS01	Q2154446	METHOD 826	TRANS-1,4-DICHLORO-2-BUTENE	20			9.27	ug/L	46.4	
LCS01	Q2154446	METHOD	1,1-DICHLOROETHANE	10			10.9	ug/L	109	



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R545534 Analytical	Analyst: H WILLIAMS Reviewer: R SHAMP		Run Date: 05-Jan-09 Review Date: 07-Jan-09		Continued					
QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
		826								
LCS01	Q2154446	METHOD 826	1,2-DICHLOROETHANE	10			10.7	ug/L	107	
LCS01	Q2154446	METHOD 826	1,1-DICHLOROETHENE	10			11	ug/L	110	
LCS01	Q2154446	METHOD 826	CIS-1,2-DICHLOROETHENE	10			10.4	ug/L	104	
LCS01	Q2154446	METHOD 826	TRANS-1,2-DICHLOROETHENE	10			11	ug/L	110	
LCS01	Q2154446	METHOD 826	1,2-DICHLOROPROPANE	10			10.3	ug/L	103	
LCS01	Q2154446	METHOD 826	1,3-DICHLOROPROPANE	10			10.1	ug/L	101	
LCS01	Q2154446	METHOD 826	2,2-DICHLOROPROPANE	10			11.4	ug/L	114	
LCS01	Q2154446	METHOD 826	1,1-DICHLOROPROPENE	10			10.5	ug/L	105	
LCS01	Q2154446	METHOD 826	CIS-1,3-DICHLOROPROPENE	10			10.3	ug/L	103	
LCS01	Q2154446	METHOD 826	TRANS-1,3-DICHLOROPROPENE	10			11.1	ug/L	111	
LCS01	Q2154446	METHOD 826	ETHYL BENZENE	10			10	ug/L	100	
LCS01	Q2154446	METHOD 826	2-HEXANONE	50			47.1	ug/L	94.2	
LCS01	Q2154446	METHOD 826	HEXACHLOROBUTADIENE	10			9.98	ug/L	99.8	
LCS01	Q2154446	METHOD 826	IODOMETHANE	10			10.6	ug/L	106	
LCS01	Q2154446	METHOD 826	ISOPROPYLBENZENE (CUMENE)	10			12	ug/L	120	
LCS01	Q2154446	METHOD 826	4-ISOPROPYLTOLUENE (P- ISOPROPYLTOLUENE)	10			10.4	ug/L	104	
LCS01	Q2154446	METHOD 826	DICHLOROMETHANE (METHYLENE CHLORIDE)	10			10.8	ug/L	108	
LCS01	Q2154446	METHOD 826	METHYL ETHYL KETONE	50			48.7	ug/L	97.4	
LCS01	Q2154446	METHOD 826	METHYL-T-BUTYL ETHER (MTBE)	10			9.89	ug/L	98.9	
LCS01	Q2154446	METHOD 826	METHYL ISOBUTYL KETONE	50			49.5	ug/L	99	
LCS01	Q2154446	METHOD 826	NAPHTHALENE	10			9.43	ug/L	94.3	
LCS01	Q2154446	METHOD 826	N-PROPYLBENZENE	10			11.5	ug/L	115	
LCS01	Q2154446	METHOD 826	STYRENE	10			10.1	ug/L	101	
LCS01	Q2154446	METHOD 826	1,1,1,2-TETRACHLOROETHANE	10			9.82	ug/L	98.2	
LCS01	Q2154446	METHOD 826	1,1,2,2-TETRACHLOROETHANE	10			9.66	ug/L	96.6	
LCS01	Q2154446	METHOD 826	TETRACHLOROETHENE	10			9.5	ug/L	95	
LCS01	Q2154446	METHOD 826	TOLUENE	10			10.7	ug/L	107	
LCS01	Q2154446	METHOD 826	1,2,3-TRICHLOROBENZENE	10			9.76	ug/L	97.6	
LCS01	Q2154446	METHOD 826	1,2,4-TRICHLOROBENZENE	10			9.6	ug/L	96	
LCS01	Q2154446	METHOD 826	1,1,1-TRICHLOROETHANE	10			11.1	ug/L	111	
LCS01	Q2154446	METHOD 826	1,1,2-TRICHLOROETHANE	10			9.96	ug/L	99.6	



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R545534 Analytical	Analyst: H WILLIAMS Reviewer: R SHAMP		Run Date: 05-Jan-09 Review Date: 07-Jan-09		Continued					
QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
LCS01	Q2154446	METHOD 826	TRICHLOROETHENE	10			10.2	ug/L	102	
LCS01	Q2154446	METHOD 826	TRICHLOROFLUOROMETHANE	10			11.6	ug/L	116	
LCS01	Q2154446	METHOD 826	1,2,3-TRICHLOROPROPANE	10			9.36	ug/L	93.6	
LCS01	Q2154446	METHOD 826	1,2,4-TRIMETHYLBENZENE	10			10	ug/L	100	
LCS01	Q2154446	METHOD 826	1,3,5-TRIMETHYLBENZENE	10			10.1	ug/L	101	
LCS01	Q2154446	METHOD 826	VINYL ACETATE	10		!	15.8	ug/L	158	
LCS01	Q2154446	METHOD 826	VINYL CHLORIDE	10			10.6	ug/L	106	
SPI01	Q2154447	A835164	Analysis Date/Time: 05-Jan-09 11:27							
SPI01	Q2154447	A835164	ACETONE (2-PROPANONE)	0	50		40.5	ug/L	81	
SPI01	Q2154447	A835164	ACROLEIN	0	100		113	ug/L	113	
SPI01	Q2154447	A835164	ACRYLONITRILE	0	100		154	ug/L	154	
SPI01	Q2154447	A835164	BENZENE	0	10		8.25	ug/L	82.5	
SPI01	Q2154447	A835164	BROMOBENZENE	0	10		8.62	ug/L	86.2	
SPI01	Q2154447	A835164	BROMOCHLOROMETHANE	0	10		8.48	ug/L	84.8	
SPI01	Q2154447	A835164	BROMODICHLOROMETHANE	0	10		7.5	ug/L	75	
SPI01	Q2154447	A835164	BROMOFORM	0	10		6.58	ug/L	65.8	
SPI01	Q2154447	A835164	BROMOMETHANE	0	10		8.68	ug/L	86.8	
SPI01	Q2154447	A835164	N-BUTYLBENZENE	0	10		8.21	ug/L	82.1	
SPI01	Q2154447	A835164	SEC-BUTYLBENZENE	0	10		8.42	ug/L	84.2	
SPI01	Q2154447	A835164	TERT-BUTYLBENZENE	0	10		8.54	ug/L	85.4	
SPI01	Q2154447	A835164	CARBON DISULFIDE	0	10		7.24	ug/L	72.4	
SPI01	Q2154447	A835164	CARBON TETRACHLORIDE	0	10		8.22	ug/L	82.2	
SPI01	Q2154447	A835164	CHLOROBENZENE	0	10		8.4	ug/L	84	
SPI01	Q2154447	A835164	DIBROMOCHLOROMETHANE	0	10		7.22	ug/L	72.2	
SPI01	Q2154447	A835164	CHLOROETHANE	0	10		9.3	ug/L	93	
SPI01	Q2154447	A835164	CHLOROFORM	0	10	!	7.89	ug/L	78.9	
SPI01	Q2154447	A835164	CHLOROMETHANE	0	10		8.15	ug/L	81.5	
SPI01	Q2154447	A835164	2-CHLOROTOLUENE (O- CHLOROTOLUENE)	0	10		8.72	ug/L	87.2	
SPI01	Q2154447	A835164	4-CHLOROTOLUENE (P- CHLOROTOLUENE)	0	10		8.8	ug/L	88	
SPI01	Q2154447	A835164	2-CHLOROETHYLVINYLETHER	0	10	!	0	ug/L	0	
SPI01	Q2154447	A835164	1,2-DIBROMO-3- CHLOROPROPANE (DBCP)	0	10		7.18	ug/L	71.8	
SPI01	Q2154447	A835164	1,2-DIBROMOETHANE (EDB)	0	10	!	7.35	ug/L	73.5	
SPI01	Q2154447	A835164	DIBROMOMETHANE	0	10		7.69	ug/L	76.9	
SPI01	Q2154447	A835164	1,2-DICHLOROBENZENE (O- DICHLOROBENZENE)	0	10		8.87	ug/L	88.7	
SPI01	Q2154447	A835164	1,3-DICHLOROBENZENE (M- DICHLOROBENZENE)	0	10		8.82	ug/L	88.2	
SPI01	Q2154447	A835164	1,4-DICHLOROBENZENE (P- DICHLOROBENZENE)	0	10		8.63	ug/L	86.3	
SPI01	Q2154447	A835164	DICHLORODIFLUOROMETHANE	0	10		7.31	ug/L	73.1	
SPI01	Q2154447	A835164	TRANS-1,4-DICHLORO-2-BUTENE	0	20	!	4.1	ug/L	20.5	
SPI01	Q2154447	A835164	1,1-DICHLOROETHANE	0	10		8.5	ug/L	85	
SPI01	Q2154447	A835164	1,2-DICHLOROETHANE	0	10		8.32	ug/L	83.2	
SPI01	Q2154447	A835164	1,1-DICHLOROETHENE	0	10		8.06	ug/L	80.6	



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R545534 Analytical	Analyst: H WILLIAMS Reviewer: R SHAMP		Run Date: 05-Jan-09 Review Date: 07-Jan-09		Continued					
QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
SPI01	Q2154447	A835164	CIS-1,2-DICHLOROETHENE	0	10		8.39	ug/L	83.9	
SPI01	Q2154447	A835164	TRANS-1,2-DICHLOROETHENE	0	10		8.21	ug/L	82.1	
SPI01	Q2154447	A835164	1,2-DICHLOROPROPANE	0	10		7.92	ug/L	79.2	
SPI01	Q2154447	A835164	1,3-DICHLOROPROPANE	0	10		8.05	ug/L	80.5	
SPI01	Q2154447	A835164	2,2-DICHLOROPROPANE	0	10		8.85	ug/L	88.5	
SPI01	Q2154447	A835164	1,1-DICHLOROPROPENE	0	10		8.25	ug/L	82.5	
SPI01	Q2154447	A835164	CIS-1,3-DICHLOROPROPENE	0	10	!	6.33	ug/L	63.3	
SPI01	Q2154447	A835164	TRANS-1,3-DICHLOROPROPENE	0	10	!	5.93	ug/L	59.3	
SPI01	Q2154447	A835164	ETHYL BENZENE	0	10		8.28	ug/L	82.8	
SPI01	Q2154447	A835164	ETHYL METHACRYLATE	0	10		7.43	ug/L	74.3	
SPI01	Q2154447	A835164	2-HEXANONE	0	50		39.4	ug/L	78.8	
SPI01	Q2154447	A835164	HEXACHLOROBTADIENE	0	10		6.91	ug/L	69.1	
SPI01	Q2154447	A835164	IODOMETHANE	0	10		8.74	ug/L	87.4	
SPI01	Q2154447	A835164	ISOPROPYLBENZENE (CUMENE)	0	10		8.59	ug/L	85.9	
SPI01	Q2154447	A835164	4-ISOPROPYLTOLUENE (P- ISOPROPYLTOLUENE)	0	10		8.47	ug/L	84.7	
SPI01	Q2154447	A835164	DICHLOROMETHANE (METHYLENE CHLORIDE)	0	10		7.03	ug/L	70.3	
SPI01	Q2154447	A835164	METHYL ETHYL KETONE	0	50		35.4	ug/L	70.8	
SPI01	Q2154447	A835164	METHYL-T-BUTYL ETHER (MTBE)	0	10		8.28	ug/L	82.8	
SPI01	Q2154447	A835164	METHYL ISOBUTYL KETONE	0	50		38.6	ug/L	77.2	
SPI01	Q2154447	A835164	NAPHTHALENE	0	10		7.99	ug/L	79.9	
SPI01	Q2154447	A835164	N-PROPYLBENZENE	0	10		8.42	ug/L	84.2	
SPI01	Q2154447	A835164	STYRENE	0	10		6.99	ug/L	69.9	
SPI01	Q2154447	A835164	1,1,1,2-TETRACHLOROETHANE	0	10		8.32	ug/L	83.2	
SPI01	Q2154447	A835164	1,1,2,2-TETRACHLOROETHANE	0	10		8.18	ug/L	81.8	
SPI01	Q2154447	A835164	TETRACHLOROETHENE	0	10	!	8.04	ug/L	80.4	
SPI01	Q2154447	A835164	TOLUENE	0	10		7.74	ug/L	77.4	
SPI01	Q2154447	A835164	1,2,3-TRICHLOROBENZENE	0	10		7.92	ug/L	79.2	
SPI01	Q2154447	A835164	1,2,4-TRICHLOROBENZENE	0	10		8.02	ug/L	80.2	
SPI01	Q2154447	A835164	1,1,1-TRICHLOROETHANE	0	10		8.42	ug/L	84.2	
SPI01	Q2154447	A835164	1,1,2-TRICHLOROETHANE	0	10		7.4	ug/L	74	
SPI01	Q2154447	A835164	TRICHLOROETHENE	0	10		8.15	ug/L	81.5	
SPI01	Q2154447	A835164	TRICHLOROFLUOROMETHANE	0	10		8.79	ug/L	87.9	
SPI01	Q2154447	A835164	1,2,3-TRICHLOROPROPANE	0	10		8.3	ug/L	83	
SPI01	Q2154447	A835164	1,2,4-TRIMETHYLBENZENE	0	10		8.13	ug/L	81.3	
SPI01	Q2154447	A835164	1,3,5-TRIMETHYLBENZENE	0	10		8.14	ug/L	81.4	
SPI01	Q2154447	A835164	VINYL ACETATE	0	10		7.99	ug/L	79.9	
SPI01	Q2154447	A835164	VINYL CHLORIDE	0	10		8.39	ug/L	83.9	
DPS01	Q2154448	A835164	Analysis Date/Time: 05-Jan-09 11:53							
DPS01	Q2154448	A835164	ACETONE (2-PROPANONE)	0	50		42.2	ug/L	84.3	3.9
DPS01	Q2154448	A835164	ACROLEIN	0	100		149	ug/L	148.9	27.6
DPS01	Q2154448	A835164	ACRYLONITRILE	0	100		208	ug/L	208.1	30.1
DPS01	Q2154448	A835164	BENZENE	0	10		8.95	ug/L	89.5	8.1
DPS01	Q2154448	A835164	BROMOBENZENE	0	10		8.74	ug/L	87.4	1.4
DPS01	Q2154448	A835164	BROMOCHLOROMETHANE	0	10		8.92	ug/L	89.2	5.1
DPS01	Q2154448	A835164	BROMODICHLOROMETHANE	0	10		8.04	ug/L	80.4	6.9
DPS01	Q2154448	A835164	BROMOFORM	0	10		6.66	ug/L	66.6	1.2



JBJ57935

VOLATILE ORGANICS, CAPILLARY COLUMN TECHNIQUE SW846-8260B

O510.5

R545534
AnalyticalAnalyst: H WILLIAMS
Reviewer: R SHAMPRun Date: 05-Jan-09
Review Date: 07-Jan-09

Continued

QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
DPS01	Q2154448	A835164	BROMOMETHANE	0	10		9.42	ug/L	94.2	8.2
DPS01	Q2154448	A835164	N-BUTYLBENZENE	0	10		8.39	ug/L	83.9	2.2
DPS01	Q2154448	A835164	SEC-BUTYLBENZENE	0	10		8.65	ug/L	86.5	2.7
DPS01	Q2154448	A835164	TERT-BUTYLBENZENE	0	10		8.67	ug/L	86.7	1.5
DPS01	Q2154448	A835164	CARBON DISULFIDE	0	10		7.69	ug/L	76.9	6
DPS01	Q2154448	A835164	CARBON TETRACHLORIDE	0	10		8.9	ug/L	89	7.9
DPS01	Q2154448	A835164	CHLOROBENZENE	0	10		8.58	ug/L	85.8	2.1
DPS01	Q2154448	A835164	DIBROMOCHLOROMETHANE	0	10		7.3	ug/L	73	1.1
DPS01	Q2154448	A835164	CHLOROETHANE	0	10		9.86	ug/L	98.6	5.8
DPS01	Q2154448	A835164	CHLOROFORM	0	10		8.53	ug/L	85.3	7.8
DPS01	Q2154448	A835164	CHLOROMETHANE	0	10		8.58	ug/L	85.8	5.1
DPS01	Q2154448	A835164	2-CHLOROTOLUENE (O- CHLOROTOLUENE)	0	10		9.04	ug/L	90.4	3.6
DPS01	Q2154448	A835164	4-CHLOROTOLUENE (P- CHLOROTOLUENE)	0	10		8.9	ug/L	89	1.1
DPS01	Q2154448	A835164	2-CHLOROETHYLVINYLETHER	0	10	!	0	ug/L	0	
DPS01	Q2154448	A835164	1,2-DIBROMO-3- CHLOROPROPANE (DBCP)	0	10		7.43	ug/L	74.3	3.4
DPS01	Q2154448	A835164	1,2-DIBROMOETHANE (EDB)	0	10		8.15	ug/L	81.5	10.3
DPS01	Q2154448	A835164	DIBROMOMETHANE	0	10		8.27	ug/L	82.7	7.3
DPS01	Q2154448	A835164	1,2-DICHLOROBENZENE (O- DICHLOROBENZENE)	0	10		9.05	ug/L	90.5	2
DPS01	Q2154448	A835164	1,3-DICHLOROBENZENE (M- DICHLOROBENZENE)	0	10		9.09	ug/L	90.9	3
DPS01	Q2154448	A835164	1,4-DICHLOROBENZENE (P- DICHLOROBENZENE)	0	10		9.1	ug/L	91	5.3
DPS01	Q2154448	A835164	DICHLORODIFLUOROMETHANE	0	10		8.59	ug/L	85.9	16.1
DPS01	Q2154448	A835164	TRANS-1,4-DICHLORO-2-BUTENE	0	20	!	4.14	ug/L	20.7	1
DPS01	Q2154448	A835164	1,1-DICHLOROETHANE	0	10		9.05	ug/L	90.5	6.3
DPS01	Q2154448	A835164	1,2-DICHLOROETHANE	0	10		9.05	ug/L	90.5	8.4
DPS01	Q2154448	A835164	1,1-DICHLOROETHENE	0	10		8.81	ug/L	88.1	8.9
DPS01	Q2154448	A835164	CIS-1,2-DICHLOROETHENE	0	10		9.12	ug/L	91.2	8.3
DPS01	Q2154448	A835164	TRANS-1,2-DICHLOROETHENE	0	10		9.04	ug/L	90.4	9.6
DPS01	Q2154448	A835164	1,2-DICHLOROPROPANE	0	10		8.44	ug/L	84.4	6.4
DPS01	Q2154448	A835164	1,3-DICHLOROPROPANE	0	10		8.33	ug/L	83.3	3.4
DPS01	Q2154448	A835164	2,2-DICHLOROPROPANE	0	10		9.44	ug/L	94.4	6.5
DPS01	Q2154448	A835164	1,1-DICHLOROPROPENE	0	10		8.79	ug/L	87.9	6.3
DPS01	Q2154448	A835164	CIS-1,3-DICHLOROPROPENE	0	10	!	6.86	ug/L	68.6	8
DPS01	Q2154448	A835164	TRANS-1,3-DICHLOROPROPENE	0	10	!	6.47	ug/L	64.7	8.7
DPS01	Q2154448	A835164	ETHYL BENZENE	0	10		8.7	ug/L	87	4.9
DPS01	Q2154448	A835164	ETHYL METHACRYLATE	0	10		7.8	ug/L	78	4.9
DPS01	Q2154448	A835164	2-HEXANONE	0	50		40.8	ug/L	81.6	3.5
DPS01	Q2154448	A835164	HEXACHLOROBUTADIENE	0	10		7.04	ug/L	70.4	1.9
DPS01	Q2154448	A835164	IODOMETHANE	0	10		9.25	ug/L	92.5	5.7
DPS01	Q2154448	A835164	ISOPROPYLBENZENE (CUMENE)	0	10		8.7	ug/L	87	1.3
DPS01	Q2154448	A835164	4-ISOPROPYLTOLUENE (P- ISOPROPYLTOLUENE)	0	10		8.52	ug/L	85.2	0.6
DPS01	Q2154448	A835164	DICHLOROMETHANE (METHYLENE CHLORIDE)	0	10		7.43	ug/L	74.3	5.5
DPS01	Q2154448	A835164	METHYL ETHYL KETONE	0	50		39	ug/L	77.9	9.5
DPS01	Q2154448	A835164	METHYL-T-BUTYL ETHER (MTBE)	0	10		8.58	ug/L	85.8	3.6



JBJ57935

VOLATILE ORGANICS, CAPILLARY COLUMN TECHNIQUE SW846-8260B

O510.5

R545534 Analytical	Analyst: H WILLIAMS Reviewer: R SHAMP		Run Date: 05-Jan-09 Review Date: 07-Jan-09			Continued				
QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
DPS01	Q2154448	A835164	METHYL ISOBUTYL KETONE	0	50		42.1	ug/L	84.2	8.8
DPS01	Q2154448	A835164	NAPHTHALENE	0	10		8.3	ug/L	83	3.8
DPS01	Q2154448	A835164	N-PROPYLBENZENE	0	10		8.81	ug/L	88.1	4.5
DPS01	Q2154448	A835164	STYRENE	0	10		7.09	ug/L	70.9	1.4
DPS01	Q2154448	A835164	1,1,1,2-TETRACHLOROETHANE	0	10		8.49	ug/L	84.9	2
DPS01	Q2154448	A835164	1,1,2,2-TETRACHLOROETHANE	0	10		8.34	ug/L	83.4	1.9
DPS01	Q2154448	A835164	TETRACHLOROETHENE	0	10		8.35	ug/L	83.5	3.8
DPS01	Q2154448	A835164	TOLUENE	0	10		8.42	ug/L	84.2	8.4
DPS01	Q2154448	A835164	1,2,3-TRICHLOROBENZENE	0	10		8.3	ug/L	83	4.7
DPS01	Q2154448	A835164	1,2,4-TRICHLOROBENZENE	0	10		8.44	ug/L	84.4	5.1
DPS01	Q2154448	A835164	1,1,1-TRICHLOROETHANE	0	10		9.15	ug/L	91.5	8.3
DPS01	Q2154448	A835164	1,1,2-TRICHLOROETHANE	0	10		8.2	ug/L	82	10.3
DPS01	Q2154448	A835164	TRICHLOROETHENE	0	10		9.02	ug/L	90.2	10.1
DPS01	Q2154448	A835164	TRICHLOROFLUOROMETHANE	0	10		9.55	ug/L	95.5	8.3
DPS01	Q2154448	A835164	1,2,3-TRICHLOROPROPANE	0	10		8.53	ug/L	85.3	2.7
DPS01	Q2154448	A835164	1,2,4-TRIMETHYLBENZENE	0	10		8.36	ug/L	83.6	2.8
DPS01	Q2154448	A835164	1,3,5-TRIMETHYLBENZENE	0	10		8.34	ug/L	83.4	2.4
DPS01	Q2154448	A835164	VINYL ACETATE	0	10		8.69	ug/L	86.9	8.4
DPS01	Q2154448	A835164	VINYL CHLORIDE	0	10		8.91	ug/L	89.1	6
SAMPLE	A836116	Analysis Date/Time: 05-Jan-09 15:46								
SAMPLE	A836116	See Certificate of Analysis, Rep: 0								
Q2153119	Value reported for analytes calibrated by linear (LIN) or									
Q2153119	quadratic (QDR) equations is r2 (Coef. of Determination).									
Q2154442	Value reported for analytes calibrated by linear (LIN) or quadratic (QDR)									
Q2154442	equations is concentration ().									
Q2154446	! COMPOUND FAILS QC CRITERIA HIGH.									
Q2154447	2-Chloroethyl vinyl ether degrades under acidic conditions. No recovery									
Q2154447	possible. Unacidified sample not available.									
Q2154448	2-Chloroethyl vinyl ether degrades under acidic conditions. No recovery									
Q2154448	possible. Unacidified sample not available.									

R545690 Analytical	Analyst: H WILLIAMS Reviewer: R SHAMP		Run Date: 08-Jan-09 Review Date: 12-Jan-09		Instrument: GC/MS VOA					
QC Type	Lab ID	Source	Parameter	True / Sample	Spike Value	RQL	Observed	Units	Rec	RPD
SAMPLE	A836116	Analysis Date/Time: 08-Jan-09 07:13								
SAMPLE	A836116	See Certificate of Analysis, Rep: 1								
CAL01	Q2153119	Analysis Date/Time: 31-Dec-08 11:48								
CAL01	Q2153119		TETRACHLOROETHENE	0.7167						3.6
CAL01	Q2153119		DICHLOROETHANE-D4	0.3910						2.8
CAL01	Q2153119		TOLUENE-D8	0.9033						2.5
CAL01	Q2153119		4-BROMOFLUOROBENZENE	0.8503						3.1
CAL01	Q2153119		DIBROMOFLUOROMETHANE	0.2486						2.2
Q2153119	Value reported for analytes calibrated by linear (LIN) or									
Q2153119	quadratic (QDR) equations is r2 (Coef. of Determination).									

RQL Result Qualifier Definition

! Outside Lab Generated Control Limits



JBJ57935

Result Qualifier Definition

BDL	Below Detection Limit
LIN	Linear Regression Used

QC Type Definition

BLA01	CALIBRATION (INSTRUMENT) BLANK
DPS01	DUPLICATE MATRIX SPIKE
CAL01	INITIAL CALIBRATION
CCVD	CONTINUING CALIBRATION VERIFICATION (USING %D)
SPI01	MATRIX SPIKE
LCS01	LABORATORY CONTROL SAMPLE

Approved By : SCOTT BRYAN

KERAMIDA ENVIRONMENTAL, INC.

401 North College Avenue
Indianapolis, Indiana 46202
(317) 685-6600 - FAX (317) 685-6610

OPERATION & MAINTENANCE LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12-30-08 Technician: Alan Harper

SYSTEM STATUS

SVE Blower Operating? (Yes/No)
Air Compressor Operating? (Yes/No)
Air Sparges Operating? (Yes/No)
Ventilation Operating? (Yes/No)

OPERATIONAL PARAMETERS

SVE System

PLC Read Influent Vacuum	<u>10.4</u>	Inches of Hg
Direct Read Influent Vacuum	<u>9.5</u>	Inches of Hg
PLC Read Influent Air Flow	<u>N/A</u>	cfm
Direct Read Influent Air Flowrate	<u>N/A</u>	fpm
Dilution Air	<u>Yes / No</u>	
Particulate Filter Differential Vacuum	<u>9.0/9.5</u>	Inches of Hg
Blower Current	<u>120</u>	Amps
Blower Hours	<u>6306</u>	Hours
Knock-Out Tank Discharge	<u>1311</u>	gallons

Air Sparging System

PLC Read Air Injection Pressure	<u>N/A</u>	psi
Direct Read Air Injection Pressure	<u>56</u>	psi
PLC Read Air Injection Flowrate	<u>150</u>	cfm

MAINTENANCE PARAMETERS:

Monthly Effluent Vapor Sample Collected? (Yes/No)
Blower Dilution Air Filter Cleaned? (Yes/No) Changed? (Yes/No)
Blower Particulate Filter Cleaned? (Yes/No) Changed? (Yes/No)
Blower Lubricated? (Yes/No)
Blower Oil Changed? (Yes/No)

If yes, name: _____

Lubricate quarterly.
Change every 2,000 hours.

NOTES:

As of 1-19-09 only 1 person at HBAS will
Be Bill Fowler from 9-4 daily 765-352-2405

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OPERATION & MAINTENANCE LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12/22/08 Technician: J. Condry

SYSTEM STATUS

SVE Blower Operating ? (Yes / No)
Air Compressor Operating ? (Yes / No)
Air Sparges Operating ? (Yes/No)
Ventilation Operating ? (Yes/No)

OPERATIONAL PARAMETERS
SVE System

PLC Read Influent Vacuum	<u>10.0</u>	Inches of Hg
Direct Read Influent Vacuum	<u>10</u>	Inches of Hg
PLC Read Influent Air Flow	<u>165</u>	cfm
Direct Read Influent Air Flowrate		fpm
Dilution Air	Yes / <u>No</u>	
Particulate Filter Differential Vacuum	<u>9</u>	Inches of Hg
Blower Current	<u>22</u>	Amps
Blower Hours	<u>6272.7</u>	Hours
Knock-Out Tank Discharge	<u>1294</u>	gallons

Air Sparging System

PLC Read Air Injection Pressure		psi
Direct Read Air Injection Pressure		psi
PLC Read Air Injection Flowrate		cfm

MAINTENANCE PARAMETERS:

Monthly Effluent Vapor Sample Collected ? (Yes/No)
Blower Dilution Air Filter Cleaned ? (Yes/No) Changed ? (Yes/No)
Blower Particulate Filter Cleaned ? (Yes/No) Changed ? (Yes/No)
Blower Lubricated ? (Yes/No)
Blower Oil Changed ? (Yes/No)

If yes, name: N/A

Lubricate quarterly.
Change every 2,000 hours.

NOTES:

System Down on H/H K/O tank upon arrival.
DRAIN K/O & collect H2O for analysis of pH & VOC's.
Restarted system

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OPERATION & MAINTENANCE LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12-17-08 Technician: A. HARPER

SYSTEM STATUS

SVE Blower Operating? (Yes/No)
Air Compressor Operating? (Yes/No)
Air Sparges Operating? (Yes/No)
Ventilation Operating? (Yes/No)

OPERATIONAL PARAMETERS**SVE System**

PLC Read Influent Vacuum	<u>2.8</u>	Inches of Hg
Direct Read Influent Vacuum	<u>8</u>	Inches of Hg
PLC Read Influent Air Flow	<u>N/A</u>	cfm
Direct Read Influent Air Flowrate	<u>N/A</u>	fpm
Dilution Air	<u>Yes / (No)</u>	
Particulate Filter Differential Vacuum	<u>8.7</u>	Inches of Hg
Blower Current	<u>7.0</u>	Amps
Blower Hours	<u>6232</u>	Hours
Knock-Out Tank Discharge	<u>1279</u>	gallons

Air Sparging System

PLC Read Air Injection Pressure	<u>N/A</u>	psi
Direct Read Air Injection Pressure	<u>58</u>	psi
PLC Read Air Injection Flowrate	<u>150.3</u>	cfm

MAINTENANCE PARAMETERS:

Monthly Effluent Vapor Sample Collected? (Yes/No)
Blower Dilution Air Filter Cleaned? (Yes/No) Changed? (Yes/No)
Blower Particulate Filter Cleaned? (Yes/No) Changed? (Yes/No)
Blower Lubricated? (Yes/No)
Blower Oil Changed? (Yes/No)

If yes, name: Alan W. Harper

Lubricate quarterly.
Change every 2,000 hours.

NOTES:

KERAMIDA ENVIRONMENTAL, INC.

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OPERATION & MAINTENANCE LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12-11-08 Technician: A. Harper

SYSTEM STATUS

SVE Blower Operating ? (Yes) / No)
Air Compressor Operating ? (Yes) / No)
Air Sparges Operating ? (Yes) / No)
Ventilation Operating ? (Yes/No)

OPERATIONAL PARAMETERS**SVE System**

PLC Read Influent Vacuum	<u>9.3</u>	Inches of Hg
Direct Read Influent Vacuum	<u>8</u>	Inches of Hg
PLC Read Influent Air Flow	<u>N/A</u>	cfm
Direct Read Influent Air Flowrate	<u>N/A</u>	cfm
Dilution Air	<u>Yes</u> / <u>No</u>	
Particulate Filter Differential Vacuum	<u>7.5 / 12.0</u>	Inches of Hg
Blower Current	<u>70</u>	Amps
Blower Hours	<u>6002</u>	Hours
Knock-Out Tank Discharge	<u>1279</u>	gallons

Air Sparging System

PLC Read Air Injection Pressure	<u>N/A</u>	psi
Direct Read Air Injection Pressure	<u>58</u>	psi
PLC Read Air Injection Flowrate	<u>150</u>	cfm

MAINTENANCE PARAMETERS:

Monthly Effluent Vapor Sample Collected ? (Yes/No)
Blower Dilution Air Filter Cleaned ? (Yes/No) Changed ? (Yes/No)
Blower Particulate Filter Cleaned ? (Yes/No) Changed ? (Yes/No)
Blower Lubricated ? (Yes/No)
Blower Oil Changed ? (Yes/No)

If yes, name: _____

Lubricate quarterly.

Change every 2,000 hours.

NOTES:

System was down upon arrival. Spoke w/ Bill Fowler in (Maintenance) he said he ran Little Green with Big Green for a day the Little Green went down & he couldn't get it to run again. I found that when our system went down it had locked out "Little Green" and it had to be restarted through our controller. It ran fine after that and Bill and I adjusted "Little Green" to get the correct pressure and flow to our system.

All is up and running and we control all aspect of the operation now because the factory isn't using any air. Bill said he would come in and run the Big compressor over weekends while no one was there because it is more reliable.

Checked pressure in vaults at 25 psi

TIME: 4.5 HR

KERAMIDA ENVIRONMENTAL, INC.



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OPERATION & MAINTENANCE LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12-2-08 Technician: A. Hansen

SYSTEM STATUS

SVE Blower Operating ? ☒ Yes / ☐ No
Air Compressor Operating ? ☐ Yes / ☐ No
Air Sparges Operating ? ☐ Yes / ☐ No
Ventilation Operating ? ☐ Yes / ☐ No

OPERATIONAL PARAMETERS

SVE System

PLC Read Influent Vacuum	<u>8.4</u>	Inches of Hg
Direct Read Influent Vacuum	<u>7.0</u>	Inches of Hg
PLC Read Influent Air Flow	<u>N/A</u>	cfm
Direct Read Influent Air Flowrate	<u>N/A</u>	fpm
Dilution Air	Yes / ☒ No	
Particulate Filter Differential Vacuum	<u>7.0 / 7.5</u>	Inches of Hg
Blower Current	<u>20</u>	Amps
Blower Hours	<u>5923</u>	Hours
Knock-Out Tank Discharge	<u>1279</u>	gallons

Air Sparging System

PLC Read Air Injection Pressure	<u>—</u>	psi
Direct Read Air Injection Pressure	<u>58</u>	psi
LC Read Air Injection Flowrate	<u>157</u>	cfm

MAINTENANCE PARAMETERS:

Monthly Effluent Vapor Sample Collected ? ☒ Yes / ☐ No
Blower Dilution Air Filter Cleaned ? ☒ Yes / ☐ No Changed ? ☒ Yes / ☐ No
Blower Particulate Filter Cleaned ? ☒ Yes / ☐ No Changed ? ☒ Yes / ☐ No
Blower Lubricated ? ☒ Yes / ☐ No
Blower Oil Changed ? ☒ Yes / ☐ No

If yes, name: _____

Lubricate quarterly.
Change every 2,000 hours.

NOTES: MAINTENANCE Personnel advised that they will be shutting down
compressors next week sometime, and at that time they will
turn on little Green Compressor and it will supply only to
our system.

OPERATION & MAINTENANCE LOG

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Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 11-20-08 Technician: A. Harper

SVE Blower Operating ? (Yes / No)
Air Compressor Operating ? (Yes / No)
Air Sparges Operating ? (Yes/No)
Ventilation Operating ? (Yes/No)

SVE System

PLC Read Influent Vacuum
Direct Read Influent Vacuum
PLC Read Influent Air Flow
Direct Read Influent Air Flowrate
Dilution Air
Particulate Filter Differential Vacuum
Blower Current
Blower Hours
Knock-Out Tank Discharge

8.6	Inches of Hg
7.5	Inches of Hg
N/A	cfm
N/A	rpm
Yes / No	
7/2.5	Inches of Hg
2.5	Amps
5640	Hours
1279	gallons

Air Sparging System

PLC Read Air Injection Pressure
Direct Read Air Injection Pressure
PLC Read Air Injection Flowrate

N/A psi
58 psi
153.2 cfm

MAINTENANCE PARAMETERS:

Monthly Effluent Vapor Sample Collected ? (Yes/No)
Blower Dilution Air Filter Cleaned ? (Yes/No) Changed ? (Yes/No)
Blower Particulate Filter Cleaned ? (Yes/No) Changed ? (Yes/No)
Blower Lubricated ? (Yes/No)
Blower Oil Changed ? (Yes/No)

If yes, name:

Alan Hays

Lubricate quarterly.
Change every 2,000 hours.

NOTES:

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OPERATION & MAINTENANCE LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 11-4-08 Technician: A. HARPER

SYSTEM STATUS

SVE Blower Operating? (Yes/No)
Air Compressor Operating? (Yes/No)
Air Spargers Operating? (Yes/No)
Ventilation Operating? (Yes/No)

OPERATIONAL PARAMETERS

SVE System

PLC Read Influent Vacuum	<u>8.1</u>	Inches of Hg
Direct Read Influent Vacuum	<u>7.0</u>	Inches of Hg
PLC Read Influent Air Flow	<u>184</u>	cfm
Direct Read Influent Air Flowrate	<u>1486</u>	gpm
Dilution Air	Yes / <u>No</u>	
Particulate Filter Differential Vacuum	<u>7.0/6.5</u>	Inches of Hg
Blower Current	<u>70</u>	Amps
Blower Hours	<u>5252</u>	Hours
Knock-Out Tank Discharge	<u>1279</u>	gallons

Air Sparging System

PLC Read Air Injection Pressure	<u>58</u>	psi
Direct Read Air Injection Pressure	<u>152</u>	psi
PLC Read Air Injection Flowrate		cfm

MAINTENANCE PARAMETERS:

Monthly Effluent Vapor Sample Collected? (Yes/No)
Blower Dilution Air Filter Cleaned? (Yes/No) Changed? (Yes/No)
Blower Particulate Filter Cleaned? (Yes/No) Changed? (Yes/No)
Blower Lubricated? (Yes/No)
Blower Oil Changed? (Yes/No)

If yes, name: _____

Lubricate quarterly.
Change every 2,000 hours.

NOTES: Met w/Robert Brewster Parana IES to attempt to resolve
Read out problem w/EOS from SVE CFM reading and
sparging pressure reading.
He was unable to resolve problem w help from EOS
Tech online to PLC and on cell phone.
He removed SVE flow transducer and will try to
simulate and make needed adjustments back
in shop at IES.

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OPERATION & MAINTENANCE LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 10/27/08 Technician: J. Juliano

SYSTEM STATUS

SVE Blower Operating ? ☒ Yes ☐ No
Air Compressor Operating ? ☒ Yes ☐ No
Air Sparges Operating ? ☒ Yes ☐ No
Ventilation Operating ? ☒ Yes ☐ No

OPERATIONAL PARAMETERS

SVE System

PLC Read Influent Vacuum	<u>8.3</u>	Inches of Hg
Direct Read Influent Vacuum	<u>7.0</u>	Inches of Hg
PLC Read Influent Air Flow	<u>182.7</u>	cfm
Direct Read Influent Air Flowrate	<u>1419</u>	fpm
Dilution Air	Yes / ☒ No	
Particulate Filter Differential Vacuum	<u>2.0</u>	Inches of Hg
Blower Current	<u>20</u>	Amps
Blower Hours	<u>5060</u>	Hours
Knock-Out Tank Discharge	<u>1279</u>	gallons

Air Sparging System

PLC Read Air Injection Pressure	<u>not ready supply</u> <u>RSF</u>	psi
Direct Read Air Injection Pressure	<u>60</u>	psi
PLC Read Air Injection Flowrate	<u>151.1</u>	cfm

MAINTENANCE PARAMETERS:

Monthly Effluent Vapor Sample Collected ? ☒ Yes ☐ No
Blower Dilution Air Filter Cleaned ? ☒ Yes ☐ No Changed ? ☒ Yes ☐ No
Blower Particulate Filter Cleaned ? ☒ Yes ☐ No Changed ? ☒ Yes ☐ No
Blower Lubricated ? ☒ Yes ☐ No
Blower Oil Changed ? ☒ Yes ☐ No

If yes, name: _____

Lubricate quarterly.
Change every 2,000 hours.

NOTES: No water in KO Tank

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OPERATION & MAINTENANCE LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 10-14-08 Technician: A. HARPER

SYSTEM STATUS

SVE Blower Operating ? (Yes) / No)
Air Compressor Operating ? (Yes) / No)
Air Sparges Operating ? (Yes) / No)
Ventilation Operating ? (Yes) / No)

OPERATIONAL PARAMETERS

SVE System

PLC Read Influent Vacuum
Direct Read Influent Vacuum
PLC Read Influent Air Flow
Direct Read Influent Air Flowrate
Dilution Air
Particulate Filter Differential Vacuum
Blower Current
Blower Hours
Knock-Out Tank Discharge

8.0 Inches of Hg
7.5 Inches of Hg
182.8 cfm
1406 fpm
Yes / No
7.5-7.0 Inches of Hg
19 Amps
4750 Hours
1279 gallons

Air Sparging System

PLC Read Air Injection Pressure
Direct Read Air Injection Pressure
C Read Air Injection Flowrate

N/A psi
56 psi
148.8 cfm

MAINTENANCE PARAMETERS:

Monthly Effluent Vapor Sample Collected ? (Yes) / No)
Blower Dilution Air Filter Cleaned ? (Yes) / No) Changed ? (Yes) / No)
Blower Particulate Filter Cleaned ? (Yes) / No) Changed ? (Yes) / No)
Blower Lubricated ? (Yes) / No)
Blower Oil Changed ? (Yes) / No)

If yes, name: Alman Harper

Lubricate quarterly.
Change every 2,000 hours.

NOTES:

Change Blower oil & lube bearings. Took
ex. air sample

Balanced SVE wells
and AS wells

System running as designed. No water in
outside pots or in K.O.T.

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APPLIED OPERATIONAL DATA LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12-30-08 Technician: Alan Harper

VAPOR EXTRACTION OPERATIONAL PARAMETERS

Applied Vacuum Levels

SVE-A	<u>⊖ Closed</u>	"H ₂ O
SVE-B	<u>55</u>	"H ₂ O
SVE-C	<u>55</u>	"H ₂ O
SVE-D	<u>50</u>	"H ₂ O
SVE-E	<u>35</u>	"H ₂ O
SVE-F	<u>50</u>	"H ₂ O
SVE-G	<u>60</u>	"H ₂ O
SVE-H	<u>60</u>	"H ₂ O
SVE-I	<u>60</u>	"H ₂ O
SVE-J	<u>60</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS

Injection Pressures

ASV-19	<u>25</u>	psi
ASV-A	<u>25</u>	psi
ASV-18R	<u>25</u>	psi
ASV-B	<u>25</u>	psi
ASV-10	<u>25</u>	psi
ASV-C	<u>25</u>	psi
ASV-9	<u>25</u>	psi

NOTES:

	<u>MW-17</u>	<u>OP 1</u>	<u>OP 2</u>	<u>SVE 28</u>
<u>TD</u>	<u>16.12</u>			
<u>STW</u>	<u>4.73</u>	<u>10.27</u>	<u>10.07</u>	<u>10.05</u>
<u>DO</u>	<u>9.14</u>	<u>8.50</u>	<u>7.74</u>	<u>5.94</u>
<u>VAC</u>	<u>0.175</u>	<u>0.42</u>	<u>0.21</u>	<u>0.22</u>

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APPLIED OPERATIONAL DATA LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12-17-08 Technician: A. Harper

VAPOR EXTRACTION OPERATIONAL PARAMETERS
Applied Vacuum Levels

SVE-A	<u>Closed</u>	"H ₂ O
SVE-B	<u>19</u>	"H ₂ O
SVE-C	<u>19</u>	"H ₂ O
SVE-D	<u>20</u>	"H ₂ O
SVE-E	<u>20</u>	"H ₂ O
SVE-F	<u>21</u>	"H ₂ O
SVE-G	<u>20</u>	"H ₂ O
SVE-H	<u>20</u>	"H ₂ O
SVE-I	<u>20</u>	"H ₂ O
SVE-J	<u>19</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS
Injection Pressures

ASV-19	<u>25</u>	psi
ASV-A	<u>25</u>	psi
ASV-18R	<u>25</u>	psi
ASV-B	<u>25</u>	psi
ASV-10	<u>25</u>	psi
ASV-C	<u>25</u>	psi
ASV-9	<u>25</u>	psi

NOTES:

<u>Vac/Pres</u>	<u>DTW</u>	<u>DO</u>
OP-1 - 1.2	11.82	Mud on Probe
OP-2 - 1.2	Day	MWD
SVE-28 - .09	11.61	DRY
MW-17 - .08	11.08	4.62
		6.21

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APPLIED OPERATIONAL DATA LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12-2-08 Technician: A. HARPER

VAPOR EXTRACTION OPERATIONAL PARAMETERS
Applied Vacuum Levels

SVE-A	<u>0</u>	"H ₂ O
SVE-B	<u>18</u>	"H ₂ O
SVE-C	<u>19</u>	"H ₂ O
SVE-D	<u>20</u>	"H ₂ O
SVE-E	<u>20</u>	"H ₂ O
SVE-F	<u>20</u>	"H ₂ O
SVE-G	<u>21</u>	"H ₂ O
SVE-H	<u>20</u>	"H ₂ O
SVE-I	<u>19</u>	"H ₂ O
SVE-J	<u>19</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS
Injection Pressures

ASV-19	<u>25</u>	psi
ASV-A	<u>25</u>	psi
ASV-18R	<u>25</u>	psi
ASV-B	<u>25</u>	psi
ASV-10	<u>25</u>	psi
ASV-C	<u>25</u>	psi
ASV-9	<u>25</u>	psi

NOTES:

	<u>VAC/Pres</u>	<u>DTW</u>
<u>OP-1</u>	<u>-.11</u>	<u>11.60</u>
<u>OP-2</u>	<u>-.11</u>	<u>DRY</u>
<u>SVE-28</u>	<u>-.08</u>	<u>11.43</u>
<u>MW-17</u>	<u>-.07</u>	<u>10.98</u>

VAULTS & well covers were frozen and had to be
HEATED w/ Torch to open. Frozen piles of leaves ALSO
had to be cleared to find the vaults along fence line.

APPLIED OPERATIONAL DATA LOG
Harman-Becker Remediation System
KERAMIDA Project No.: 11913

VAPOR EXTRACTION OPERATIONAL PARAMETERS

AIR SPARGING OPERATIONAL PARAMETERS

Injection Pressures

SVE-A	0	"H ₂ O
SVE-B	18	"H ₂ O
SVE-C	19	"H ₂ O
SVE-D	20	"H ₂ O
SVE-E	20	"H ₂ O
SVE-F	20	"H ₂ O
SVE-G	21	"H ₂ O
SVE-H	20	"H ₂ O
SVE-I	19	"H ₂ O
SVE-J	19	"H ₂ O

ASV-19	25	psi
ASV-A	25	psi
ASV-18R	25	psi
ASV-B	25	psi
ASV-10	25	psi
ASV-C	25	psi
ASV-9	25	psi

NOTES:

APPLIED OPERATIONAL DATA LOG
Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Technician: A. Hancock

AIR SPARGING OPERATIONAL PARAMETERS

	Close	"H ₂ O
SVE-A	14	"H ₂ O
SVE-B	14	"H ₂ O
SVE-C	14	"H ₂ O
SVE-D	14	"H ₂ O
SVE-E	15	"H ₂ O
SVE-F	15	"H ₂ O
SVE-G	15	"H ₂ O
SVE-H	14	"H ₂ O
SVE-I	15	"H ₂ O
SVE-J	14	"H ₂ O

ASV-19	25	psi
ASV-A	25	psi
ASV-18R	25	psi
ASV-B	25	psi
ASV-10	25	psi
ASV-C	25	psi
ASV-9	25	psi

NOTES:

NOTES:

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APPLIED OPERATIONAL DATA LOG
Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 10/27/08 Technician: J. J. Liano

VAPOR EXTRACTION OPERATIONAL PARAMETERS**Applied Vacuum Levels**

SVE-A	<u>0</u>	"H ₂ O
SVE-B	<u>20</u>	"H ₂ O
SVE-C	<u>20</u>	"H ₂ O
SVE-D	<u>18</u>	"H ₂ O
SVE-E	<u>18</u>	"H ₂ O
SVE-F	<u>18</u>	"H ₂ O
SVE-G	<u>20</u>	"H ₂ O
SVE-H	<u>20</u>	"H ₂ O
SVE-I	<u>20</u>	"H ₂ O
SVE-J	<u>20</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS**Injection Pressures**

ASV-19	<u>25</u>	psi
ASV-A	<u>25</u>	psi
ASV-18R	<u>25</u>	psi
ASV-B	<u>25</u>	psi
ASV-10	<u>25</u>	psi
ASV-C	<u>25</u>	psi
ASV-9	<u>25</u>	psi

mw-17	DTW
op-1	10.32
SVE-28	10.95
op-2	10.81
op-3	10.79
	10.98

NOTES:

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APPLIED OPERATIONAL DATA LOG

Harman-Becker Remediation System

KERAMIDA Project No.: 11913

Date: 10-14-08 Technician: A. HARPER

VAPOR EXTRACTION OPERATIONAL PARAMETERS

Applied Vacuum Levels

SVE-A	<u>Closed</u>	"H ₂ O
SVE-B	<u>14</u>	"H ₂ O
SVE-C	<u>14</u>	"H ₂ O
SVE-D	<u>14</u>	"H ₂ O
SVE-E	<u>14</u>	"H ₂ O
SVE-F	<u>14</u>	"H ₂ O
SVE-G	<u>14</u>	"H ₂ O
SVE-H	<u>14</u>	"H ₂ O
SVE-I	<u>14</u>	"H ₂ O
SVE-J	<u>14</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS

Injection Pressures

ASV-19	<u>25</u>	psi
ASV-A	<u>25</u>	psi
ASV-18R	<u>25</u>	psi
ASV-B	<u>25</u>	psi
ASV-10	<u>25</u>	psi
ASV-C	<u>25</u>	psi
ASV-9	<u>25</u>	psi

NOTES:	DTW	VAC/PRES	D.O.
<u>MIN 17</u>	<u>10.00</u>	<u>-1.05</u>	<u>6.01</u>
<u>OP-1</u>	<u>10.61</u>	<u>-1.14</u>	<u>6.44</u>
<u>SVE MIN - 28</u>	<u>10.45</u>	<u>-1.08</u>	<u>4.00</u>
<u>OP-2</u>	<u>10.47</u>	<u>-1.11</u>	<u>2.30</u>
<u>OP-3</u>	<u>10.69</u>	<u>-1.07</u>	<u>6.44</u>

Harman-Becker Automotive Systems, Inc.

Performance Data Review

December 17, 2008

KERAMIDA Project No. 11913

I. SVE Influence

A. SVE Operational Only

- SVE – D @ 20" water vacuum on 11/20/08
ROI = 16', see attached ROI plot

B. SVE w/AS Operational

1. SVE – D @ 14" water vacuum, AS-18R @ 25 psi w/AC unit @ 148 cfm on 10/14/08
ROI = 22', see attached ROI plot
2. SVE – D @ 20' water vacuum, AS-18R @ 25 psi w/AC unit @ 158 cfm on 11/20/08
ROI = 10', see attached ROI plot
3. SVE – D @ 20' water vacuum, AS-18R @ 25 psi w/AC unit @ 158 cfm on 12/2/08
ROI = 25', see attached ROI plot
4. SVE – D @ 20' water vacuum, AS-18R @ 25 psi w/AC unit @ 150 cfm on 12/17/08
ROI = 25', see attached ROI plot
5. SVE – D @ 55' water vacuum, AS-18R @ 25 psi w/AC unit @ 150 cfm on 12/30/08
ROI = 41', see attached ROI plot

C. Average ROI of 23'

II. AS Influence

Well	Distance from AS-18R (ft)	Pressure	Groundwater Mounding	DO Levels	Notes
OP-1	12	Y	Slight	--	Mud/silt present in bottom/no DO measurement collected
OP-2	39	N	Dry	Dry	--
MW-17	12	Slight	Y	Y	--
SVE-28	22	Y	Slight	--	Mud/silt present in bottom/no DO measurement collected

- Only wells experiencing influence based on data changes in all 3 categories above considered as influenced
- Influence is seen from 12' – 22' from AS-18R.
ROI = ~25'



Date: 11-20-08

Technician: A. Hampson

SVE - D vacuum set @ "H₂O

SVE - C & E shut off and used as observation points during testing

SVE blower Airflow @ 2 cfm N/AAS - 18R pressure set @ 25 psi

AS - A & B shut off during testing

AC unit Airflow @ 158 cfm

Time	OP-1		
	Vac. (-)/Pres. (+) ("H ₂ O)	DTW (feet) (Screened from 3-13' bgs)	DO (% or mg/L) <u>ORP</u>
W/O Sparge	.18	11.50	10.82 320
11:15	.10	11.49	unable to measure
11:30	.09	11.50	due to mud in well
11:45	.09	11.47	
12:15	.10	11.47	
12:45	.10	11.43	
13:15	.10	11.41	
Time	OP-2		
	Vac. (-)/Pres. (+) ("H ₂ O)	DTW (feet) (Screened from 3-13' bgs)	DO (% or mg/L)
W/O Sparge	.01	DRY	UNABLE TO MEASURE
11:15	0	DRY	
11:30	0	DRY	
11:45	0	DRY	
12:15	0	DRY	
12:45	0	DRY	
13:15	0	DRY	
Time	SVE-28		
	Vac. (-)/Pres. (+) ("H ₂ O)	DTW (feet) (Screened from 3-13' bgs)	DO (% or mg/L)
W/O Sparge	.07	11.35	MUD UNABLE TO
11:15	.03	11.33	MEASURE
11:30	.035	11.33	
11:45	.02	11.31	
12:15	.04	11.29	
12:45	.02	11.26	
13:15	.07	11.25	
Time	MW-17		
	Vac. (-)/Pres. (+) ("H ₂ O)	DTW (feet) (Screened from 7-17' bgs)	DO (% or mg/L)
W/O Sparge	.06	10.97	10.82 / 320
11:15	.01	10.88	8.88 / 309
11:30	.01	10.88	8.88 / 309
11:45	.01	10.85	8.89 / 300
12:15	.01	10.82	9.61 / 316
12:45	0	10.80	10.66 / 312
13:15	0	10.77	10.60 / 305

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APPLIED OPERATIONAL DATA LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 10-14-08 Technician: A. HARPER

VAPOR EXTRACTION OPERATIONAL PARAMETERS

Applied Vacuum Levels

SVE-A	<u>Closed</u>	"H ₂ O
SVE-B	<u>14</u>	"H ₂ O
SVE-C	<u>14</u>	"H ₂ O
SVE-D	<u>14</u>	"H ₂ O
SVE-E	<u>14</u>	"H ₂ O
SVE-F	<u>14</u>	"H ₂ O
SVE-G	<u>14</u>	"H ₂ O
SVE-H	<u>14</u>	"H ₂ O
SVE-I	<u>14</u>	"H ₂ O
SVE-J	<u>14</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS

Injection Pressures

ASV-19	<u>25</u>	psi
ASV-A	<u>25</u>	psi
ASV-18R	<u>25</u>	psi
ASV-B	<u>25</u>	psi
ASV-10	<u>25</u>	psi
ASV-C	<u>25</u>	psi
ASV-9	<u>25</u>	psi

NOTES: MIN 17

DTW

VAC/PRES

O.D.

10.00

- .05

6.01

10.61

- .14

6.44

10.45

- .08

4.00

10.47

- .11

2.30

10.69

+ .07

6.44

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APPLIED OPERATIONAL DATA LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12-7-08 Technician: A. HARPER

VAPOR EXTRACTION OPERATIONAL PARAMETERS
Applied Vacuum Levels

SVE-A	<u>0</u>	"H ₂ O
SVE-B	<u>18</u>	"H ₂ O
SVE-C	<u>19</u>	"H ₂ O
SVE-D	<u>20</u>	"H ₂ O
SVE-E	<u>20</u>	"H ₂ O
SVE-F	<u>20</u>	"H ₂ O
SVE-G	<u>21</u>	"H ₂ O
SVE-H	<u>20</u>	"H ₂ O
SVE-I	<u>19</u>	"H ₂ O
SVE-J	<u>19</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS
Injection Pressures

ASV-19	<u>25</u>	psi
ASV-A	<u>25</u>	psi
ASV-18R	<u>25</u>	psi
ASV-B	<u>25</u>	psi
ASV-10	<u>25</u>	psi
ASV-C	<u>25</u>	psi
ASV-9	<u>25</u>	psi

NOTES:

	<u>VAC/Pres</u>	<u>DTW</u>
<u>OP-1</u>	<u>-.11</u>	<u>11.60</u>
<u>OP-2</u>	<u>-.11</u>	<u>DRY</u>
<u>SVE-28</u>	<u>-.08</u>	<u>11.43</u>
<u>MW-17</u>	<u>-.07</u>	<u>10.98</u>

VAULTS & well covers were frozen and had to be HEATED w/ Torch to open. Frozen piles of leaves also had to be cleared to find the vaults along fence line.

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APPLIED OPERATIONAL DATA LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12-17-08 Technician: A. Hansen

VAPOR EXTRACTION OPERATIONAL PARAMETERS
Applied Vacuum Levels

SVE-A	<u>Closed</u>	"H ₂ O
SVE-B	<u>19</u>	"H ₂ O
SVE-C	<u>19</u>	"H ₂ O
SVE-D	<u>20</u>	"H ₂ O
SVE-E	<u>20</u>	"H ₂ O
SVE-F	<u>21</u>	"H ₂ O
SVE-G	<u>20</u>	"H ₂ O
SVE-H	<u>20</u>	"H ₂ O
SVE-I	<u>20</u>	"H ₂ O
SVE-J	<u>19</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS
Injection Pressures

ASV-19	<u>25</u>	psi
ASV-A	<u>25</u>	psi
ASV-18R	<u>25</u>	psi
ASV-B	<u>25</u>	psi
ASV-10	<u>25</u>	psi
ASV-C	<u>25</u>	psi
ASV-9	<u>25</u>	psi

NOTES:

	<u>Vac/Pres</u>	<u>DTN</u>	<u>DU</u>
OP-1	-1.2	11.82	Mud on Probe
OP-2	-1.2	Day	DRY
SVE-28	-.09	11.61	4.62
MW-17	-.08	11.08	6.21

KERAMIDA ENVIRONMENTAL, INC.

401 North College Avenue
Indianapolis, Indiana 46202
(317) 685-6600 - FAX (317) 685-6610

APPLIED OPERATIONAL DATA LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 12-30-08 Technician: Alan Harper

VAPOR EXTRACTION OPERATIONAL PARAMETERS
Applied Vacuum Levels

SVE-A	<u>⊖ Closed</u>	"H ₂ O
SVE-B	<u>55</u>	"H ₂ O
SVE-C	<u>55</u>	"H ₂ O
SVE-D	<u>51</u>	"H ₂ O
SVE-E	<u>25</u>	"H ₂ O
SVE-F	<u>56</u>	"H ₂ O
SVE-G	<u>60</u>	"H ₂ O
SVE-H	<u>60</u>	"H ₂ O
SVE-I	<u>60</u>	"H ₂ O
SVE-J	<u>60</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS
Injection Pressures

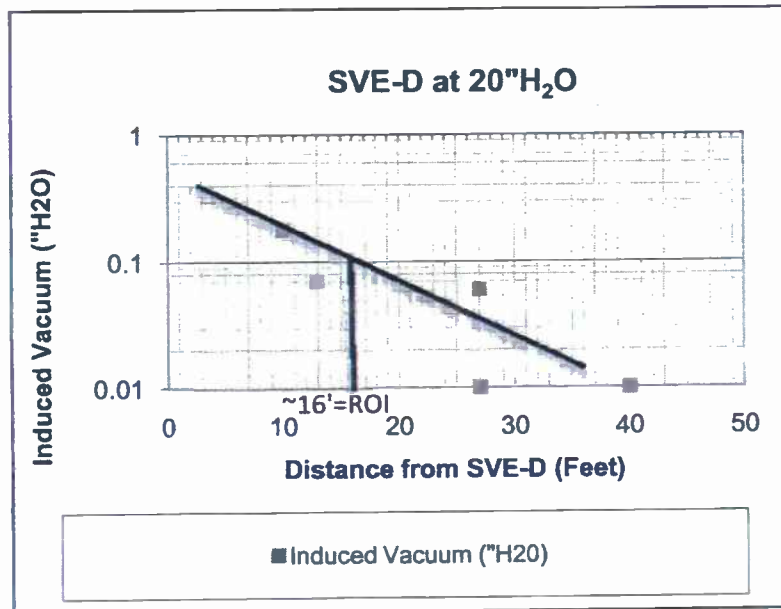
ASV-19	<u>25</u>	psi
ASV-A	<u>25</u>	psi
ASV-18R	<u>25</u>	psi
ASV-B	<u>25</u>	psi
ASV-10	<u>25</u>	psi
ASV-C	<u>25</u>	psi
ASV-9	<u>25</u>	psi

NOTES:

	MW-17	OP 1	OP 2	SUE 28
T.D.	<u>16.12</u>			
STW	<u>4.73</u>	<u>10.27</u>	<u>10.07</u>	<u>10.05</u>
DO	<u>9.14</u>	<u>8.30</u>	<u>7.74</u>	<u>5.94</u>
VAC	<u>0.175</u>	<u>0.42</u>	<u>0.21</u>	<u>0.22</u>

11/20/08
SVE Operational Only

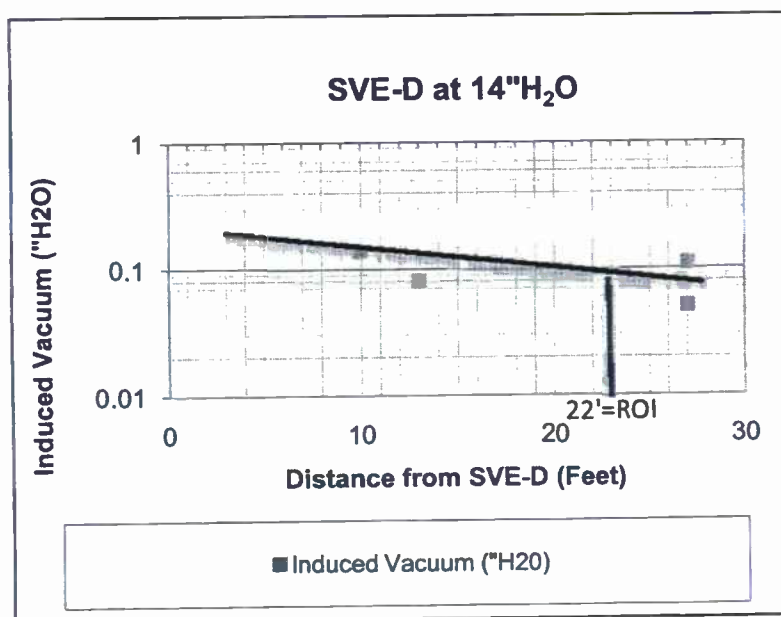
Observation Point	Distance (feet) From SVE-D	Induced Vacuum ("H ₂ O)
OP-1	10	0.18
OP-2	27	0.01
SVE-28	13	0.07
MW-17	27	0.06
SVE-E	40	0.01



10/14/08
SVE/AS Operational
AC @ 148cfm

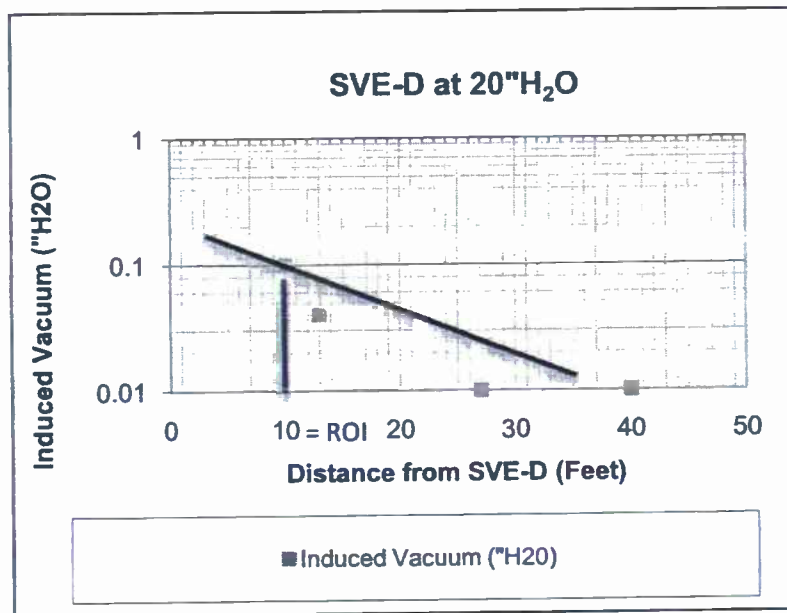
Observation Point	Distance (feet) From SVE-D	Induced Vacuum ("H ₂ O)
OP-1	10	0.14
OP-2*	27	0.11
SVE-28	13	0.08
MW-17	27	0.05

* OP-2 is 27-feet from SVE-D and 13-feet from SVE-E. Both SVE-D and SVE-E were operating.



11/20/08
SVE/AS Operational
AC @ 158cfm

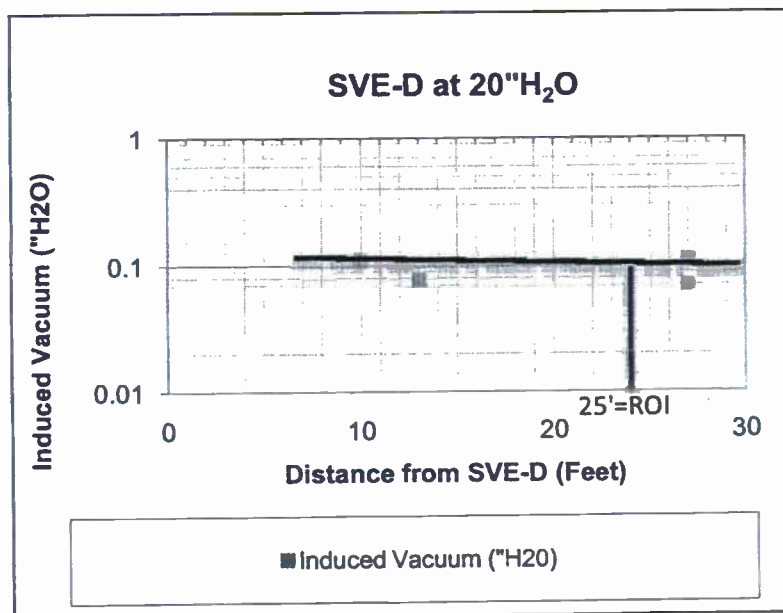
Observation Point	Distance (feet) From SVE-D	Induced Vacuum ("H ₂ O)
OP-1	10	0.1
SVE-28	13	0.04
MW-17	27	0.01
SVE-C	40	0.01
SVE-E	40	0.01



12/2/08
SVE/AS Operational
AC @ 158cfm

Observation Point	Distance (feet) From SVE-D	Induced Vacuum ("H ₂ O)
OP-1	10	0.11
OP-2	27	0.11
SVE-28	13	0.08
MW-17	27	0.07

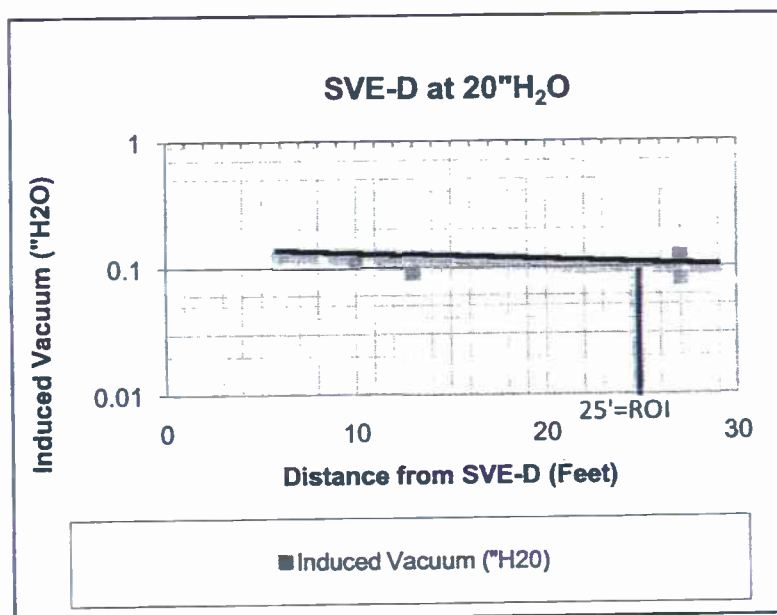
* OP-2 is 27-feet from SVE-D and 13-feet from SVE-E. Both SVE-D and SVE-E were operating.



12/17/08
SVE/AS Operational
AC @ 150cfm

Observation Point	Distance (feet) From SVE-D	Induced Vacuum ("H ₂ O)
OP-1	10	0.12
OP-2	27	0.12
SVE-28	13	0.09
MW-17	27	0.08

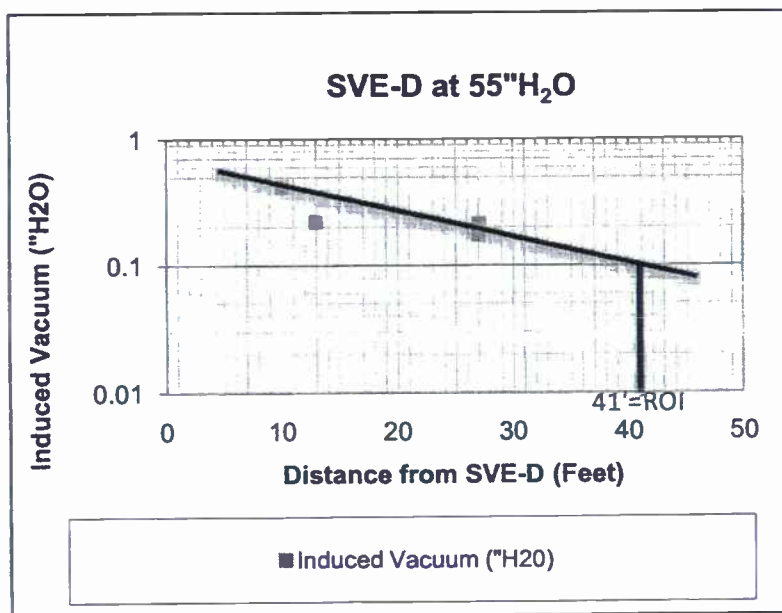
* OP-2 is 27-feet from SVE-D and 13-feet from SVE-E. Both SVE-D and SVE-E were operating.



12/30/08
SVE/AS Operational
AC @ 150cfm

Observation Point	Distance (feet) From SVE-D	Induced Vacuum ("H ₂ O)
OP-1	10	0.42
OP-2	27	0.21
SVE-28	13	0.22
MW-17	27	0.175

* OP-2 is 27-feet from SVE-D and 13-feet from SVE-E. Both SVE-D and SVE-E were operating.



VOC Vapor Discharge Summary
Harman/Becker Automotive Systems
1201 South Ohio Street, Martinsville, Indiana
KERAMIDA Project No. 11912/3

Operation Dates	Operational Hours (hr)	VOC Discharge Rate (lbs/24hr)	VOC Discharge (lbs)
7/11/07-7/12/07	11.00	0	0.00
7/13/07-7/17/07	40.75	0	0.00
7/18/07-7/24/07	134.00	0.28	1.56
7/25/07-8/16/07	480.00	0.67	13.40
8/17/07-9/10/07	593.00	0.29	7.17
9/11/07-10/18/07	618.50	0.1	2.58
10/19/07-11/10/07	465.5	0.15	2.91
11/11/07-2/6/08	728.0	0	0.00
2/7/08-3/5/08	669.0	0.004	0.11
3/6/08-3/31/08	627.0	0.001	0.03
4/1/08-5/1/08	616.0	0.048	1.23
5/2/08-6/5/08	699.0	0.008	0.23
6/6/08-7/1/08	138.0	0.008	0.05
7/2/08-9/4/08	333.0	0.039	0.54
9/4/08-9/30/08	607.0	0.02	0.51
9/30/08-10/27/08	643.0	0.012	0.32
10/27/08-11/20/08	580.0	0.006	0.15
11/20/08-12/30/08	666.0	0.019	0.53
	8,648.75	:Subtotals:	31.30

Vapor Discharge Calculation Worksheet

Site: HBAS, Martinsville, IN - Groundwater Remediation System

Date: 12-17-08

Time:

Enter Air Flowrate in CFM

275

Enter Concentrations in PPMV

Vinyl Chloride

0

Methylene Chloride

0

t-1,2 DCE

0

Chloroform

0

1,1,1 TCA

0

Carbon Tetrachloride

0

TCE

0.009

PCE

0.105

Vinyl Chloride

0.000

Discharge Rate
(pounds/hour)

0.00

Methylene Chloride

0.000

0.00

t-1,2 DCE

0.000

0.00

Chloroform

0.000

0.00

1,1,1 TCA

0.000

0.00

Carbon Tetrachloride

0.000

0.00

TCE

0.001

0.00

PCE

0.018

0.00

Total Chlorinated HC

0.019

0.00

Discharge Rate (pounds/day)	Discharge Rate (pounds/hour)
0.000	0.00
0.000	0.00
0.000	0.00
0.000	0.00
0.000	0.00
0.000	0.00
0.001	0.00
0.018	0.00
0.019	0.00

Vapor Discharge Calculation Worksheet

Site: HBAS, Martinsville, IN - Groundwater Remediation System

Date: 11-20-08

Time:

Enter Air Flowrate in CFM

275

Enter Concentrations in PPMV

Vinyl Chloride

0

Methylene Chloride

0

t-1,2 DCE

0

Chloroform

0

1,1,1 TCA

0

Carbon Tetrachloride

0

TCE

0.005

PCE

0.03

Vinyl Chloride

0.000

0.00

Methylene Chloride

0.000

0.00

t-1,2 DCE

0.000

0.00

Chloroform

0.000

0.00

1,1,1 TCA

0.000

0.00

Carbon Tetrachloride

0.000

0.00

TCE

0.001

0.00

PCE

0.005

0.00

Total Chlorinated HC

0.006

0.00

Vapor Discharge Calculation Worksheet

Site: HBAS, Martinsville, IN - Groundwater Remediation System

Date: 10-14-08

Time:

Enter Air Flowrate in CFM

275

Enter Concentrations in PPMV

Vinyl Chloride

0

Methylene Chloride

0

t-1,2 DCE

0

Chloroform

0

1,1,1 TCA

0

Carbon Tetrachloride

0

TCE

0.006

PCE

0.066

Vinyl Chloride

0.000

0.00

Methylene Chloride

0.000

0.00

t-1,2 DCE

0.000

0.00

Chloroform

0.000

0.00

1,1,1 TCA

0.000

0.00

Carbon Tetrachloride

0.000

0.00

TCE

0.001

0.00

PCE

0.011

0.00

Total Chlorinated HC

0.012

0.00



Analytical Laboratory & Geoprobe Sampling

KERAMIDA
JAN 07 2009
RECEIVED

12/30/2008

Mr. Rob Fedorchak
Keramida Environmental, Inc.
401 N. College AVE
Indianapolis, IN 46202

Dear Rob:

Enclosed are the sample data report, chain of custody record and quality control data for the sample received on December 22, 2008 for your project; 11913 - HBAS.

Please give me a call if you have questions or I can be of further assistance. Thank you for using Vaportech Services.

Sincerely,

A handwritten signature in dark ink, appearing to read 'David J. Masdea'.

David J. Masdea

Enclosure:

Vaportech Services, Inc.

KER233-8972

Keramida Environmental, Inc.
Project: 11913 - HBAS

CONCENTRATIONS IN PPMV

COMPOUND	SVE EX	PQL
1,1 DICHLOROETHYLENE	ND	0.01
METHYLENE CHLORIDE	ND	0.05
TRANS-1,2 DICHLOROETHYLENE	ND	0.01
1,1 DICHLOROETHANE	ND	0.02
CIS-1,2 DICHLOROETHYLENE	ND	0.01
CHLOROFORM	ND	0.005
1,1,1 TRICHLOROETHANE	ND	0.005
CARBON TETRACHLORIDE	ND	0.005
TRICHLOROETHYLENE	0.009	0.005
TETRACHLOROETHYLENE	0.105	0.005
VINYL CHLORIDE	ND	1

FILE NAME	V58B.675.BND
DATE SAMPLED	12/17/08
DATE RECEIVED	12/22/08
DATE ANALYZED	12/29/08

PQL - denotes lower 'Practical Quantitation Limit'

ND - 'Not Detected' at or above the lower practical quantitation limit

30-Dec-08

Reviewed by: 

Vaportech Services, Inc.

Keramida Environmental, Inc.
Quality Control
Laboratory Project(s): 8972

CONTINUING CALIBRATION CHECK

STANDARDS: 21V-R4 VC-1000
FILE NAME: V58B.672.BND V58A.674.BND
DATE ANALYZED: 12/29/08 12/29/08

LABORATORY BLANK RESULTS

BLANK: N2 IN VIAL
FILE NAME: V58A/B.671.BND
DATE ANALYZED: 12/29/08

COMPOUND	KNOWN (PPMV)	RESULT (PPMV)	PERCENT DIFFERENCE
1,1 DICHLOROETHYLENE	1.01	1.00	1.29
METHYLENE CHLORIDE	1.15	1.16	0.61
TRANS-1,2 DICHLOROETHYLENE	1.01	1.06	4.46
1,1 DICHLOROETHANE	0.99	1.10	11.01
CIS-1,2 DICHLOROETHYLENE	1.01	1.02	0.79
CHLOROFORM	0.820	0.841	2.56
1,1,1 TRICHLOROETHANE	0.730	0.760	4.11
CARBON TETRACHLORIDE	0.640	0.650	1.56
TRICHLOROETHYLENE	0.740	0.737	0.41
PERCHLOROETHYLENE	0.590	0.594	0.68
VINYL CHLORIDE	1000	989	1.10

COMPOUND	BLANK (PPMV)	PRACTICAL QUANTITATION LIMIT (PPMV)
1,1 DICHLOROETHYLENE	ND	0.01
METHYLENE CHLORIDE	ND	0.10
TRANS-1,2 DICHLOROETHYLENE	ND	0.01
1,1 DICHLOROETHANE	ND	0.02
CIS-1,2 DICHLOROETHYLENE	ND	0.01
CHLOROFORM	ND	0.005
1,1,1 TRICHLOROETHANE	ND	0.005
CARBON TETRACHLORIDE	ND	0.005
TRICHLOROETHYLENE	ND	0.005
TETRACHLOROETHYLENE	ND	0.005
VINYL CHLORIDE	ND	1

ND - 'Not Detected' at or above the lower practical quantitation limit

CHAIN-OF-CUSTODY RECORD



Company Name: ~~THE~~ KERAMIDA
Address: 401 N. College Ave
City: INDIANAPOLIS State: IN Zip: 46202
Proj. Manager: ROB FEDORCHAK
Proj. Location: HBAS
Proj. Number: 11913
Phone #: 317 685-6600 Fax #: 317 685-6610

Sampler's signature:

Alvin Hayes

Analysis Options:

Enter letters in Requested Analysis columns below.

A	Light Hydrocarbons	F	BTEX
B	Permanent Gases	G	BTEX & C5 - C10
C	Methane	H	TPH (C4 - C12 range)
D	Methane, Ethane, Ethylene	I	Chlorinated Hydrocarbons
E	Hydrogen	J	624 Compound List

Light Hydrocarbons: Methane, Ethane, Ethylene, Propane, Propylene, iso-Butane, n-Butane
Permanent Gases: Carbon Dioxide, Oxygen, Nitrogen, Methane, Carbon Monoxide
BTEX: Benzene, Toluene, Ethyl Benzene, m & p -Xylene, o-Xylene
C5-C10: Pentane, Hexane, Heptane, Octane, Nonane, Decane
Chlorinated HC: 1,1-DCB, 1,1-DCA, Methylene Chloride, trans-1,2-DCE, cis-1,2-DCE, Chloroform
 1,1,1-TCA, Carbon Tetrachloride, Trichloroethylene (TCE), Tetrachloroethylene (PCE)

[illegible]

Results to :

Rob Fedorchak

Invoice to :

Cheryl Apple

Relinquished by : <i>Alan Sayson</i>	Company : <i>Keramida</i>	Date : <i>12/22/08</i>	Time : <i>10:00</i>	Received by : <i>Mintore</i>	Company : <i>Harfeel</i>	Date : <i>12/22/08</i>	Time : <i>1430</i>
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :

WHITE COPY : Laboratory to return.

LOW COPY : Laboratory

PINK COPY : Submitter



Analytical Laboratory & Geoprobe Sampling

KERAMIDA
UFL 04 2008
RECEIVED

11/28/2008

Mr. Rob Fedorchak
Keramida Environmental, Inc.
401 N. College AVE
Indianapolis, IN 46202

Dear Rob:

Enclosed are the sample data report, chain of custody record and quality control data for the sample received on November 25, 2008 for your project; 11913 - HBAS.

Please give me a call if you have questions or I can be of further assistance. Thank you for using Vaportech Services.

Sincerely,

A handwritten signature in dark ink, appearing to read 'David J. Masdea', written in a cursive style.

David J. Masdea

Enclosure:

Vaportech Services, Inc.

KER230-8910

Keramida Environmental, Inc.
Project: 11913 - HBAS

CONCENTRATIONS IN PPMV

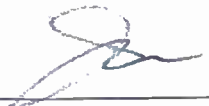
COMPOUND	SVE EX	PQL
1,1 DICHLOROETHYLENE	ND	0.01
METHYLENE CHLORIDE	ND	0.05
TRANS-1,2 DICHLOROETHYLENE	ND	0.01
1,1 DICHLOROETHANE	ND	0.02
CIS-1,2 DICHLOROETHYLENE	ND	0.01
CHLOROFORM	ND	0.005
1,1,1 TRICHLOROETHANE	ND	0.005
CARBON TETRACHLORIDE	ND	0.005
TRICHLOROETHYLENE	0.005	0.005
TETRACHLOROETHYLENE	0.030	0.005
VINYL CHLORIDE	ND	1

FILE NAME	V58B.486.BND
DATE SAMPLED	11/20/08
DATE RECEIVED	11/24/08
DATE ANALYZED	11/27/08

PQL - denotes lower 'Practical Quantitation Limit'

ND - 'Not Detected' at or above the lower practical quantitation limit

28-Nov-08

Reviewed by: 

Vaportech Services, Inc.

Keramida Environmental, Inc.
Quality Control
Laboratory Project(s): 8910

CONTINUING CALIBRATION CHECK

STANDARDS: 21V-R4 VC-1000
FILE NAME: V58B.481.BND V58A.435.BND
DATE ANALYZED: 11/27/08 11/25/08

LABORATORY BLANK RESULTS

BLANK: N2 IN VIAL
FILE NAME: V58A/B.139.BND
DATE ANALYZED: 11/27/08

COMPOUND	KNOWN (PPMV)	RESULT (PPMV)	PERCENT DIFFERENCE
1,1 DICHLOROETHYLENE	1.01	1.05	3.86
METHYLENE CHLORIDE	1.15	1.30	12.87
TRANS-1,2 DICHLOROETHYLENE	1.01	1.11	9.70
1,1 DICHLOROETHANE	0.99	1.16	17.17
CIS-1,2 DICHLOROETHYLENE	1.01	1.08	6.73
CHLOROFORM	0.820	0.871	6.22
1,1,1 TRICHLOROETHANE	0.730	0.775	6.16
CARBON TETRACHLORIDE	0.640	0.667	4.22
TRICHLOROETHYLENE	0.740	0.765	3.38
PERCHLOROETHYLENE	0.590	0.624	5.76
VINYL CHLORIDE	1000	984	1.60

COMPOUND	BLANK (PPMV)	PRACTICAL QUANTITATION LIMIT (PPMV)
1,1 DICHLOROETHYLENE	ND	0.01
METHYLENE CHLORIDE	ND	0.10
TRANS-1,2 DICHLOROETHYLENE	ND	0.01
1,1 DICHLOROETHANE	ND	0.02
CIS-1,2 DICHLOROETHYLENE	ND	0.01
CHLOROFORM	ND	0.005
1,1,1 TRICHLOROETHANE	ND	0.005
CARBON TETRACHLORIDE	ND	0.005
TRICHLOROETHYLENE	ND	0.005
TETRACHLOROETHYLENE	ND	0.005
VINYL CHLORIDE	ND	1

ND - 'Not Detected' at or above the lower practical quantitation limit

CHAIN-OF-CUSTODY RECORD



Company Name: KERAMIDA
Address: 401 N College Ave
City: INDIANAPOLIS State: IN Zip: 46202
Proj. Manager: Rob Fedorchak
Proj. Location: HBAS
Proj. Number: 11913
Phone #: 317 685 6600 Fax #: 317 685 6610

Sampler's signature:

Analysis Options:

Enter letters in Requested Analysis columns below.

A	Light Hydrocarbons	F	BTEX
B	Permanent Gases	G	BTEX & C5 - C10
C	Methane	H	TPH (C4 - C12 range)
D	Methane, Ethane, Ethylene	I	Chlorinated Hydrocarbons
E	Hydrogen	J	624 Compound List

Light Hydrocarbons: Methane, Ethane, Ethylene, Propane, Propylene, iso-Butane, n-Butane
Permanent Gases: Carbon Dioxide, Oxygen, Nitrogen, Methane, Carbon Monoxide
BTEX: Benzene, Toluene, Ethyl Benzene, m & p -Xylene, o-Xylene
C5-C10: Pentane, Hexane, Heptane, Octane, Nonane, Decane
Chlorinated HC: 1,1-DCE, 1,1-DCA, Methylene Chloride, trans-1,2-DCE, cis-1,2-DCE, Chloroform
 1,1,1-TCA, Carbon Tetrachloride, Trichloroethylene (TCB), Tetrachloroethylene (PCE)

[illegible]

Results to :

Rob Fedorchak

Invoice to :

Cheryl Apple

Relinquished by : <i>[Signature]</i>	Company : <i>Keramida</i>	Date : <i>11-20-08</i>	Time : <i>9:45</i>	Received by : <i>[Signature]</i>	Company : <i>Vaportech</i>	Date : <i>11/24/08</i>	Time : <i>11:30</i>
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :

WHITE COPY : Laboratory to return.

LOW COPY : Laboratory

PINK COPY : Submitter



Analytical Laboratory & Geoprobe Sampling

KERAMIDA

NOV 4 2008

RECEIVED

10/27/2008

Mr. Rob Fedorchak
Keramida Environmental, Inc.
401 N. College AVE
Indianapolis, IN 46202

Dear Rob:

Enclosed are the sample data report, chain of custody record and quality control data for the sample received on October 16, 2008 for your project; 11913 - HBAS.

Please give me a call if you have questions or I can be of further assistance. Thank you for using Vaportech Services.

Sincerely,

A handwritten signature in black ink, appearing to read 'David J. Masdea', written in a cursive style.

David J. Masdea

Enclosure:

Vaportech Services, Inc.

KER228-8793

Keramida Environmental, Inc.
Project: 11913 - HBAS

CONCENTRATIONS IN PPMV

COMPOUND	SVE EX	PQL
1,1 DICHLOROETHYLENE	ND	0.01
METHYLENE CHLORIDE	ND	0.05
TRANS-1,2 DICHLOROETHYLENE	ND	0.01
1,1 DICHLOROETHANE	ND	0.02
CIS-1,2 DICHLOROETHYLENE	ND	0.01
CHLOROFORM	ND	0.005
1,1,1 TRICHLOROETHANE	ND	0.005
CARBON TETRACHLORIDE	ND	0.005
TRICHLOROETHYLENE	0.006	0.005
TETRACHLOROETHYLENE	0.066	0.005
VINYL CHLORIDE	ND	1

FILE NAME	V58B.148.BND
DATE SAMPLED	10/14/08
DATE RECEIVED	10/16/08
DATE ANALYZED	10/17/08

PQL - denotes lower 'Practical Quantitation Limit'

ND - 'Not Detected' at or above the lower practical quantitation limit

27-Oct-08

Reviewed by: 

Vaportech Services, Inc.

Keramida Environmental, Inc.
Quality Control
Laboratory Project(s): 8793

CONTINUING CALIBRATION CHECK

STANDARDS: 21V-R4 VC-1000
FILE NAME: V58B.140.BND V58A.142.BND
DATE ANALYZED: 10/16/08 10/16/08

COMPOUND	KNOWN (PPMV)	RESULT (PPMV)	PERCENT DIFFERENCE
1,1 DICHLOROETHYLENE	1.01	1.04	3.07
METHYLENE CHLORIDE	1.15	1.22	5.65
TRANS-1,2 DICHLOROETHYLENE	1.01	1.05	3.66
1,1 DICHLOROETHANE	0.99	1.07	7.88
CIS-1,2 DICHLOROETHYLENE	1.01	1.07	6.34
CHLOROFORM	0.820	0.869	5.98
1,1,1 TRICHLOROETHANE	0.730	0.775	6.16
CARBON TETRACHLORIDE	0.640	0.669	4.53
TRICHLOROETHYLENE	0.740	0.772	4.32
TETRACHLOROETHYLENE	0.590	0.613	3.90
VINYL CHLORIDE	1000	1083	8.30

LABORATORY BLANK RESULTS

BLANK: N2 IN VIAL
FILE NAME: V58A/B.139.BND
DATE ANALYZED: 10/16/08

COMPOUND	BLANK (PPMV)	PRACTICAL QUANTITATION LIMIT (PPMV)
1,1 DICHLOROETHYLENE	ND	0.01
METHYLENE CHLORIDE	ND	0.10
TRANS-1,2 DICHLOROETHYLENE	ND	0.01
1,1 DICHLOROETHANE	ND	0.02
CIS-1,2 DICHLOROETHYLENE	ND	0.01
CHLOROFORM	ND	0.005
1,1,1 TRICHLOROETHANE	ND	0.005
CARBON TETRACHLORIDE	ND	0.005
TRICHLOROETHYLENE	ND	0.005
TETRACHLOROETHYLENE	ND	0.005
VINYL CHLORIDE	ND	1

ND - 'Not Detected' at or above the lower practical quantitation limit

CHAIN-OF-CUSTODY RECORD



Tel: 724-898-2622 • Fax: 724-898-2633

Company Name: Keramida
Address: 401 N. College
City: INDIANAPOLIS State: IN Zip: 46202
Proj. Manager: Rob Fedorchak
Proj. Location: HBAS
Proj. Number: 11913
Phone #: 317-685-1660 Fax #: 317-685-6660

Sampler's signature:

Alan W. Karger

Analysis Options:

Enter letters in Requested Analysis columns below.

A	Light Hydrocarbons	F	BTEX
B	Permanent Gases	G	BTEX & C5 - C10
C	Methane	H	TPH (C4 - C12 range)
D	Methane, Ethane, Ethylene	I	Chlorinated Hydrocarbons
E	Hydrogen	J	624 Compound List

Light Hydrocarbons: Methane, Ethane, Ethylene, Propane, Propylene, iso-Butane, n-Butane

Permanent Gases: Carbon Dioxide, Oxygen, Nitrogen, Methane, Carbon Monoxide

BTEX: Benzene, Toluene, Ethyl Benzene, m & p-Xylene, o-Xylene

C5-C10: Pentane, Hexane, Heptane, Octane, Nonane, Decane

Chlorinated HC: 1,1-DCE, 1,1-DCA, Methylene Chloride, trans-1,2-DCE, cis-1,2-DCE, Chloroform
1,1,1-TCA, Carbon Tetrachloride, Trichloroethylene (TCE), Tetrachloroethylene (PCE)

[illegible]

Results to :

Rob Fedonchak

Invoice to :

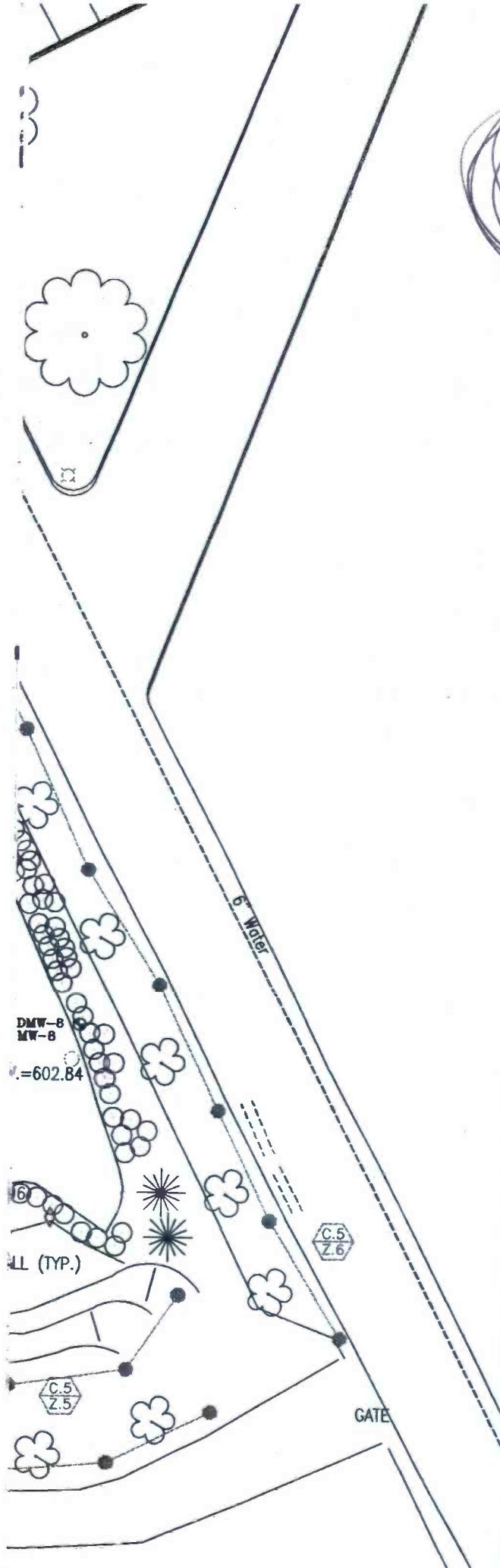
Cheryl Apple

Relinquished by : <i>W. S. D. D.</i>	Company : <i>Keramida</i>	Date : <i>10-14-08</i>	Time : <i>9:00</i>	Received by : <i>M. S. D.</i>	Company : <i>V. S. D.</i>	Date : <i>10/16/08</i>	Time : <i>1:00</i>
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :

WHITE COPY : Laboratory to return.

LOW COPY : Laboratory

PINK COPY : Submitter



IDEM VFC note:
Ref. 1 large format dwg.
for additional information.



KERAMIDA

A Global EHS Services Provider

401 North College Avenue
Indianapolis, Indiana 46202
(317) 685-6600 - Fax (317) 685-6610

Client Name and Address

HARMAN BECKER
AUTOMOTIVE SYSTEMS, INC.
Martinsville, Indiana

Project Name

Groundwater Remediation
System

Sheet Title

AS-BUILT
SITE PLAN