



KERAMIDA

SUSTAINABLE STRATEGIES
ENVIRONMENT • HEALTH • SAFETY
COMPLIANCE • ENGINEERING • REMEDIATION

401 North College Avenue
Indianapolis, Indiana 46202
(317) 685-6600 • Fax (317) 685-6610
1-800-508-8034
keramida@keramida.com • www.keramida.com

Direct Phone No.: 317/685-6623
Direct E-mail: rfedorchak@keramida.com

VIA HAND DELIVERY

September 8, 2008

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

Re: Remediation System Evaluation Report from April through June 2008
Harman-Becker Automotive Systems – North America
1201 South Ohio Street, Martinsville, Indiana
KERAMIDA Project No. 11913

Dear Mr. Kavanaugh:

This letter transmits three (3) copies of the Remediation System Evaluation Report from April through June 2008 for the above referenced facility. If you require additional information or clarification, please do not hesitate to contact us.

Sincerely,
KERAMIDA Environmental, Inc.

Robert S. Fedorchak, P.E.
Senior Engineer / Project Manager

Enclosures

cc: Mr. Jeremy Lindsey, Harman-Becker Automotive Systems – North America

INCREASING OUR CLIENTS' PROFITABILITY THROUGH SMART CONSULTING™

ENGINEERS • GEOLOGISTS • SCIENTISTS • SAFETY PROFESSIONALS • INDUSTRIAL HYGIENISTS • TOXICOLOGISTS • MODELING EXPERTS
INDIANAPOLIS, IN • CINCINNATI, OH • CHARLESTON, SC • SACRAMENTO, CA • ATHENS, GREECE • ABU DHABI, U.A.E.



KERAMIDA

SUSTAINABLE STRATEGIES
ENVIRONMENT • HEALTH • SAFETY
COMPLIANCE • ENGINEERING • REMEDIATION

401 North College Avenue
Indianapolis, Indiana 46202
(317) 685-6600 • Fax (317) 685-6610
1-800-508-8034

keramida@keramida.com • www.keramida.com

REMEDIATION SYSTEM EVALUATION REPORT
APRIL THROUGH JUNE 2008
HARMAN/BECKER AUTOMOTIVE SYSTEMS
1201 SOUTH OHIO STREET
MARTINSVILLE, INDIANA 46151
KERAMIDA PROJECT NO. 11913

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

Submitted by: **KERAMIDA INC.**
401 North College Avenue
Indianapolis, Indiana 46202
(317)685-6600

Robert S. Fedorchak, P.E.
Senior Engineer/Project Manager

Reviewed by:

Douglas B. Zabonick, P.E.
Senior Vice President

September 8, 2008

INCREASING OUR CLIENTS' PROFITABILITY THROUGH SMART CONSULTING™

ENGINEERS • GEOLOGISTS • SCIENTISTS • SAFETY PROFESSIONALS • INDUSTRIAL HYGIENISTS • TOXICOLOGISTS • MODELING EXPERTS
INDIANAPOLIS, IN • CINCINNATI, OH • CHARLESTON, SC • SACRAMENTO, CA • ATHENS, GREECE • ABU DHABI, U.A.E.

**REMEDATION SYSTEM EVALUATION REPORT
APRIL THROUGH JUNE 2008
HARMAN/BECKER AUTOMOTIVE SYSTEMS
1201 SOUTH OHIO STREET
MARTINSVILLE, INDIANA 46151
KERAMIDA PROJECT NO. 11913**

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

Submitted by:

KERAMIDA INC.
401 North College Avenue
Indianapolis, Indiana 46202
(317)685-6600

September 8, 2008

EXECUTIVE SUMMARY

KERAMIDA Inc. was contracted by Harman/Becker Automotive Systems – North America 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 April through June 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.

The system is stripping and extracting VOC vapors from groundwater based on performance and vapor recovery data. The radius of influence of the system components nearly matched the design and over 29 pounds of vapors have been recovered. Operational issues have been or are being corrected. The remediation system is not operational due to high water levels caused by flooding within the City of Martinsville in early-June 2008. Once groundwater drops to appropriate pre-flood levels, the remediation system will be restarted. KERAMIDA recommends the continued operation of the system and collection of operational and performance data. As the monitoring and evaluation of the system performance continues, the SVE and AS portions of the system will be adjusted and balanced to maximize influence and vapor recovery.

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION.....	1
2.0 CONTAMINANTS OF CONCERN	1
3.0 REMEDIATION SYSTEM OVERVIEW.....	2
4.0 REMEDIATION SYSTEM O&M AND PERFORMANCE	3
4.1 OPERATIONS.....	3
4.2 MAINTENANCE	3
4.3 PERFORMANCE.....	4
4.4 LIQUID WASTE MANAGEMENT	5
5.0 CONCLUSIONS AND RECOMENDATIONS	5
6.0 USE OF REPORT.....	6
7.0 LIMITATIONS	6

FIGURES

1. Site Location Map
2. As-Built Site Plan

ATTACHMENTS

1. Field Notes/Operation & Maintenance Logs
2. Operational Data Logs
3. Performance Data Logs & Review
4. Vapor Analytical Reports and Discharge Calculations

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

1.0 INTRODUCTION

KERAMIDA Inc. was contracted by Harman/Becker Automotive Systems – North America (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 modified 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. Existing AS wells AS-9, AS-10, AS-18R, and AS-19 were incorporated into the system. 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 REMEDIATION SYSTEM O&M AND PERFORMANCE

Operations, maintenance, performance and liquid waste management are detailed below. O&M Logs are provided as Attachment 1, Operational Logs used to document applied vacuum/pressure levels are provided as Attachment 2, Performance Data Logs that document induced levels used in determining radii of influence (ROIs) are provided in Attachment 3 and vapor sampling analytical/discharge calculations are provided as Attachment 4.

4.1 OPERATIONS

The remediation system began operating in July 2007 and through July 1, 2008 it has operated for a total of 5,819.75 hours. The remedial system operated 67% of the time from April through June 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 and with an additional sample collected quarterly for analysis of permanent gases.
- Monthly collection of an effluent condensate water sample 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.

4.2 MAINTENANCE

Various repairs were completed during the operation of the remediation system. This included the replacement of the SVE blower's exhaust sampling port, cleaning of condensate water flow meter and enabling of recently installed SVE flow meter to connect with the programmable logic controller. The oil was also changed in the SVE blower.

Due to recent Spring 2008 storms the system has flooded, causing it to cease operating. Following the flooding event, the SVE blower knock-out was drained and the system was restarted during a normally scheduled O&M visit. The latest high water event occurred over the weekend of June 6-8, 2008. The rain event caused severe flooding throughout the City of

Martinsville, including the wells associated with the remediation system and other portions of the Harman facility. All components of the remediation system were inspected. The wells and wellheads were not impacted. Water levels were measured and found very high, approximately 3 to 3.5-feet below the ground surface (bgs). Water levels are normally 8 to 8.5-feet bgs or deeper. Approximately 900-gallons of water was drained from the process piping inside and outside the building and discharged to the sanitary sewer system. Water was also drained from the SVE blower, however, the seals were intact and no water was found in the grease or oil. The high amount of water in the SVE blower was due to inoperable level switches, which were subsequently replaced. Recent gauging data indicates that water levels currently are near 7 to 7.5-feet bgs, which are too high to operate the system without constantly drawing in water. Once water levels drop to 8 to 8.5-feet bgs, the remediation system will be restarted.

4.3 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	30"H ₂ O at 28cfm 25-foot ROI
AS Wells	35psi at 10cfm 30-foot ROI	25psi at 16-26cfm 32-foot ROI	27psi at 21cfm 30-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 calls for an applied vacuum per well of 45-50"H₂O to 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 25-feet using an applied vacuum of

approximately 30"H₂O. Current conditions continue to indicate the overlapping influence of the SVE portion of the system.

Differences also are evident between the designed, 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 32 feet. However, current conditions indicate an ROI ranging from approximately 30-feet is achieved at an injection rate of at 27 psi. The spacing between AS wells is approximately 50 feet, providing an overlap of actual ROIs.

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 1.51 pounds of VOC vapors have been removed from the subsurface by the remediation system during the current monitoring period. A total of 29.26 pounds of VOC vapors have been removed from the subsurface since startup in July 2007.

4.4 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 June 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.

5.0 CONCLUSIONS AND RECOMENDATIONS

The existing remediation system was evaluated to determine if it could be modified to mitigate VOC groundwater contamination along the western property boundary to reduce concentrations leaving the Site. 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 system is stripping and extracting VOC vapors from groundwater based on performance and vapor recovery data. The ROI of the system components nearly matched the design and over 29 pounds of VOC vapors have been recovered. Operational issues have been or are being corrected. KERAMIDA recommends the continued operation of the system and collection of operational and performance data. As the monitoring and evaluation of the system performance continues, the SVE and AS portions of the system will be adjusted and balanced to maximize influence and vapor recovery.

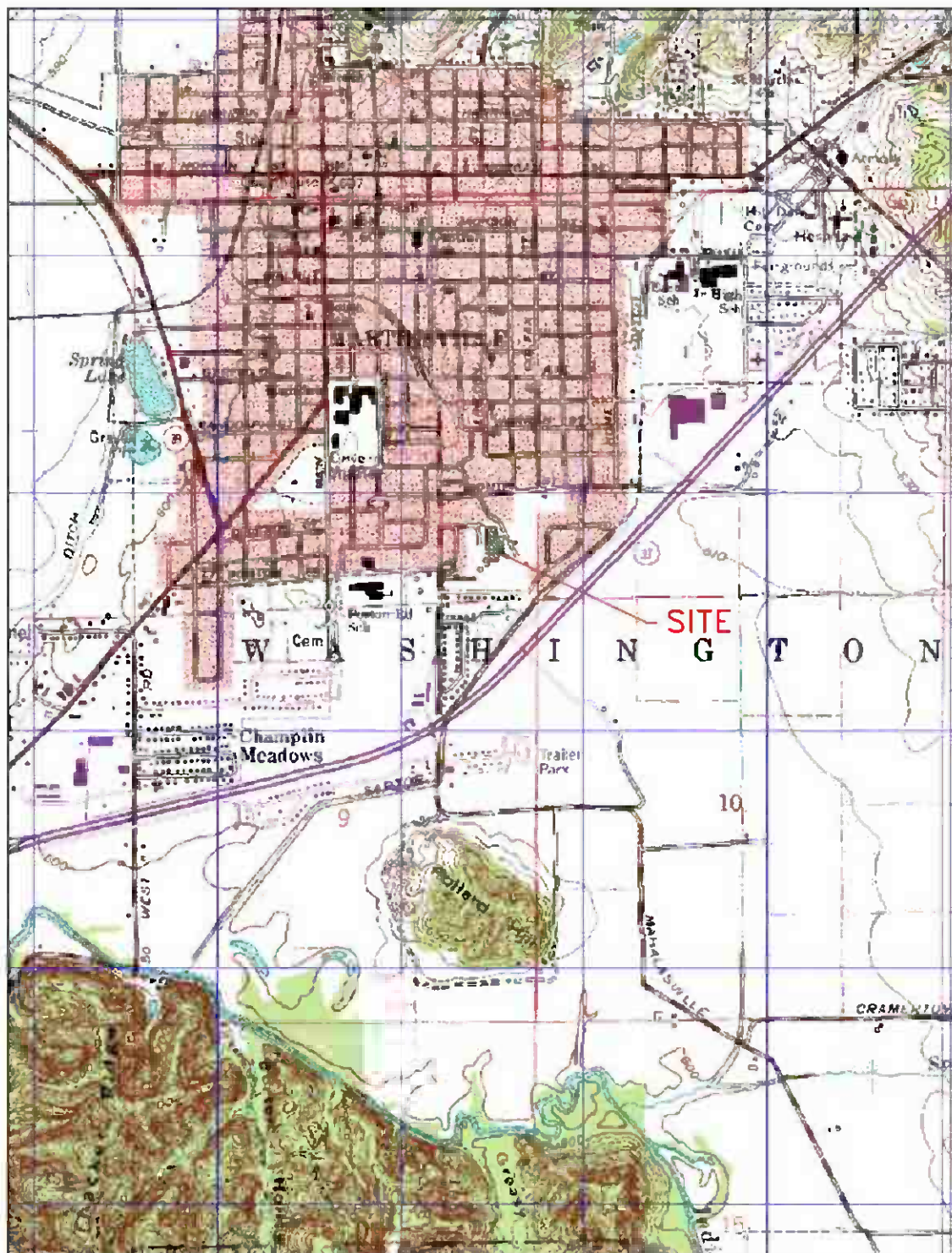
6.0 USE OF REPORT

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.

7.0 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.

FIGURES



NORTH



INDIANA

SCALE: 1" = 2000'



REF: USGS 7.5 MINUTE SERIES
INDIANA-MARTINSVILLE QUADRANGLE



KERAMIDA
ENVIRONMENTAL, INC
ENGINEERING-CONSULTING-REMEDIATION

Project: HARMAN/BECKER AUTOMOTIVE SYSTEMS
MARTINSVILLE, INDIANA

Scale:	1" = 2000'	Drawn By:	J. CLARK
Project Number:	10300F	Approved By:	BEW
Date:	February 17, 2005	File No.	10300DFig1

Figure 1

Site Location Map

ATTACHMENT 1

Field Notes/Operation & Maintenance Logs

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: 7-1-08 Technician: Ⓟ: H. Harper

SYSTEM STATUS

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

OPERATIONAL PARAMETERS

SVE System

PLC Read Influent Vacuum	<u>0</u>	Inches of Hg
PLC Read Influent Air Flowrate		cfm
Dilution Air	Yes / No	
Particulate Filter Differential Vacuum		Inches of Hg
Blower Current		Amps
Blower Hours	<u>3477</u>	Hours
Knock-Out Tank Discharge	<u>1279</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)	If yes, name: _____
Blower Dilution Air Filter Cleaned? (Yes/No) Changed? (Yes/No)	
Blower Particulate Filter Cleaned? (Yes/No) Changed? (Yes/No)	
Blower Lubricated? (Yes/No)	Lubricate quarterly.
Blower Oil Changed? (Yes/No)	Change every 2,000 hours

NOTES: Took H₂O sample for VOC + pH

Had to call in the morning the impeller wasn't spinning
soaked in lubricatic and Sanitation. Rinsed and checked for operation
it was working on departure.

Pumped out the outside pots and the inside KOT

WORK REQUEST FORM

Date Submitted: 6/24/2008 Project No. 11913, 208
 Project Manager: Rob Fedorchak Personnel: Alan Harper
 Project: HBAS - System O&M Dates Required: 6/25/2008
 Site Location: 1201 South Ohio Street, Martinsville, Indiana

Tasks:

- 1.) Robert with I&ES to be on-Site at 9:00am to install new level switches.
- 2.) Once installed, restart SVE system and test switches. If operable then restart entire system.
- 3.) Collected operational data from equipment.
- 4.) Collect SVE blower effluent sample and submit to Vapor Tech for VOC and vinyl chloride analysis. Sampling supplies in box attached.
- 5.) Balance & record applied vacuums at the SVE wells.
- 6.) Balance & record applied pressure levels at the AS wells.
- 7.) Record induced vacuum/pressures, depth to water and DO in OP-1, 2, 3, SVE-28 & MW-17.
- 8.) Document on attached logs/forms.

Deliverables: This WRF (fill out below), Logs/Forms, field notes and equipment usage sheet.

Time Allotment:

TASK NUMBER	HOURS ALLOTTED	ACTUAL TIME	COMPLETION DATE	EXPLANATION OF VARIANCE
All	8 hours	11.5	6-25-08	MULTIPLE

Work on 11/1/08
 11/1/08 11:00 AM
 11/1/08 11:00 AM

Field Notes

1. HAD trouble getting the old probes out of tank. As well as a tank plug that had to be cut out w/chisel. Tried Heat, drill, eze-out etc first.
2. Lower part of tank was plugged up with much & scale etc. there isn't a clean out access had to try to clean through 3/4" hole! this is why other floats didn't work, bulbs stuck in much. This took most time.
3. Installed new float sys. (5) Tested. (5) left running Tank air sample. didn't have time for other.

WORK REQUEST FORM

Date Submitted: 6/13/2008 Project No. 11913, 208
 Project Manager: Rob Fedorchak Personnel: Alan Harper
 Project: HBAS - System O&M Dates Required: 6/16/2008
 Site Location: 1201 South Ohio Street, Martinsville, Indiana

Tasks:

- 1.) Check SVE blower to see if dry. If dry then spray a thin mist of a light oil aerosol into intake to coat blower to aid in preventing rust and shut down blower. If not dry then leave running as is. Let Ken know in either case.
- 2.) Note hour meter reading.
- 3.) Remove and bring back the pressure switch/transducer that is associated with the AC unit for repair/replacement by I&ES.
- 4.) Record water levels in OP-1, 2, 3, SVE-28 & MW-17. W.L.M.
- 5.) Document in field notes.

Deliverables: This WRF (fill out below), Logs/Forms, field notes and equipment usage sheet.

Time Allotment:

TASK NUMBER	HOURS ALLOTTED	ACTUAL TIME	COMPLETION DATE	EXPLANATION OF VARIANCE
All	4-5 hours	5	6-16-08	

SVE HR METER 3475 Well DTW
 OPENED UP BLOWER AND CHECKED FOR MW-17 - 4.80
 WATER. FOUND NO WATER IN BLOWER AND OP-3 - 5.40
 SPRAYED BLOWER INTAKE W/ MOISTURE OUT SVE-28 - 5.20
 PERMEATING OIL FOR SEVERAL SECONDS. OP-2 - 5.24
 SHUT DOWN BLOWER AFTER LUBRICATING BLOWER OP-1 - 4.72
 LOSES. REMOVED PRESSURE TRANSDUCER FROM
 AIR LINE TO SPARGE LINES AND REPLACE A
 PIPE PLUG IN ITS PLACE. MOVED OUTSIDE TO
 CHECK DTW IN MONITOR WALL. RESULTS AS ABOVE
 Ken Craig want in today.

Field Notes

Alan Harper

Harman Becker

6-12-08

Proj # 11913

Weather: Part Sun- 92° 5-10 mph wind west

Arrived on site and went to the wells to inspect for any problems. All wells and area of well was in good shape.

Inspected the condensate pots outside and found both full of water. Rung both pots down.

Took D.T.W. measurements in the wells that are commonly used for performance evaluations. MW-17(3.10) OP-1(3.60) MW-28(3.40) OP-2(3.55) OP-3(3.70)

Went inside to check system. The pump was hooked up to (+) air and pumping meter read 1267 gpm. There was no water left in KOT. Opened up particulate filter housing and it was very wet and upon removal I found water standing in 6" piping to the blower. Removed water w/siphon hose. Checked blower oil case for water found none. Hooked up grease gun to pump and purged grease till it overflowed and it showed no water either. Removed the vac gauge from the six inch line & found water at blower removed it w/siphon hose, the silencer tank beyond blower was with water at the height of blower.

Decided only way to remove was to
run the blower in hand with particulate
filter out and lid off the will flow
air w/o urd vac. to the wells.
Hopefully this will dry out tank over a
few days. I showed Ken Craig what was
done. ~~th~~

Worked w/Rob over phone to try to
get KOT alarms to work correctly
but had no success. the internal
floats are mechanically sound but the
electronics are not working correctly.

Alan Harper

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: 6-5-08 Technician: A. HANPER

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

10.4 Inches of Hg
1477 cfm
Yes / ☒ No
9/9.5 Inches of Hg
20 Amps
3339 Hours
394 gallons TOTAL

Air Sparging System

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

— psi
58 psi
150 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 closure on arrival high alum. in KOT

Drained water, and collected SVE H₂O EFFLUENT sample and delivered to PAC

Drained outside condensate water. Pots they were very full of water.

Restarted system and recorded system data
checked on VAC and pres. on SVE wells and
bl. sparge wells. No adjustments needed.

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: 5-22-08 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
PLC Read Influent Air Flowrate
Dilution Air
Particulate Filter Differential Vacuum
Blower Current
Blower Hours
Knock-Out Tank Discharge

<u>8.8</u>	Inches of Hg	
<u>1430</u>	cfm	FPM 6' pipe
Yes ☒ No ☐		
<u>7/7.5</u>	Inches of Hg	
<u>20</u>	Amps	
<u>3163</u>	Hours	
<u>343</u>	gallons	

Air Sparging System

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

<u>—</u>	psi
<u>59</u>	psi
<u>150.5</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: Took SVE EXHAUST AIR SAMPLE (VOC + VINYL CHLORIDE)
TOOK WATER SAMPLE FROM KOT (EFFLUENT)
(VOC + PH)

System was running from KOT had 32 gal water
outside but solvent full enough to pump down.

System running as designed

No interruption of water sparging noticed at ASV-18R

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 7-19-00 Technician: A. P. HAYLER

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

PLC Read Influent Vacuum
PLC Read Influent Air Flowrate
Influent Air Temperature
Dilution Air
Particulate Filter Vacuum
Effluent Air Pressure
Effluent Air Temperature
Blower Current
Blower Hours
Knock-Out Tank Discharge

7.3	Inches of H2O	3 1/2" pipe
14.6	ftm FPM	
17.5	°F	
Yes		
6.1	Inches of H2O	
7.0	Inches of H2O	
	°F	
20	hours	amps
7.0	amps	amps
11	gallons	

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

psi	
psi	60-75
cfm	164.9
*F	

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 1,000 hours.

[illegible]

Delivered Sample to Rec. for Analysis.

45-18 F. Begon Sewing co., on from Council cut again.
Racked sparge flow to 150 C.F.M. @ 60 PSI at regulator
gauge.

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: 5-13-08 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
PLC Read Influent Air Flowrate
Dilution Air
Particulate Filter Differential Vacuum
Blower Current
Blower Hours
Knock-Out Tank Discharge

9.1 Inches of Hg
1420 ~~cfm~~ FPM
Yes / No
#1 6.75 ~~422~~ 8" Inches of Hg
20 Amps
2926 Hours
307 gallons

Air Sparging System

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

— psi
64 psi
171.5 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 K.O.T. for example.

Robert Brewster from IES showed up at 1:30 he installed new flow meter in SVE line he was unable to get it to work it appears that the processor in this E.O.S won't recognize the millamp signal, the unit has its own display that reads in (FPM) instead of (CFM) I can record this bi-weekly on visits

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: 5-1-08 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>8.7</u>	Inches of Hg
PLC Read Influent Air Flowrate	<u>N/A</u>	cfm
Dilution Air	Yes / No	
Particulate Filter Differential Vacuum	<u>#1 6Hg #2 7.5</u>	Inches of Hg
Blower Current	<u>2.6</u>	Amps Yes
Blower Hours	<u>2640</u>	Hours Yes
Knock-Out Tank Discharge	<u>307</u>	gallons

Air Sparging System

PLC Read Air Injection Pressure	<u>N/A</u>	psi
Direct Read Air Injection Pressure	<u>64</u>	psi
PLC Read Air Injection Flowrate	<u>167</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:

R.L.D. of SVE EX = 1.4

Replaced Copper tubing on sampling line w/ ~~new~~ vinyl tubing
AND NEW 1/4 turn valve.

NO WATER IN R.D. TANK or in outside Pats.

KERAMIDA ENVIRONMENTAL, INC.



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

OPERATION & MAINTENANCE LOG

Harnan-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 4-29-08 Technician: A. Harper, G. Nolan

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>11.0</u>	Inches of H ₂ O
PLC Read Influent Air Flowrate	<u>N/A</u>	cfm
Dilution Air	Yes / <u>No</u>	
Particulate Filter Differential Vacuum	#1 <u>9.0 lb</u> #2 <u>1.0</u>	Inches of Hg
Blower Current	<u>22</u>	amps
Blower Hours	<u>2610</u>	HR.
Knock-Out Tank Discharge	<u>307</u>	gallons Total

Air Sparging System

PLC Read Air Injection Pressure	<u>N/A</u>	psi
Direct Read Air Injection Pressure	<u>59</u>	psi
PLC Read Air Injection Flowrate	<u>150</u>	cfm

MAINTENANCE PARAMETERS:

Monthly Effluent Vapor Sample Collected? No (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 Harper

Lubricate quarterly.
Change every 2,000 hours.

NOTES: System is ready for oil change soon.

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: 4-15-08 Technician: A. HARPER

SYSTEM STATUS

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

checked for water in KOT - None
checked for water in outside pit - None

Restarted System

OPERATIONAL PARAMETERS

SVE System

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

2.6 Inches of H₂O Hg
N/A cfm
Yes / No
6 2 7 Inches of H₂O Hg
20 hours AMPs
2273 amps ARS
307 gallons NO WATER THIS VISIT

Air Sparging System

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

N/A psi
42 psi - Increased to 51 psi
80.1 cfm - Increased to 121.0

MAINTENANCE PARAMETERS:

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

If yes, name: _____

Lubricate quarterly.

Change every 2,000 hours.

NOTES: System alarm showed. UPS PWR. ON 4-10-08

monitored venting of SVE Duct from level at 3'
Duct Cross at AS-A Duct Air 18" from fence at that
point this is 4' south of fire hydrant
then venting is 12' from fence at the SIDE - A
due to a 6' jog in fence line.

ATTACHMENT 2

Operational Data Logs

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: 6-5-08 Technician: A. Harper

VAPOR EXTRACTION OPERATIONAL PARAMETERS
Applied Vacuum Levels

SVE-A	<u>CLOSED</u>	"H ₂ O
SVE-B	<u>28</u>	"H ₂ O
SVE-C	<u>27</u>	"H ₂ O
SVE-D	<u>27</u>	"H ₂ O
SVE-E	<u>28</u>	"H ₂ O
SVE-F	<u>28</u>	"H ₂ O
SVE-G	<u>27</u>	"H ₂ O
SVE-H	<u>27</u>	"H ₂ O
SVE-I	<u>27</u>	"H ₂ O
SVE-J	<u>28</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS
Injection Pressures

ASV-19	<u>26</u>	psi
ASV-A	<u>26</u>	psi
ASV-18R	<u>26</u>	psi
ASV-B	<u>26</u>	psi
ASV-10	<u>26</u>	psi
ASV-C	<u>26</u>	psi
ASV-9	<u>26</u>	psi

NOTES:

Drained the outside water pots on SVE trunk line. They were very full of water. Both of the expansion plugs need replaced in the concrete pump pots they are both cracked and losing vac. I requests an order need all metal expansion plugs from Seismic Pipe. Let me know and I'll take care of them if its OK.

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: 5-27-08 Technician: Alan Harper

VAPOR EXTRACTION OPERATIONAL PARAMETERS
Applied Vacuum Levels

	<u>CLOSED</u>	"H ₂ O
SVE-A	28	
SVE-B	<u>28</u>	"H ₂ O
SVE-C	<u>27</u>	"H ₂ O
SVE-D	<u>27</u>	"H ₂ O
SVE-E	<u>28</u>	"H ₂ O
SVE-F	<u>27</u>	"H ₂ O
SVE-G	<u>27</u>	"H ₂ O
SVE-H	<u>27</u>	"H ₂ O
SVE-I	<u>27</u>	"H ₂ O
SVE-J	<u>28</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS
Injection Pressures

ASV-19	<u>26</u>	psi
ASV-A	<u>26</u>	psi
ASV-18R	<u>26</u>	psi
ASV-B	<u>26</u>	psi
ASV-10	<u>26</u>	psi
ASV-C	<u>26</u>	psi
ASV-9	<u>26</u>	psi

NOTES: NO ADJUSTMENTS REQUIRED ON SVE WELLS OR
OR SPARGING WELLS WITH B.C.D. AIR SPARGING 100%

	VAC	DTW	D.O.
OP-3	+1.50	8.59	6.92
OP-2	-0.30	8.36	5.52
SVE-28	+1.03	8.35	8.34
OP-1	-0.18	8.51	7.57
MW-17	-0.04	8.90	6.14

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: 5-13-08 Technician: A. HARPER

VAPOR EXTRACTION OPERATIONAL PARAMETERS

Applied Vacuum Levels

SVE-A	<u>CLOSED</u>	"H ₂ O
SVE-B	<u>28</u>	"H ₂ O
SVE-C	<u>28</u>	"H ₂ O
SVE-D	<u>30</u>	"H ₂ O
SVE-E	<u>30</u>	"H ₂ O
SVE-F	<u>30</u>	"H ₂ O
SVE-G	<u>32</u>	"H ₂ O
SVE-H	<u>30</u>	"H ₂ O
SVE-I	<u>32</u>	"H ₂ O
SVE-J	<u>30</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS

Injection Pressures

ASV-19	<u>26</u>	psi
ASV-A	<u>26</u>	psi
ASV-18R	<u>26</u>	psi
ASV-B	<u>26</u>	psi
ASV-10	<u>26</u>	psi
ASV-C	<u>26</u>	psi
ASV-9	<u>26</u>	psi

NOTES:

Checked all SVE wells only a couple of adjustments were needed

No water in the RA pits outside (not enough to pump out)

	DTL	VAC "H ₂ O
OP-3	8.66	+1.35
OP-2	8.45	-0.28
SUC-2	8.45	+1.01
OP-1	8.57	-1.10
mw-17	7.95	+1.01

AS - 26 psi
VAC 30" H₂O

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: 4/30/08 Technician: R. Fedoruk / G. N. N. N.

VAPOR EXTRACTION OPERATIONAL PARAMETERS**Applied Vacuum Levels**

SVE-A	<u>35 off</u>	"H ₂ O
SVE-B	<u>25</u>	"H ₂ O
SVE-C		"H ₂ O
SVE-D		"H ₂ O
SVE-E		"H ₂ O
SVE-F		"H ₂ O
SVE-G		"H ₂ O
SVE-H		"H ₂ O
SVE-I		"H ₂ O
SVE-J		"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS**Injection Pressures**

ASV-19	<u>35-7</u>	psi
ASV-A		psi
ASV-18R		psi
ASV-B		psi
ASV-10		psi
ASV-C		psi
ASV-9		psi

NOTES:

SVE-A pulling too much air, when off all other SVE's inc. vac., ~10-15" H₂O.

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: 4-15-08 Technician: A. Harper

VAPOR EXTRACTION OPERATIONAL PARAMETERS

Applied Vacuum Levels

SVE-A	<u>21.5</u>	"H ₂ O
SVE-B	<u>27</u>	"H ₂ O
SVE-C	<u>30</u>	"H ₂ O
SVE-D	<u>30</u>	"H ₂ O
SVE-E	<u>30</u>	"H ₂ O
SVE-F	<u>30</u>	"H ₂ O
SVE-G	<u>30</u>	"H ₂ O
SVE-H	<u>30</u>	"H ₂ O
SVE-I	<u>30</u>	"H ₂ O
SVE-J	<u>30</u>	"H ₂ O

AIR SPARGING OPERATIONAL PARAMETERS

Injection Pressures

ASV-19	<u>26</u>	psi
ASV-A	<u>26</u>	psi
ASV-18R	<u>26</u>	psi
ASV-B	<u>26</u>	psi
ASV-10	<u>26</u>	psi
ASV-C	<u>26</u>	psi
ASV-9	<u>26</u>	psi

NOTES: Reamed out wells. SVE A- is down a bit from last
visit, but it is all that could be done as the well is open
and the others would have been less than 30" for
pressure more at SVE-A

ATTACHMENT 3

Performance Data Logs & Review

KERAMIDA ENVIRONMENTAL, INC.

413 North College Avenue
Indianapolis, Indiana 46212
(317) 685-6691 - FAX (317) 685-6619

INDUCED PERFORMANCE DATA LOG

Harman-Becker Remediation System
KERAMIDA Project No.: 11913

Date: 4/30/08

Technician: R. Fedorchak / G. Nolan

SVE: ☒ Vacuum set @ 30" H₂O
SVE: ☒ ☒ used as observation points
SVE blower Airflow @ 170 cfm

AS: 100 pressure set @ 27" H₂O
AS: ☒ shut off during testing
AC unit Airflow @ 170 cfm *

SVE Restarted @ 0940

Sparging initiated @ 1100 (seconds)

* Initial readings w/ sparging after 15 min.

SVE 10' Time 15 min		Vac. (-) / Pres. (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 2-10 bgs)	DO (% or mg/L)	ORP (% or mg/L)
1010		-0.29	—	8.71	9.76	—
1040		-0.38	↓	8.70	12.64	↓
* 1220		-0.17	↓	8.32	12.43	↓
1235		-0.20	↓	8.28	13.50	↓
1305		-0.20	↓	8.13	21.82	↓
1335		-0.20	↓	8.00	22.06	↓
1420		-0.18	↓	7.86	13.70	↓
27' Time 30 min		Vac. (-) / Pres. (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 3-12 bgs)	DO (% or mg/L)	ORP (% or mg/L)
1010		-0.06	—	8.57	10.45	—
1040		-0.03	↓	8.57	10.33	↓
* 1220		-0.07	↓	8.22	15.16	↓
1235		-0.04	↓	8.15	10.20	↓
1305		-0.04	↓	7.98	21.0	↓
1335		-0.04	↓	7.88	20.62	↓
1420		-0.03	↓	7.64	15.81	↓
50' Time 60 min		Vac. (-) / Pres. (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 4-15 bgs)	DO (% or mg/L)	ORP (% or mg/L)
1010		-0.01	—	8.88	12.85	—
1040		-0.01	↓	8.48	12.00	↓
* 1220		+0.03	↓	8.35	12.77	↓
1235		+0.03	↓	8.23	14.13	↓
1305		+0.02	↓	8.07	26.90?	↓
1335		+0.04	↓	7.88	26.48	↓
1420		0	↓	7.68	19.45	↓
13' Time 30 min		Vac. (-) / Pres. (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 2-10 bgs)	DO (% or mg/L)	ORP (% or mg/L)
1010		-0.17	—	8.55	12.07	—
1040		-0.19	↓	8.54	12.91	↓
* 1220		-0.12	↓	8.16	11.97	↓
1235		-0.13	↓	8.09	13.10	↓
1305		-0.11	↓	7.98	21.90	↓
1335		-0.12	↓	7.80	21.81	↓
1420		-0.15	↓	7.65	13.66	↓

SVE Blower w/o sparging @ 1045

w/ sparging

0.4 ppm @ 1305

0.4-7 @ 1400

170 cfm

15 min @ 0.4 ppm sample collected for VOC's

KERAMIDA ENVIRONMENTAL, INC.

401 North College Avenue
Indianapolis, Indiana 46202
(317) 685-6400 • FAX (317) 685-6610

INDUCED PERFORMANCE DATA LOG

Harmco-Barker Remediation System
KERAMIDA Project No.: 11913

Date: 4/30/08

Technician: R. Fedoruk / G. Nelson

SVE: E Vacuum set @ 30 "H₂O
SVE: A & B used as observation points
SVE blower Airflow @ — cfm

AS: 1PR pressure set @ 22 psi
AS: A & B shut off during testing
AC unit Airflow @ 12 cfm

SVE Restarted @ 0940
Spraying initiated @ 1100 (seawater)
+ Initial readings w/ spraying after 15 min.

27'		Time	12'	NW-17			DO (% or mg/L)	ORP (% or mg/L)
				Vac (-) Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen <u>2-17</u> bgs)		
		1010		-0.14	—	8.07	10.98	—
		1040		-0.17	↓	8.06	11.33	↓
		* 1220		-0.04	↓	7.65	11.14	↓
		1235		-0.05	↓	7.60	9.86	↓
		1305		-0.07	↓	7.58	17.22	↓
		1335		-0.08	↓	7.41	15.51	↓
		1420		-0.10	↓	7.28	9.57	↓
		Time		SVE-C			DO (% or mg/L)	ORP (% or mg/L)
				Vac (-) Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen <u>2-35</u> bgs)		
40'		1010	23' 40'	-0.02	—	—	—	—
		1040		-0.03	↓	↓	↓	↓
		* 1220		-0.01	↓	↓	↓	↓
		1235		-0.02	↓	↓	↓	↓
		1305		-0.02	↓	↓	↓	↓
		1335		-0.02	↓	↓	↓	↓
		1420		-0.02	↓	↓	↓	↓
		Time	51'	SVE-E			DO (% or mg/L)	ORP (% or mg/L)
				Vac (-) Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen <u>3-35</u> bgs)		
		* 1010		-0.02	—	—	—	—
		1040		-0.02	↓	↓	↓	↓
		1220		-0.01	↓	↓	↓	↓
		1235		0	↓	↓	↓	↓
		1305		-0.02	↓	↓	↓	↓
		1335		-0.02	↓	↓	↓	↓
		1420		-0.02	↓	↓	↓	↓
		Time		See below to left.			DO (% or mg/L)	ORP (% or mg/L)
				Vac (-) Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen <u>—</u> bgs)		
		1505	OP-1	-0.18	—	7.71	14.88	—
			2	-0.05	↓	7.48	14.22	↓
			3	+0.01	↓	7.52	24.52	↓
			SE-28	-0.18	↓	7.50	19.02	↓
			NW-17	+0.05	↓	7.18	10.73	↓
			SE-C	-0.03	↓	—	—	↓
			E	-0.03	↓	—	—	↓

KERAMIDA ENVIRONMENTAL, INC.

411 North College Avenue
Indianapolis, Indiana 46202
D173-685-4400 • FAX (317) 685-1610

INDUCED PERFORMANCE DATA LOG

Harmian-Berkey Remediation System
KERAMIDA Project No.: 11913

Date 4/29/08

Technician

R. F. B. / G. W. / A. HarperSVE: 0 Vacuum set @ 30 "H₂OSVE: C & E used as observation pointsSVE blower airflow @ — cfmAS - 100 pressure set @ 27 psAS - A B shut off during testingAC unit airflow @ 150 cfm

Time	OP-1				
	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen _____ bgs)	DO (% or mg/L)	ORP (% or mg/L)
1250	-16	0	8.63	12.50	↓
1305	-40	—	8.58	13.43	
1320	-46	0	8.55	13.62	
1350	-15	—	8.46	13.14	
1420	-18	0	8.38	13.37	
1450	-12	—	8.31	14.83	
1520	-0.18	—	8.20	15.05	↓
1545 Time	—	—	8.18	13.16	—
Time	OP-2				
	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen _____ bgs)	DO (% or mg/L)	ORP (% or mg/L)
1250	-06	0	8.53	9.92	↓
1305	-02	—	8.47	10.04	
1320	-05	0	8.42	9.82	
1350	-0.02	—	8.35	11.42	
1420	-0.04	0	8.24	12.04	
1450	-0.03	—	8.14	10.55	
1520	-0.04	—	8.05	10.73	↓
1545 Time	—	—	8.00	10.90	—
Time	OP-3				
	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen _____ bgs)	DO (% or mg/L)	ORP (% or mg/L)
1250	+41	0	8.69	13.09	↓
1305	+38	—	8.63	13.42	
1320	+37	0	8.57	12.72	
1350	+31	—	8.47	15.26	
1420	+26	0	8.32	14.66	
1450	+24	—	8.21	14.14	
1520	+0.30	—	8.14	15.90	↓
1545 Time	—	—	8.04	15.02	—
Time	SVE-20				
	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen _____ bgs)	DO (% or mg/L)	ORP (% or mg/L)
1250	-0.03	0	8.51	12.39	↓
1305	-0.04	—	8.44	13.06	
1320	-0.04	0	8.28	12.59	
1350	-0.07	—	8.31	13.31	
1420	-0.05	0	8.21	13.22	
1450	-0.04	—	8.14	15.45	
1520	-0.04	—	8.05	15.83	↓
1545 Time	—	—	8.00	12.82	—

Technician: R. F. Black / G. W. W. / A. Harper

AS - 100 pressure set @ 37 psi
AS - A & B shut off during testing
AC unit airflow @ 154 cfm

[illegible]

KERAMIDA ENVIRONMENTAL, INC.

489 North College Avenue
Indiatown, Indiana 46213
(317) 685-6610 • FAX (317) 685-6610

INDUCED PERFORMANCE DATA LOG

Harman-Becker Remediation System
KERAMIDA Project No. 11913

Date: 4/29/03

SVE: 0 Vacuum set @ 14" H₂O

SVE: C & F used as observation points

SVE blower Airflow @ 150 cfm

Technician

R. Beck / K. Nolen / A. Harper

AS: 100 pressure set @ 25 ps

AS: A & B shut off during testing

AC unit Airflow @ 150 cfm

Spurge initiated @ 1040

Time	10'	Vac (-) / Pres (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen ____ bgs)	DO (% or mg/L)	ORP (% or mg/L)
0930		-	-	8.89	11.34	-
1000	14" H ₂ O	0	0	8.98	10.93	-
1030	30" H ₂ O	-0.25	0	9.02	12.35	-
1100		-0.16	0	8.92	12.44	-
1115		-0.17	0	8.86	13.23	-
1130		-0.15	-	8.76	12.06	-
1230		-0.17	0	8.70	12.46	-
Time	20'	Vac (-) / Pres (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen ____ bgs)	DO (% or mg/L)	ORP (% or mg/L)
0930		-	-	8.79	9.36	-
1000		-0.03	0	8.89	8.94	-
1030		-0.04	0	8.92	9.38	-
1100		-0.04	0	8.87	9.21	-
1115		-0.04	0	8.79	9.17	-
1130		-0.06	-	8.67	9.44	-
1230		-0.05	0	8.58	8.75	-
Time	50'	Vac (-) / Pres (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen ____ bgs)	DO (% or mg/L)	ORP (% or mg/L)
0930		-	-	9.06	15.48	-
1000		+0.45	0	9.19	12.70	-
1030		+0.45	0	9.44	12.23	-
1100		+0.50	0	9.14	12.33	-
1115		+0.52	0	9.05	12.47	-
1130		+0.55	-	8.91	12.32	-
1230		+0.47	0	8.78	11.11	-
Time	13'	Vac (-) / Pres (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen ____ bgs)	DO (% or mg/L)	ORP (% or mg/L)
0930		-	-	8.76	10.32	-
1000		-0.12	0	8.86	11.72	-
1030		-0.10	0	8.90	11.97	-
1100		-0.05	0	8.81	12.33	-
1115		-0.04	0	8.72	12.26	-
1130		-0.04	-	8.62	12.33	-
1230		-0.06	-	8.55	12.05	-

Date 4/29/08

Technician.

R. Feldman / G. Noh / A. Harper

SVE - 0 Vacuum seal @ 30 °H₂O
SVE - 6 & 8 used as observation points
SVE blowers Airflow @ - cfm

AS - RR pressure set @ psi
AS - & shut off during testing
AC unit Airflow @ 100 cfm

[illegible]



KERAMIDA
ENVIRONMENTAL, INC.
ENGINEERING • CONSULTING • REMEDIATION
AIR • LAND • WATER • WASTE

330 North College Avenue
Indianapolis, Indiana 46202
(317) 685-6600
Fax (317) 685-6610
1-800-508-8034
keramida@keramida.com

JOB NAME HBAS-System O&M KEI # 11913
SHEET NO. 1 OF 12
CALCULATED BY RSF DATE 5/12/08
CHECKED BY _____ DATE _____
Performance Data Review

I. SVE Influence

A. SVE Operational Only

- 1.) SVE-D @ 30" H₂O on 4/29/08
ROI = 21', See ROI plot attached
- 2.) SVE-D @ 30" H₂O on 4/30/08
ROI = 25', See ROI plot attached

B. SVE w/AS Operational

- 1.) SVE-D @ 30" H₂O, AS-18R @ 27psi w/ AC unit @ 120cfm 4/29/08
ROI = 18', See ROI plot attached
- 2.) SVE-D @ 30" H₂O, AS-18R @ 27psi w/ AC unit @ 150cfm 4/29/08
ROI = 20', See ROI plot attached
- 3.) SVE-D @ 30" H₂O, AS-18R @ 27psi w/ AC unit @ 170cfm 4/30/08
ROI = 25'

Co SVE left operational on 4/20/08 w/ SVE's @ 30" H₂O; (AS sprays @ 27psi w/ AC unit @ 170cfm)
see below

II AS Influence

A. Well	Dist. from AS-18R	120/150/170cfm			Notes
		Pressure	Gas Monitoring	OO Levels	
OP-1	12'	Y/Y/Y	Y/Y/Y	Y/Y/Y	-
2	39'	N/N/N	Y/Y/Y	Y/Y/Y	-
3	60'	NA (Leakage from AS-B)			Not used in eval.
MW-17	12'	Y/Y/Y	Y/Y/Y	Y/Y/Y	-
SVE-D8	22'	Y/Y/Y	Y/Y/Y	Y/Y/Y	-
C	23'	No (all 3)	NA	NA	Screened above H ₂ O, Not used in eval.
E	51'	No (all 3)	NA	NA	" " " " " " " " " " " "

- B. Only well experiences of influence based on data; changes in all 3 categories were considered as influence.
∴ Influence is seen @ 22' from AS-18R. Some influence maybe found @ 23'. ∴ ROI = ~ 30'

DATE 4/30/08

Technician R. Fedorchak / G. Nolan

VE - Vacuum set @ 30 "H₂O
VE - E & F used as observation points
VE Blower Airflow @ 170 cfm

AS - 188 pressure set @ 27 ps
AS - A & B shut off during testing
AC unit Airflow @ 170 cfm

SVE Restarted @ 0940
Spraying initiated @ 1100 (5 minutes)
+ in full recovery w/ spraying after 15 min.

Time	Time	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 1-15 bgs)	DO (% or mg/L)	ORP (% or mg/L)
1010	1010	-0.29	-	8.71	9.76	-
1040	1040	-0.28		8.70	12.64	
* 1220	1220	-0.17		8.32	12.43	
1235	1235	-0.20		8.26	13.50	
1305	1305	-0.20		8.13	21.82	
1335	1335	-0.20		8.00	22.06	
1420	1420	-0.18	↓	7.86	13.70	↓
Time	Time	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 1-15 bgs)	DO (% or mg/L)	ORP (% or mg/L)
1010	1010	-0.06	-	8.57	10.45	-
1040	1040	-0.03		8.57	10.33	
* 1220	1220	-0.07		8.27	12.96	
1235	1235	-0.04		8.15	10.20	
1305	1305	-0.04		7.98	21.0	
1335	1335	-0.04		7.88	20.62	
1420	1420	-0.03	↓	7.64	15.81	↓
Time	Time	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 1-15 bgs)	DO (% or mg/L)	ORP (% or mg/L)
1010	1010	-0.01	-	8.88	12.85	-
1040	1040	-0.01		8.48	12.00	
* 1220	1220	+0.03		8.35	12.77	
1235	1235	+0.03		8.23	14.13	
1305	1305	+0.02		8.07	26.90?	
1335	1335	+0.04	↓	7.88	26.48	↓
1420	1420	0	↓	7.68	19.43	↓
Time	Time	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 1-15 bgs)	DO (% or mg/L)	ORP (% or mg/L)
1010	1010	-0.17	-	8.55	12.07	-
1040	1040	-0.19		8.54	12.91	
* 1220	1220	-0.12		8.16	11.97	
1235	1235	-0.13		8.04	13.10	
1305	1305	-0.11		7.98	21.90	
1335	1335	-0.12	↓	7.80	21.81	↓
1420	1420	-0.15	↓	7.65	13.66	↓

SVE Blower w/o spraying Oppm @ 1045

w/ spraying

0.4 ppm @ 1205
0.4-1 @ 1400

170 cfm 15 min 0.4 ppm sample collected for VOC's

3/11

ERAMIDA ENVIRONMENTAL, INC.

611 North College Avenue
Indianapolis, Indiana 46202
(317) 681-6600 • FAX (317) 681-6610

DATE: 4/30/08

Technician:

R. F. D. / G. Nelson

VE - D Vacuum set @ 30 "H₂O
VE - A E used as observation points
VE blower Airflow @ 120 cfm

AS - 1 APR pressure set @ 22 psi
AS - A & B taken off during testing
AC unit Airflow @ 120 cfm

INDUCED PERFORMANCE DATA LOG

Harpass-Becker Remediation System

KERA MSDA Project No.: 11913

SVE Restarted @ 0940

Sparging initiated @ 1100 (scavenger)

+ Initial readings w/ sparging after 15 min.

27' Time 12'		NW-17				
		Vac (-) Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 2-1) (gpg)	DO (% or mg/L)	ORP (% or mg/L)
1010		-0.14	—	8.07	10.98	—
1040		-0.12		8.06	11.33	
* 1220		-0.04		7.65	11.14	
1235		-0.05		7.60	9.86	
1305		-0.07		7.58	17.22	
1335		-0.08		7.41	15.51	
1420		-0.10		7.28	9.57	
Time		SVE-C				
		Vac (-) Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 2-5) (gpg)	DO (% or mg/L)	ORP (% or mg/L)
40' 1010 23' 40'		-0.02	—	—	—	—
1040		-0.03				
* 1220		-0.01				
1235		-0.02				
1305		-0.02				
1335		-0.02				
1420		-0.02				
Time 51'		SVE-E				
		Vac (-) Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 2-5) (gpg)	DO (% or mg/L)	ORP (% or mg/L)
* 1010		-0.02	—	—	—	—
1040		-0.02				
1220		-0.01				
1235		0				
1305		-0.02				
1335		-0.02				
1420		-0.02				
Time		See below table				
		Vac (-) Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) (Screen 2-5) (gpg)	DO (% or mg/L)	ORP (% or mg/L)
1505 09-1		-0.18	—	7.71	14.88	—
2		-0.05		7.48	14.22	
3		+0.01		7.52	24.52	
SE-28		-0.18		7.50	19.02	
NW-17		-0.05		7.18	10.73	
SVE-C		-0.03		—	—	
F		-0.03		—	—	

4/29/08

Technician R. P. D. / K. W. / A. Harper

VE - 0 Vacuum set @ 30" H₂O
VE - 6 & 7 used as observation points
VE blower Airflow @ 150 cfm

AS - 100 pressure set @ 27 ps
AS - A & B when OGT during testing
AC unit Airflow @ 150 cfm

Time	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) / Screen (ft)	DO (%) or (mg/L)	ORP (%) or (mg/L)
1250	-16	0	8.63	12.50	↓
1305	-40	-	8.58	13.43	↓
1320	-16	0	8.55	13.62	↓
1350	-15	-	8.46	13.14	↓
1420	-18	0	8.38	13.37	↓
1450	-12	-	8.31	14.83	↓
1520	-0.18	-	8.22	15.05	↓
1545	-	-	8.18	13.16	-
Time	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) / Screen (ft)	DO (%) or (mg/L)	ORP (%) or (mg/L)
1250	-06	0	8.53	9.92	-
1305	-02	-	8.47	10.04	↓
1320	-05	0	8.42	9.82	↓
1350	-0.02	-	8.35	11.42	↓
1420	-0.04	0	8.24	12.04	↓
1450	-0.03	-	8.14	10.55	↓
1520	-0.04	-	8.05	10.73	↓
1545	-	-	8.00	10.96	-
Time	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) / Screen (ft)	DO (%) or (mg/L)	ORP (%) or (mg/L)
1250	+41	0	8.69	13.09	-
1305	+38	-	8.63	13.42	↓
1320	+37	0	8.57	12.72	↓
1350	+31	-	8.47	15.26	↓
1420	+26	0	8.32	14.66	↓
1450	+24	-	8.21	14.14	↓
1520	+0.30	-	8.14	15.90	↓
1545	-	-	8.04	15.02	-
Time	Vac (-) / Pres (+) ("H ₂ O)	Headspace (ppm)	DTW (feet) / Screen (ft)	DO (%) or (mg/L)	ORP (%) or (mg/L)
1250	-03	0	8.51	12.39	↓
1305	-04	-	8.44	13.06	↓
1320	-04	0	8.28	12.59	↓
1350	-07	-	8.31	13.31	↓
1420	-05	0	8.21	13.22	↓
1450	-04	-	8.14	15.45	↓
1520	-0.04	-	8.05	15.83	↓
1545	-	-	8.00	12.82	-

4/29/03
Vacuum set @ 14" H₂O
used as observation points
blower Airflow @ 100 cfm

Technician REB/ckk/B.N. kw/A. Harper
AS - BB pressure set @ 25 psi
AS - R & B shut off during testing
AC unit Airflow @ 100 cfm

Scrape with 1" @ 1040

OP-1						
Time	10'	Vac (-)/Pres. (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen _____) (psi)	DO (% or mg/L)	ORP (% or mg/L)
0930		-	-	8.89	11.34	-
1000	14" H ₂ O	0	0	8.93	10.93	-
1030	30" H ₂ O	-0.25	0	9.02	12.35	-
1100		-0.16	0	8.92	12.44	-
1115		-0.17	0	8.86	13.23	-
1145		-0.15	-	8.76	12.06	-
1230		-0.17	0	8.70	12.46	-
OP-2						
Time	20'	Vac (-)/Pres. (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen _____) (psi)	DO (% or mg/L)	ORP (% or mg/L)
0930		-	-	8.79	8.36	-
1000		-0.03	0	8.89	8.94	-
1030		-0.04	0	8.92	9.38	-
1100		-0.04	0	8.87	9.21	-
1115		-0.04	0	8.79	9.17	-
1145		-0.06	-	8.67	9.44	-
1230		-0.05	0	8.58	8.75	-
OP-3						
Time	50'	Vac (-)/Pres. (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen _____) (psi)	DO (% or mg/L)	ORP (% or mg/L)
0930		-	-	9.06	15.48	-
1000		+0.45	0	9.19	12.70	-
1030		+0.45	0	9.44	12.23	-
1100		+0.50	0	9.14	12.33	-
1115		+0.52	0	9.05	12.47	-
1145		+0.55	-	8.91	12.32	-
1230		+0.47	0	8.78	11.11	-
SUE-02A						
Time	13'	Vac (-)/Pres. (+) (H ₂ O)	Headspace (ppm)	DTW (feet) (Screen _____) (psi)	DO (% or mg/L)	ORP (% or mg/L)
0930		-	-	8.76	10.32	-
1000		-0.12	0	8.88	11.72	-
1030		-0.10	0	8.90	11.97	-
1100		-0.05	0	8.81	12.33	-
1115		-0.04	0	8.72	12.26	-
1145		-0.04	-	8.62	12.33	-
1230		-0.06	-	8.55	12.05	-

nr. 4/29/08

Technicians

R. Federick / G. Nolen / A. Harper

RE. D Vacuum set @ 30 "H₂O

AS - PAR pressure set @ psi

1/E. 1 & 2 used as observation points
1/E blower airflow @ 1 cfm

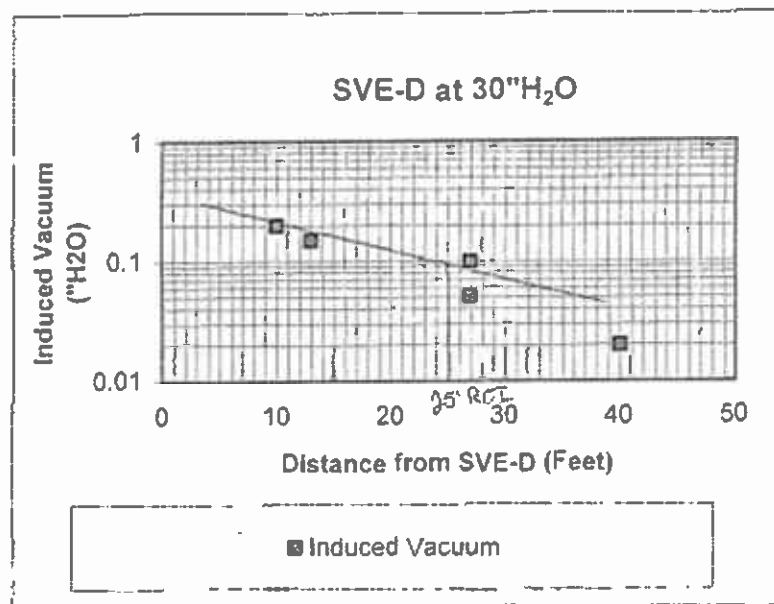
AS - A & B shut off during testing
AC w/ Airflow @ 10 cfm

IE blewsi Airflow De _____ efen

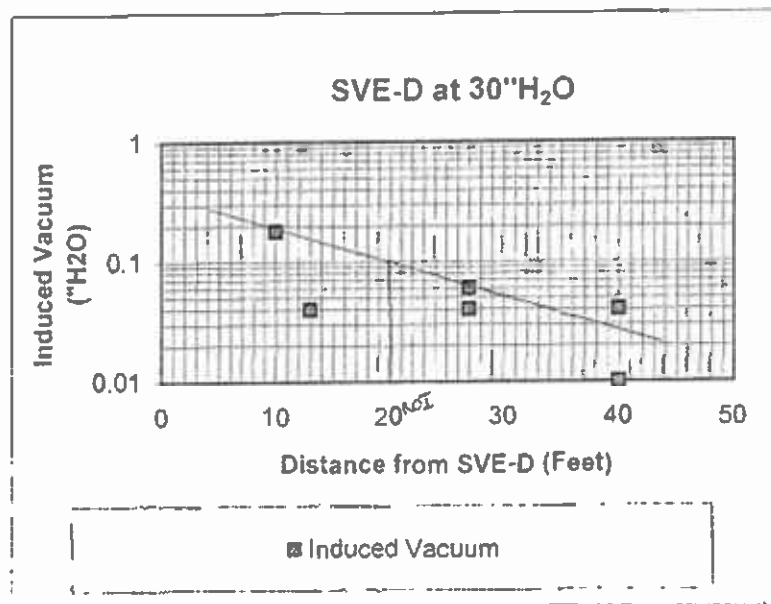
AC 100: Airflow @ 100 cfm

[illegible]

Observation Point	Distance From SVE-D	Induced Vacuum
OP-1	10	0.2
OP-2	27	0.05
SVE-28	13	0.15
MW-17	27	0.1
SVE-C	40	0.02
SVE-E	40	0.02

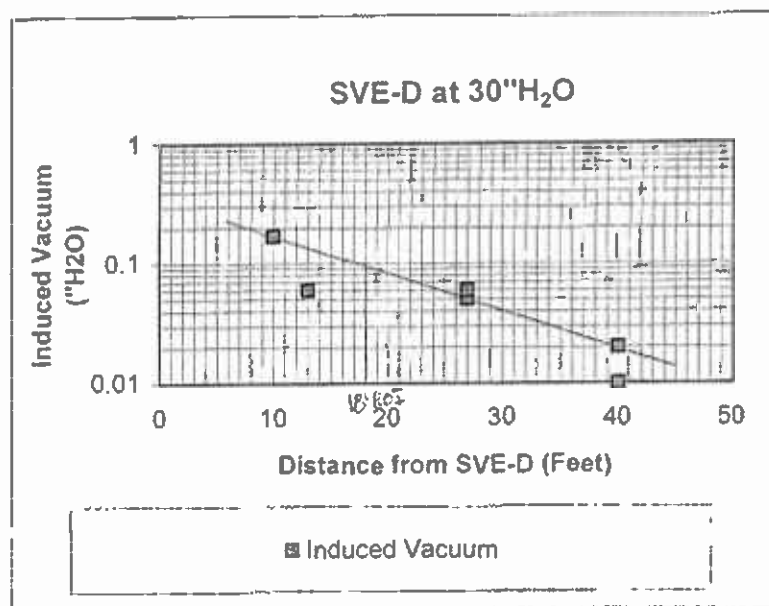


Observation Point	Distance From SVE-D	Induced Vacuum
OP-1	10	0.18
OP-2	27	0.04
SVE-28	13	0.04
MW-17	27	0.06
SVE-C	40	0.04
SVE-E	40	0.01



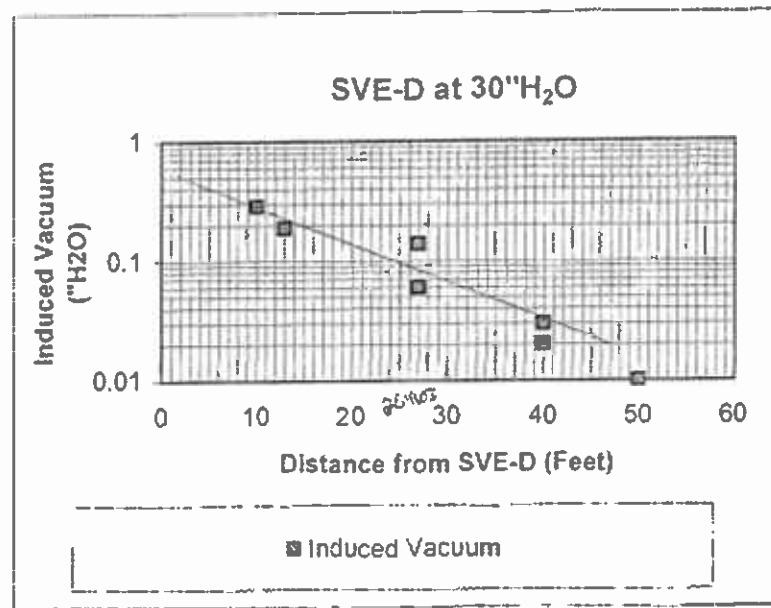
4/29/08
SVE/AS Operational
AC @ 120cfm

Observation Point	Distance From SVE-D	Induced Vacuum
OP-1	10	0.17
OP-2	27	0.05
SVE-28	13	0.06
MW-17	27	0.06
SVE-C	40	0.02
SVE-E	40	0.01

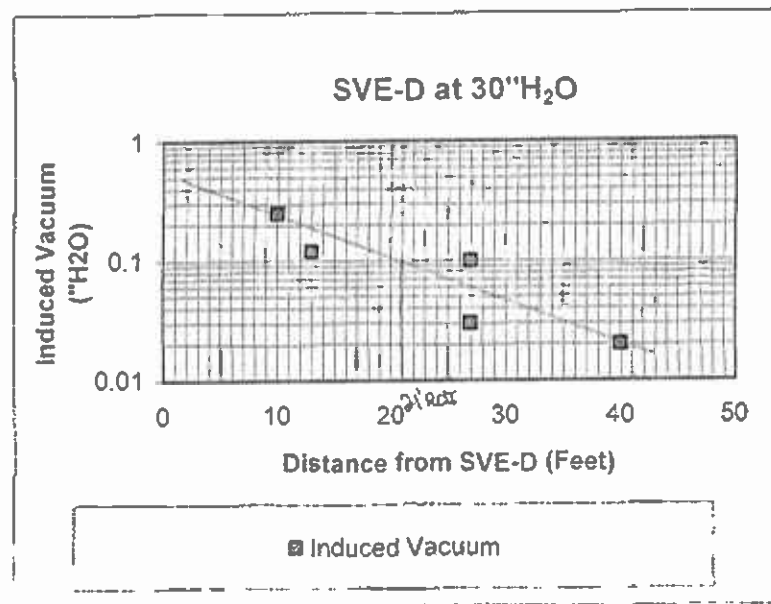


4/30/08
SVE Operational Only

Observation Point	Distance From SVE-D	Induced Vacuum
OP-1	10	0.29
OP-2	27	0.06
OP-3	50	0.01
SVE-28	13	0.19
MW-17	27	0.14
SVE-C	40	0.03
SVE-E	40	0.02



Observation Point	Distance From SVE-D	Induced Vacuum
OP-1	10	0.25
OP-2	27	0.03
SVE-28	13	0.12
MW-17	27	0.1
SVE-C	40	0.02



ATTACHMENT 4

Vapor Analytical Reports and Discharge Calculations

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
	5,819.75	:Subtotals:	29.26

Vapor Discharge Calculation Worksheet

Site: HBAS, Martinsville, IN - Groundwater Remediation System

Date: 06-25-08

Time:

Enter Air Flowrate in CFM

280

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

PCE

0.047

Vinyl Chloride

Discharge Rate
(pounds/day)

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

0.000

0.00

PCE

0.008

0.00

Total Chlorinated HC

0.008

0.00

Vapor Discharge Calculation Worksheet

Site: HBAS, Martinsville, IN - Groundwater Remediation System

Date: 05-27-08

Time:

Enter Air Flowrate in CFM

280

Enter Concentrations in PPMV

Vinyl Chloride

0

Methylene Chloride

0

t-1,2 DCE

0

Chloroform

0

1,1,1 TCA

0.006

Carbon Tetrachloride

0

TCE

0.007

PCE

0.035

Vinyl Chloride

Discharge Rate
(pounds/day)

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

0.001

0.00

Carbon Tetrachloride

0.000

0.00

TCE

0.001

0.00

PCE

0.006

0.00

Total Chlorinated HC

0.008

0.00

Vapor Discharge Calculation Worksheet

Site: HBAS, Martinsville, IN - Groundwater Remediation System

Date: 05-01-08

Time:

Enter Air Flowrate in CFM

350

Enter Concentrations in PPMV

Vinyl Chloride

0

Methylene Chloride

0

t-1,2 DCE

0

Chloroform

0

1,1,1 TCA

0.011

Carbon Tetrachloride

0

TCE

0.015

PCE

0.216

Vinyl Chloride

Discharge Rate
(pounds/day)

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

0.002

0.00

Carbon Tetrachloride

0.000

0.00

TCE

0.003

0.00

PCE

0.048

0.00

Total Chlorinated HC

0.052

0.00

Vapor Discharge Calculation Worksheet

Site: HBAS, Martinsville, IN - Groundwater Remediation System

Date: 04-30-08

Time: 1540

Enter Air Flowrate in CFM

350

Enter Concentrations in PPMV

Vinyl Chloride

0

Methylene Chloride

0

t-1,2 DCE

0

Chloroform

0

1,1,1 TCA

0.007

Carbon Tetrachloride

0

TCE

0.013

PCE

0.185

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

0.001

0.00

Carbon Tetrachloride

0.000

0.00

TCE

0.002

0.00

PCE

0.041

0.00

Total Chlorinated HC

0.044

0.00



Analytical Laboratory & Geoprobe Sampling

RECEIVED

JUL 14 2008

KERAM.

7/8/2008

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 June 30, 2008 for your project; 11913 - Harman Becker Automotive.

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.

KER216-8528

Keramida Environmental, Inc.
Project: 11913 - Harman Becker Automotive

CONCENTRATIONS IN PPMV

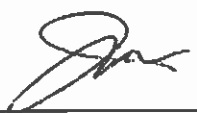
COMPOUND	SVE EXH	PQL
1,1 DICHLOROETHYLENE	ND	0.01
METHYLENE CHLORIDE	ND	0.05
TRANS-1,2 DICHLOROETHYLENE	ND	0.01
1,1 DICHLOROETHANE	ND	0.02
CIS-1,2 DICHLOROETHYLENE	ND	0.01
CHLOROFORM	ND	0.005
1,1,1 TRICHLOROETHANE	ND	0.005
CARBON TETRACHLORIDE	ND	0.005
TRICHLOROETHYLENE	ND	0.005
TETRACHLOROETHYLENE	0.047	0.005
VINYL CHLORIDE	ND	1

FILE NAME	V56B.492.BND
DATE SAMPLED	06/25/08
DATE RECEIVED	06/30/08
DATE ANALYZED	07/01/08

PQL - denotes lower 'Practical Quantitation Limit'

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

08-Jul-08

Reviewed by: 

Vaportech Services, Inc.

Keramida Environmental, Inc.
Quality Control
Laboratory Project(s): 8528

CONTINUING CALIBRATION CHECK

STANDARDS: 21V-R4 STD VC1000
FILE NAME: V56A/B.495.BND V56A.490.BND
DATE ANALYZED: 07/01/08 07/01/08

COMPOUND	KNOWN (PPMV)	RESULT (PPMV)	PERCENT DIFFERENCE
1,1 DICHLOROETHYLENE	1.01	0.99	1.68
METHYLENE CHLORIDE	1.15	1.12	2.26
TRANS-1,2 DICHLOROETHYLENE	1.01	1.00	1.19
1,1 DICHLOROETHANE	0.99	0.96	2.83
CIS-1,2 DICHLOROETHYLENE	1.01	0.99	1.98
CHLOROFORM	0.820	0.794	3.17
1,1,1 TRICHLOROETHANE	0.730	0.714	2.19
CARBON TETRACHLORIDE	0.640	0.627	2.03
TRICHLOROETHYLENE	0.740	0.729	1.49
TETRACHLOROETHYLENE	0.590	0.584	1.02
VINYL CHLORIDE	1000	991	0.95

LABORATORY BLANK RESULTS

BLANK: N2 IN VIAL
FILE NAME: V56A/B.488.BND
DATE ANALYZED: 07/01/08

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



APORTECH
Services, Inc.

1158 Pittsburgh Road • Suite 201 • Valencia, PA 16059
Tel: 724-898-2622 • Fax: 724-898-2633

Analysis Options:

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
RTEX: 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)

Chas. W. Ayer

[illegible]

Results to : Rob Fedorcha K @ Keramida

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
<i>William S. Morgan</i>	<i>Keremidis</i>	<i>6-26-08</i>	<i>0730</i>	<i>W. S. Morgan</i>	<i>W. S. Morgan</i>	<i>6/30/08</i>	<i>1330</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.

YELLOW COPY : Laboratory

PINK COPY : Submitter



Analytical Laboratory & Geoprobe Sampling

6/4/2008

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 May 30, 2008 for your project; 11913 - Harman Becker Automotive.

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:

RECEIVED

JUN 12 2008

Vaportech Services, Inc.

KER215-8451

Keramida Environmental, Inc.
Project: 11913 - Harman Becker Automotive

CONCENTRATIONS IN PPMV

COMPOUND	SVE EXH	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	0.006	0.005
CARBON TETRACHLORIDE	ND	0.005
TRICHLOROETHYLENE	0.007	0.005
TETRACHLOROETHYLENE	0.035	0.005
VINYL CHLORIDE	ND	1

FILE NAME	V56B.325.BND
DATE SAMPLED	05/27/08
DATE RECEIVED	05/30/08
DATE ANALYZED	06/04/08

PQL - denotes lower 'Practical Quantitation Limit'

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

04-Jun-08

Reviewed by: 

Vaportech Services, Inc.

Keramida Environmental, Inc.
Quality Control
Laboratory Project(s): 8451

CONTINUING CALIBRATION CHECK

STANDARDS: 21V-R4 STD VC1000
FILE NAME: V56A/B.317.BND V56A.319.BND
DATE ANALYZED: 06/03/08 06/03/08

COMPOUND	KNOWN (PPMV)	RESULT (PPMV)	PERCENT DIFFERENCE
1,1 DICHLOROETHYLENE	1.01	0.87	13.56
METHYLENE CHLORIDE	1.15	1.15	0.09
TRANS-1,2 DICHLOROETHYLENE	1.01	0.98	2.57
1,1 DICHLOROETHANE	0.99	1.23	24.24
CIS-1,2 DICHLOROETHYLENE	1.01	1.05	3.47
CHLOROFORM	0.820	0.969	18.17
1,1,1 TRICHLOROETHANE	0.730	0.923	26.44
CARBON TETRACHLORIDE	0.640	0.779	21.72
TRICHLOROETHYLENE	0.740	0.760	2.70
TETRACHLOROETHYLENE	0.590	0.605	2.54
VINYL CHLORIDE	1000	994	0.64

LABORATORY BLANK RESULTS

BLANK: N2 IN VIAL
FILE NAME: V56A/B.316.BND
DATE ANALYZED: 06/03/08

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



VAPORTECH
Services, Inc.

1158 Pittsburgh Road • Suite 201 • Valencia, PA 16059
Tel: 724-898-2622 • Fax: 724-898-2633

1158 Pittsburgh Road • Suite 201 • Valencia, PA 16059
Tel: 724-898-2622 • Fax: 724-898-2633

Sampler's signature: Olivia W. Ferguson

Sampler's signature:

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

Analysis Options:

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-DCA, Methylene Chloride, trans-1,2-DCE, cis-1,2-DCE, 1,1,1-TCE, Carbon Tetrachloride, Trichloroethylene (TCE), Tetrachloroethylene (PCE)

[illegible]

Invoice to :

Results to: Rob Fedorechak

Relinquished by : <i>William S. Taylor</i>	Company : <i>Rembrandt</i>	Date : <i>5-27-08</i>	Time :	Received by : <i>William S. Taylor</i>	Company : <i>Rembrandt</i>	Date : <i>5/30/08</i>	Time : <i>12:30</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.

YELLOW COPY : Laboratory

PINK COPY : Submitter



Analytical Laboratory & Geoprobe Sampling

RECEIVED

MAY 12 2008

KERAMIDA

RECEIVED

MAY 14 2008

KEHAMIDA

5/6/2008

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 samples received on May 2, 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.

KER213-8349

Keramida Environmental, Inc.
Project: 11913 - HBAS

CONCENTRATIONS IN PPMV

COMPOUND	SVE EFF @ 1540	SVE EXH	PQL
1,1 DICHLOROETHYLENE	ND	ND	0.01
METHYLENE CHLORIDE	ND	ND	0.05
TRANS-1,2 DICHLOROETHYLENE	ND	ND	0.01
1,1 DICHLOROETHANE	ND	ND	0.02
CIS-1,2 DICHLOROETHYLENE	ND	ND	0.01
CHLOROFORM	ND	ND	0.005
1,1,1 TRICHLOROETHANE	0.007	0.011	0.005
CARBON TETRACHLORIDE	ND	ND	0.005
TRICHLOROETHYLENE	0.013	0.015	0.005
TETRACHLOROETHYLENE	0.185	0.216	0.005
VINYL CHLORIDE	ND	ND	1

FILE NAME	V56B.052.BND	V56B.053.BND
DATE SAMPLED	04/30/08	05/01/08
DATE RECEIVED	05/02/08	05/02/08
DATE ANALYZED	05/02/08	05/02/08

PQL - denotes lower 'Practical Quantitation Limit'

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

06-May-08

Reviewed by: 

Vaportech Services, Inc.

Keramida Environmental, Inc.
Quality Control
Laboratory Project(s): 8349

CONTINUING CALIBRATION CHECK

STANDARDS: 21V-R4 STD VC1000
FILE NAME: V56A/B.047.BND V56A.049.BND
DATE ANALYZED: 05/02/08 05/02/08

COMPOUND	KNOWN (PPMV)	RESULT (PPMV)	PERCENT DIFFERENCE
1,1 DICHLOROETHYLENE	1.01	0.98	2.87
METHYLENE CHLORIDE	1.15	0.98	14.87
TRANS-1,2 DICHLOROETHYLENE	1.01	0.83	18.12
1,1 DICHLOROETHANE	0.99	1.09	10.10
CIS-1,2 DICHLOROETHYLENE	1.01	0.95	5.94
CHLOROFORM	0.820	0.915	11.59
1,1,1 TRICHLOROETHANE	0.730	0.819	12.19
CARBON TETRACHLORIDE	0.640	0.691	7.97
TRICHLOROETHYLENE	0.740	0.715	3.38
TETRACHLOROETHYLENE	0.590	0.586	0.68
VINYL CHLORIDE	1000	994	0.64

LABORATORY BLANK RESULTS

BLANK: N2 IN VIAL
FILE NAME: V56A/B.045.BND
DATE ANALYZED: 05/02/08

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

06-May-08

Reviewed by: 



VAPORTECH
Services, Inc.

1158 Pittsburgh Road • Suite 201 • Valencia, PA 16059
Tel: 724-898-2622 • Fax: 724-898-2633

[Signature]

Light Hydrocarbons: Methane, Ethane, Ethylene, Propane, Propylene, iso-Butane, n-Butane
Permanent Gases: Carbon Dioxide, Oxygen, Nitrogen, Methane, Carbon Monoxide
RTEX: 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, Trichloromethylene (TCE), Tetrachloroethylene (PCE)

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
RTEX: 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, 1,1,1-TCA, Carbon Tetrachloride, Trichloroethylene(TCE), Tetrachloroethylene

Results to :	Bob Federick		Invoice to :	Cheryl Apple	
Relinquished by :	Company :	Date :	Time :	Received by :	Company :
Relinquished by :	Company :	Date :	Time :	Received by :	Company :
Relinquished by :	Company :	Date :	Time :	Received by :	Company :

WHITE COPY: Laboratory to return.

YELLOW COPY : Laboratory

PINK COPY: Submitter