Technical Memorandum No. 1

To: Gary Jablonski, RIDEM

From: Ed Summerly and Michael Healey, GZA
CC: Tracey Nelson-Hay, Richmond Town Hall
Clark Memorial Library, Charbert Repository

File No: 32795.35

Date: November 3, 2009

Re: Recommended Monitoring Well Installation Zones for Bedrock Boreholes
Former Charbert Manufacturing Facility
Alton, Rhode Island

The purpose of this technical memorandum is to provide recommendations for the depths of monitoring well sampling zones to be installed within the newly drilled bedrock boreholes at the Chabert Manufacturing Facility, located in Alton, Rhode Island. GZA GeoEnvironmental, Inc. (GZA) conducted the bedrock drilling and testing program, and monitoring well sampling zone selection process on behalf of our client, Charbert, Division of NFA. This memorandum specifically addresses the proposed placement of Waterloo System sampling zones in boreholes GZML-4 and GZML-5. As-built drilling locations for these boreholes are provided on Figure 1, attached.

DATA EVALUATION

GZA in conjunction with the drilling contractor (Geologic of Norfolk, Massachusetts) and Hager GeoScience, Inc. (H-G) of Woburn, Massachusetts conducted an in-situ testing program subsequent to drilling the two new boreholes. The following paragraphs briefly describe the testing program and our findings as they relate to the selection of sampling zones. Boring logs recorded during the drilling of each hole are included in Attachment A.

GZML-5 Borehole Obstruction

Between the time of drilling and borehole testing, a partial collapse occurred in borehole GZML-5 at approximately 126 feet below ground surface (bgs), resulting in the borehole being obstructed at this depth. Multiple attempts were made to reopen the borehole, and though the borehole can be reopened temporarily by drilling through the obstruction, it has become obstructed again at the same depth following each attempt. The bottom of the borehole is 200 feet bgs, leaving approximately 74 feet of open borehole in which multi-level well system can not be installed, due to the obstruction. Leaving this length of borehole open could lead to groundwater movement upward or downward in the aquifer. To prevent, this we propose to remount and grout the borehole up to a depth of 140 feet bgs. High solids bentonite grout will be used up to a depth of 150 feet bgs; above this altering 1-foot thick layers of bentonite and filter sand will be used to a depth of 142 feet bgs. The grouted plug will be finished with 2 feet of filter sand, to keep the grout/bentoinite from expanding higher than 140 feet bgs.

Borehole Geophysics

Subsequent to drilling, and at GZA's direction, H-G completed a suite of borehole geophysical testing of each of the two boreholes. The geophysical logging program consisted of acoustic televiewer (ATV), three-arm caliper, poly-electric logging with natural gamma and fluid logs, and heat pulse flow meter (HPFM) for ambient and stressed well conditions. A complete copy of Hagar GeoScience's report is provided as Attachment B. GZA reviewed the findings provided in Hager GeoScience's geophysical report, and carefully evaluated the individual well logs. The major geophysical parameters considered in descending order during well screen/sampling zone selection were the ATV, the heat pulse flow meter, and the three-arm caliper logs.

Fracture frequency for each injection packer test zone is displayed on Table 2. GZML-4 has an average fracture frequency of 1.75 fractures/foot and GZML-5 has an average fracture frequency of 2.29 fractures/foot. For comparison the average fracture frequencies of the three previously drilled Charbert bedrock wells are 2.12 fractures/foot, 2.61 fractures/foot, and 2.55 fractures/foot for GZML-1, GZML-2, and GZ-ML-3 respectively. In general, fracture frequencies for the injection packer test zones are slightly lower for GZML-4 and GZML-5 than for previously drilled bedrock boreholes at the sight. This difference is likely due to the methods used in selecting borehole locations. The previous investigation focused on likely fracture zones (i.e., bedrock depressions and low seismic velocity areas) likely to bear water; the locations of GZML-4 and GZML-5 were chosen predominately based on contaminant distribution and likely migration routes. Based on this, a slightly lower fracture frequency from previously drilled onsite bedrock boreholes may be expected. An expanded discussion of fracture frequency and orientation of all bedrock boreholes will be presented in the forthcoming bedrock aquifer evaluation report.

As shown in Attachment B, fractures in GZML-4 predominately strike in the northeast to southwest direction with a steep westerly dip angle, (dip angles ranged from approximately 45 to 75 degrees from the horizontal). GZML-5 is similar. The majority of fracture dip azimuths for both boreholes generally range from 270 degrees to 360 degrees. Results for GZML-1, GZML-2, and GZML-3 showed a similar pattern of fracturing.

Pressure Testing and Discreet Zone Sampling

Following the completion of the borehole drilling and geophysical program, each of the boreholes was subjected to discreet zone groundwater quality sampling and pressure injection permeability testing. This work was conducted by Geologic under the direction of

GZA. Test zones ranged in length from 8 feet to 15 feet. Samples of the extracted water from each zone were analyzed for volatile organic compounds (VOCs) by GZA GeoEnvironmental's Environmental Chemistry Laboratory of Hopkinton, Massachusetts employing EPA Method 8260B. The analytical results are summarized on Table 1 which lists detected compounds only. Laboratory certificates of analysis are provided as Attachment C.

Hydraulic conductivity values (K), derived from the pressure injection test data were calculated following methods presented in the Groundwater Manual[1] and are presented in Table 2. The accuracy of the test system was estimated based on the minimum discernable deflection of the flow meter (i.e., 0.01 gallons) divided by the time between meter readings (generally 1 minute) resulting in a minimum observable flow of 0.01 gallons/minute. The minimum hydraulic conductivity value was calculated using the test zone length and applied pressured which yielded the highest minimum hydraulic conductivity value of 4.3 feet/year. For purposes of reporting, zones where less than the minimum deflection were observed (i.e., a zero reading, indicating no flow into the zone) where reported as having a hydraulic conductivity less than this minimum value. The maximum quantifiable hydraulic conductivity was dependant on the flow capacity of the water supply pump at a given pressure. For each zone, injection tests were run with at least two different pressures; the number of tests conducted on each zone and their corresponding pressures were dependant on the response of each zone, i.e. if zones showed no flow at the lowest test pressure, the test pressure was raised gradually until a response was observed, or the maximum safe test pressure, was reached. The maximum safe test pressure is the pressure at which the injected water will not result in dilation of the fractures with an appropriate factor of safety. We used 1 psi per foot of depth from ground surface to the top of each test zone as the maximum applied pressure.

Calculated average K values range from a high of 564.3 feet/year to a low of 2.8 feet/year (excluding zones with no flow), with an average hydraulic conductivity of 56.2 feet/year for the 23 zones tested as part of this program. For averaging purposes, zones with no flow were considered to have a K value of zero. The average hydraulic conductivity from the first round of testing (i.e. GZML-1, GZML-2, and GZML-3) was 29.5 feet/year, excluding two zones with hydraulic conductivities above 1,000 feet/year. The tests performed in this study show that at Chabert, hydraulic conductivity generally decreases with increasing depth below top of bedrock, although some deep zones were found to have relatively high hydraulic conductivities.

SAMPLE ZONE SELECTION

We utilized all available data from the boring logs, geophysical testing, and packer testing programs in our evaluation of potential sample zones. However, the primary parameters considered during the selection process, in order of priority, were hydraulic conductivity values (K), ATV fracture data, VOC results, HPFM, and the three-arm caliper data. Table 3

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[1] Groundwater Manual, A Water Resources Technical Publication, United States Department of the Interior Bureau of Reclamation, Revised Reprint 1981

depicts the proposed monitoring zones and provides a summary of our rational for the selection of each of the recommended sampling zones.

The geophysical properties of the boreholes were relatively uniform. Large numbers of fractures are present in each zone tested, with the majority of zones having a fracture frequency between 1 and 2 feet/year. Note that the minimum fracture frequency observed is 0.70 fractures/foot and only two zones had a fracture frequency below 1 fracture/foot.. Therefore, VOC results become a deciding factor in the selection of sampling zones.

In GZML-4, three zones showing VOC detects, significant fracturing, and detectable hydraulic conductivities were selected for sampling. Five of the fourteen packer test zones in GZML-4 had no flow for at least one injection packer test pressure and had VOC detects. GZA believes these VOC detects where likely from residual borehole water contamination trapped between the packers that originated from zones with detectable hydraulic conductivities. The bottom zone of GZ-ML-4 was chosen in order to evaluate changes in piezometric head and water quality with increasing that depth within the aquifer at this location.

In GZML-5, VOC detects were relatively low as expected, and three well sampling zones were placed generally uniformly through the borehole, i.e., one sampling zone near the top of the borehole, one near the middle, and one near the bottom. This was done to evaluate changes in piezometric head and water quality with increasing depth within the aquifer at this location, which bounds the southern extent of bedrock contamination at the Site.

DEEP MULTI-LEVEL WELL INSTALLATIONS

Consistent with prior bedrock wells installed at the Site, the GZML series wells will have the Solinst Waterloo Systems installed. The Waterloo system consists of both a double valve water pump and vibrating wire pressure transducer. Three zones were selected for GZML-4 ranging in length from 12 to 15 feet. Three zones were also selected for GZML-5 ranging in length from 14 to 20 feet. Permanent packers (using Dow-Well expansive sealant) will be used in the system because they provide a more reliable seal versus hydraulically inflated packers. Note that a top packer is not needed for a zone starting at the bottom of casing and a bottom packer is not needed for a zone ending at the bottom of the borehole. Provided in Attachment D is an information packet on the Solinst Waterloo System.

SCHEDULE

Solinst indicates that the Waterloo materials will take 3 to 4 weeks to construct and deliver to the site once an order is placed.

As such we anticipate field installation will commence in early to mid-December, assuming the sampling zone locations are approved before November 1st, and will require 3 to 4 days of field work to complete.

We look forward to discussing this information with you and will await your approval of these recommendations prior to placing equipment order.

Michael S. Healey, C.P.G, P.G.
Senior Project Manager

Edward A. Summerly. P.G.
Principal

Attachments: Tables 1 to 3
Figure 1
Attachment A: Boring Logs
Attachment B: Hager Geoscience, Inc Report
Attachment C: Laboratory Certificates
Attachment D: Solinst Waterloo System Information Packet

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TABLES

TABLE 1
VOLATILE ORGANIC ANALYTICAL RESULTS FROM ZONE EXTRACTION TESTS

Bedrock Aquifer Evaluation - Charbert Division of NFA Corporation
Alton, Rhode Island

Location/ Zone	Depth Interval (ft)	K FT/YR	Parameter	Concentration (ug/L)
GZML-4	53.5-64.5	No Flow	Trichloroethene	2.9
			Tetrachloroethene	46.0
			Trichloroethene-Blind Duplicate	2.9
			Tetrachloroethene-Blind Duplicate	48.0
	76.5-87.5	72.71	Tetrachloroethene	19
	86.5-97.5	26.92	Tetrachloroethene	12.0
	99.5-110.5	26.98	Tetrachloroethene	8.6
	112.5-123.5	23.87	Tetrachloroethene	5.6
	122-134	No Flow	No sample collected due to insufficient flow rate	
	132-143	2.82	No sample collected due to insufficient flow rate	
	142-154	26.98	No sample collected due to insufficient flow rate	
	156.5-167.5	20.24	Tetrachloroethene	2.7
	170.5-181.5	31.79	Tetrachloroethene	1.6
	180.5-191.5	16.79	Tetrachloroethene	1.4
	189-200	14.01	No sample collected due to leaking packer	
GZML-5	42.5-53.6	564.3	cis-1,2-Dichloroethene	5.1
			Tetrachloroethene	1.1
	56-67	38.78	cis-1,2-Dichloroethene	2.7
	66.5-77.5	5.52	cis-1,2-Dichloroethene	3.1
	73.5-84.5	No Flow	cis-1,2-Dichloroethene	3.8
	84-95	70.63	cis-1,2-Dichloroethene	2.0
	96.5-107.5	25.27	cis-1,2-Dichloroethene	2.1
	107-118	6.18	cis-1,2-Dichloroethene	1.7
	114.5-125.5	168.28	All	ND

Notes:

1. Information based on extraction packer testing collection methods.
2. ND indicates no detects in zone.
3. Analytical testing conducted by GZA, GeoEnvironmental Laboratory of Hopkinton, MA using EPA Method 8260.
4. K values presented in this table are average values from injection tests which correspond best to extraction test zones.
5. GZML-4 was drilled to an approximate depth of 200 feet below ground surface (bgs), with top of bedrock and bottom of steel casing at approximately 44 feet bgs. Groundwater during injection packer testing was observed at approximately 10 feet bgs.
6. GZML-5 was drilled to an approximate depth of 200 feet below ground surface (bgs), with top of bedrock and bottom of steel casing at approximately 41 feet bgs. However, groundwater during injection packer testing was observed at approximately 12 feet bgs. Note however, that a partial collapse occurred in the borehole t approximately 126 feet bgs), resulting in the borehole being obstructed at this depth.

TABLE 2
PACKER PRESSURE INJECTION TESTING RESULTS

Bedrock Aquifer Evaluation - Charbert Division of NFA Corporation
Alton, Rhode Island

TEST ZONE	DEPTH INTERVAL (feet bgs)	FRACTURE FREQUENCY (# fractures/ft)	PRESSURE (PSI)	K FT/YR	Comments
			GZML-4		
1	58-68	3.00	35	<4.3	No Flow
			45	<4.3	No Flow
			63	<4.3	No Flow
	AVERAGE K (FT/YR)			**<4.3**	
2	71-86	3.00	43.8	67.39	
			59.8	76.02	
			82.8	74.72	
	AVERAGE K (FT/YR)			**72.71**	
3	87-97	1.40	48.6	23.95	
			65.6	21.80	
			92.6	35.00	
	AVERAGE K (FT/YR)			**26.92**	
4	100-110	0.80	55.4	2.83	
			75.4	8.50	
			105.4	69.59	
	AVERAGE K (FT/YR)			**26.98**	
5	113-123	1.30	60.3	9.17	
			84.3	0.00	
			115.3	62.43	
	AVERAGE K (FT/YR)			**23.87**	
6	122-132	0.70	70.75	<4.3	No Flow
			84.75	<4.3	No Flow
	AVERAGE K (FT/YR)			**<4.3**	
7	131-141	1.00	71.1	<4.3	No Flow
			96.1	<4.3	No Flow
			116.1	8.46	
	AVERAGE K (FT/YR)			**2.82**	
8	141-150	1.67	75.7	0.00	No Flow
			104.7	3.32	
			135.7	77.62	
	AVERAGE K (FT/YR)			**26.98**	
9	148-158	1.00	79.2	<4.3	No Flow
			109.2	8.97	
			144.2	57.18	
	AVERAGE K (FT/YR)			**22.05**	
10	157-167	2.20	69.9	4.56	
			84.9	19.00	
			109.9	37.15	
	AVERAGE K (FT/YR)			**20.24**	
11	166-176	2.10	75.4	36.14	
			90.4	44.76	
			120.4	73.50	
			100.4	48.60	
	AVERAGE K (FT/YR)			**50.75**	

TABLE 2
PACKER PRESSURE INJECTION TESTING RESULTS

Bedrock Aquifer Evaluation - Charbert Division of NFA Corporation
Alton, Rhode Island

TEST ZONE	DEPTH INTERVAL (feet bgs)	FRACTURE FREQUENCY (# fractures/ft)	PRESSURE (PSI)	K FT/YR	Comments
12	173-183	1.90	89.5	30.73	
			104.5	34.30	
			79.5	30.33	
	AVERAGE K (FT/YR)			**31.79**	
13	180-191	1.73	81	16.83	
			91	16.75	
	AVERAGE K (FT/YR)			**16.79**	
14	189-199	2.70	86.3	14.97	
			101.3	14.46	
			111.3	13.21	
			126.3	14.30	
			86.3	13.10	
	AVERAGE K (FT/YR)			**14.01**	
GZML-5					
1	45-55	1.60	41.7	500.95	
			56.7	557.76	
			31.7	634.19	
	AVERAGE K (FT/YR)			**564.30**	
2	56-66	2.20	32.1	<4.3	No Flow
			42.1	<4.3	No Flow
			57.1	13.52	
			67.1	32.66	
			77.1	110.81	
			57.1	75.70	
	AVERAGE K (FT/YR)			**38.78**	
3	65-75	2.30	46.5	<4.3	No Flow
			56.5	<4.3	No Flow
			66.5	11.76	
			76.5	10.33	
	AVERAGE K (FT/YR)			**5.52**	
4	74-83	3.33	47.4	<4.3	No Flow
			57.4	<4.3	No Flow
			67.4	<4.3	No Flow
			77.4	<4.3	No Flow
			92.4	<4.3	No Flow
	AVERAGE K (FT/YR)			**<4.3**	
5	84-94	1.80	50.9	9.00	
			70.9	13.31	
			90.9	77.42	
			105.9	182.81	
	AVERAGE K (FT/YR)			**70.63**	

TABLE 2
PACKER PRESSURE INJECTION TESTING RESULTS

Bedrock Aquifer Evaluation - Charbert Division of NFA Corporation
Alton, Rhode Island

TEST ZONE	DEPTH INTERVAL (feet bgs)	FRACTURE FREQUENCY (# fractures/ft)	PRESSURE (PSI)	K FT/YR	Comments
6	93-102	1.67	71.8	<4.3	
			81.8	10.36	
			101.8	23.62	
			116.8	59.22	
			81.8	33.14	
	AVERAGE K (FT/YR)			**25.27**	
7	102-111	2.00	81.2	20.86	
			101.2	135.70	
	AVERAGE K (FT/YR)			**78.28**	
7A	105-113	2.75	80.3	<4.3	No Flow
			90.3	<4.3	No Flow
			100.3	<4.3	No Flow
			110.3	<4.3	No Flow
			120.3	<4.3	No Flow
			130.3	10.00	
			140.3	33.28	
	AVERAGE K (FT/YR)			**6.18**	
8	116-126	2.30	86.5	165.89	
			106.5	174.25	
			126.5	218.68	
			86.5	114.28	
	AVERAGE K (FT/YR)			**168.28**	

Notes

1. Hydraulic conductivity of bedrock was calculated based upon methods presented in the Groundwater Manual, (U.S. Department of the Interior, Revised Reprint 1981).
2. No Flow indicates that no water movement was recorded during the test.
3. Packer test depth intervals indicate the length of individual test zones with reference to ground surface.
4. Fracture traces per foot represent the number of apparent rock fractures within each depth interval divided by the length of the test interval. Fracture trace data was obtained from Acoustic Televiewer Logs performed by Hager-Geoscience Inc. Note, Hager indicates that not all features identified in the ATV logs are necessarily rock fractures. Other features such as filled fractures, foliation, and mineralized or weathered zones may be identified and would be included here as fractures.
5. Packer tests were generally performed at variable test pressures dependant on the response of the borehole section being tested.
6. Televiewer logs for each borehole were interpreted by Hager Geosciences, Inc.

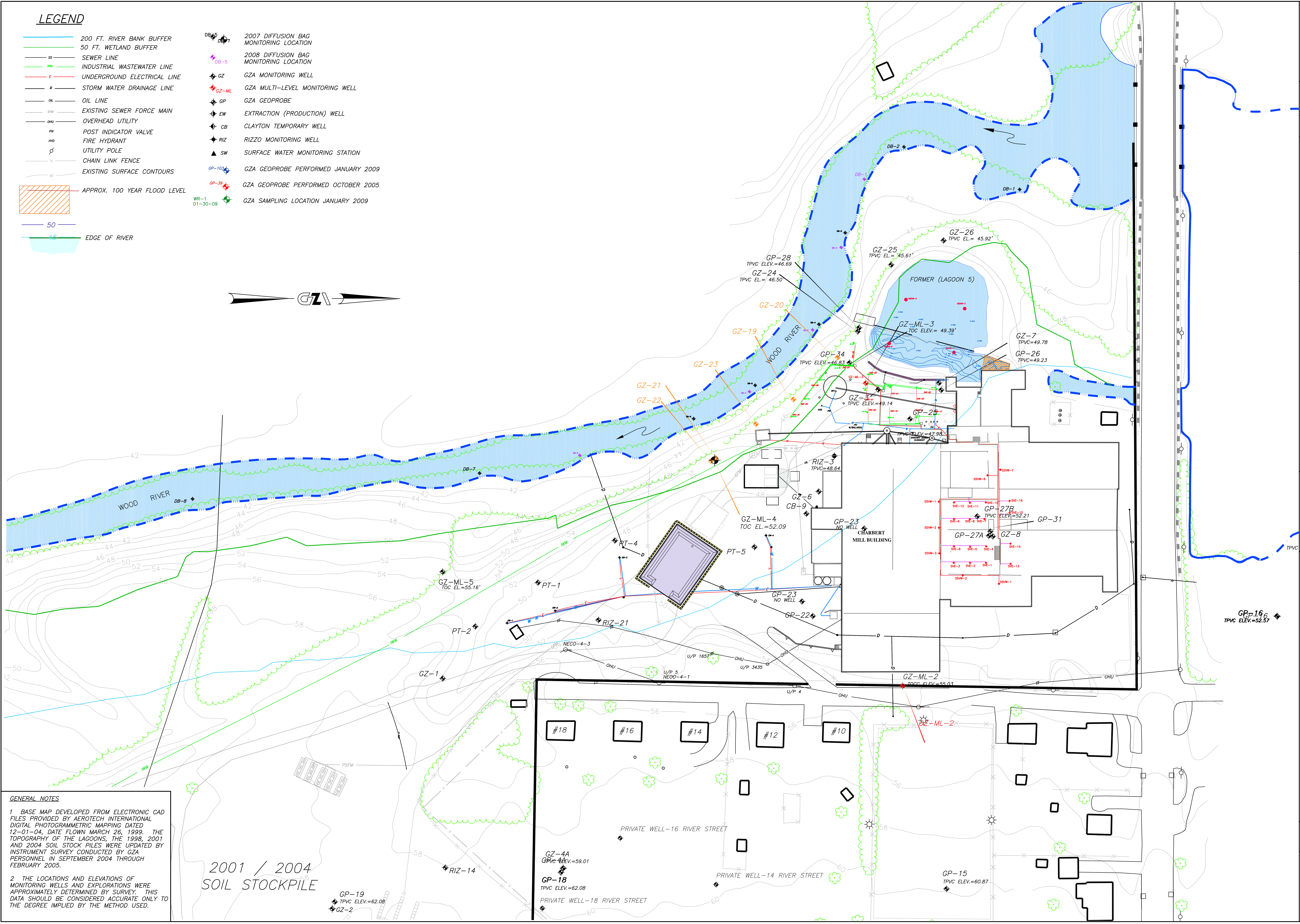
TABLE 3

WELL ZONE SELECTION RATIONALE

Bedrock Aquifer Evaluation - Charbert, Division of NFA Corporation, Alton, RI

BOREHOLE ID	SAMPLE ZONE DESIGNATION	SAMPLE ZONE DEPTH (ft. bgs)	SELECTION RATIONALE
GZML-4	1	45-62	Packer testing indicates zone of no flow; however, injection packer test zone covers only the bottom two feet of the proposed zone. Based on the Heat Pulse Flow Meter logs and Acoustic Televiewer (ATV) logs, we believe the zone is water bearing.
			Chemical testing indicates highest tetrachloroethene concentration observed in borehole
		No top packer	ATV indicates multiple small and moderate fractures in zone
			Heat Pulse Flow Meter (HPFM) indicates one suggested inflow point at 53 ft
	2	75-89	Packer testing indicates zone of highest hydraulic conductivity (K) in borehole.
			Chemical testing indicates second highest tetrachloroethene concentration observed in borehole
			ATV indicates multiple small, moderate, and large fractures in zone
			HPFM indicates suggested inflow point at 81 ft
	3	187-200	Packer testing indicates detectable K.
			Chemical testing indicates detect of tetrachloroethene, which may be from residual borehole water
		No bottom packer	HPFM indicates suggested inflow point 193 ft
	Total of 3 Zones		
GZML-5[1]	1	46-60	Packer testing indicates zone of highest hydraulic conductivity (K) observed in borehole.
		No top packer	ATV indicates multiple small, 2 medium, and 2 large fractures in zone
			Chemical testing indicates highest cis-1,2-dichloroethene concentration observed in borehole and only detection of tetrachloroethene in borehole
			HPFM indicates suggested inflow point at 58 ft
	2	80-95	Packer testing indicates relatively high K
			Heat Pulse Flow Meter (HPFM) indicates suggested inflow point at 87 ft.
			Chemical testing indicates detect of cis-1,2-dichloroethene
	3	120-140	ATV indicates three large fractures around 122 ft
		No bottom packer	Provides vertical gradient information for borehole
	Total of 3 Zones		

FIGURES



GENERAL NOTES

1 BASE MAP DEVELOPED FROM ELECTRONIC CAD FILES PROVIDED BY AEROTECH INTERNATIONAL DIGITAL PHOTOGRAMMETRIC MAPPING DATED 12-01-04, DATE FLOWN MARCH 26, 1999. THE TOPOGRAPHY OF THE LAGOONS, THE 1998, 2001 AND 2004 SOIL STOCK PILES WERE UPDATED BY INSTRUMENT SURVEY CONDUCTED BY GZA PERSONNEL IN SEPTEMBER 2004 THROUGH FEBRUARY 2005.

2 THE LOCATIONS AND ELEVATIONS OF MONITORING WELLS AND EXPLORATIONS WERE APPROXIMATELY DETERMINED BY SURVEY. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

CHARBERT FACILITY
ALTON, RHODE ISLAND

JULY 2009 NEW WELLS
EXPLORATION AND LOCATION PLAN

PROJ MGR: SMA
DESIGNED BY:
REVIEWED BY:EAS
OPERATOR: SMA
CHECKER: TRG
DATE: JUL., 2009

SCALE: 1" = 50'
0 25 50 100

GZA
GeoEnvironmental, Inc.
Engineers and Scientists
530 BROADWAY
PROVIDENCE, RHODE ISLAND 02909
(401) 421-4140
(401) 751-8613

REV. NO.	DESCRIPTION	BY	DATE

PROJECT NO.
32795.35

FIGURE NO.
1

ATTACHMENT A

BORING LOGS

GZA GEOENVIRONMENTAL INC.	PROJECT	REPORT OF BORING NO.	GZ-ML-4
530 BROADWAY, PROVIDENCE, RHODE ISLAND	Charbert Industries	SHEET	1 of 5
GEOTECH/GEOHYDROLOGICAL CONSULTANTS	Phase II Bedrock Study	FILE NO.	32795.35
HYDROLOGICAL BORING LOG	Alton, Rhode Island	CHKD BY	EAS

BORING CO.	Geologic	BORING LOCATION	8' EAST OF GZ-23		
FOREMAN	Charles O'Donell	GROUND SURFACE ELEV.	Approximately 49.0'	DATUM	MSL
GZA ENGINEER	Stephen Andrus	DATE START	6-16-09	DATE END	6-25-09

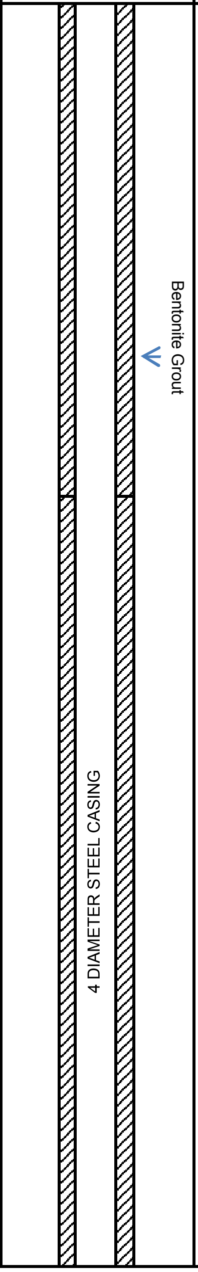
SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 IN

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 LB HAMMER FALLING 24 IN.

CASING SIZE: 5" OTHER: 3 3/4" HAS Air Hammer

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME

DPTH	CASING	SAMPLE				SAMPLE DESCRIPTION	STRATUM	EQUIPMENT	FID/PID	R
(FT)	BLOWS	NO	PEN/REC	DEPTH (FT)	BLOWS/6"	BURMISTER CLASSIFICATION	DESCRIPTION	INSTALLED	TVOC	K
		S-1	24/2	0-2	PUSH	LOAM			2/0	1
5		S-2	24/18	4-6	5-7	Medium dense, brown, fine to coarse SAND, trace fine Gr	FILL		1/1	
					8-4	trace fine Gravel, trace Silt				
10		S-3	24/12	9-11	7-8	Medium dense, brown, fine to coarse SAND,			2/1	
					6-7	trace fine to coarse Gravel, trace Silt				
15		S-4	24/12	14-16	7-8	Loose, grey, fine to coarse SAND,	LOOSE TO MEDIUM		0/0	
					6-7	trace fine Gravel, trace- Silt	DENSE SAND			
20		S-5	24/12	19-21	5-4	Loose, grey, fine to coarse SAND,			0/0	
					6-7	trace fine Gravel, trace- Silt				
25		S-6	24/10	24-26	3-4	Loose, grey, fine to coarse SAND,			2/2	
					4-5	trace fine Gravel, trace- Silt				
30		S-7	24/12	29-31	8-6	Medium dense, grey, fine to coarse SAND,			2/0	
					6-8	trace fine Gravel, trace- Silt				
						Medium dense, grey, fine to coarse SAND,				
35		S-8	24/12	34-36	13-9	trace fine Gravel, trace- Silt	TILL		0/0	
		S-9			11-17	Grey fine to coarse SAND, trace Gravel, trace Silt			3/2	

REMARKS:

1. Field screening with Foxboro TVA-1000 FID/PID Reported as total VOCs by Volume (TVOC) in parts per million.

NOTES:
1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA GEOENVIRONMENTAL INC. 530 BROADWAY, PROVIDENCE, RHODE ISLAND GEOTECH/GEOHYDROLOGICAL CONSULTANTS	PROJECT Charbert Industries Phase II Bedrock Study Alton, Rhode Island	REPORT OF BORING NO. GZ-ML-4 SHEET 2 of 5 FILE NO. 32795.35 CHKD BY EAS

DPTH	CASING BLOWS	SAMPLE NO	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	8' EAST OF GZ-23 Approximately 49.0'	EQUIPMENT INSTALLED	MSL	FIELD TESTING	RK
40		S-10	24/8	39-41	19-11	Medium dense, grey, fine to coarse SAND,		4" Steel Casing			
					10-18	trace fine Gravel, trace- Silt	41'				
							TILL				
			3 3/4" HAS Air Hammer				44'				
45	90	RS-1								0	2
	120					Pink/grey <1/8"	BED ROCK				3
	80										4
	90										
	80	RS-2								0	
50	100					Fracture 2" drop					
	20										
	30										
	70										
	90	RS-3				Pink/grey < 1/8"	ROCK			0	
55	60										
	90						Pink/Gray moderately				
	45						to highly fractured Hope				
	30						Valley Alaskite Gneiss				
	30					Fractured area					
60	30	RS-4				Dark grey < 1/8"				0	
	15							OPEN 4" HOLE			
	80					Pink/grey < 1/8"				1	
	40										
	40										
65	90	RS-5									
	60										
	60										
	60										
	45										
70	30	RS-6				Fractured				1	
	60										
	60										
	60					Pink/grey < 1/8"					
	45										
75	30	RS-7				Fractured					
	60										
	10										
	10					Large Fractuerd Area					

REMARKS:

2. Bedrock exploration advanced by rotary air hammer.
3. Samples (RS) were collected from Air Exhaust.
4. Field screening with Thermo Env. PID 580B with 10.6 lamp.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA GEOENVIRONMENTAL INC.
530 BROADWAY, PROVIDENCE, RHODE ISLAND
GEOTECH/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Charbert Industries
Phase II Bedrock Study
Alton, Rhode Island

REPORT OF BORING NO. GZ-ML-4
SHEET 3 of 5
FILE NO. 32795.35
CHKD BY EAS

DPTH	CASING BLOWS	SAMPLE NO	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	8' EAST OF GZ-23 Approximately 49.0'	EQUIPMENT INSTALLED	FIELD TESTING	R MSL
	30									4
80	20	RS-8				Brown mud/water in hole			0	
	40									5
	90									
	90					Pink/grey < 1/4"				
	120									
85	90	RS-10							0	
	75		3 3/4" HAS Air Hammer							
	40									
	20									
	20					3" Drop				
90	20	RS-11				2" Drop			0	
	90					Fracture area				
	40									
	60					Pin/kwhite < 1/4"				
	90					Fractured 2" Drop			0	
95	60	RS-12								
	80									
	75					Pink/white 2" drop	Pink/Gray moderately to highly fractured Hope Valley Alaskite Gneiss with severely weathered zones			
	105								0	
	90									
100	120	RS-13								
	90									
	50									
	75								0	
	75	RS-14								
105	60					Fracture				
	60									
	45									
	45								0	
	90					Fracture				
110	45	RS-15				Brown/pink/white				
	45									
	40									1
	60								0	
	60	RS-16				Red/pink				
115	45									
	60									
	40									
	70								0	
	50	RS-17				Fracture				
	30					Red/green/pink				

REMARKS:
4. Field screening with Thermo Env. PID 580B with 10.6 lamp.
5. First sign of water in the rock.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA GEOENVIRONMENTAL INC.	PROJECT	REPORT OF BORING NO. GZ-ML-4
530 BROADWAY, PROVIDENCE, RHODE ISLAND	Charbert Industries	SHEET 4 OF 5
GEOTECH/GEOHYDROLOGICAL CONSULTANTS	Phase II Bedrock Study	FILE NO. 32795.35
	Alton, Rhode Island	CHKD BY EAS

DPTH	CASING BLOWS	SAMPLE NO	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	8' EAST OF GZ-23 Approximately 49.0'	EQUIPMENT INSTALLED	FIELD TESTING	R MSL
										4
120	30									
	60									
	60					Pink/white/green				
	120									
	110	RS-18							0	
125	105									
	120		OTHER: 3 3/4" HAS Air Hammer			Pink/white/grey weathered chips				
	90									
	90									
	60					Pink/grey/red/brown				
130	110	RS-19								
	90								0	
	60									
	90					Fracture 2" Drop				
	90	RS-20								
135	60					6" Drop			0	
	30						Pink/Grey			
	60					Pink/grey	moderately to highly			
	60					Fracture pink/red	fractured Hope			
	60						Valley Alaskite			
140	40	RS-21					Gneiss			
	40					Pink/brown				
	50								0	
	45									
	60					Fracture				
145	60	RS-22								
	60								0	
	45									
	45					Pink/white				
	45	RS-23								
150	70									
	70								0	
	60									1
	60									
	60									
155	60	RS-24								
	60								0	
	60									
	75									
	90									
	90									

REMARKS:

4. Field screening with thermo env .PID 580B with 10.6 lamp.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA GEOENVIRONMENTAL INC.
530 BROADWAY, PROVIDENCE, RHODE ISLAND
GEOTECH/GEOHYDROLOGICAL CONSULTANTS

PROJECT	
Charbert Industries	
Phase II Bedrock Study	
Alton, Rhode Island	

REPORT OF BORING NO.	GZ-ML-4
SHEET	5 of 5
FILE NO.	32795.35
CHKD BY	EAS

DPTH	CASING BLOWS	SAMPLE NO	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	8' EAST OF GZ-23 Approximately 49.0'	EQUIPMENT INSTALLED	FIELD TESTING	R MSL
									0	4
160	90	RS-25								
	90					Fracture				
	45					2" drop				
	40								0	
	65									
165	60	RS-26				Pink/white/green				
	75		OTHER: 3 3/4" HAS Air Hammer							
	90									
	80					Pink/white			0	
	60									
170	75	RS-27								
	90									
	30									
	45								0	
	75	RS-28								
175	45					Fracture				
	45						Pink/Gray moderately to highly fractured Hope Valley Alaskite Gneiss			
	50					Pink/white			0	
	80									
	80									
180	45	RS-29				Fracture				
	90					Pink/green				
	30								0	
	45					Pink/white				
	60									
185	45	RS-30								
	45					Fracture area				
	20					Grey/green			0	
	20	RS-31								
	40									
190	40					Pink/grey/green				
	40									
	60					Pink/white				
	60	RS-32							0	
	60									
195	40									
	20					Fracture				
	60					Pink/white/green				
	90	RS-33				White/pink/green				
	90					Pink			0	
200	90					End of Exploration				

REMARKS:

4. Field screening with Thermo Env. PID 580B with 10.6 lamp.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA GEOENVIRONMENTAL INC.
530 BROADWAY, PROVIDENCE, RHODE ISLAND
GEOTECH/GEOHYDROLOGICAL CONSULTANTS
HYDROLOGICAL BORING LOG

PROJECT
Charbert Facility
Phase II Bedrock Study
Alton, Rhode Island

REPORT OF BORING NO. GZ-ML-5
SHEET 1 of 5
FILE NO. 32795.35
CHKD BY EAS

BORING CO. Geologic
FOREMAN Charles O'Donell
GZA ENGINEER Stephen Andrus

BORING LOCATION East of Wood River
GROUND SURFACE ELEV. Approximately 50.0' DATUM MSL
DATE START 06-15-09 DATE END 6-23-09

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 IN

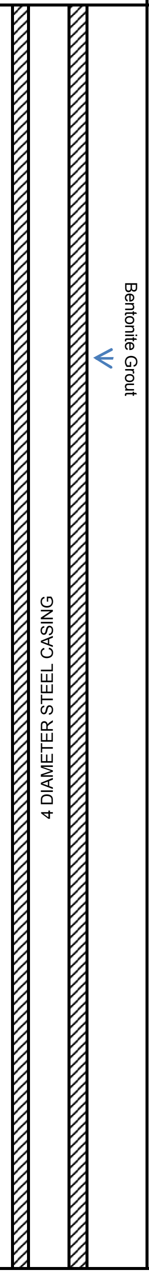
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 LB HAMMER FALLING 24 IN.

CASING SIZE: 5" OTHER: 3 3/4" HAS Air Hammer

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME

DPTH (FT)		SAMPLE NO	PEN/REC	DEPTH (FT)	BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	RK
		S-1	24/16	0-2	9-8-9-11	Medium dense, LOAM			0/0	
						Medium dense, brown, fine to medium				
						SAND, trace Silt.				
		S-2	24-12	4-6	11-10-13	Medium dense, brown, fine to medium	SAND		0/0	
5	41				13	SAND, trace Silt.				
	49									
	55									
	49									
	45								3/0	
10	52	S-3	24-12	9-11	7-6	Medium dense, brown fine to medium SAND,				
	65				7-6	trace Silt, trace fine Gravel.	MEDIUM DENSE			
	45						SAND AND GRAVEL			
	48									
	39									
15	47	S-4	24-4	14-16	6-6	Medium dense, brown fine to medium SAND,			1/0	
	48				7-6	trace Silt, trace fine Gravel.				
	39									
	38									
	44									
20	47	S-5	24/12	19-21	6-3-4	Medium dense, brown fine to medium SAND,			5/0	
	52				5	trace Silt, trace fine Gravel.				
	43									
	44									
	56									
25	52	S-6	24/12	24-26	7-5-7	Medium dense, gray fine to medium SAND, trace Silt.	SAND		2/0	
	48	S-7			8	(Black starting at 25')			10/6	
	48									
	57									
	52									
30		S-8	24	29-31	9-5-8	Medium dense, gray fine to medium SAND, trace Silt.			2/2	
					7					
35		S-9	24/16	34-36	10.10.10	Medium dense, gray fine SAND, little Silt.	SILTY SAND		4/2	
					12					



REMARKS:

1. Field screening with Foxboro TVA-1000 FID/PID Reported as total VOCs by Volume (TVOC) in parts per million.
2. From 30' bgs down, drilled/washed ahead, then drove casing.

NOTES:
1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA GEOENVIRONMENTAL INC.
530 BROADWAY, PROVIDENCE, RHODE ISLAND
GEOTECH/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Charbert Facility
Phase II Bedrock Study
Alton, Rhode Island

REPORT OF BORING NO.	GZ-ML-5
SHEET	2 of 5
FILE NO.	32795.35
CHKD BY	EAS

DPTH		SAMPLE NO	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION BURMISTER CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	RK
						Medium dense, gray fine to coarse SAND,	SAND AND GRAVEL	4"		
40		S-10	24/16	39-40	18 12	trace fine Gravel, trace Silt.		S	7/2	
	Refusal	S-11			17 24	Orange fine to coarse SAND, trace fine Gravel,		T	1/0	3.
						trace Silt.		E		
							TILL	E		4.
								L		
45		S-12	11/	44-46	45-100	Weathered ROCK 46.5'	WEATHERED			5.
							ROCK	C	7/2	
	45							A		
	45							S		
	45							I		
50	45					Pink/white 2 1/4"		N		
	45							G		
	60									
	60									
	45									
55	45									
	45									
	30									
	60					Water in the hole.	BEDROCK			
	60						Pink/white moderately			
60	60					FRACTURE Weather chips.	to highly fractured		0	6.
	60						Hope Valley			
							Alaskite Gneiss			
		R S-1								
65						Pink/White/Gray				
						FRACTURE				
								4" Open Hole		
70		R S-2							0	
	150									
	25					FRACTURE - LARGE			0	
	70	R S-3								
	90									
75	60					Pink				
	45									
	45								0	
	60	R S-4								

REMARKS:
3 Casing refusal at 41'.
4. Split spoon refusal at 45'.
5 Began air rotary hammer.
6 Field screening with Thermo Environmental 580 B PID with a 10.6 bulb.

NOTES:
1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA GEOENVIRONMENTAL INC.
530 BROADWAY, PROVIDENCE, RHODE ISLAND
GEOTECH/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Charbert Facility
Phase II Bedrock Study
Alton, Rhode Island

REPORT OF BORING NO. GZ-ML-5
SHEET 3 of 5
FILE NO. 32795.35
CHKD BY EAS

DPTH		SAMPLE				SAMPLE DESCRIPTION	STRATUM	EQUIPMENT	FIELD	R
		NO	PEN/REC	DEPTH (FT)	BLOWS/6"	BURMISTER CLASSIFICATION	DESCRIPTION	INSTALLED	TESTING	K
	60									
80	90					FRACTURE Weathered chips				
	60									
	60	RS-5								
	45									
	60								0	
85	40									
	45									
	90									
	35					FRACTURE				
	40	R S-6								
90	90									
	120	R S-7								
	80	R S-8								
	45								0	
	40									
95	40									
	40					FRACTURE 3" Drop	BEDROCK			
	45						Pink/white moderately			
	45						to highly fractured	4" Open Hole	0	
	45						Hope Valley			
100	45						Alaskite Gneiss			
	45					FRACTURE 3" Drop			0	
	60									
	60									
	60					Pink/White				
105	90	R S-9								
	45								0	
	45									
	45									
	45					Pink			0	
110	60					Pink				
	45									
	25	R S-10				FRACTURES				
	25									
	40									
115	35								0	
	55					Pink/Green				
	45					Pink/White				
	55									
	45									
120	45	R S-11							0	

REMARKS:

6. Field screening with Thermo Environmental 580 B PID with a 10.6 bulb.

NOTES:
1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA GEOENVIRONMENTAL INC.
530 BROADWAY, PROVIDENCE, RHODE ISLAND
GEOTECH/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Charbert Facility
Phase II Bedrock Study
Alton, Rhode Island

REPORT OF BORING NO. GZ-ML-5
SHEET 4 of 5
FILE NO. 32795.35
CHKD BY EAS

DPTH		SAMPLE				SAMPLE DESCRIPTION	STRATUM	EQUIPMENT	FIELD	R
		NO	PEN/REC	DEPTH (FT)	BLOWS/6"	BURMISTER CLASSIFICATION	DESCRIPTION	INSTALLED	TESTING	K
	50									
	45	R S-12				Large FRACTURES weathered chips				
	10									
	15									
125	30	R S-13								
	30									
	35									
	65									
	90									
130	120	R S-14				Pink/white.				
	90					Pink/White 1/2" diameter chips				
	90									
	120									
	90	R S-15								
135	120					FRACTURE.				
	10	R S-16								
	60					Pink/White weathered.	BEDROCK			
	60						Pink/white moderately	4" Open Hole		
	150	R S-17				Pink/white fracture.	to highly fractured			
140	120						Hope Valley			
	120						Alaskite Gneiss			
	150	R S-18				Pink/white/gray.				
	120									
	90									
145	120									
	160									
	150									
	120									
	75	R S-19				Pink				
150	75					Pink/white/gray.				
	120					Pink/white.				
	120									
	120									
	120	R S-20								
155	120									
	120									
	60									
	45	R S-21				FRACTURE 3/4" diameter chips.				
	45									
160	45									
	90									
	60									

REMARKS:

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA GEOENVIRONMENTAL INC.
530 BROADWAY, PROVIDENCE, RHODE ISLAND
GEOTECH/GEOHYDROLOGICAL CONSULTANTS

PROJECT
Charbert Facility
Phase II Bedrock Study
Alton, Rhode Island

REPORT OF BORING NO.	GZ-ML-5
SHEET	5 of 5
FILE NO.	32795.35
CHKD BY	EAS

DPTH		SAMPLE				SAMPLE DESCRIPTION	STRATUM	EQUIPMENT	FIELD	R
		NO	PEN/REC	DEPTH (FT)	BLOWS/6"	BURMISTER CLASSIFICATION	DESCRIPTION	INSTALLED	TESTING	K
	60	R S-22								
	120								0	
165	120					Pink/white .				
	150									
	100									
	120	R S-23				Red/pink/white.				
	90					FRACTURE 2" drop				
170	90					Pink/gray.				
	120								0	
	60	R S-24				Fracture red/pink/gray.				
	90									
	60					Pink/gray/white.				
175	75									
	110						BEDROCK		0	
	90						Pink/white moderately			
	60						to highly fractured			
	60						Hope Valley			
180	90	R S-25					Alaskite Gneiss			
	90									
	60	R S-26								
	90					Green/pink/white				
	90									
185	90								0	
	120					Weathered ROCK FRACTURE				
	60								0	
	60					FRACTURE 3" drop				
	60									
190	45	R S-27				Gray/pink/white				
	45									
	60									
	60								0	
	15	R S-28								
195	45					FRACTURE				
	60					Pink				
	90								0	
	90	R S-29								
	90									
200	90								0	
						End of Exploration				

REMARKS:

NOTES:
1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED; FLUCTUATIONS OF GROUNDWATER TABLE MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

ATTACHMENT B

HAGER GEOSCIENCE, INC REPORT

GZML-4 & GZML-5
BOREHOLE GEOPHYSICAL LOGGING
BEDROCK AQUIFER EVALUATION
CHARBERT FACILITY
ALTON, RHODE ISLAND

Prepared for:

GZA GeoEnvironmental, Inc.
140 Broadway
Providence, Rhode Island 02903

Prepared by:

Hager GeoScience, Inc.
596 Main Street
Woburn, Massachusetts 01801

File 2009047
July 2009

1.0 INTRODUCTION

In June 2009, Hager GeoScience, Inc. (HGI) was contracted by GZA GeoEnvironmental, Inc. (GZA) to perform geophysical borehole logging in two wells at the Charbert Facility in Alton, Rhode Island. The borehole logging was part of an ongoing bedrock evaluation study. The objective of the logging was to characterize fractured bedrock in wells GZML-4 and GZML-5. Fieldwork was performed on June 30th and July 1st, 2009. The work was performed under the direction of GZA for the Rhode Island Department of Environmental Management (RIDEM).

2.0 DATA ACQUISITION

The HGI logging system consisted of a Mount Sopris Instruments 5MXA-1000 Matrix logger and MSI 4MXA-1000 winch; MSI 2CAA-1000 three-arm caliper probe; Advanced Logic Technologies FAC40 acoustic televiewer (ATV); MSI 2PEA-1000 poly-electric with MSI 2SFA-1000 fluid temperature and resistivity; and MSI HFP-2293 Heat Pulse Flow Meter (HPFM). Section 5 discusses the geophysical technique and its limitations.

A computer housed in the HGI logging truck controlled the system. An HGI geologist monitored the logs in real time during data acquisition and recorded hardware and software settings as well as data anomalies in a logbook and on forms developed for the project. Raw data from the logging runs were stored digitally on the computer for on-site and later processing, analysis, and plotting.

Five logging runs were made in each of wells GZML-4 and GZML-5. The suite consisted of the following logs (run in the order listed):

- Caliper
- Acoustic Televiewer (ATV)
- Poly-Electric with Natural Gamma and Fluid logs
- Heat-Pulse Flow Meter (HPFM) – Ambient well condition
- Heat-Pulse Flow Meter (HPFM) – Stressed well condition

Rock fragments from breakout zones created obstructions in both wells, resulting in difficult borehole conditions. The obstructions were overcome in GZML-4, but required multiple attempts to complete caliper and HPFM logs. A major obstruction in GZML-5 located at approximately 126 feet could not be breeched, resulting in a reduced logging interval.

Logging Procedure

The log suite used on this project and the sequence of logging are summarized below.

1) Caliper Probe

Caliper logs record borehole diameter using a simple three-arm measuring system. Changes in borehole diameter are related to well construction, such as casing or drilling-bit size, and to fracturing or breakout along the borehole wall. Because borehole diameter commonly affects log response, the caliper log is useful in the analysis of other geophysical logs. Caliper data are also combined with ATV data to produce 3-D "virtual cores." The hearty caliper tool is usually run first in order to probe and assess the suitability of the borehole for using more sensitive and expensive logging tools. The caliper sampling interval was 0.04 feet at a logging rate of approximately 15 feet per minute. The caliper probe calibration was checked on site before each run and re-calibration was performed as necessary.

2) Poly-electric Probe

The poly-electric probe is a combination tool that measures various electrical properties, temperature, and natural gamma content of the bedrock and borehole fluid. The measurements, made using a sampling interval of 0.1 feet, are described below.

Normal formation resistivity measures the electrical resistivity, in ohmmeters, of the rocks surrounding the borehole and interstitial water. Variably spaced potential electrodes on the logging probe provide resistivity measurements ranging from shallow to deep penetration into the borehole wall. Spacing of the potential electrodes is 8, 16, 32, and 64 inches.

Single point resistance measures the electrical resistance from points within the borehole to an electrical ground at the surface. In general, resistance increases with increasing grain size and decreases with increasing borehole diameter, fracture density, and concentration of dissolved solids in the water. When used in combination with other logs, single-point resistance logs are useful in determining lithology, water quality, and the location of fracture zones.

Spontaneous potential measures the electrical potential developed between the borehole fluid and the surrounding materials. Spontaneous potential logs can be used to help determine lithology and water quality.

Gamma Probe: **Natural gamma** is useful to determine the presence and location of clay-filled fractures. These logs record the amount of natural gamma radiation emitted by the rocks surrounding the borehole. The most significant naturally occurring sources of gamma radiation are potassium-40 and daughter products of the uranium- and thorium-decay series. Shale and clay-filled fractures commonly emit relatively high gamma radiation because they include weathering products of potassium feldspar and mica and tend to concentrate uranium and thorium by ion absorption and exchange. The natural gamma probe can be run independently or in combination as a poly-electric probe.

Fluid Temperature/Resistivity Probe: **Fluid temperature logs** record water temperature with depth in the borehole. These logs are useful for delineating water-bearing zones and identifying vertical flow in the borehole between zones of differing hydraulic head penetrated by wells. Borehole flow between zones is indicated by temperature gradients that are less than the regional geothermal gradient, which is about 1 degree Fahrenheit per 100 feet of depth.

Fluid resistivity logs measure the electric resistivity of water in the borehole. Changes in fluid resistivity reflect differences in the concentration of dissolved solids in water. Fluid resistivity logs are useful for delineating water-bearing zones and, possibly, contaminants in the borehole.

The sample interval for the poly-electric logging was 0.04 feet at a logging rate of approximately 6 feet per minute. When run independently, the natural gamma logging sample interval was 0.04 feet at a logging rate of 16 feet per minute.

3) Acoustic Televiewer (ATV) Probe

Using high frequency acoustic energy, the **acoustic televiewer** measures the acoustic impedance of the borehole wall and the two-way travel time of the transmitted signals. Major differences in travel time and reflection amplitudes from background values are seen as anomalous features. Borehole deviation data, recorded from a three-component magnetometer and two accelerometers, are used to provide the corrected orientation and shape of the imaged features. As a result, it is possible to calculate the dip direction and dip angle of imaged planar features. Discontinuities imaged with the ATV include open or filled fractures, foliation, mineralization, weathered zones, and other rock fabric.

The sample interval used for ATV logging was 0.01 foot. A scan time of 1250 µsec was used with a sample rate of 288 measurements per revolution. The logging rate was approximately 6 feet per minute. Logging tools and cable were cleaned after each run with a clean water rinse.

4) and 5) Heat Pulse Flow Meter Probe

The **heat-pulse flow meter (HPFM) log** is usually run under ambient and stressed conditions at predetermined depth intervals or at intervals selected on-site after a preliminary review of the previous log data. The tool contains a thermistor, for generating a pulse of heat into the water, and two temperature sensors for measuring the direction and magnitude of the pulse of heated water in the borehole. Diverters are used to channel the heated water flow past the sensors for measurement. The HPFM measures the direction and rate of induced low vertical flow in the borehole. The HPFM probe is designed to resolve flow rates from approximately 0.01 to 1.0 gpm. Accurate measurements require sufficient time between readings for the area around the tool to stabilize. At least three readings, each lasting up to 15 seconds, are recorded per interval to obtain a reasonable average measurement. The HPFM log is run under ambient and stressed well conditions to provide data for quantitative flow analyses. In certain circumstances, such as with very small open-hole intervals and wells with very low or very high well recharge rates, reasonable pump rates cannot be maintained for measuring flow under stressed-well conditions. In such cases, testing can be performed to obtain the relative productivity of the exposed fractures.

Both ambient and stressed HPFM measurements were made in GZML-4 and GZML-5, using a pumping rate of approximately 1 gpm for the stressed well HPFM measurements. Flow measurements were made at 10-foot intervals in both wells, with minor adjustments for large fractures that would prevent a proper diverter separation.

3.0 DATA REDUCTION

Borehole logging data were processed as graphical logs using WELLCAD for Windows© software system, Excel spreadsheets, and Rockworks. Logs were compiled onto a one-sheet format to allow for more efficient graphical log analysis. Log scales were set to optimize the detection of readings that depart from baseline and background values. *Field logging* depths were referenced to the top of casing. *Report logs* have been shifted and are referenced to the ground surface (Appendix A).

ATV deviation data are affected by metal casing. The probe's magnetometers are progressively affected starting from approximately 6 feet below the casing. Consequently, measurements of borehole structures made within this interval using unadjusted orientation data will be incorrect. HGI uses a procedure to correct the affected data to a value representing a good approximation of the true values of measured structures.

Structure logs identifying notable and representative discontinuities from ATV data were constructed using WELLCAD. Borehole image and deviation logs were rotated from the magnetic north reference markers to True North using a site-specific 14.67-degree west magnetic declination. Depths are relative to ground level and all structural data are relative to true north. The structure (discontinuity) data were used to calculate dip direction and dip angle. Tables 1 and 2 in Appendix B contain tabulated data for discontinuities interpreted from the ATV logs for the two wells. The stereonets shown at mid-depth on the logs are constructed using a southern hemisphere equal-area Schmidt polar projection showing ***dip direction and dip angle***. The structural data set has been color-coded to reflect the relative and apparent openness of the imaged discontinuities. The ranking system is based on caliper, acoustic amplitude, and acoustic travel time logs. The ranking index is subjective and attempts to qualitatively identify the potential weakness of the individual discontinuities. Red (code 105), green (code 106), blue (code 107), and magenta (code 110) colors represent wide-, moderate-, small-, and tight-fracture aperture, respectively. Large formal rose diagrams and stereonets are included in Appendix C.

ATV logs are presented as 2-D and 3-D images of the borehole in combination with the caliper, poly-electric, and HPFM logs. The 3-D virtual core is constructed using the caliper log data to define the core shape. The 3-D Caliper virtual core log is a true physical representation of the borehole geometry. The 3-D view is useful for analyzing the physical characteristics of the structures/discontinuities shown as amplitude variations on the 2-D ATV log format.

Bull's Eye and 3D cylinder deviation plots were constructed from the ATV deviation data and are included in Appendix D to show the borehole trajectory.

Digital files of the logs for each well are on a CD in a pocket at the end of this report. The CD also contains a WELLCAD Reader that allows the user to view the log files. The reader functions in a Windows operating environment and is designed to facilitate log analysis performed by the reviewer. The WellCAD reader can be used to scroll logs, view and rotate 3-D logs, review digital log data, and print logs.

4.0 RESULTS

Preliminary caliper logs were provided to GZA on July 1st, prior to leaving the well site. Appendix A contains individual and combination logs for GZML-4 and GZML-5. The report log suite (see Appendix A) for each well consists of:

- Caliper Log
- Poly-Electric Log
- HPFM Log (ambient & stressed)
- Combination Log (caliper, HPFM, 4-trace resistivity, SP, SPR, natural gamma, fluid temperature, fluid resistivity, ATV image, structure, 3-D core, rose plot, polar plot, and deviation plots)

The predominant features observed from the image logs are interpreted to be fracture discontinuities and possible foliation. The structural results are consistent with those obtained from nearby wells in December of 2006. The predominant dip direction of discontinuities in both wells is to the northwest. GZML-5 contains a tighter distribution of fracture orientations than GZML-4 and suggests conjugate fracture sets. GZML-4 dip directions are more widely distributed in the northwest quadrant than those of GZML-5 and also include a conjugate fracture set with northeast-southwest dips.

Most of the discontinuities observed in the boreholes were tight or had small aperture. Common to wells GZML-4 and GZML-5 is a moderately deep alteration zone extending to approximately 70 feet below the bottom of the casing, or almost 130 feet below ground surface. This is reflected in resistivity and natural gamma logs for GZML-4 that show low resistivity and higher gamma counts to a depth of approximately 130 feet, below which the formation becomes more resistive and shows lower gamma counts.

HPFM measurements were made every ten feet in both wells starting at well bottom in GZML-4 and at 120 feet in GZML-5. HPFM results show that upward flow in GZML-5 reached almost 1.3 gpm with almost all of the inflow occurring in a large breakout at 47 feet, approximately 2 feet below the bottom of the casing. Flow rates in GZML-4 reached approximately 0.7 gpm. Unlike GZML-5, flow rates increased progressively up the well, with a large jump in flow rate after a large breakout at 78 feet. Under ambient test conditions, these wells showed no fracture flow and are, therefore, considered to be in equilibrium.

Borehole deviation data show that GZML-4 deviated approximately 10.5 feet to the northeast and GZML-5 approximately 4 feet to the southeast at 120-foot depths.

5.0 GEOPHYSICAL BOREHOLE LOGGING

5.1. Description of the Method. HGI performs borehole logging using a fully equipped field vehicle that includes a lunchbox computer, heavy-duty generator, tools, and other necessary equipment and supplies. The HGI logging system consists of a Mount Sopris Instruments 5MXA-1000 Matrix logger and MSI 4MXA-1000 winch; MSI 2PEA/F_0-2500Ohm-m,T,F-R combination poly-electric probe (includes fluid temperature/resistivity and natural gamma probes); MSI 2CAA-1000 three-arm caliper probe; Advanced Logic Technologies FAC40 acoustic televiewer (ATV); and MSI HFP-2293 Heat Pulse Flow Meter (HPFM).

The Mount Sopris single-conductor system stores digitized log data on the hard drive of a portable computer. Logging speeds can range from 1.5 to 20 feet per minute depending on the resolution desired. All logging activities are performed in accordance with the equipment manufacturer’s recommended procedures, as well as the appropriate ASTM standard. We normally clean the logging probes and wireline with non-phosphate soap and a tap water rinse during each upward run and/or after completing work on each well.

5.2. Data Analysis and Interpretation. Borehole logging data are processed as graphical logs using WELLCAD for Windows© and MS Heat© (for HPFM) software systems, Excel spreadsheets, and Rockworks©. Caliper and ATV logs are compiled onto a one-sheet format to allow for more efficient graphical log analysis. Data ranges will be set to optimize the detection of readings that depart from baseline and background readings.

We use WELLCAD to construct structure logs identifying notable and representative discontinuities from ATV data and superimpose them onto the ATV log. Numerical representations of the structural traces are used to calculate strike and dip values of discontinuities and subsequently used to construct rose diagrams and stereonet projections of the structural data. Apparent aperture values for discontinuities visible in the ATV log are tabulated. Acoustic images of the borehole (360 degrees) are graphically represented as false-color amplitude and travel-time logs in developed cylindrical view format on a strip log. 3-D core-like representation of the borehole can also be developed from the ATV data.

5.3. Limitations of the Method. The ATV must be properly centered in the borehole to provide clear images. Eccentricity of the ATV tool in the borehole will produce an asymmetrical pattern of the acoustic wave front emanating from the tool, thereby making it difficult to establish a uniform background amplitude and travel-time log of the reflected energy against which the anomalous reflections can be discerned. Borehole tilt and small borehole diameters both degrade data quality.

ATV features or discontinuities may represent open or filled fractures, foliation, and mineralized or weathered zones. Interpreting the type of feature present from the ATV log requires using other logs or core data, if available. For open fractures imaged in the ATV log, the width of the feature does not represent the true aperture. A portion of the acoustic energy hitting the fracture surface is diffracted. The recorded arrivals of these diffractions will appear on the log above and below the normal position of the fracture edges as lower-amplitude arrivals with longer travel times. Subtle changes in amplitude within each discontinuity can be used to approximate the true aperture; however, the measurement is approximate and should be designated as “apparent aperture.”

APPENDIX A.

REPORT WELL LOGS

GZ-ML-4

REPORT WELL LOGS

Hager GeoScience Inc.

Geophysical Logging Record:

Caliper Log

Site: Charbert Facility

Boring #: GZ-ML-4

Location: Alton, MA

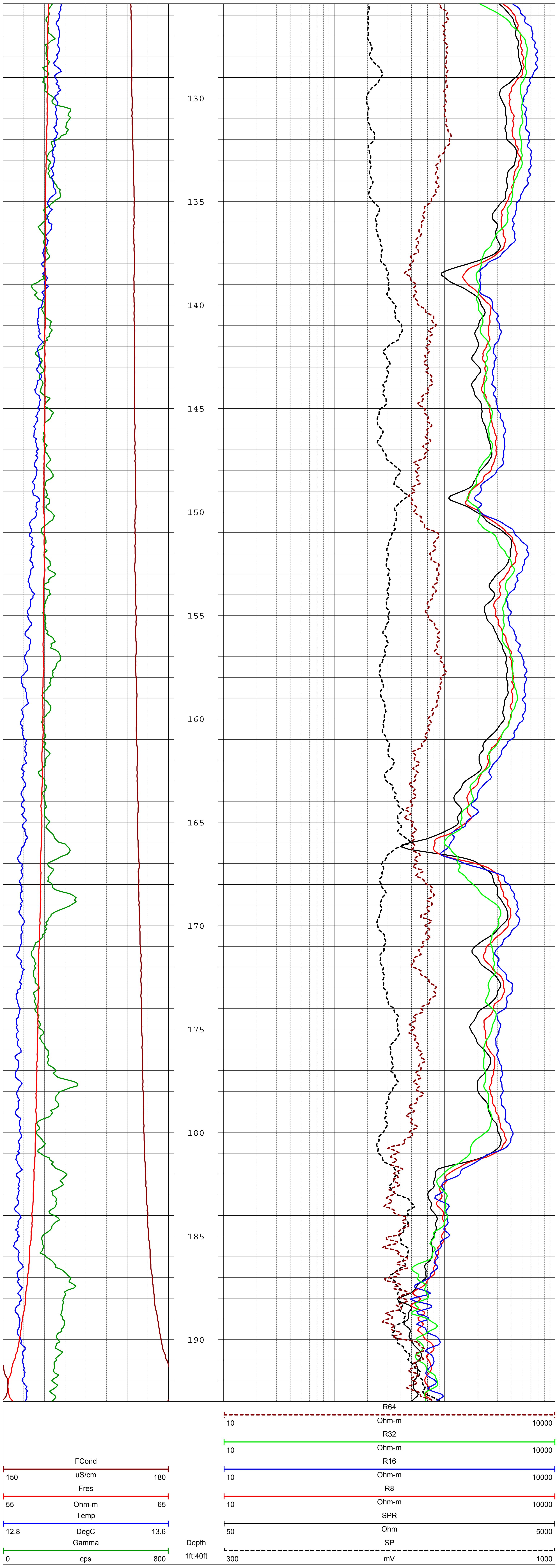
Date Logged: 7-1-09

Client: GZA GeoEnvironmental

Logged By: MC, JB, KS


110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
Depth
1ft:40ft
Caliper1+3
2
in
8

Hager GeoScience Inc.	Geophysical Logging Record: ***Poly-Electric Log***
Site: Charbert Facility	Boring #: GZ-ML-4
Location: Alton, RI	Date Logged: 7-1-09
Client: GZA Environmental	Logged By: MC, JB, KS

130
135
140
145
150
155
160
165
170
175
180
185
190
R64
10
Ohm-m
10000
R32
10
Ohm-m
10000
R16
10
Ohm-m
10000
R8
10
Ohm-m
10000
SPR
50
Ohm
5000
SP
300
mV
1000
FCond
150
uS/cm
180
Fres
55
Ohm-m
65
Temp
12.8
DegC
13.6
Gamma
0
cps
800
Depth
1ft:40ft

Hager GeoScience Inc.

Geophysical Logging Record:

HPFM Ambient & Stressed Logs

Site: Charbert Facility

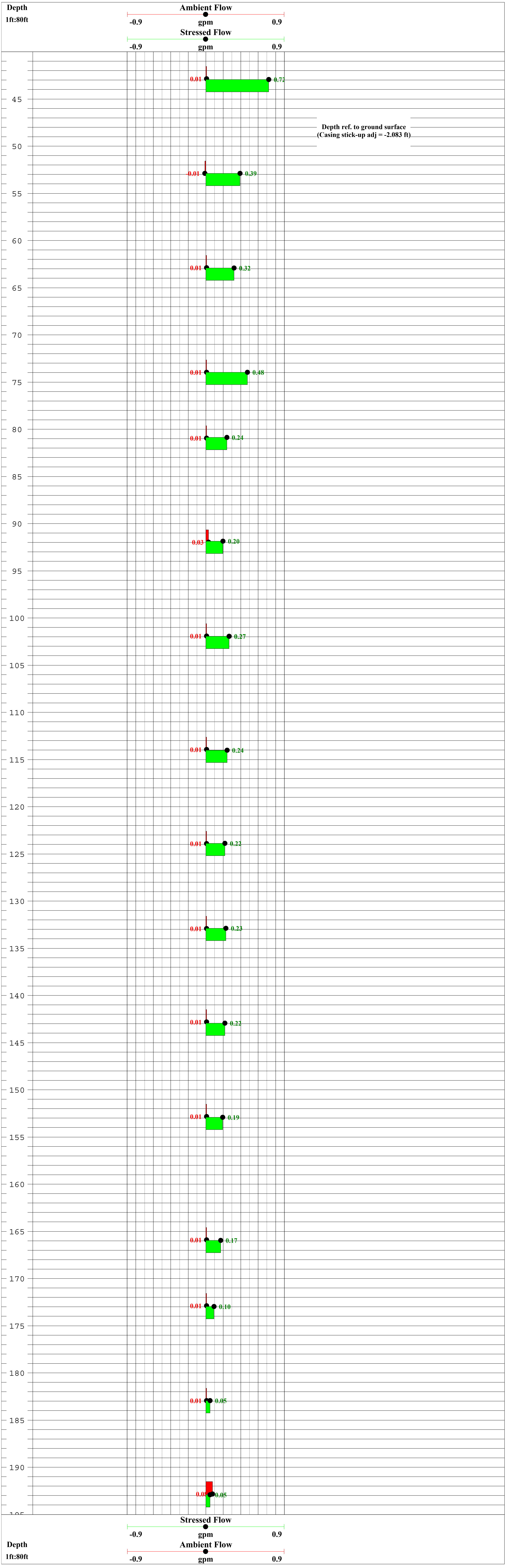
Boring #: GZ-ML-4

Location: Alton, RI

Date Logged: 7-1-09

Client: GZA GeoEnvironmental

Logged By: MC, JB, KS



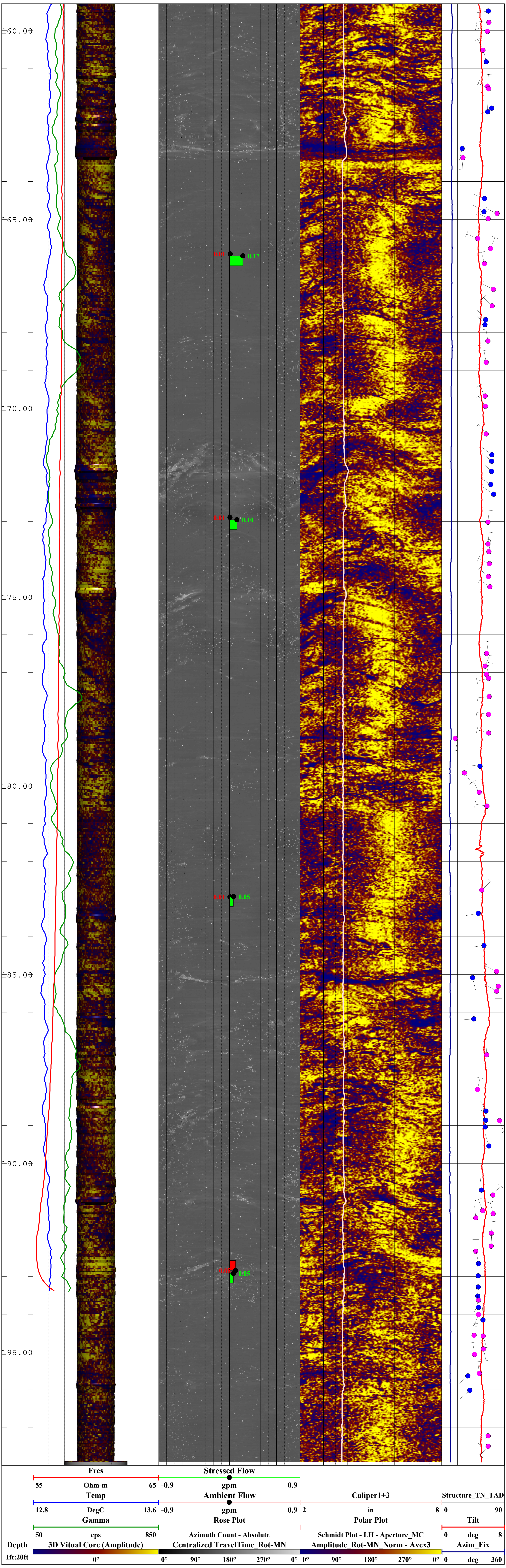
Hager GeoScience Inc.

Geophysical Logging Record:

Image, Fluid, & Structure Logs

Site: Charbert Facility	Boring #: GZ-ML-4
Location: Alton, MA	Date Logged: 7-01-09
Client: GZA GeoEnvironmental	Logged By: MC, JB, KS


100.00
105.00
110.00
115.00
120.00
125.00
130.00
135.00
140.00
145.00
150.00
155.00
0.01
0.27
0.01
0.24
Azimuth Count - Absolute
Depth: 40.00 [ft] to 198.00 [ft]
0°
30
20
10
10
20
30
180°
Schmidt Plot - LH - Aperture_MC
Depth: 40.00 [ft] to 198.00 [ft]
0°
75
60
45
30
15
15
30
45
60
75
180°
0.01
0.22
0.01
0.23
0.01
0.22
0.01
0.19


160.00
165.00
170.00
175.00
180.00
185.00
190.00
195.00
0.01
0.17
0.01
0.10
0.01
0.05
0.08
0.05
Fres
55
Ohm-m
65
Stressed Flow
-0.9
gpm
0.9
Temp
12.8
DegC
13.6
Ambient Flow
-0.9
gpm
0.9
Caliper1+3
2
in
8
Structure_TN_TAD
0
90
Gamma
50
cps
850
Rose Plot
Azimuth Count - Absolute
Polar Plot
Schmidt Plot - LH - Aperture_MC
Tilt
0
deg
8
Depth
1ft:20ft
3D Vitual Core (Amplitude)
0°
Centralized TravelTime_Rot-MN
0°
90°
180°
270°
0°
Amplitude_Rot-MN_Norm - Avex3
0°
90°
180°
270°
0°
Azim_Fix
0
deg
360

Borehole Geophysical Logging
Charbert Facility
Alton, RI

File 2009047

GZ-ML-5

REPORT WELL LOGS

Hager GeoScience, Inc.

Hager GeoScience Inc.

Geophysical Logging Record:

Caliper Log

Site: Charbert Facility

Boring #: GZ-ML-5

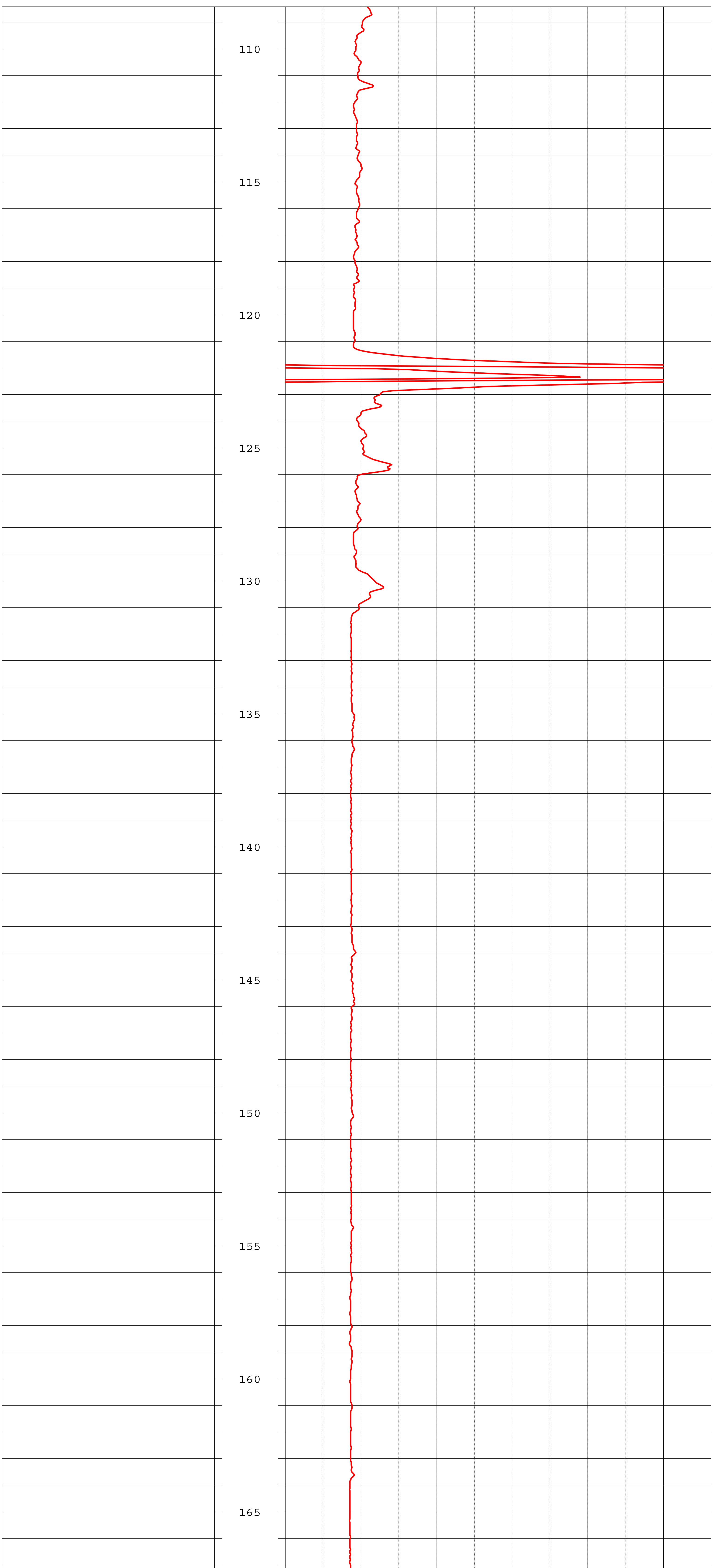
Location: Alton, RI

Date Logged: 6-30-09

Client: GZA GeoEnvironmental

Logged By: MC, JB, KS

Depth ref. to ground surface
(Casing stick-up adj = -2.042 ft)


110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
Depth
1ft:40ft
Caliper
3
in
8

Hager GeoScience Inc.

Geophysical Logging Record:

Poly-Electric Log

Site: Charbert Facility

Boring #: GZ-ML-5

Location: Alton, MA

Date Logged: 6-30-09

Client: GZA GeoEnvironmental

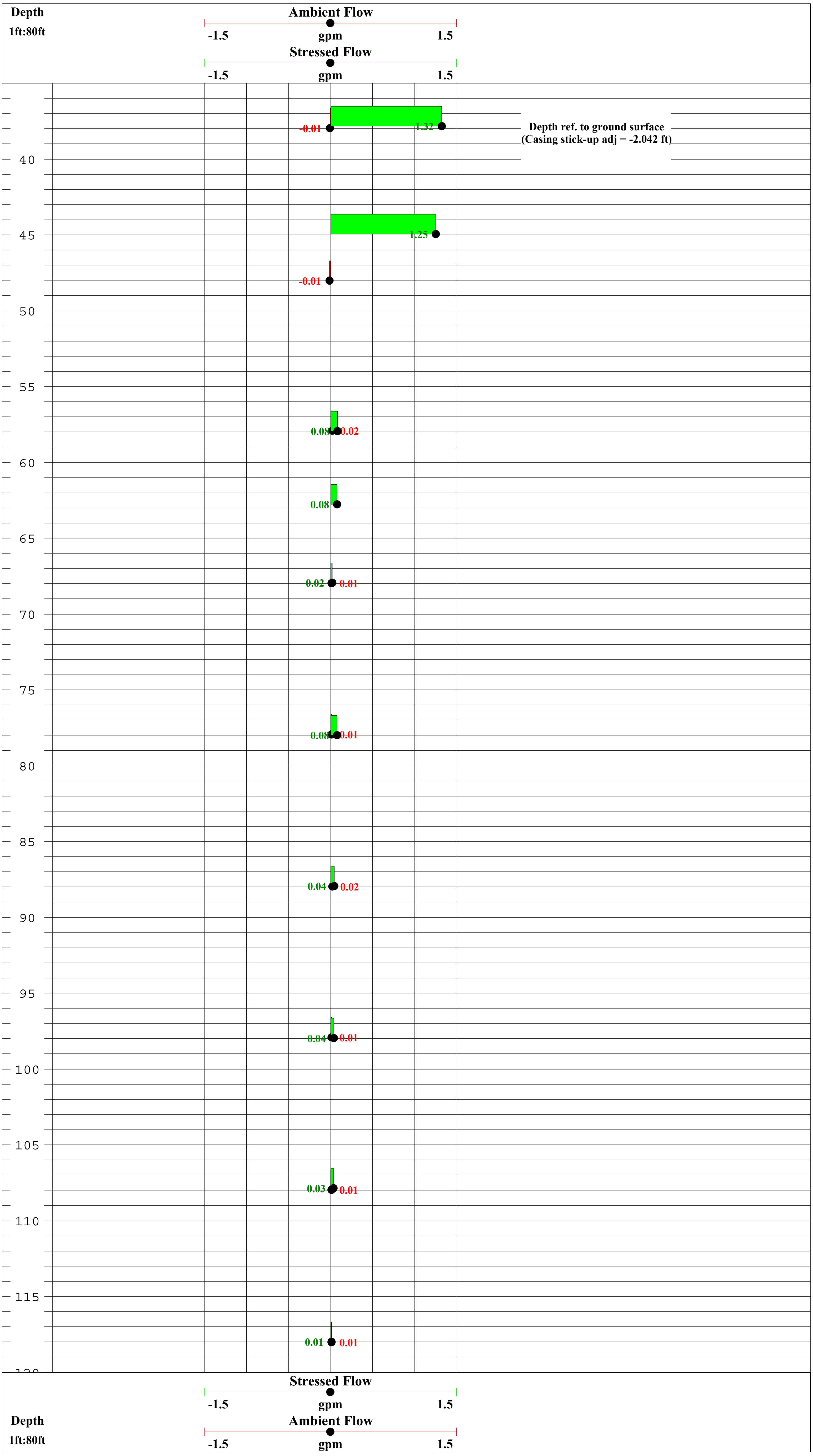
Logged By: MC, JB, KS

Hager GeoScience Inc.

Geophysical Logging Record:

HPFM Ambient & Stressed Logs

Site: Charbert Facility
Boring #: GZ-ML-5
Location: Alton, RI
Date Logged: 6-30-09
Client: GZA GeoEnvironmental
Logged By: MC, JB, KS

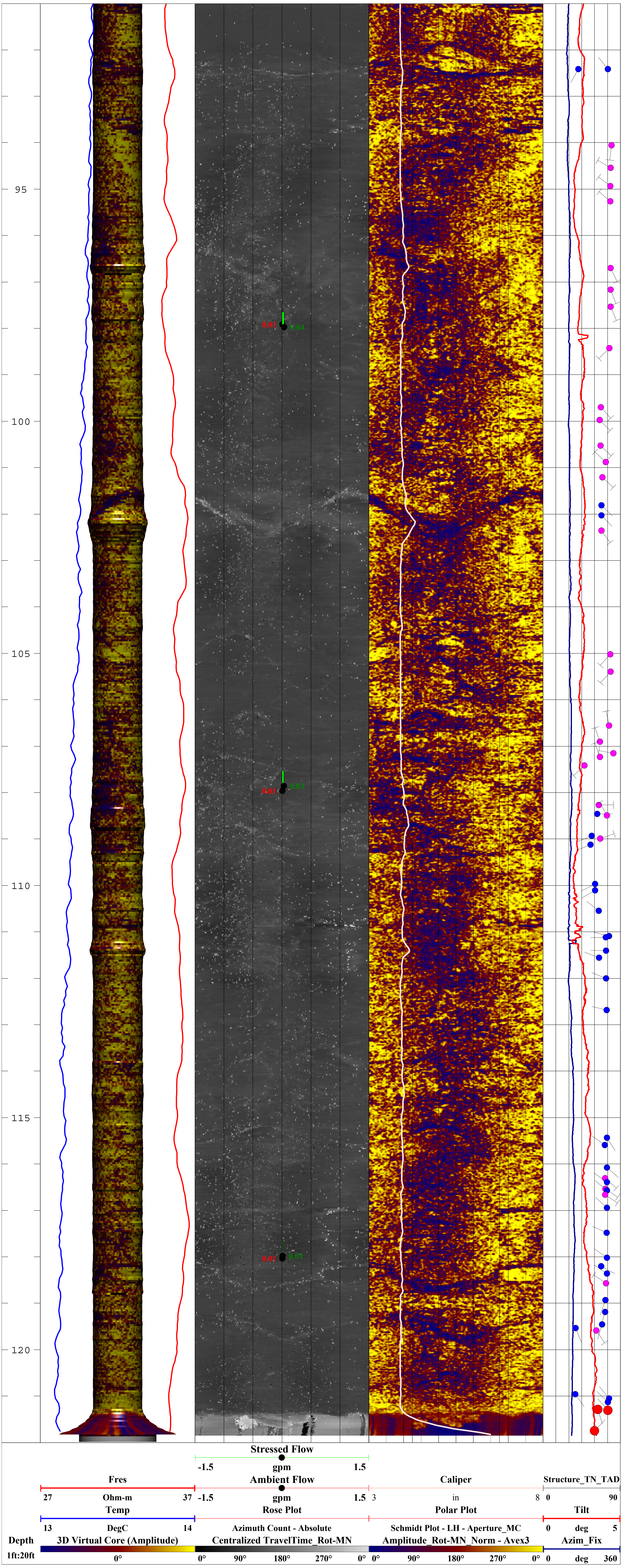


Depth ref. to ground surface
(Casing stick-up adj = -2.042 ft)

Hager GeoScience Inc.

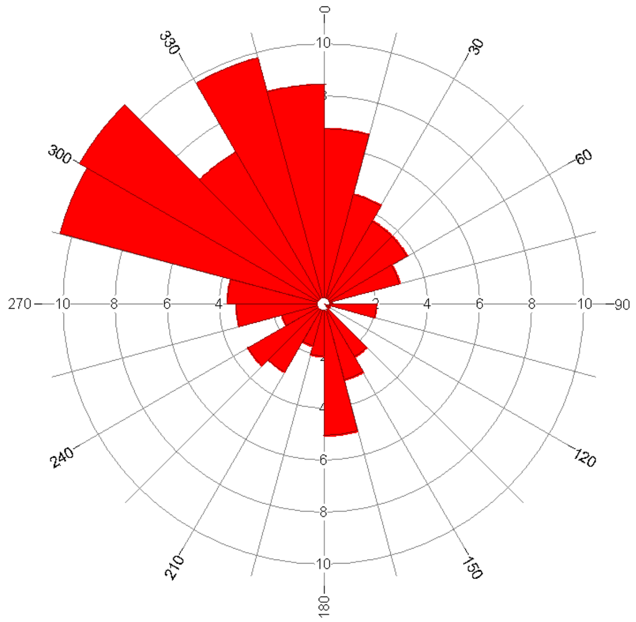
Geophysical Logging Record:
Image, Fluid, and Structure Logs

Site: Charbert Facility	Boring #: GZ-ML-5
Location: Alton, RI	Date Logged: 6-30-09
Client: GZA GeoEnvironmental	Logged By: MC, JB, KS


95
100
105
110
115
120
0.01
0.01
0.01
0.01
0.01
0.01
Stressed Flow
-1.5 gpm 1.5
Fres
27 Ohm-m 37
Ambient Flow
-1.5 gpm 1.5
Caliper
3 in 8
Structure_TN_TAD
0 90
Temp
13 DegC 14
Rose Plot
Azimuth Count - Absolute
Polar Plot
Schmidt Plot - LH - Aperture_MC
Tilt
0 deg 5
Depth
1ft:20ft
3D Virtual Core (Amplitude)
0°
Centralized TravelTime_Rot-MN
0° 90° 180° 270° 0°
Amplitude_Rot-MN_Norm - Avex3
0° 90° 180° 270° 0°
Azim_Fix
0 deg 360

APPENDIX C.

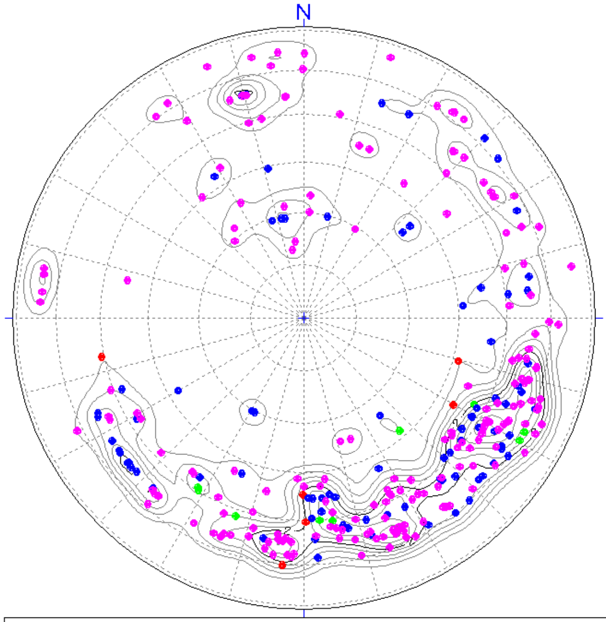
ROSE DIAGRAMS
AND
STEREONETS



Well GZ-ML-4

Calculation Method	Frequency
Class Interval	15 Degrees
Length Filtering	Deactivated
Azimuth Filtering	Deactivated
Data Type	Unidirectional
Population	296
Maximum Percentage	10.8 Percent
Mean Percentage	4.5 Percent
Standard Deviation	3.01 Percent
Vector Mean	321.47 Degrees
Confidence Interval ...	10.8 Degrees
R-mag	0.41

Well GZ-ML-4



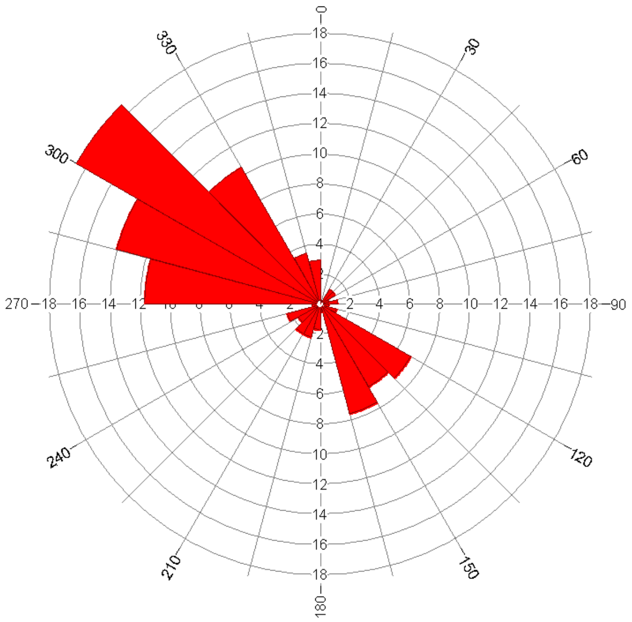
Projection	Schmidt (Equal Area)
Number of Sample Points	296
Mean Lineation Azimuth	149.2
Mean Lineation Plunge	26.4
Great Circle Azimuth	48.4
Great Circle Plunge	26.8
1st Eigenvalue	0.542
2nd Eigenvalue	0.312
3rd Eigenvalue	0.146
LN (E1 / E2)	0.553
LN (E2 / E3)	0.762
(LN(E1/E2)] / (LN(E2/E3)) ..	0.725
Spherical variance	0.4211
Rbar	0.5789

Charbert Facility

Polar Plot Diagram - Dip Azimuth & Angle

- 🟥 Large Apperture
- 🟩 Moderate Apperture
- 🟦 Small Apperture
- 🟪 Tight Apperture
- 🟦 Rock Fabric
- 🟨 Bedding

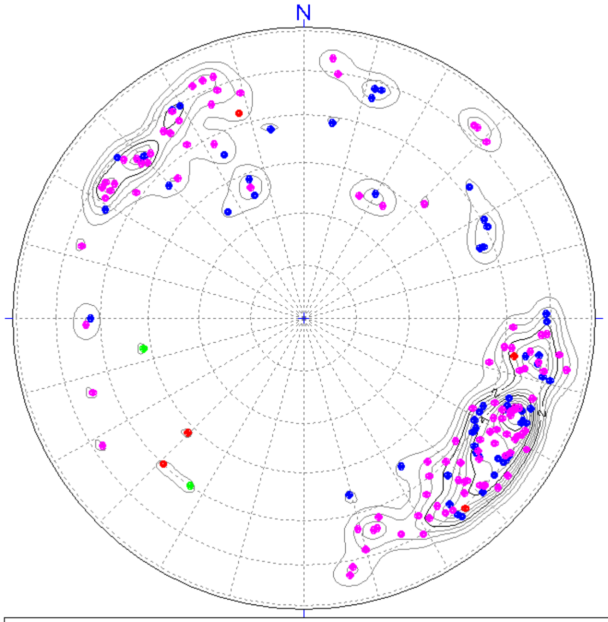
Hager GeoScience, Inc.



Well GZ-ML-5

```
Calculation Method .... Frequency
Class Interval ........ 15 Degrees
Length Filtering ...... Deactivated
Azimuth Filtering ..... Deactivated
Data Type ............. Unidirectional
Population ............ 171
Maximum Percentage .... 18.7 Percent
Mean Percentage ....... 4.5 Percent
Standard Deviation .... 5.07 Percent
Vector Mean ........... 284.6 Degrees
Confidence Interval ... 15.35 Degrees
R-mag ................. 0.38
```

Well GZ-ML-5



```
Projection ................. Schmidt (Equal Area)
Number of Sample Points .... 171
Mean Lineation Azimuth ..... 126.4
Mean Lineation Plunge ...... 12.3
Great Circle Azimuth ....... 322
Great Circle Plunge ........ 39.2
1st Eigenvalue ............. 0.685
2nd Eigenvalue ............. 0.209
3rd Eigenvalue ............. 0.106
LN ( E1 / E2 ) ............. 1.189
LN ( E2 / E3 ) ............. 0.678
(LN(E1/E2)] / (LN(E2/E3)) .. 1.755
Spherical variance ......... 0.4731
Rbar ....................... 0.5269
```

Charbert Facility

Polar Plot Diagram - Dip Azimuth & Angle

🟥 Large Apperture
🟩 Moderate Apperture
🟦 Small Apperture
🟪 Tight Apperture
🟦 Rock Fabric
🟨 Bedding

Hager GeoScience, Inc.

APPENDIX D.

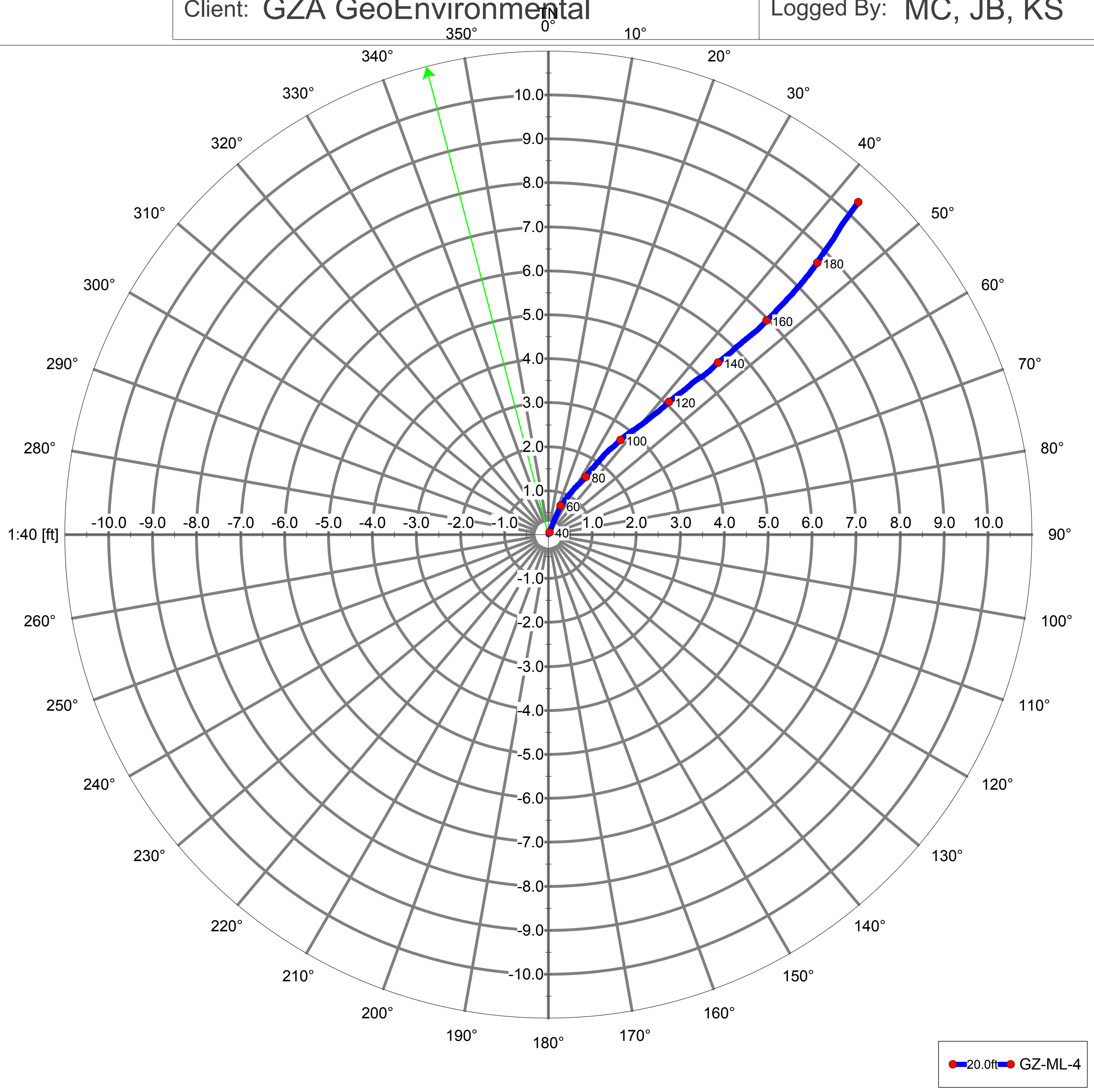
DEVIATION PLOTS

Hager GeoScience Inc.

Geophysical Logging Record:

Bull's Eye Deviation Plot

Site: Charbert Facility	Boring #: GZ-ML-4
Location: Alton, RI	Date Logged: 7-1-09
Client: GZA GeoEnvironmental	Logged By: MC, JB, KS



Hager GeoScience Inc.

Geophysical Logging Record:

3D Cylinder Deviation Plot

Site: Charbert Facility

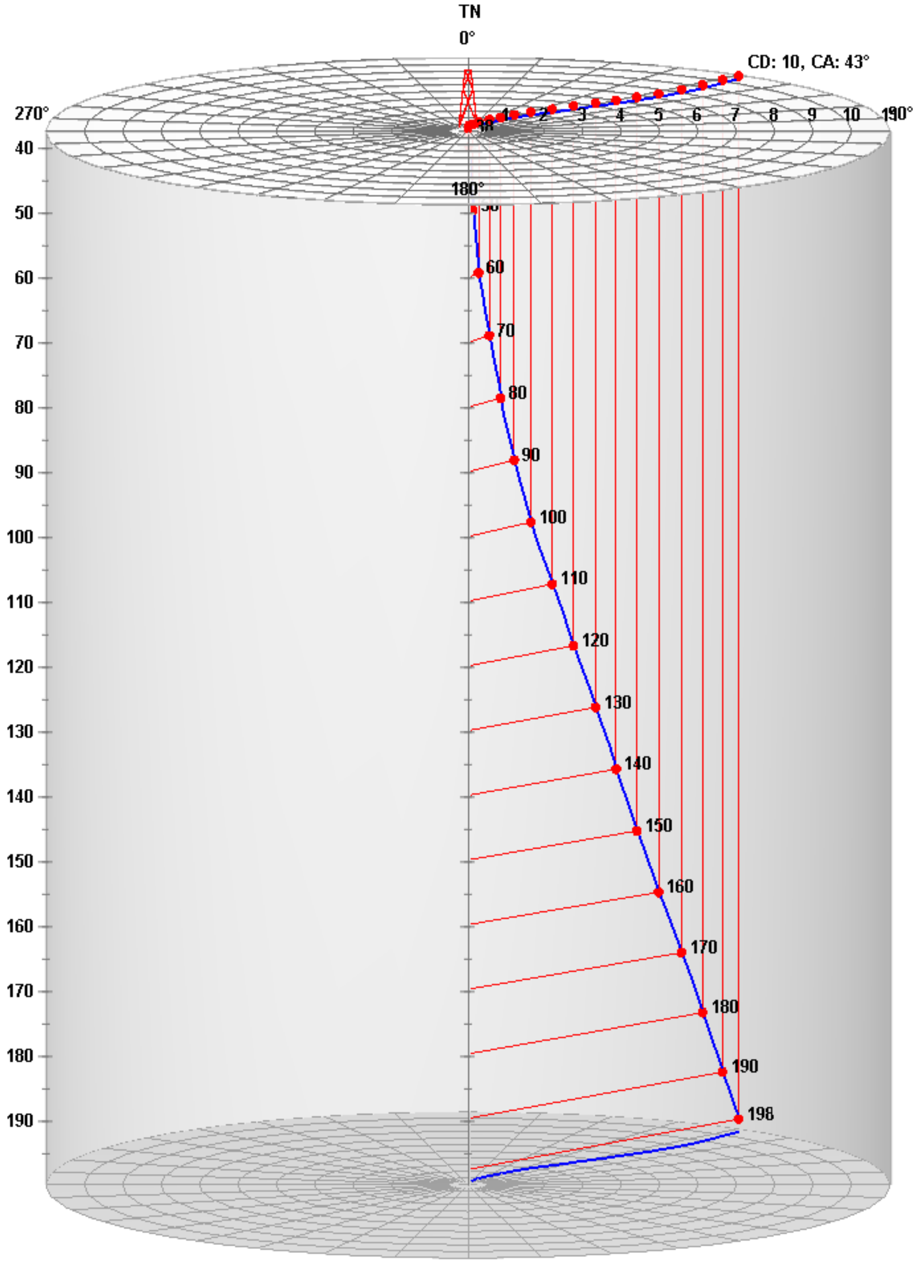
Boring #: GZ-ML-4

Location: Alton, RI

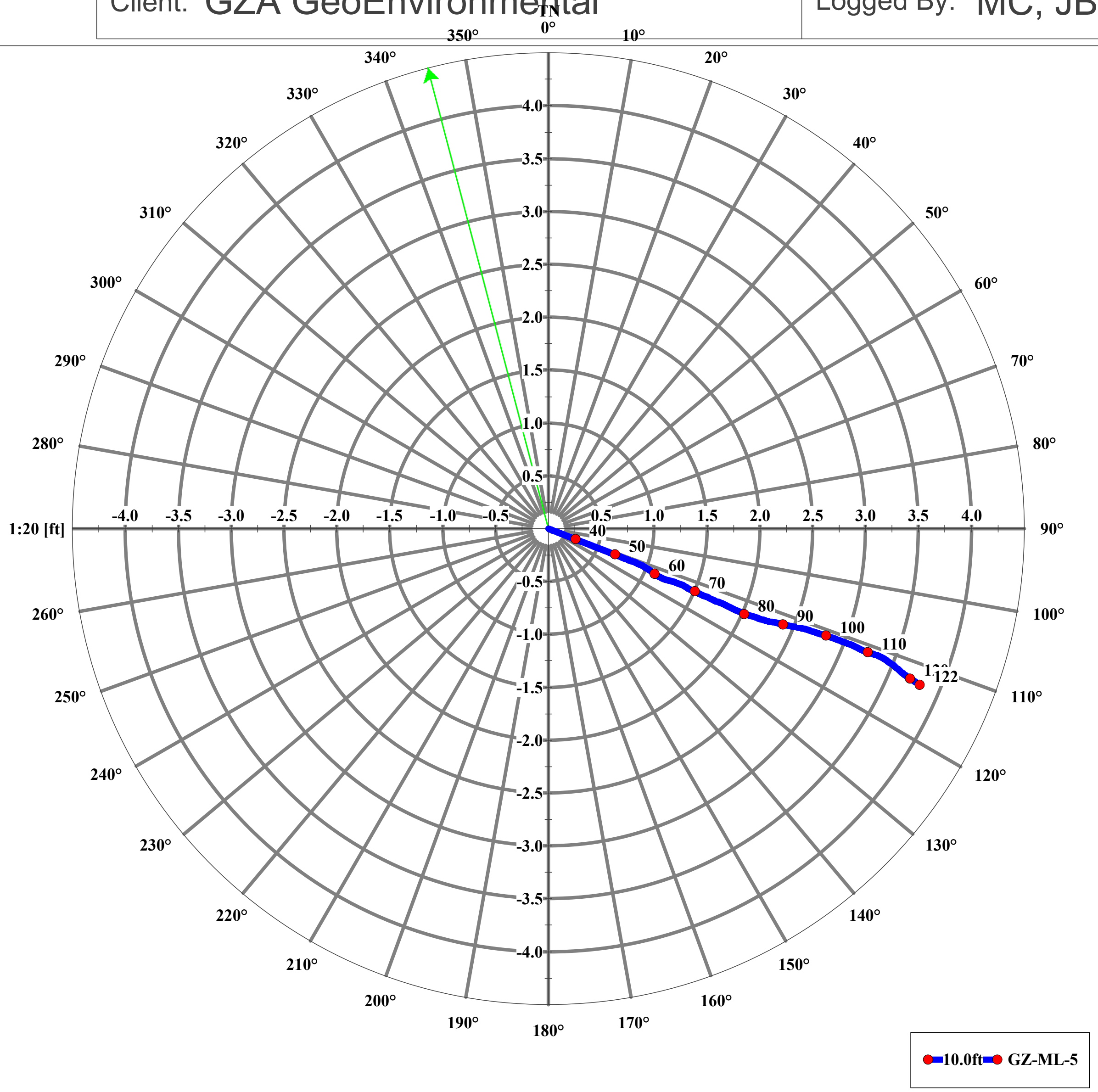
Date Logged: 7-1-09

Client: GZA Environmental

Logged By: MC, JB, KS



Hager GeoScience Inc.	Geophysical Logging Record: ***Bull's Eye Deviation Plot***
Site: Charbert Facility	Boring #: GZ-ML-5
Location: Alton, RI	Date Logged: 6-30-09
Client: GZA GeoEnvironmental	Logged By: MC, JB, KS



Hager GeoScience Inc.

Geophysical Logging Record:

3D Cylinder Deviation Plot

Site: Charbert Facility

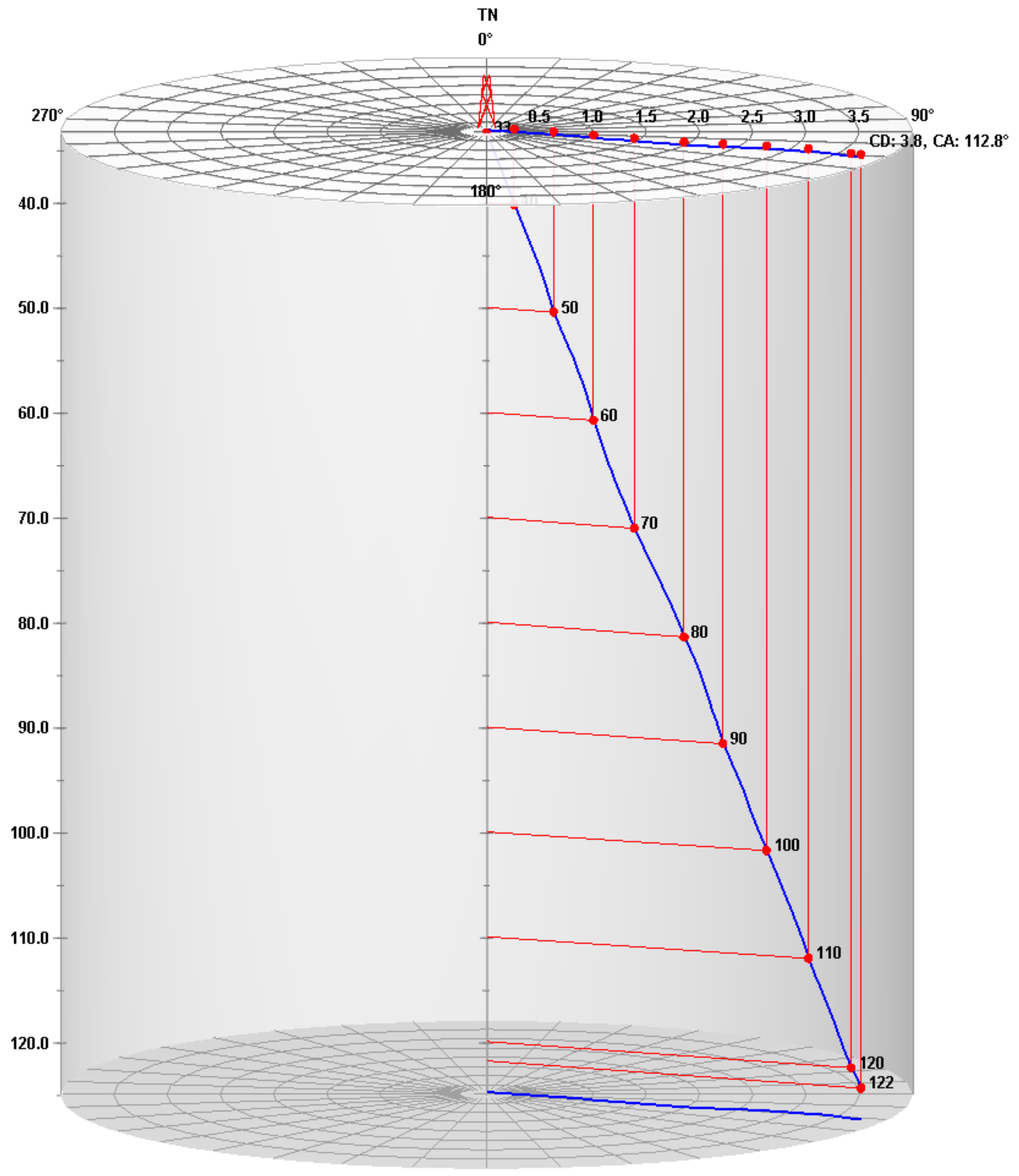
Boring #: GZ-ML-5

Location: Alton, RI

Date Logged: 6-30-09

Client: GZA Environmental

Logged By: MC, JB, KS



ATTACHMENT C

LABORATORY CERTIFICATES

GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748
(781) 278-4700

Laboratory Identification Numbers:
MA and ME: **MA092** NH: **2028**
CT: **PH0579** RI: **LAO00236**
NELAC - NYS DOH: **11063**

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project No.: **03.0032795.35**
Work Order No.: **0907-00033**
Date Received: **07/07/2009**
Date Reported: **07/15/2009**

SAMPLE INFORMATION

Date Sampled	Matrix	Laboratory ID	Sample ID
07/06/2009	Aqueous	0907-00033 001	TB
07/06/2009	Aqueous	0907-00033 002	GZ-ML-4 Z-1A
07/06/2009	Aqueous	0907-00033 003	GZ-ML-4 Z-2
07/06/2009	Aqueous	0907-00033 004	GZ-ML-4 Z-3A
07/06/2009	Aqueous	0907-00033 005	GZ-ML-4 BD
07/06/2009	Aqueous	0907-00033 006	GZ-ML-4 Z-4
07/06/2009	Aqueous	0907-00033 007	GZ-ML-4 Z-5
07/06/2009	Aqueous	0907-00033 008	GZ-ML-4 Z-6
07/06/2009	Aqueous	0907-00033 009	GZ-ML-4 Z-7
07/06/2009	Aqueous	0907-00033 010	GZ-ML-4 Z-11

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 07/07/09 via _x_GZA courier, __EC, __FEDEX, or ___hand delivered. The temperature of the _x_temperature blank/__cooler air, was 4.9 degrees C. The temperature requirement for most analyses is above freezing to 6 degrees C. The samples were received intact for all requested analyses.

The chain of custody indicates that the samples, when required, were chemically preserved in accordance with the method they reference.

2. EPA Method 8260 - VOCs

Attach QC 8260 07/14/09 S - Aqueous

GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748
(781) 278-4700

ANALYTICAL REPORT

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Project No.: **03.0032795.35**

Date Received: **07/07/2009**
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Data Authorized By: ______________________

NELAC certification, as indicated by the NELAC Lab ID Number, is per analyte. For a complete list of NELAC validated analytes, please contact the laboratory.

Abbreviations:
% R = % Recovery
DF = Dilution Factor
DFS = Dilution Factor Solids
CF = Calculation Factor
DO = Diluted Out

Method Key:
Method 8260: The current version of the method is 8260B.
Method 8270: The current version of the method is 8270D.
Method 6010: The current version of the method is 6010B.

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

Soil data is reported on a dry weight basis unless otherwise specified.
Matrix Spike / Matrix Spike Duplicate sets are performed as per method and are reported at the end of the analytical report if assigned on the Chain of Custody.

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **TB**
Sample No.: **001**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/14/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/14/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009

GZA GeoEnvironmental, Inc.
530 Broadway
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Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **TB**
Sample No.: **001**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrachloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	92.3	70-130	% R	MQS	07/14/2009
***Toluene-D8	EPA 8260	101	70-130	% R	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
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Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **TB**
Sample No.: **001**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	100	70-130	% R	MQS	07/14/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/14/2009

ANALYTICAL REPORT

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Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-1A**
Sample No.: **002**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/14/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/14/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009

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Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-1A**
Sample No.: **002**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrachloroethene	EPA 8260	1.4	1.0	ug/L	MQS	07/14/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	97.3	70-130	% R	MQS	07/14/2009
***Toluene-D8	EPA 8260	102	70-130	% R	MQS	07/14/2009

ANALYTICAL REPORT

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Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-1A**
Sample No.: **002**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	101	70-130	% R	MQS	07/14/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/14/2009

ANALYTICAL REPORT

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Providence, RI 02909

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Project Name.:	**Phase II Bedrock - Charbert**	Date Received:	**07/07/2009**
Project No.:	**03.0032795.35**	Date Reported:	**07/15/2009**
		Work Order No.:	**0907-00033**

Sample ID:	**GZ-ML-4 Z-2**	Sample No.:	**003**
Sample Date:	**07/06/2009**		

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/14/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/14/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009

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530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-2**
Sample No.: **003**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrachloroethene	EPA 8260	1.6	1.0	ug/L	MQS	07/14/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	92.5	70-130	% R	MQS	07/14/2009
***Toluene-D8	EPA 8260	102	70-130	% R	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-2**
Sample No.: **003**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	100	70-130	% R	MQS	07/14/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/14/2009

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Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-3A**
Sample No.: **004**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/14/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/14/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichloroethene	EPA 8260	2.9	1.0	ug/L	MQS	07/14/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009

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Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-3A**
Sample No.: **004**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrachloroethene	EPA 8260	46	1.0	ug/L	MQS	07/14/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	98.9	70-130	% R	MQS	07/14/2009
***Toluene-D8	EPA 8260	102	70-130	% R	MQS	07/14/2009

ANALYTICAL REPORT

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Providence, RI 02909

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Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**
Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-3A**
Sample No.: **004**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	104	70-130	% R	MQS	07/14/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/14/2009

ANALYTICAL REPORT

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Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 BD**
Sample No.: **005**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/14/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/14/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichloroethene	EPA 8260	2.9	1.0	ug/L	MQS	07/14/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009

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Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 BD**
Sample No.: **005**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrachloroethene	EPA 8260	48	1.0	ug/L	MQS	07/14/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	97.4	70-130	% R	MQS	07/14/2009
***Toluene-D8	EPA 8260	101	70-130	% R	MQS	07/14/2009

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Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 BD**
Sample No.: **005**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	101	70-130	% R	MQS	07/14/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/14/2009

ANALYTICAL REPORT

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Providence, RI 02909

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Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-4**
Sample No.: **006**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/14/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/14/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-4**
Sample No.: **006**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrachloroethene	EPA 8260	19	1.0	ug/L	MQS	07/14/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	94.8	70-130	% R	MQS	07/14/2009
***Toluene-D8	EPA 8260	101	70-130	% R	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-4**
Sample No.: **006**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	102	70-130	% R	MQS	07/14/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-5**
Sample No.: **007**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/14/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/14/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**
Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-5**
Sample No.: **007**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrachloroethene	EPA 8260	12	1.0	ug/L	MQS	07/14/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	97.9	70-130	% R	MQS	07/14/2009
***Toluene-D8	EPA 8260	101	70-130	% R	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-5**

Sample No.: **007**

Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	101	70-130	% R	MQS	07/14/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/14/2009

ANALYTICAL REPORT

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530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-6**
Sample No.: **008**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/14/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/14/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009

GZA GeoEnvironmental, Inc.
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Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-6**
Sample No.: **008**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrachloroethene	EPA 8260	8.6	1.0	ug/L	MQS	07/14/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	101	70-130	% R	MQS	07/14/2009
***Toluene-D8	EPA 8260	103	70-130	% R	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-6**

Sample No.: **008**

Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	100	70-130	% R	MQS	07/14/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**
Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-7**
Sample No.: **009**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/14/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/14/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.:	**Phase II Bedrock - Charbert**	Date Received:	**07/07/2009**
Project No.:	**03.0032795.35**	Date Reported:	**07/15/2009**
		Work Order No.:	**0907-00033**

Sample ID: **GZ-ML-4 Z-7** Sample No.: **009**

Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrachloroethene	EPA 8260	5.6	1.0	ug/L	MQS	07/14/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	95.0	70-130	% R	MQS	07/14/2009
***Toluene-D8	EPA 8260	102	70-130	% R	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-7**
Sample No.: **009**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	103	70-130	% R	MQS	07/14/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/14/2009

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-11**
Sample No.: **010**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/14/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/14/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.:	**Phase II Bedrock - Charbert**	Date Received:	**07/07/2009**
Project No.:	**03.0032795.35**	Date Reported:	**07/15/2009**
		Work Order No.:	**0907-00033**

Sample ID: **GZ-ML-4 Z-11** Sample No.: **010**

Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Tetrachloroethene	EPA 8260	2.7	1.0	ug/L	MQS	07/14/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/14/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/14/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/14/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	98.0	70-130	% R	MQS	07/14/2009
***Toluene-D8	EPA 8260	102	70-130	% R	MQS	07/14/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/07/2009**
Date Reported: **07/15/2009**
Work Order No.: **0907-00033**

Sample ID: **GZ-ML-4 Z-11**
Sample No.: **010**
Sample Date: **07/06/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	104	70-130	% R	MQS	07/14/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/14/2009

GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748

EPA Method 8260 / 524.2 Aqueous Method Blank (MB) and Laboratory Control Sample/Duplicate (LCS/LCSD) Data

Method Blank

Date Analyzed:	7/14/2009	
Volatile Organics	**Conc. ug/L**	**Acceptance Limit**
dichlorodifluoromethane	< 1.0	< 1.0
chloromethane	< 1.0	< 1.0
vinyl chloride	< 0.5	< 0.5
bromomethane	< 1.0	< 1.0
chloroethane	< 0.5	< 0.5
trichlorofluoromethane	< 1.0	< 1.0
diethyl ether	< 2.5	< 2.5
acetone	< 13	< 13
1,1-dichloroethene	< 0.5	< 0.5
FREON-113	< 1.0	< 1.0
iodomethane	< 0.5	< 0.5
carbon disulfide	< 5.0	< 5.0
dichloromethane	< 1.0	< 1.0
tert-butyl alcohol (TBA)	< 13	< 13
acrylonitrile	< 0.5	< 0.5
methyl-tert-butyl-ether	< 0.5	< 0.5
trans-1,2-dichloroethene	< 0.5	< 0.5
1,1-dichloroethane	< 0.5	< 0.5
di-isopropyl ether (DIPE)	< 1.0	< 1.0
ethyl tert-butyl ether (EtBE)	< 1.0	< 1.0
vinyl acetate	< 13	< 13
2-butanone	< 13	< 13
2,2-dichloropropane	< 0.5	< 0.5
cis-1,2-dichloroethene	< 0.5	< 0.5
chloroform	< 0.5	< 0.5
bromochloromethane	< 0.5	< 0.5
tetrahydrofuran	< 5.0	< 5.0
1,1,1-trichloroethane	< 0.5	< 0.5
1,1-dichloropropene	< 0.5	< 0.5
carbon tetrachloride	< 0.5	< 0.5
1,2-dichloroethane	< 0.5	< 0.5
benzene	< 0.5	< 0.5
tert-amyl methyl ether (TAME)	< 1.0	< 1.0
trichloroethene	< 0.5	< 0.5
1,2-dichloropropane	< 0.5	< 0.5
bromodichloromethane	< 0.5	< 0.5
1,4-Dioxane	< 50	< 50
dibromomethane	< 0.5	< 0.5
4-methyl-2-pentanone	< 13	< 13
cis-1,3-dichloropropene	< 0.5	< 0.5
toluene	< 0.5	< 0.5
trans-1,3-dichloropropene	< 1.0	< 1.0
1,1,2-trichloroethane	< 0.5	< 0.5
2-hexanone	< 13	< 13
1,3-dichloropropane	< 0.5	< 0.5
tetrachloroethene	< 0.5	< 0.5
dibromochloromethane	< 0.5	< 0.5
1,2-dibromoethane (EDB)	< 1.0	< 1.0
chlorobenzene	< 0.5	< 0.5
1,1,1,2-tetrachloroethane	< 0.5	< 0.5
ethylbenzene	< 0.5	< 0.5
1,1,2,2-tetrachloroethane	< 0.5	< 0.5
m&p-xylene	< 1.0	< 1.0
o-xylene	< 0.5	< 0.5
styrene	< 0.5	< 0.5
bromoform	< 1.0	< 1.0
isopropylbenzene	< 0.5	< 0.5
1,2,3-trichloropropane	< 0.5	< 0.5
bromobenzene	< 0.5	< 0.5
n-propylbenzene	< 0.5	< 0.5
2-chlorotoluene	< 0.5	< 0.5
1,3,5-trimethylbenzene	< 0.5	< 0.5
trans-1,4-dichloro-2-butene	< 1.0	< 1.0
4-chlorotoluene	< 0.5	< 0.5
tert-butyl-benzene	< 0.5	< 0.5
1,2,4-trimethylbenzene	< 0.5	< 0.5
sec-butyl-benzene	< 0.5	< 0.5
p-isopropyltoluene	< 0.5	< 0.5
1,3-dichlorobenzene	< 0.5	< 0.5
1,4-dichlorobenzene	< 0.5	< 0.5
n-butylbenzene	< 0.5	< 0.5
1,2-dichlorobenzene	< 0.5	< 0.5
1,2-dibromo-3-chloropropane	< 2.5	< 2.5
1,3,5-trichlorobenzene	< 0.5	< 0.5
1,2,4-trichlorobenzene	< 0.5	< 0.5
hexachlorobutadiene	< 0.5	< 0.5
naphthalene	< 1.0	< 1.0
1,2,3-trichlorobenzene	< 0.5	< 0.5

Laboratory Control Sample / **Laboratory Control Sample Duplicate**

Date Analyzed:	7/14/2009			7/14/2009					
Spike Concentration = 20ug/L	**% Recovery**	**Acceptance Limits**	**Verdict**	**% Recovery**	**Acceptance Limits**	**Verdict**	**RPD**	**Limit**	**Verdict**
dichlorodifluoromethane	97.2	70-130	ok	94.9	70-130	ok	2.44	<25	ok
chloromethane	106	70-130	ok	110	70-130	ok	3.33	<25	ok
vinyl chloride	94.9	80-120	ok	96.2	70-130	ok	1.28	<25	ok
bromomethane	89.0	70-130	ok	88.1	70-130	ok	0.94	<25	ok
chloroethane	90.8	70-130	ok	89.7	70-130	ok	1.19	<25	ok
trichlorofluoromethane	85.0	70-130	ok	82.1	70-130	ok	3.54	<25	ok
diethyl ether	95.5	70-130	ok	92.2	70-130	ok	3.49	<25	ok
acetone	106	70-130	ok	103	70-130	ok	2.06	<25	ok
1,1-dichloroethene	92.9	80-120	ok	91.9	70-130	ok	1.06	<25	ok
FREON-113	83.4	70-130	ok	84.5	70-130	ok	1.38	<25	ok
iodomethane	76.9	70-130	ok	78.4	70-130	ok	1.96	<25	ok
carbon disulfide	103	70-130	ok	103	70-130	ok	0.09	<25	ok
dichloromethane	93.3	70-130	ok	93.6	70-130	ok	0.36	<25	ok
tert-butyl alcohol (TBA)	89.9	70-130	ok	94.5	70-130	ok	4.95	<25	ok
acrylonitrile	102	70-130	ok	103	70-130	ok	0.32	<25	ok
methyl-tert-butyl-ether	93.9	70-130	ok	91.7	70-130	ok	2.38	<25	ok
trans-1,2-dichloroethene	102	70-130	ok	99.9	70-130	ok	1.91	<25	ok
1,1-dichloroethane	94.4	70-130	ok	92.5	70-130	ok	2.01	<25	ok
di-isopropyl ether (DIPE)	103	70-130	ok	102	70-130	ok	0.53	<25	ok
ethyl tert-butyl ether (EtBE)	90.9	70-130	ok	90.2	70-130	ok	0.78	<25	ok
vinyl acetate	86.2	70-130	ok	87.1	70-130	ok	1.02	<25	ok
2-butanone	103	70-130	ok	104	70-130	ok	0.49	<25	ok
2,2-dichloropropane	95.9	70-130	ok	91.7	70-130	ok	4.43	<25	ok
cis-1,2-dichloroethene	88.5	70-130	ok	88.3	70-130	ok	0.28	<25	ok
chloroform	87.6	80-120	ok	85.2	70-130	ok	2.79	<25	ok
bromochloromethane	84.3	70-130	ok	84.3	70-130	ok	0.07	<25	ok
tetrahydrofuran	108	70-130	ok	106	70-130	ok	2.05	<25	ok
1,1,1-trichloroethane	83.3	70-130	ok	82.2	70-130	ok	1.29	<25	ok
1,1-dichloropropene	93.0	70-130	ok	91.6	70-130	ok	1.53	<25	ok
carbon tetrachloride	81.1	70-130	ok	78.6	70-130	ok	3.11	<25	ok
1,2-dichloroethane	82.9	70-130	ok	80.7	70-130	ok	2.64	<25	ok
benzene	101	70-130	ok	100	70-130	ok	0.95	<25	ok
tert-amyl methyl ether (TAME)	91.0	70-130	ok	90.0	70-130	ok	1.04	<25	ok
trichloroethene	84.9	70-130	ok	82.1	70-130	ok	3.32	<25	ok
1,2-dichloropropane	100	80-120	ok	98.9	70-130	ok	1.40	<25	ok
bromodichloromethane	85.6	70-130	ok	83.4	70-130	ok	2.54	<25	ok
1,4-Dioxane	95.8	70-130	ok	98.9	70-130	ok	3.17	<25	ok
dibromomethane	85.3	70-130	ok	83.5	70-130	ok	2.16	<25	ok
4-methyl-2-pentanone	103	70-130	ok	102	70-130	ok	0.48	<25	ok
cis-1,3-dichloropropene	93.3	70-130	ok	91.7	70-130	ok	1.79	<25	ok
toluene	96.6	80-120	ok	95.1	70-130	ok	1.62	<25	ok
trans-1,3-dichloropropene	91.2	70-130	ok	88.5	70-130	ok	3.00	<25	ok
1,1,2-trichloroethane	89.3	70-130	ok	86.9	70-130	ok	2.66	<25	ok
2-hexanone	99.7	70-130	ok	99.9	70-130	ok	0.20	<25	ok
1,3-dichloropropane	94.7	70-130	ok	93.1	70-130	ok	1.69	<25	ok
tetrachloroethene	80.4	70-130	ok	82.0	70-130	ok	2.01	<25	ok
dibromochloromethane	79.8	70-130	ok	78.7	70-130	ok	1.49	<25	ok
1,2-dibromoethane (EDB)	88.6	70-130	ok	88.4	70-130	ok	0.19	<25	ok
chlorobenzene	83.5	70-130	ok	83.4	70-130	ok	0.19	<25	ok
1,1,1,2-tetrachloroethane	77.9	70-130	ok	77.8	70-130	ok	0.12	<25	ok
ethylbenzene	89.6	80-120	ok	88.9	70-130	ok	0.84	<25	ok
1,1,2,2-tetrachloroethane	97.4	70-130	ok	96.5	70-130	ok	1.00	<25	ok
m&p-xylene	88.3	70-130	ok	88.0	70-130	ok	0.32	<25	ok
o-xylene	108	70-130	ok	105	70-130	ok	2.94	<25	ok
styrene	107	70-130	ok	105	70-130	ok	1.51	<25	ok
bromoform	97.3	70-130	ok	95.5	70-130	ok	1.92	<25	ok
isopropylbenzene	123	70-130	ok	119	70-130	ok	3.20	<25	ok
1,2,3-trichloropropane	103	70-130	ok	98.1	70-130	ok	5.10	<25	ok
bromobenzene	96.9	70-130	ok	95.3	70-130	ok	1.65	<25	ok
n-propylbenzene	117	70-130	ok	114	70-130	ok	3.06	<25	ok
2-chlorotoluene	110	70-130	ok	108	70-130	ok	2.00	<25	ok
1,3,5-trimethylbenzene	106	70-130	ok	103	70-130	ok	2.70	<25	ok
trans-1,4-dichloro-2-butene	109	70-130	ok	105	70-130	ok	4.14	<25	ok
4-chlorotoluene	111	70-130	ok	107	70-130	ok	2.95	<25	ok
tert-butyl-benzene	93.4	70-130	ok	91.2	70-130	ok	2.46	<25	ok
1,2,4-trimethylbenzene	104	70-130	ok	103	70-130	ok	1.32	<25	ok
sec-butyl-benzene	103	70-130	ok	101	70-130	ok	2.53	<25	ok
p-isopropyltoluene	98.1	70-130	ok	96.0	70-130	ok	2.15	<25	ok
1,3-dichlorobenzene	98.4	70-130	ok	95.6	70-130	ok	2.93	<25	ok
1,4-dichlorobenzene	97.8	70-130	ok	96.7	70-130	ok	1.11	<25	ok
n-butylbenzene	112	70-130	ok	109	70-130	ok	3.00	<25	ok
1,2-dichlorobenzene	96.7	70-130	ok	93.7	70-130	ok	3.16	<25	ok
1,2-dibromo-3-chloropropane	94.4	70-130	ok	92.9	70-130	ok	1.55	<25	ok
1,3,5-trichlorobenzene	103	70-130	ok	100	70-130	ok	2.70	<25	ok
1,2,4-trichlorobenzene	108	70-130	ok	106	70-130	ok	2.34	<25	ok
hexachlorobutadiene	105	70-130	ok	103	70-130	ok	2.18	<25	ok
naphthalene	89.9	70-130	ok	88.9	70-130	ok	1.14	<25	ok
1,2,3-trichlorobenzene	96.0	70-130	ok	95.4	70-130	ok	0.63	<25	ok

Surrogates:	**Recovery (%)**	**Acceptance Limits**
DIBROMOFLUOROMETHANE	92.5	70-130
1,2-DICHLOROETHANE-D4	98.8	70-130
TOLUENE-D8	100	70-130
4-BROMOFLUOROBENZENE	102	70-130
1,2-DICHLOROBENZENE-D4	93.7	70-130

Surrogates:	**Recovery (%)**	**Acceptance Limits**	**Verdict**	**Recovery (%)**	**Acceptance Limits**	**Verdict**	**RPD**	**Acceptance Limits**	**Verdict**
DIBROMOFLUOROMETHANE	90.6	70-130	ok	91.9	70-130	ok	1.41	<25	ok
1,2-DICHLOROETHANE-D4	98.6	70-130	ok	97.1	70-130	ok	1.52	<25	ok
TOLUENE-D8	101	70-130	ok	101	70-130	ok	0.07	<25	ok
4-BROMOFLUOROBENZENE	106	70-130	ok	106	70-130	ok	0.18	<25	ok
1,2-DICHLOROBENZENE-D4	103	70-130	ok	100.0	70-130	ok	3.32	<25	ok

Instrument: HP GC/MS "S"

CHAIN-OF-CUSTODY RECORD

W.O. # 0907-00033
(for lab use only)

			ANALYSIS REQUIRED																													
Sample I.D.	Date/Time Sampled	Matrix A=Air S=Soil GW=Ground W. SW=Surface W. WW=Waste W. DW=Drinking W. P=Product Other (specify)	☐ pH ☐ Cond.	GC Methane, Ethane, Ethene	EPA 8260	EPA 8260 – 8010 List (Chlor.)	EPA 8260 – 8021 list	EPA 8021 – 8020 List (BTEX)	EPA 524.2 DW VOCs	EPA 624 WW VOCs	☐ 601 ☐ 602 WW VOCs	EPA 8270 FULL SVOCs	EPA 8270 ☐ PAH ☐ A ☐ BN	EPA 625 WW SVOCs	EPA 8082–PCBs	EPA 8081–Pest	TPH–GC (Mod. 8100)	TPH–GC w/FING.	EPH (MA DEP)	VPH (MA DEP)	Metals ☐ PPM-13 ☐ R-8	MCP 14 Metals (MA)	Metals (List Below)**	TCLP – Specify Below	SPLP – Specify Below	EPA 300 ☐ Cl ☐ SO4	EPA 300 ☐ NO2 ☐ NO3						Total # of Cont.	Note #
TB	7/6/09 8:00	GW			X																												3	
GZ-ML-4 Z-1A	7/6/09 9:10	GW			X																												3	
GZ-ML-4 Z-2	7/6/09 9:40	GW			X																												3	
GZ-ML-4 Z-3A	7/6/09 10:00	GW			X																												3	
GZ-ML-4 BD	7/6/09 10:00	GW			X																												3	
GZ-ML-4 Z-4	7/6/09 10:20	GW			X																												3	
GZ-ML-4 Z-5	7/6/09 10:50	GW			X																												3	
GZ-ML-4 Z-6	7/6/09 11:~~25~~	GW			X																												3	
GZ-ML-4 Z7	7/6/09 12:00	GW			X																												3	
GZ-ML-4 Z-11	7/6/09 13:45	GW			X																													
PRESERVATIVE (Cl - HCl, M=Methanol, N - HNO3, S - H2SO4, Na - NaOH, O - Other)*					Cl																													
CONTAINER TYPE (P-Plastic, G-Glass, V-Vial, T-Teflon, O-Other)*					G																													

RELINQUISHED BY: (AFFILIATION)	DATE/TIME	RECEIVED BY: (AFFILIATION)
	7/6/09 1415	7/6/09
RELINQUISHED BY: (AFFILIATION)	DATE/TIME	RECEIVED BY: (AFFILIATION)
		7/7/09
RELINQUISHED BY: (AFFILIATION)	DATE/TIME	RECEIVED BY: (AFFILIATION)
	7/7/09 1222	7/7/09 1400

NOTES: (Unless otherwise noted, all samples have been refrigerated to 4° C)
*Specify "Other" preservatives and containers types in this space.

PROJECT MANAGER Mike Healy EXT:
Steve Andrus

TURNAROUND TIME: [✓ Standard] Rush___ Days, Approved by ________

LAB USE:
TEMP. OF COOLER 4.9 °C_____ Temp Blank 07109
Cooler Air_____

GZA FILE NO: 03-00 32795.35 TASK NO:__________ P.O. NO.__________

PROJECT Chestnut Phase II Bedrock Exploration

LOCATION Alton RI

COLLECTOR(S) __________ SHEET_____ OF_____

GZA GeoEnvironmental, Inc.
Labaratory Division

106 South Street
Hopkinton, MA 01748
(781) 278-4700
FAX (508) 435-9912

GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748
(781) 278-4700

Laboratory Identification Numbers:
MA and ME: **MA092** NH: **2028**
CT: **PH0579** RI: **LAO00236**
NELAC - NYS DOH: **11063**

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project No.:	**03.0032795.35**
Work Order No.:	**0907-00068**
Date Received:	**07/10/2009**
Date Reported:	**07/17/2009**

SAMPLE INFORMATION

Date Sampled	Matrix	Laboratory ID	Sample ID
07/08/2009	Aqueous	0907-00068 001	GZ-ML-5 Z-1
07/08/2009	Aqueous	0907-00068 002	TB
07/09/2009	Aqueous	0907-00068 003	GZ-ML-5 Z-2
07/09/2009	Aqueous	0907-00068 004	GZ-ML-5 Z-3
07/09/2009	Aqueous	0907-00068 005	GZ-ML-5 Z-4
07/09/2009	Aqueous	0907-00068 006	GZ-ML-5 Z-5
07/09/2009	Aqueous	0907-00068 007	GZ-ML-5 Z-6
07/09/2009	Aqueous	0907-00068 008	GZ-ML-5 Z-7
07/09/2009	Aqueous	0907-00068 009	GZ-ML-5 Z-8

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 07/10/09 via _x_GZA courier, __EC, __FEDEX, or ___hand delivered. The temperature of the __temperature blank/_x_cooler air, was 2.1 degrees C. The temperature requirement for most analyses is above freezing to 6 degrees C. The samples were received intact for all requested analyses.

The chain of custody indicates that the samples, when required, were chemically preserved in accordance with the method they reference.

2. EPA Method 8260 - VOCs

Attach QC 8260 07/16/09 S - Aqueous

GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748
(781) 278-4700

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Data Authorized By: ______________________

NELAC certification, as indicated by the NELAC Lab ID Number, is per analyte. For a complete list of NELAC validated analytes, please contact the laboratory.

Abbreviations:
% R = % Recovery
DF = Dilution Factor
DFS = Dilution Factor Solids
CF = Calculation Factor
DO = Diluted Out

Method Key:
Method 8260: The current version of the method is 8260B.
Method 8270: The current version of the method is 8270D.
Method 6010: The current version of the method is 6010B.

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

Soil data is reported on a dry weight basis unless otherwise specified.
Matrix Spike / Matrix Spike Duplicate sets are performed as per method and are reported at the end of the analytical report if assigned on the Chain of Custody.

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-1**
Sample No.: **001**
Sample Date: **07/08/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/16/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
cis-1,2-Dichloroethene	EPA 8260	5.1	1.0	ug/L	MQS	07/16/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/16/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-1**
Sample No.: **001**
Sample Date: **07/08/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrachloroethene	EPA 8260	1.1	1.0	ug/L	MQS	07/16/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	94.1	70-130	% R	MQS	07/16/2009
***Toluene-D8	EPA 8260	99.0	70-130	% R	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-1**
Sample No.: **001**
Sample Date: **07/08/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	105	70-130	% R	MQS	07/16/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **TB**
Sample No.: **002**
Sample Date: **07/08/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/16/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/16/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **TB**
Sample No.: **002**
Sample Date: **07/08/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrachloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	94.7	70-130	% R	MQS	07/16/2009
***Toluene-D8	EPA 8260	101	70-130	% R	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **TB**
Sample No.: **002**
Sample Date: **07/08/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	105	70-130	% R	MQS	07/16/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-2**
Sample No.: **003**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/16/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
cis-1,2-Dichloroethene	EPA 8260	2.7	1.0	ug/L	MQS	07/16/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/16/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-2**
Sample No.: **003**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrachloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	95.1	70-130	% R	MQS	07/16/2009
***Toluene-D8	EPA 8260	100	70-130	% R	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-2**
Sample No.: **003**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	103	70-130	% R	MQS	07/16/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/16/2009

ANALYTICAL REPORT

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530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-3**
Sample No.: **004**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/16/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
cis-1,2-Dichloroethene	EPA 8260	3.1	1.0	ug/L	MQS	07/16/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/16/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-3**
Sample No.: **004**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrachloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	95.1	70-130	% R	MQS	07/16/2009
***Toluene-D8	EPA 8260	102	70-130	% R	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-3**
Sample No.: **004**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	104	70-130	% R	MQS	07/16/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-4**
Sample No.: **005**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/16/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
cis-1,2-Dichloroethene	EPA 8260	3.8	1.0	ug/L	MQS	07/16/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/16/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-4**
Sample No.: **005**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrachloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	94.9	70-130	% R	MQS	07/16/2009
***Toluene-D8	EPA 8260	99.5	70-130	% R	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-4**
Sample No.: **005**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	105	70-130	% R	MQS	07/16/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-5**
Sample No.: **006**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/16/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
cis-1,2-Dichloroethene	EPA 8260	2.0	1.0	ug/L	MQS	07/16/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/16/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-5**
Sample No.: **006**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrachloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	93.5	70-130	% R	MQS	07/16/2009
***Toluene-D8	EPA 8260	98.7	70-130	% R	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-5**
Sample No.: **006**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	105	70-130	% R	MQS	07/16/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**
Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-6**
Sample No.: **007**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/16/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
cis-1,2-Dichloroethene	EPA 8260	2.1	1.0	ug/L	MQS	07/16/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/16/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**
Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-6**
Sample No.: **007**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrachloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	91.6	70-130	% R	MQS	07/16/2009
***Toluene-D8	EPA 8260	99.8	70-130	% R	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-6**
Sample No.: **007**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	106	70-130	% R	MQS	07/16/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.:	**Phase II Bedrock - Charbert**	Date Received:	**07/10/2009**
Project No.:	**03.0032795.35**	Date Reported:	**07/17/2009**
		Work Order No.:	**0907-00068**

Sample ID: **GZ-ML-5 Z-7** Sample No.: **008**

Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/16/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
cis-1,2-Dichloroethene	EPA 8260	1.7	1.0	ug/L	MQS	07/16/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/16/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-7**
Sample No.: **008**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrachloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	93.9	70-130	% R	MQS	07/16/2009
***Toluene-D8	EPA 8260	99.5	70-130	% R	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-7**
Sample No.: **008**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	101	70-130	% R	MQS	07/16/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-8**
Sample No.: **009**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
VOLATILE ORGANICS	EPA 8260				MQS	07/16/2009
Dichlorodifluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Vinyl Chloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromomethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichlorofluoromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Diethylether	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
Acetone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
1,1-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dichloromethane	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Methyl-Tert-Butyl-Ether	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Butanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
2,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
cis-1,2-Dichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Chloroform	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrahydrofuran	EPA 8260	<10	10	ug/L	MQS	07/16/2009
1,1,1-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Carbon Tetrachloride	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Benzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Trichloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromodichloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromomethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Methyl-2-Pentanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009
cis-1,3-Dichloropropene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Toluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
trans-1,3-Dichloropropene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,1,2-Trichloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Hexanone	EPA 8260	<25	25	ug/L	MQS	07/16/2009

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-8**
Sample No.: **009**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
1,3-Dichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Tetrachloroethene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Dibromochloromethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromoethane (EDB)	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Chlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,1,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Ethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
m&p-Xylene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
o-Xylene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Styrene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromoform	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
Isopropylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,1,2,2-Tetrachloroethane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,3-Trichloropropane	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Bromobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
N-Propylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
2-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3,5-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
4-Chlorotoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
tert-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2,4-Trimethylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
sec-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
p-Isopropyltoluene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,3-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,4-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
n-Butylbenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
1,2-Dibromo-3-Chloropropane	EPA 8260	<5.0	5.0	ug/L	MQS	07/16/2009
1,2,4-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Hexachlorobutadiene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Naphthalene	EPA 8260	<2.0	2.0	ug/L	MQS	07/16/2009
1,2,3-Trichlorobenzene	EPA 8260	<1.0	1.0	ug/L	MQS	07/16/2009
Surrogates:	EPA 8260					
***1,2-Dichloroethane-D4	EPA 8260	94.3	70-130	% R	MQS	07/16/2009
***Toluene-D8	EPA 8260	99.8	70-130	% R	MQS	07/16/2009

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

Steve Andrus / Mike Healy

Project Name.: **Phase II Bedrock - Charbert**
Project No.: **03.0032795.35**

Date Received: **07/10/2009**
Date Reported: **07/17/2009**
Work Order No.: **0907-00068**

Sample ID: **GZ-ML-5 Z-8**
Sample No.: **009**
Sample Date: **07/09/2009**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date
***4-Bromofluorobenzene	EPA 8260	104	70-130	% R	MQS	07/16/2009
Preparation	EPA 5030B	1.0		CF	MQS	07/16/2009

GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748

EPA Method 8260 / 524.2 Aqueous Method Blank (MB) and Laboratory Control Sample/Duplicate (LCS/LCSD) Data

Method Blank			**Laboratory Control Sample**				**Laboratory Control Sample Duplicate**					
Date Analyzed:	**7/16/2009**		**Date Analyzed:**	**7/16/2009**			**7/16/2009**					
Volatile Organics	**Conc. ug/L**	**Acceptance Limit**	**Spike Concentration = 20ug/L**	**% Recovery**	**Acceptance Limits**	**Verdict**	**% Recovery**	**Acceptance Limits**	**Verdict**	**RPD**	**Limit**	**Verdict**
dichlorodifluoromethane	< 1.0	< 1.0	dichlorodifluoromethane	82.5	70-130	ok	84.9	70-130	ok	2.84	<25	ok
chloromethane	< 1.0	< 1.0	chloromethane	107	70-130	ok	111	70-130	ok	3.83	<25	ok
vinyl chloride	< 0.5	< 0.5	vinyl chloride	94.0	80-120	ok	95.0	70-130	ok	1.08	<25	ok
bromomethane	< 1.0	< 1.0	bromomethane	85.0	70-130	ok	84.1	70-130	ok	1.05	<25	ok
chloroethane	< 0.5	< 0.5	chloroethane	89.3	70-130	ok	89.2	70-130	ok	0.04	<25	ok
trichlorofluoromethane	< 1.0	< 1.0	trichlorofluoromethane	74.3	70-130	ok	75.9	70-130	ok	2.12	<25	ok
diethyl ether	< 2.5	< 2.5	diethyl ether	91.4	70-130	ok	95.8	70-130	ok	4.70	<25	ok
acetone	< 13	< 13	acetone	107	70-130	ok	107	70-130	ok	0.50	<25	ok
1,1-dichloroethene	< 0.5	< 0.5	1,1-dichloroethene	88.5	80-120	ok	91.8	70-130	ok	3.68	<25	ok
FREON-113	< 1.0	< 1.0	FREON-113	79.7	70-130	ok	81.3	70-130	ok	1.90	<25	ok
iodomethane	< 0.5	< 0.5	iodomethane	73.7	70-130	ok	74.8	70-130	ok	1.40	<25	ok
carbon disulfide	< 5.0	< 5.0	carbon disulfide	102	70-130	ok	105	70-130	ok	2.96	<25	ok
dichloromethane	< 1.0	< 1.0	dichloromethane	97.4	70-130	ok	101	70-130	ok	3.23	<25	ok
tert-butyl alcohol (TBA)	< 13	< 13	tert-butyl alcohol (TBA)	90.8	70-130	ok	93.2	70-130	ok	2.58	<25	ok
acrylonitrile	< 0.5	< 0.5	acrylonitrile	115	70-130	ok	111	70-130	ok	3.18	<25	ok
methyl-tert-butyl-ether	< 0.5	< 0.5	methyl-tert-butyl-ether	88.4	70-130	ok	92.5	70-130	ok	4.54	<25	ok
trans-1,2-dichloroethene	< 0.5	< 0.5	trans-1,2-dichloroethene	101	70-130	ok	102	70-130	ok	0.53	<25	ok
1,1-dichloroethane	< 0.5	< 0.5	1,1-dichloroethane	96.4	70-130	ok	96.1	70-130	ok	0.34	<25	ok
di-isopropyl ether (DIPE)	< 1.0	< 1.0	di-isopropyl ether (DIPE)	107	70-130	ok	110	70-130	ok	2.27	<25	ok
ethyl tert-butyl ether (EtBE)	< 1.0	< 1.0	ethyl tert-butyl ether (EtBE)	89.3	70-130	ok	91.3	70-130	ok	2.20	<25	ok
vinyl acetate	< 13	< 13	vinyl acetate	93.3	70-130	ok	92.0	70-130	ok	1.37	<25	ok
2-butanone	< 13	< 13	2-butanone	113	70-130	ok	116	70-130	ok	2.51	<25	ok
2,2-dichloropropane	< 0.5	< 0.5	2,2-dichloropropane	89.4	70-130	ok	89.4	70-130	ok	0.00	<25	ok
cis-1,2-dichloroethene	< 0.5	< 0.5	cis-1,2-dichloroethene	91.0	70-130	ok	89.2	70-130	ok	2.03	<25	ok
chloroform	< 0.5	< 0.5	chloroform	83.6	80-120	ok	82.4	70-130	ok	1.43	<25	ok
bromochloromethane	< 0.5	< 0.5	bromochloromethane	79.2	70-130	ok	78.7	70-130	ok	0.60	<25	ok
tetrahydrofuran	< 5.0	< 5.0	tetrahydrofuran	114	70-130	ok	117	70-130	ok	2.33	<25	ok
1,1,1-trichloroethane	< 0.5	< 0.5	1,1,1-trichloroethane	75.8	70-130	ok	77.1	70-130	ok	1.67	<25	ok
1,1-dichloropropene	< 0.5	< 0.5	1,1-dichloropropene	94.2	70-130	ok	92.6	70-130	ok	1.68	<25	ok
carbon tetrachloride	< 0.5	< 0.5	carbon tetrachloride	74.8	70-130	ok	75.1	70-130	ok	0.39	<25	ok
1,2-dichloroethane	< 0.5	< 0.5	1,2-dichloroethane	74.9	70-130	ok	76.2	70-130	ok	1.73	<25	ok
benzene	< 0.5	< 0.5	benzene	107	70-130	ok	107	70-130	ok	0.05	<25	ok
tert-amyl methyl ether (TAME)	< 1.0	< 1.0	tert-amyl methyl ether (TAME)	88.4	70-130	ok	92.5	70-130	ok	4.51	<25	ok
trichloroethene	< 0.5	< 0.5	trichloroethene	78.8	70-130	ok	80.1	70-130	ok	1.57	<25	ok
1,2-dichloropropane	< 0.5	< 0.5	1,2-dichloropropane	107	80-120	ok	108	70-130	ok	1.00	<25	ok
bromodichloromethane	< 0.5	< 0.5	bromodichloromethane	80.7	70-130	ok	81.0	70-130	ok	0.42	<25	ok
1,4-Dioxane	< 50	< 50	1,4-Dioxane	107	70-130	ok	114	70-130	ok	6.80	<25	ok
dibromomethane	< 0.5	< 0.5	dibromomethane	82.4	70-130	ok	82.9	70-130	ok	0.57	<25	ok
4-methyl-2-pentanone	< 13	< 13	4-methyl-2-pentanone	105	70-130	ok	109	70-130	ok	3.42	<25	ok
cis-1,3-dichloropropene	< 0.5	< 0.5	cis-1,3-dichloropropene	95.6	70-130	ok	95.1	70-130	ok	0.46	<25	ok
toluene	< 0.5	< 0.5	toluene	96.6	80-120	ok	97.8	70-130	ok	1.19	<25	ok
trans-1,3-dichloropropene	< 1.0	< 1.0	trans-1,3-dichloropropene	87.3	70-130	ok	89.3	70-130	ok	2.23	<25	ok
1,1,2-trichloroethane	< 0.5	< 0.5	1,1,2-trichloroethane	86.2	70-130	ok	85.8	70-130	ok	0.45	<25	ok
2-hexanone	< 13	< 13	2-hexanone	101	70-130	ok	102	70-130	ok	1.34	<25	ok
1,3-dichloropropane	< 0.5	< 0.5	1,3-dichloropropane	94.2	70-130	ok	95.1	70-130	ok	0.87	<25	ok
tetrachloroethene	< 0.5	< 0.5	tetrachloroethene	76.0	70-130	ok	75.2	70-130	ok	1.01	<25	ok
dibromochloromethane	< 0.5	< 0.5	dibromochloromethane	72.8	70-130	ok	72.2	70-130	ok	0.81	<25	ok
1,2-dibromoethane (EDB)	< 1.0	< 1.0	1,2-dibromoethane (EDB)	82.3	70-130	ok	82.7	70-130	ok	0.49	<25	ok
chlorobenzene	< 0.5	< 0.5	chlorobenzene	78.7	70-130	ok	78.5	70-130	ok	0.23	<25	ok
1,1,1,2-tetrachloroethane	< 0.5	< 0.5	1,1,1,2-tetrachloroethane	70.2	70-130	ok	69.4	70-130	out	1.12	<25	ok
ethylbenzene	< 0.5	< 0.5	ethylbenzene	85.8	80-120	ok	83.7	70-130	ok	2.55	<25	ok
1,1,2,2-tetrachloroethane	< 0.5	< 0.5	1,1,2,2-tetrachloroethane	94.0	70-130	ok	96.6	70-130	ok	2.71	<25	ok
m&p-xylene	< 1.0	< 1.0	m&p-xylene	84.9	70-130	ok	82.5	70-130	ok	2.87	<25	ok
o-xylene	< 0.5	< 0.5	o-xylene	113	70-130	ok	111	70-130	ok	1.58	<25	ok
styrene	< 0.5	< 0.5	styrene	113	70-130	ok	110	70-130	ok	2.30	<25	ok
bromoform	< 1.0	< 1.0	bromoform	102	70-130	ok	99.6	70-130	ok	2.14	<25	ok
isopropylbenzene	< 0.5	< 0.5	isopropylbenzene	125	70-130	ok	124	70-130	ok	0.51	<25	ok
1,2,3-trichloropropane	< 0.5	< 0.5	1,2,3-trichloropropane	105	70-130	ok	104	70-130	ok	1.71	<25	ok
bromobenzene	< 0.5	< 0.5	bromobenzene	96.5	70-130	ok	97.1	70-130	ok	0.58	<25	ok
n-propylbenzene	< 0.5	< 0.5	n-propylbenzene	123	70-130	ok	120	70-130	ok	2.84	<25	ok
2-chlorotoluene	< 0.5	< 0.5	2-chlorotoluene	113	70-130	ok	112	70-130	ok	0.93	<25	ok
1,3,5-trimethylbenzene	< 0.5	< 0.5	1,3,5-trimethylbenzene	107	70-130	ok	106	70-130	ok	1.05	<25	ok
trans-1,4-dichloro-2-butene	< 1.0	< 1.0	trans-1,4-dichloro-2-butene	114	70-130	ok	117	70-130	ok	2.45	<25	ok
4-chlorotoluene	< 0.5	< 0.5	4-chlorotoluene	113	70-130	ok	113	70-130	ok	0.45	<25	ok
tert-butyl-benzene	< 0.5	< 0.5	tert-butyl-benzene	94.0	70-130	ok	91.6	70-130	ok	2.55	<25	ok
1,2,4-trimethylbenzene	< 0.5	< 0.5	1,2,4-trimethylbenzene	105	70-130	ok	105	70-130	ok	0.19	<25	ok
sec-butyl-benzene	< 0.5	< 0.5	sec-butyl-benzene	106	70-130	ok	104	70-130	ok	1.26	<25	ok
p-isopropyltoluene	< 0.5	< 0.5	p-isopropyltoluene	97.3	70-130	ok	96.8	70-130	ok	0.51	<25	ok
1,3-dichlorobenzene	< 0.5	< 0.5	1,3-dichlorobenzene	97.2	70-130	ok	97.5	70-130	ok	0.30	<25	ok
1,4-dichlorobenzene	< 0.5	< 0.5	1,4-dichlorobenzene	97.6	70-130	ok	97.6	70-130	ok	0.04	<25	ok
n-butylbenzene	< 0.5	< 0.5	n-butylbenzene	117	70-130	ok	114	70-130	ok	2.20	<25	ok
1,2-dichlorobenzene	< 0.5	< 0.5	1,2-dichlorobenzene	94.4	70-130	ok	95.3	70-130	ok	0.90	<25	ok
1,2-dibromo-3-chloropropane	< 2.5	< 2.5	1,2-dibromo-3-chloropropane	97.7	70-130	ok	99.9	70-130	ok	2.23	<25	ok
1,3,5-trichlorobenzene	< 0.5	< 0.5	1,3,5-trichlorobenzene	104	70-130	ok	106	70-130	ok	2.56	<25	ok
1,2,4-trichlorobenzene	< 0.5	< 0.5	1,2,4-trichlorobenzene	106	70-130	ok	109	70-130	ok	3.23	<25	ok
hexachlorobutadiene	< 0.5	< 0.5	hexachlorobutadiene	106	70-130	ok	105	70-130	ok	1.07	<25	ok
naphthalene	< 1.0	< 1.0	naphthalene	87.4	70-130	ok	92.0	70-130	ok	5.15	<25	ok
1,2,3-trichlorobenzene	< 0.5	< 0.5	1,2,3-trichlorobenzene	97.3	70-130	ok	98.6	70-130	ok	1.37	<25	ok

Surrogates:	**Recovery (%)**	**Acceptance Limits**	**Surrogates:**	**Recovery (%)**	**Acceptance Limits**	**Verdict**	**Recovery (%)**	**Acceptance Limits**	**Verdict**	**RPD**	**Acceptance Limits**	**Verdict**
DIBROMOFLUOROMETHANE	83.9	70-130	DIBROMOFLUOROMETHANE	85.7	70-130	ok	86.5	70-130	ok	0.99	<25	ok
1,2-DICHLOROETHANE-D4	91.7	70-130	1,2-DICHLOROETHANE-D4	97.5	70-130	ok	91.9	70-130	ok	5.93	<25	ok
TOLUENE-D8	96.6	70-130	TOLUENE-D8	97.6	70-130	ok	97.7	70-130	ok	0.04	<25	ok
4-BROMOFLUOROBENZENE	103	70-130	4-BROMOFLUOROBENZENE	107	70-130	ok	107	70-130	ok	0.52	<25	ok
1,2-DICHLOROBENZENE-D4	92.6	70-130	1,2-DICHLOROBENZENE-D4	99.6	70-130	ok	100.0	70-130	ok	0.38	<25	ok

Instrument: HP GC/MS "S"

CHAIN-OF-CUSTODY RECORD

W.O. # 0907 - 00068
(for lab use only)

ANALYSIS REQUIRED

Sample I.D.	Date/Time Sampled	Matrix A=Air S=Soil GW=Ground W. SW=Surface W. WW=Waste W. DW=Drinking W. P=Product Other (specify)	☐ pH ☐ Cond.	GC Methane, Ethane, Ethene	EPA 8260	EPA 8260 – 8010 List (Chlor.)	EPA 8260 – 8021 list	EPA 8021 – 8020 List (BTEX)	EPA 524.2 DW VOCs	EPA 624 WW VOCs	☐ 601 ☐ 602 WW VOCs	EPA 8270 FULL SVOCs	EPA 8270 ☐ PAH ☐ A ☐ BN	EPA 625 WW SVOCs	EPA 8082–PCBs	EPA 8081–Pest	TPH–GC (Mod. 8100)	TPH–GC w/FING.	EPH (MA DEP)	VPH (MA DEP)	Metals ☐ PPM-13 ☐ R-8	MCP 14 Metals (MA)	Metals (List Below)**	TCLP - Specify Below	SPLP - Specify Below	EPA 300 ☐ Cl ☐ SO4	EPA 300 ☐ NO2 ☐ NO3						Total # of Cont.	Note #
GZ-ML-5 Z-1	7/8/09 14:50				X																												3	
TB	7/8/09 14:00				X																												3	
GZ-ML-5 Z-2	7/9/09 8:00				X																												3	
GZ-ML-5 Z-3	7/9/09 8:25				X																												3	
GZ-ML-5 Z-4	7/9/09 8:50				X																												3	
GZ-ML-5 Z-5	7/9/09 9:10				X																												3	
GZ-ML-5 Z-6	7/9/09 9:35				X																												3	
GZ-ML-5 Z-7	7/9/09 10:10				X																												3	
GZ-ML-5 Z-8	7/9/09 11:20				X																												3	
PRESERVATIVE (Cl - HCl, M=Methanol, N - HNO3, S - H2SO4, Na - NaOH, O - Other)*					Cl																													
CONTAINER TYPE (P-Plastic, G-Glass, V-Vial, T-Teflon, O-Other)*					G																													

RELINQUISHED BY: (AFFILIATION) DATE/TIME RECEIVED BY: (AFFILIATION)
Mind 7/10/09

RELINQUISHED BY: (AFFILIATION) DATE/TIME RECEIVED BY: (AFFILIATION)
Mind 7/10/09 1215 7/10/09 1520

RELINQUISHED BY: (AFFILIATION) DATE/TIME RECEIVED BY: (AFFILIATION)

NOTES: (Unless otherwise noted, all samples have been refrigerated to 4° C)
*Specify "Other" preservatives and containers types in this space.

PROJECT MANAGER: Mike Healey EXT:
Steve Andrus

GZA GEOENVIRONMENTAL, INC.
Labaratory Division

106 South Street
Hopkinton, MA 01748
(781) 278-4700
FAX (508) 435-9912

TURNAROUND TIME: [✓ Standard] Rush___ Days, Approved by ___________

LAB USE:
TEMP. OF COOLER 2.1 °C
Temp Blank____
Cooler Air 090

7/10

GZA FILE NO: 03.0032795.35 TASK NO:__________ P.O. NO.__________

PROJECT Charlest Phase II Bedrock

LOCATION Alton, Rhode Island

COLLECTOR(S)__________ SHEET 1 OF ______

ATTACHMENT D

SOLINST WATERLOO SYSTEM INFORMATION PACKET

Waterloo Multilevel Groundwater Monitoring System*

The Waterloo System is used to obtain groundwater samples, hydraulic head measurements and permeability measurements from many discretely isolated zones in a single borehole.

The Waterloo System originated with Dr. John Cherry at the Groundwater Institute of the University of Waterloo in 1984. Ongoing development of the System by Solinst has taken place on a continuous basis since then, with encouragement and suggestions from Dr. Cherry.

Detailed 3-D Data

When a number of Waterloo Systems are used at a site, they allow detailed three-dimensional groundwater information to be obtained at a reasonable cost. Fewer drilled holes are an advantage and monitoring times are reduced.

The simple modular system is customized for the needs of each project. This allows monitoring zones to be placed at desired depths using options suitable for either bedrock, overburden or combination applications and with either permanent or removable systems.

Discrete zone monitoring is the only means of obtaining accurate data for site interpretation and assessments. Transects of multilevels provide the detailed data necessary to calculate mass flux and conservatively assess risk to receptors.

*Manufactured
under exclusive license
from the University of Waterloo.
Canadian Patent #1232836
U.S. Patent #5048605 & International Patents.

Advantages

- Detailed 3D data of flow and concentrations
- Data integrity
- Reduced project costs
- Purging and sampling times reduced
- Fewer drilled holes
- Reduced site disturbance
- Variety of monitoring options

Detailed 3-D Data

- **Overburden or Bedrock Installations**
  - Allow monitoring of multiple zones in any geologic setting
- **Permanent Waterloo Packers**
  - Excellent in bedrock or cased holes
  - Engineered for permanent seals
- **Removable Hydraulic Packers**
  - Reuse at new zones or locations
  - Easy decommissioning

Waterloo System

Why Multilevels

Superior quality of data is obtained when monitoring a series of discrete isolated intervals at various depths in a single borehole. The detailed information provided by Multilevels in the form of horizontal and vertical flow, in conjunction with discrete zone sampling for contaminants, is ideal for accurate site assessments.

- **Biases with Long Screened Wells**
  - Contaminant mixing over long screens masks vertical variations resulting in underestimating the aerial extent of plumes and diluting the true concentration of contaminants.
  - Ambient vertical flow within the well has potential to transmit contaminants to previously isolated zones.
- **Detailed Multilevel Data – Advantages**
  - Transects of Multilevels across a groundwater flow path provide the best data to use for Mass Flux calculations. This has proven to be an important tool for site assessments that require realistic estimates of maximum contaminant concentration/risk to receptors.
  - Optimize performance of in-situ remediation by using detailed 3-D data from a series of Multilevels. Subsequently, transects can be used to evaluate the success of the chosen remediation option and any improvements.
- **Economics**
  - Proven cost reductions for drilling and sediment disposal
  - Savings, both in field personnel time and disposal costs, when purge volumes are reduced. The discrete interval that a Multilevel port encompasses allows for smaller purge volumes, rapid responses to level changes and is ideal for low flow sampling techniques.

The Waterloo System

The System uses modular components which form a sealed casing string of various casing lengths, packers, ports, a base plug and a surface manifold. This allows accurate placement of ports at precise monitoring zones.

Monitoring tubes attached to the stem of each port individually connect that monitoring zone to the surface. The standard system is built on 2" (50 mm) Sch. 80 PVC to fit 3"- 4" (75 - 100 mm) boreholes and uses 3 ft. (915 mm) long packers. Stainless steel components, custom packer materials and sizes, Teflon® tubing are available.

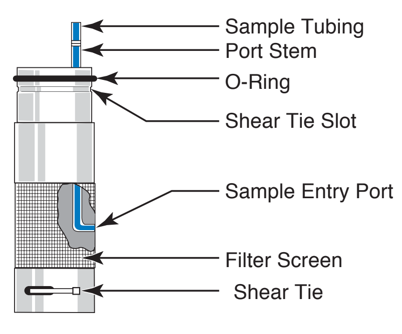
Manifold

O-Ring Joints with Shear Wire

Ports

Monitoring ports are constructed from 316 stainless steel. Ports are isolated by packers at each desired monitoring zone and are individually connected to the surface manifold with narrow diameter tubing. Thus formation water enters the port, passes into the stem, up into the monitoring tube attached to the stem, to its static level.

A sampling pump or pressure transducer may be dedicated to each monitoring zone by attachment to the port stem. Dual stem ports are available to allow both sampling and hydraulic head measurements from the same port. Alternatively, the monitoring tubes may be left open to allow sampling and hydraulic head measurements with portable equipment. For installations in silty deposits there are special sampling ports with extra screening to prevent silt entry into the port.



Stainless Steel Ports

Joints*

The patented method of joining components of the Waterloo System uses a nylon shear wire and an o-ring. This gives reliable, leakproof joints so that the core of the Waterloo casing string is isolated from external formation waters. Groundwater is only accessible via the port stems and attached monitoring equipment. This water-tight seal also prevents contact between packer inflation water inside the casing and the formation water outside the casing.

Manifolds

The manifold completes the system at surface. It organizes, identifies, and coordinates the tubes and/or cables from each monitoring zone.

The manifold allows connection to each transducer in turn, and a simple, one-step connection for operation of pumps. When dedicated pumps are selected, it allows individual zones to be purged separately, or purging of many zones simultaneously to reduce field times.

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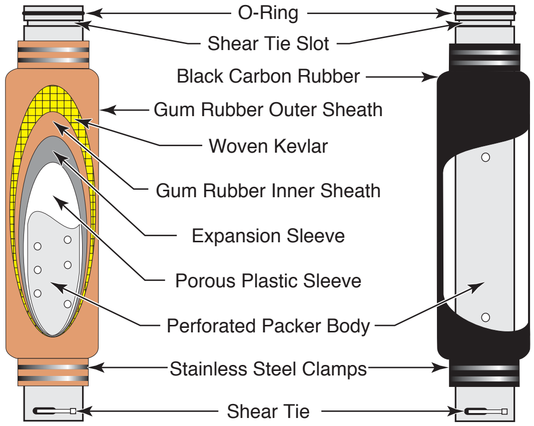
* US Patent 5,255,945 ®Teflon is a registered trade-mark of the Dupont Corporation.

Permanent Waterloo Packers

Permanent packers ensure long term integrity of seals in cored bedrock holes and cased wells. They use a water activated expansion sleeve fitted over the perforated packer body. A layer of porous plastic distributes water evenly to the packer expansion material. A Rubber/Kevlar/Rubber sheath envelops the expansion material. The Kevlar layer provides strength to bridge across large fissures. The pliant gum rubber forms an effective seal against the borehole wall.

Water is added to the inside of the sealed casing string after installation. The water passes through the packer body into the expansion sleeve, causing the material to expand. Thus an engineered seal is permanently formed against the borehole wall.



Permanent Waterloo Packer

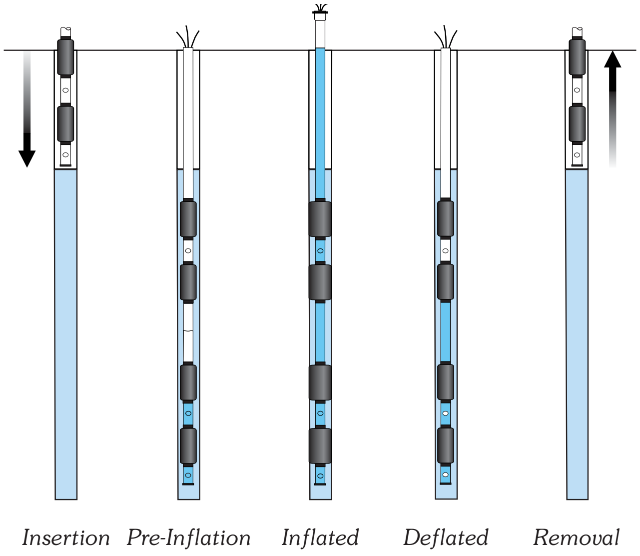
Removable Hydraulic Packer

Permanent Waterloo Packer

Overburden Applications

Waterloo Multilevel Systems can be used to monitor multiple zones within unconsolidated formations, as well as in bedrock. There are three methods of System installation:

- Within hollow stem augers or temporary casing. Special screened ports are used and flowing sand formations are allowed to collapse around the System.
- Within hollow stem augers or temporary casing using standard tremie methods to place sand around the ports and bentonite seals in the annular space between the monitoring zones, as the augers or temporary casing is lifted.
- Within a cased and screened well, using packers to seal zones.



Removable Hydraulic Packers

These packers allow reuse of the system at other zones or new locations. They facilitate system maintenance and borehole decommissioning, simplify grouting of the hole and allow parts of the system to be reused.

Removable packers are made with black carbon rubber and are inflated hydraulically or pneumatically by pressurizing the interior of the Waterloo System casing string. Packers can be constructed to suit various diameters of holes.

Installation within Wellscreen/Casing

A permanent 3" or 4" casing and screen string can be installed by a drilling contractor using typical sand and bentonite placement methods. Then a Waterloo System with either permanent or removable packers can be installed within the screen and casing string, as in a bedrock borehole.

Installs Quickly

Installation of the Waterloo System is quick and easy. Starting with the base plug and lowermost sections, the components are joined together in the order required. As each new port is put into position a new monitoring tube, dedicated pump and/or transducer is connected to it. Successive components are threaded over these tubes, building the casing string, until the System is complete.

Typically, installations are completed in a day, using a 3-4 member team. Depending on the depth, a drill rig may be required. Solinst can provide a trained technician to assist with installation.

System Flexibility

The Waterloo System is extremely flexible to your design criteria. Each System is customized to suit monitoring needs, site conditions and budget constraints:

- Removable or permanent system
- Bedrock or overburden applications for groundwater or vadose zone monitoring

Packers and ports can be accurately placed to monitor each zone of interest.

Materials

For particular applications specific materials may be chosen. These may include stainless steel casing and packer bodies, and stainless steel, nylon or Teflon® tubing.

Borehole Size

Waterloo or removable packers are designed for use in 3"- 4” boreholes (75 - 100 mm). Systems can be installed in larger boreholes using:

- Placement of sand and bentonite to isolate parts around a Waterloo casing string with no packers.
- 3-4” screen and casing, installed within a larger hole, completed by installing a Waterloo System with packers.

Number of Monitoring Zones/Hole

The maximum number of monitoring zones for a System is determined by the number of tubes and/or cables that will fit inside the casing string. This number is dependent on the monitoring options chosen. Systems can be designed to monitor from 2 to as many as 24 zones.

Standard 2” (50mm) Waterloo System	
Site Dependent Monitoring Options	**# Zones**
Dedicated Pumps and Transducers	8
Open Tubes Only (varies with tube size)	15
Dedicated Pumps and Open Tubes	6
Dedicated Pumps Only	12
Dedicated Pressure Transducers Only	24

Using core logs to identify placement of Ports and Packers

Multi-Purge Manifold with Transducers and Dedicated Pumps for four zone monitoring

Monitoring Options

- **Dedicated sampling pumps and/or pressure transducers**

  Each monitoring port may be fitted with a dedicated sampling pump and/or pressure transducer. This maximizes the speed with which each data set can be obtained, and avoids the need to decontaminate and repeatedly lower portable devices. The sampling pumps are suitable for sampling many types of contaminants, including VOCs.

  Purge volumes are very small. With dedicated pumps all zones can be purged simultaneously. Ports with two stems allows a dedicated pump and a transducer to be placed at exactly the same level.

- **Open tubes**

  The most basic version uses open tubes attached to each port. This option allows monitoring with a portable sampler and a narrow diameter Water Level Meter. This provides a very economical and flexible multilevel monitoring device.

- **Mix of open tubes and dedicated equipment**

  A third option is to choose a mix of open tubes and dedicated equipment in different zones. This method combines the advantages of less expensive portable equipment for shallower zones (i.e. 100 ft., 30 m) and the more time efficient dedicated equipment for deeper zones.

- **Water level monitoring only**

  The System can comprise pressure transducers only, for pressure monitoring in up to 24 discrete zones.

Dedicated Sampling Pumps

Dedicated equipment reduces the time and effort required to obtain data, as equipment is not lowered down the borehole and purge volumes are reduced. It gives significant cost savings and avoids cross contamination.

For long term or frequent sampling Waterloo Systems most commonly use the gas drive, Solinst Double Valve Pumps with stainless steel and Teflon® valves. A pump is connected directly to the stem of each port and dual line polyethylene or Teflon® tubing connects the pump to the wellhead manifold.

Both automatic and manual pump control units are simple to use. They have quick-connect couplings with only a single connection to the manifold required. Samples from all levels are easily and rapidly obtained. Purging from some or all levels simultaneously is accommodated by the multi-purge feature of the manifold.

Collecting a Sample from a Dedicated DVP

Low Flow Purging and Sampling

Purge volumes are very small due to the small annular space and tubing diameters used in the system. Consequently sampling is rapid, even though flows are low, especially with dedicated pumps when all zones can be purged simultaneously.

Dedicated Bladder and Double Valve Pumps, (DVP), as well as a portable DVP are ideal for use when low flow sampling and purging techniques are desired.

Portable Micro Double Valve Pump

The Micro Double Valve Pump (Micro DVP) provides high quality samples, uses coaxial Teflon® tubing, and is small enough to fit in 1/2" (13 mm) ID tubing. The unique combination of flexibility and size make the pump ideal for sampling at depth in small flexible tubes.

Model 408M Double Valve Pump

Taking pressure measurements with Model 404 Geokon Vibrating Wire Readout

Dedicated Transducers

Dedicated pressure transducers allow rapid and accurate measurement of temperature and total water pressure. Unless static water levels are shallow, transducers are the preferred method of water level measurement, both from an efficiency and an accuracy point of view.

The transducers chosen for use in the Waterloo System are vibrating wire transducers, which are very accurate and rugged. They have superior long term operation with minimal drift over time. They can be read with a manual readout, or with a datalogger which can provide remote, unattended monitoring and telemetry, if desired. Transducers are available with pressure ranges from 50 psi to 500 psi. (7.25 kPa to 72.5 kPa).

Model 102, P1 Water Level Meter

Dedicated Sampling Pump & Transducer

Portable Monitoring Equipment

Water level measurements can be made in Waterloo ports fitted with an open tube using the narrow, Solinst Model 102, P1 Water Level Meter. It has a weighted, flexible probe, 1/4" OD by 1.5" long (6.35mm x 38 mm).

Sampling may be performed in open tubes using a Mini Inertial Pump, Micro Double Valve Pump, or a Peristaltic Pump.

® *Teflon is a registered trade-mark of the Dupont Corporation.*

Designing Your System

The options chosen for each System will be site and application specific.

Each design is dependent on:

- Zones of interest
- Geology of the site
- Monitoring methods preferred
- Cost considerations
- Borehole depth, diameter and type

Refer to the drawings below, then select the type of installation that suits your project. Consider the size and depth of each borehole, and whether casing is to be present. Decide if permanent or temporary Systems are preferred, the number of zones and depth of each zone per System, the monitoring options preferred, and any special materials required.

During development of your plans, the Solinst technical staff will be pleased to help evaluate the options and customize a System that best suits your needs.

Projects

Waterloo Systems have been used to monitor:

- Salt water intrusion
- Industrial cleanups
- Pipeline leaks
- Dam leakage/rehabilitation
- Contaminant identification/cleanup
- DNAPL & LNAPL spill sites
- Waste disposals/landfills
- Soil gas surveys

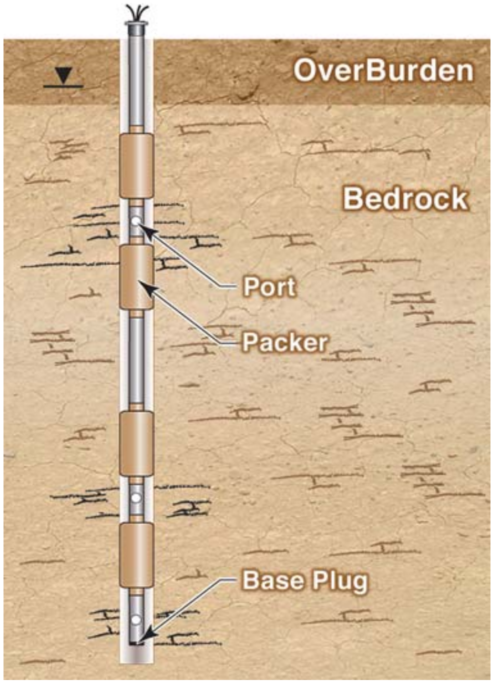
Applications

The Waterloo System has been specified by various industries and consultants for numerous sites across the United States, Canada and overseas. Waterloo Systems have been specified and approved at several sites with Superfund or RCRA designations and in each of the U.S. E.P.A. regions.

The System has been used for:

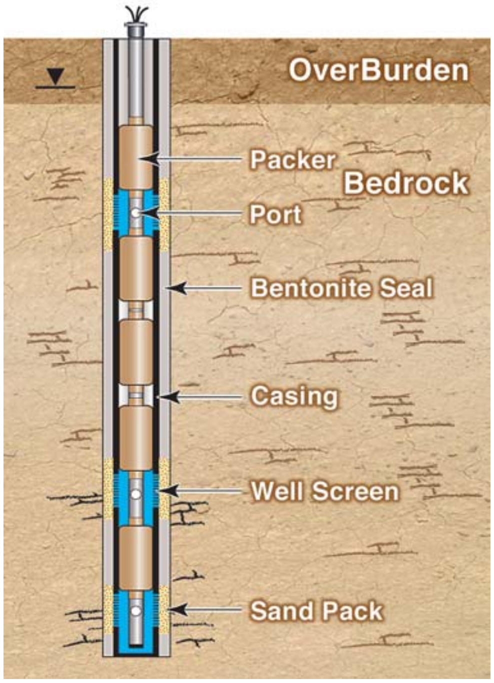
- defining groundwater flow patterns
- performance monitoring of pump and treat systems
- identification and determination of spatial distribution of contaminants
- early warning system/detection of migrating contaminants

Bedrock



Permanent or Removable Packers in Cored Hole

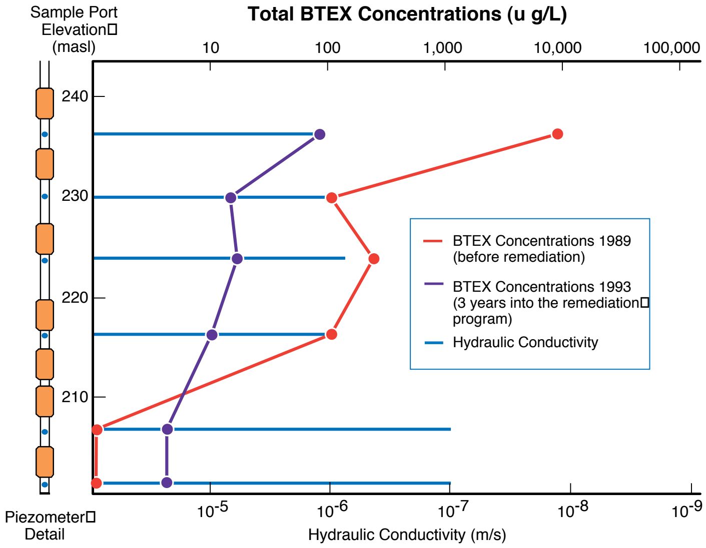
Bedrock and/or Overburden



Permanent or Removable Packers in Casing or Well Screen

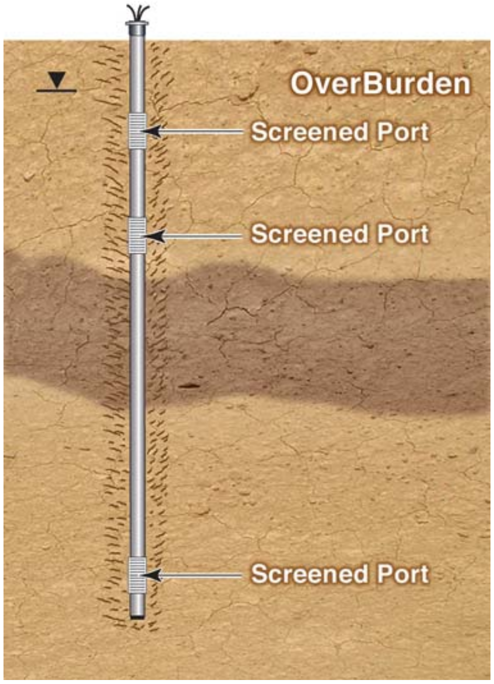
Reliable Data

The effectiveness of the Waterloo System is proven by its ability to accurately and repeatedly obtain pressure and groundwater chemistry data from several distinct zones in a single borehole. The data set below shows a decrease in Total BTEX contamination due to ongoing pump and treat operations at an oil pipeline leak.



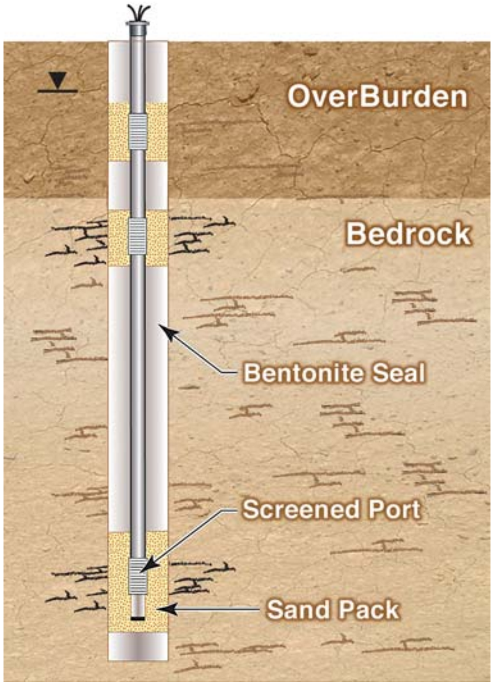
Underground oil pipeline leak assessment. Three 150 ft. (45m) installations. Two point rising head permeability tests were conducted in each interval of the Multilevel System. (See diagram showing contaminant distribution at left.)

Overburden



Direct Burial: Formation Collapse with Screened Ports

Bedrock and/or Overburden

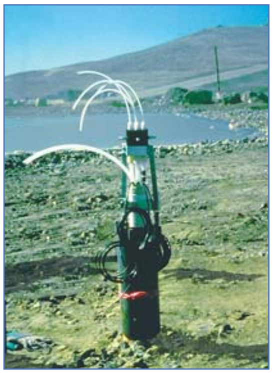


Direct Placement: Sand and Bentonite with Screened Ports

Waterloo Systems comprised entirely of stainless steel casing, packers and ports with Teflon-lined tubing were used to monitor contaminant flow in this bedrock application.

Contaminant investigation at a U.S. Air Force Base. Waterloo Systems installed to 700 ft. in overburden using screened and cased wells. Up to 6 zones per hole with dedicated pumps and transducers.

Detailed investigation of PCE delineation in carbonate bedrock. A cost analysis of the 14 Waterloo Systems compared with nested piezometers indicated savings both on the capital costs and on the on-going monitoring.



Landfill site over fractured granite, monitored with five Waterloo Systems. Each System comprised of dedicated Double Valve Pumps and Pressure Transducers in 4-6 intervals to depths of 275 feet (84m). The Multi-Purge Manifold allowed the monitoring of 21 zones to be completed in less than 2 days.

An EPA regulated site in Northeast, USA. This multilevel array allowed a sampling team to purge and sample from 40 monitoring zones across 10 borehole locations in just 4 days. These Waterloo Systems were installed in overburden using preinstalled casing.

750ft. (230m) Waterloo System installation for a deep tunnel assessment study. Three zones monitored with dedicated Double-Valve Pumps and pressure transducers. Picture shows technician obtaining pressure measurements and groundwater samples with portable readout and pump control unit.

An investigation of hydraulic properties beneath a large waste site. Waterloo Multilevel Systems were chosen to allow water quality sampling and to help determine the zones of highest permeability within the aquifer.

A large Midwestern USA research project studying agricultural effects on water quality. 22 Waterloo System installations with 3-4 zones each were installed to depths of 24-60 ft. (7.3-18.3 m) in overburden. Dedicated Double Valve Pumps and Peristaltic Pumps were used.

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