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INTERIM GROUNDWATER MONITORING REPORT

Hattiesburg, Mississippi

PREPARED FOR:

Hercules, Incorporated

JANUARY 2003

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1.0 INTRODUCTION

Eco-Systems, Inc (Eco-Systems) has been retained by Hercules, Incorporated (Hercules) to conduct site investigations at the Hercules plant in Hattiesburg, Mississippi. The site location is shown on Figure 1. This report is an interim report on progress to date in conducting site investigations in accordance with *Hercules' Site Investigation Work Plan* (Eco-Systems, February 1999) and additional comments of the Mississippi Department of Environmental Quality (MDEQ) approval letter dated April 5, 1999. In addition, the locations of MW-8 and MW-9 were changed in accordance with the MDEQ approval on February 1, 2000 based on information contained in Eco-Systems' submittal on December 27, 1999.

The work described in the approved work plan centered on efforts to determine whether the pesticide Dioxathion was present in site soil and groundwater. The work plan included installation of 5 additional groundwater monitoring wells, MW-7, MW-8, MW-9, MW-10, and MW-11, to provide groundwater quality information near the former Dioxathion production area and near former wastewater sludge pits. The work also included installation of 14 temporary piezometers and 4 staff gauges. The piezometers and staff gauges were installed to provide hydrogeologic information in the uppermost saturated interval and to establish the relationship, if any, of the uppermost saturated interval to Green's Creek. Monitoring well and piezometer locations are shown on Figure 2. The staff gauges have been washed out, or otherwise destroyed, between the time of their installation and the present.

Installation of the temporary piezometers was conducted in April/May 1999. Installation of monitoring wells was conducted in February 2000. However, prior to sampling the additional monitoring wells, questions arose regarding analytical methods for Dioxathion and the quality of Dioxathion for use as a laboratory standard. In the ensuing months, Hercules, in conjunction with MDEQ's consultant, Mississippi State University (MSU) developed analytical protocols for soil and groundwater (Appendix A). Since the quality of available analytical standards was questionable, Hercules contracted with Sigma Aldritch to synthesize Dioxathion standards. In August 2002 Dioxathion had been manufactured of a suitable quality to be used as laboratory standard, and Hercules and the MDEQ had agreed to a laboratory protocol. In October 2002, groundwater samples were collected from four wells (MW-1, MW-4, MW-5, and MW-6), and those samples were analyzed by Bonner Analytical and Testing Company (BATCO) and the Mississippi State Chemical Laboratory (MSCL) to test the newly established laboratory protocol. Comparison of the results from the two laboratories was deemed acceptable by MDEQ and the site investigation was resumed.

On December 4 and 5, 2002, groundwater samples were collected from the eleven site monitoring wells, and those samples analyzed for Dioxathion. At the request of the MDEQ, samples from the wells installed in 2000 (MW-7 through MW-11) were also analyzed for volatile organic compounds (VOC) and semi-volatile organic compounds

(SVOC). Due to the extended time required to implement all phases of the work plan and the number of alterations to the original work plan that have occurred, periodic documentation of investigative efforts at the site was deemed appropriate. Boring logs and well construction diagrams for the additional monitoring wells and the temporary piezometers were provided to the MDEQ in a letter report dated August 28, 2002 and are also included in Appendix B. This *Interim Groundwater Monitoring* report has been prepared to document the results of the analytical protocol sample analysis and advise the MDEQ of the results of the groundwater monitoring conducted in December 2002.

2.0 FIELD ACTIVITIES

Groundwater sample collection was conducted in accordance with the work plan and the EPA Region IV's Standard Operating Procedures and Quality Assurance Manual (November 2001). Groundwater samples were collected using a peristaltic pump and Teflon® tubing. Low flow/low stress sampling techniques were utilized for wells where there was sufficient recharge. If there was insufficient recharge for low flow/low stress sampling techniques to be utilized, traditional volume-based sampling techniques were used. Copies of the sample collection logs for both the protocol sampling and the groundwater monitoring are included in Appendix C.

Groundwater samples were collected directly from the discharge tubing into containers provided by BATCO. A BATCO representative was on site during sample collection and samples to be analyzed by BATCO were delivered directly to the BATCO site representative. Samples to be analyzed by the MSCL were placed in an iced cooler and shipped via overnight courier. Chain-of-custody documentation was maintained for all samples collected.

2.1 PROTOCOL SAMPLING

Groundwater samples were collected to evaluate the Dioxathion analytical protocol on October 14, 2002 from monitoring wells MW-1, MW-4, and MW-5. Quality assurance/ quality control (QA/QC) samples were also collected. The QA/QC samples included a rinsate blank, a matrix spike and a matrix spike duplicate sample. All samples were analyzed for Dioxathion by both BATCO and MSCL. At the request of the MDEQ, samples were also collected from monitoring wells MW-5 and MW-6 for VOC and SVOC analyses. Samples submitted for VOC and SVOC analysis were analyzed by BATCO. Representatives of the MDEQ were on site during protocol sample collection but did not elect to split samples.

2.2 GROUNDWATER MONITORING

On December 4 and 5, 2002, Eco-Systems collected groundwater samples from the eleven groundwater monitoring wells at the site. As with the protocol sampling, QA/QC samples were also collected and include rinsate blank, trip blank, blind duplicate, matrix spike and matrix spike duplicate samples. At the request of the MDEQ, the sample collected from MW-4 was analyzed for VOCs and samples collected from monitoring wells MW-7, MW-8, MW-9, MW-10 and MW-11 were analyzed for VOCs and SVOCs. Samples were delivered to the BATCO site representative for analysis. Representatives of the MDEQ were on site December 4, 2002 and collected a split sample from monitoring well MW-11.

2.3 GROUNDWATER ELEVATIONS

Water level information was collected from the existing monitoring wells and piezometers on December 4, 2002. As mentioned in Section 1.0, staff gauges installed in Green's Creek in 1999 have been destroyed. Depth to water measurements were subtracted from well casing elevations to determine groundwater elevations. Groundwater elevations are summarized in Table 1. A potentiometric surface map based on the December 4, 2002 groundwater elevations has been prepared and is included as Figure 2.

Groundwater in the uppermost, saturated interval beneath the site tends to mimic surface topography. In the active portions of the plant operations, which are located in the southeastern portion of the site, the potentiometric surface indicates the presence of a southwest to northeastward trending divide. The potentiometric surface map indicates that groundwater northwest of the divide would tend to move northwestward towards Green's Creek. Likewise, groundwater southeast of the divide would tend to move southeastward. On the north side of Green's Creek, the potentiometric surface indicates that groundwater in the uppermost, saturated interval moves generally southward towards Green's Creek.

3.0 LABORATORY ANALYTICAL RESULTS

Samples were analyzed for Dioxathion according to the analytical protocol established by Hercules and approved by the MDEQ. Samples submitted for VOC and SVOC analysis were analyzed according to U.S. EPA SW-846 methods 8260 and 8270, respectively, for the target compound list (TCL) compounds. Analytical data for detected parameters are summarized in Table 2 and Table 3. Copies of the analytical reports are included in Appendix D.

The following sections are intended to provide a brief overview of the laboratory analytical results, and not an exhaustive discussion of the analytical data.

3.1 PROTOCOL SAMPLING

Samples collected for evaluation of the Dioxathion protocol were analyzed for cis-Dioxathion, trans-Dioxathion, and Dioxenethion. Analysis of the protocol samples by MSCL was conducted by both high performance liquid chromatography/mass spectrometry (HPLC/MS) methods and ultraviolet (HPLC/UV) methods. Analysis of the protocol samples by BATCO was conducted by Gas Chromatography/Mass Spectrometry (GC/MS). The results of the Dioxathion analyses are shown in Table 2.

VOCs and SVOCs were not detected in the groundwater samples collected from MW-5 and MW-6.

3.2 GROUNDWATER MONITORING

Samples collected during the groundwater monitoring event were analyzed using GC/MS methods by BATCO. Concentrations of cis-Dioxathion were detected in the groundwater samples collected from monitoring wells MW-4 and MW-9. Concentrations of trans-Dioxathion were detected in the groundwater sample collected from monitoring well MW-8. Concentrations of total Dioxathion (i.e. the sum of the concentrations of cis-Dioxathion and trans-Dioxathion) above the target remediation goal (TRG) of 54.8 were not detected in the groundwater samples collected from the site. The TRGs are found in the Tier 1 Target Remedial Goal Table of the Final Regulations Governing Brownfields Voluntary Cleanup And Redevelopment In Mississippi, published by the Mississippi Commission on Environmental Quality and adopted May 1999 and revised March 2002.

Concentrations of Dioxenethion were detected in the groundwater samples collected from monitoring wells MW-4, MW-6, MW-7, MW-8, MW-9, and MW-11. There is not a TRG for Dioxenethion.

Neither Dioxathion isomers nor Dioxenethion were detected in the groundwater samples collected from MW-1, MW-2, MW-3, MW-5, and MW-10.

Eight VOCs were detected in the groundwater sample collected from MW-4. Four of the eight VOCs, benzene, carbon tetrachloride, chloroethane, and chloromethane were detected at concentrations exceeding their respective TRGs.

Twenty-eight VOCs were detected in the groundwater sample collected from MW-8. Fourteen of the 28 VOCs were detected at concentrations above their respective TRGs.

Three VOCs were detected in the groundwater sample collected from MW-9. One of the three VOCs detected in the sample collected from MW-9 was above its TRG.

Two VOCs were detected in the groundwater sample collected from MW-11. One of the two VOCs detected in the groundwater sample collected from MW-11 was above the applicable TRG.

VOCs were not detected in the groundwater samples collected from monitoring wells MW-7 and MW-10.

One SVOC was detected in the groundwater sample collected from MW-8 at a concentration less than its TRG. SVOC were not detected in the groundwater samples collected from MW-7, MW-9, MW-10, and MW-11.

4.0 FINDINGS AND CONCLUSIONS

The findings and conclusions of this report are based on, or reasonably ascertainable from, published information, field observations, and the results of specific laboratory analyses.

- Groundwater beneath the site tends to mimic surface topography. In the active portions of the plant operations, the potentiometric surface indicates the presence of a southwest to northeast trending divide. Groundwater northwest of the divide would tend to move northwestward towards Green's Creek. Groundwater southeast of the divide would tend to move southeastward. North of Green's Creek, the potentiometric surface indicates that groundwater in the uppermost saturated interval moves generally southward towards Green's Creek.

- Dioxathion isomers, Dioxenethion, VOCs and SVOCs were not detected in the groundwater samples collected from monitoring well MW-5. Monitoring well MW-5 is located immediately downgradient of the landfill. The analytical results for the samples collected from monitoring well MW-5 do not indicate that Dioxathion isomers, Dioxenethion, VOCs and/or SVOCs are migrating from the landfill via groundwater in the uppermost saturated interval.

- Concentrations of Dioxathion isomers were detected in samples collected from MW-4, MW-8 and MW-9 at concentrations less than the TRG. Monitoring well MW-8 is located northwestward of the former Dioxathion production area. Monitoring well MW-11 is located southward, and downgradient, of the wastewater sludge pits. Concentrations of Dioxenethion were detected in the groundwater samples collected from MW-4, MW-6, MW-7, MW-8, MW-9, and MW-11. There is no TRG for Dioxenethion.

- Concentrations of VOCs above their respective TRGs were detected in groundwater samples collected from MW-4, MW-8, and MW-9. Monitoring well MW-4 is located southward, and downgradient, of the wastewater sludge pits. As stated above, monitoring well MW-8 is located northwestward of the former Dioxathion production area. Monitoring well MW-9 is located eastward of the former Dioxathion production area.

5.0 RECOMMENDATIONS

Based on the information obtained during the completed portions of the site investigation Eco-Systems recommends the following:

- Groundwater samples should be collected from monitoring wells MW-4, MW-8, MW-9, and MW-11 to confirm the presence and concentrations of VOCs. These confirmation samples are scheduled to be collected on February 11, 2003.

Pending review and approval of MDEQ, Eco-Systems recommends the following:

- Staff gauges should be re-installed in Green's Creek to provide necessary information to evaluate the relationship, if any, between the uppermost saturated interval and Green's Creek.

- Schedule technical discussion between Hercules/BATCO and MDEQ/MSCL to consider raising the method detection limit for Dioxathion from 1 ppb to 10 ppb.

- Proceed with the completion of Hercules' Site Investigation Work Plan (Eco-Systems, February 1999) with the following modifications:

  - Field observations and topography will be used to establish the boundaries of the landfill instead of excavating test pits.

  - Schedule technical discussion between Hercules and MDEQ to define the objectives of the geophysical investigation that has been requested by MDEQ.

- Surface water samples should be collected from the staff gauge locations along Green's Creek to evaluate the potential for discharge to the creek of groundwater containing Dioxathion and VOCs.

- Investigate the potential for non-aqueous phase liquids (NAPLs) in areas of elevated VOC concentrations.

TABLES

TABLES

TABLE 1
SUMMARY OF GROUNDWATER ELEVATION DATA
December 4, 2002
Hercules, Incorporated
Hattiesburg, Mississippi

WELL NO.	TOC ELEVATION (ft.)[1]	WATER DEPTH (ft)[2]	GROUNDWATER ELEVATION (ft.)
PERMANENT MONITOR WELLS			
MW-1	174.12	5.15	168.97
MW-2	160.07	5.50	154.57
MW-3	160.03	6.04	153.99
MW-4	159.75	9.92	149.83
MW-5	160.99	8.05	152.94
MW-6	174.05	7.73	166.32
PIEZOMETERS			
TP-1	172.18	4.54	167.64
TP-2	171.72	10.81	160.91
TP-3	169.74	8.90	160.84
TP-4	163.64	3.92	159.72
TP-5	160.54	7.42	153.12
TP-6	158.63	6.69	151.94
TP-7	167.17	8.77	158.40
TP-8	183.79	13.65	170.14
TP-9	163.44	6.35	157.09
TP-10	179.69	13.81	165.88
TP-11	162.26	8.26	154.00
TP-12	159.95	9.87	150.08
TP-13	156.99	6.83	150.16
TP-14	164.35	6.90	157.45

[1] TOC = "top of casing" measured relative to mean sea level (ft. MSL).

[2] Water depth is a relative depth measured from the TOC.

[3] Date water level survey was completed is presented in parentheses for each site.

TABLE 2
SUMMARY OF PROTOCOL SAMPLING ANALYTICAL RESULTS
October 14, 2002
Hercules, Incorporated
Hattiesburg, Mississippi

		Concentrations in parts per billion (ppb)		
		MSCL[1]		BATCO[2]
Well	**Isomer**	**HPLC/MS**	**HPLC/UV**	**GC/MS**
MW-1	**Dioxenethion**	nd[3]	nd	nd
	cis-Dioxathion	nd	nd	nd
	trans-Dioxathion	nd	1.5	nd
MW-4	**Dioxenethion**	32	25	19.22
	cis-Dioxathion	nd	nd	4.80
	trans-Dioxathion	nd	nd	1.61
MW-5	**Dioxenethion**	nd	nd	5.09
	cis-Dioxathion	nd	nd	1.70
	trans-Dioxathion	0.92	10	1.44
Rinsate	**Dioxenethion**	nd	nd	nd
	cis-Dioxathion	nd	nd	nd
	trans-Dioxathion	nd	nd	nd

1 - MSCL = Mississippi State Chemical Laboratory

2 - BATCO = Bonner Analytical & Testing Company

3 - nd = Analyte not detected at or above the practical quantitation limit.

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
December 4 and 5, 2002
Hercules, Incorporated
Hattiesburg, Mississippi

Analytes	Concentrations in parts per billion (ppb)											
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	TRG[1]
Dioxathion												
cis-Dioxathion	nd	nd	nd	3.34	nd	nd	nd	nd	12.8	nd	5	
trans-Dioxathion	nd	nd	nd	nd	nd	nd	nd	53.9	nd	nd	nd	
total	nd	nd	nd	3.34	nd	nd	nd	53.9	12.8	nd	5	54.8
Dioxenethion	nd[2]	nd	nd	12.9	nd	1.12	9.57	94.3	5.9	nd	50.3	na
Volatiles												
1,1-dichloroethene	na[3]	na	na	nd	na	na	nd	**17**	5.92	nd	nd	7
benzene	na	na	na	**14**	na	na	nd	**6900**	**9.15**	nd	**114**	5
trichloroethene	na	na	na	nd	na	na	nd	**5.8**	nd	nd	nd	5
toluene	na	na	na	nd	na	na	nd	28	nd	nd	nd	1000
chlorobenzene	na	na	na	1.81	na	na	nd	290	nd	nd	nd	100
bromodichloromethane	na	na	na	nd	na	na	nd	**6.84**	nd	nd	nd	0.168
bromomethane	na	na	na	nd	na	na	nd	4.07	nd	nd	nd	8.52
carbon tetrachloride	na	na	na	**10**	na	na	nd	**16000**	nd	nd	nd	5
chloroethane	na	na	na	**63**	na	na	nd	**66**	nd	nd	nd	3.64
chloroform	na	na	na	nd	na	na	nd	**1800**	nd	nd	nd	0.155
chloromethane	na	na	na	1.72	na	na	nd	39.2	nd	nd	nd	1.43
dibromochloromethane	na	na	na	nd	na	na	nd	**4.45**	nd	nd	nd	0.126
1,2-dichlorobenzene	na	na	na	nd	na	na	nd	2.71	nd	nd	nd	600
1,3-dichlorobenzene	na	na	na	nd	na	na	nd	3.75	nd	nd	nd	5.48
1,4-dichlorobenzene	na	na	na	nd	na	na	nd	3.8	nd	nd	nd	75
1,2-dichloroethane	na	na	na	nd	na	na	nd	**20**	nd	nd	3.11	5
cis-1,2-dichloroethene	na	na	na	nd	na	na	nd	19	nd	nd	nd	70
ethyl benzene	na	na	na	nd	na	na	nd	55.6	nd	nd	nd	700
isopropylbenzene	na	na	na	1.26	na	na	nd	4.6	2.48	nd	nd	679
p-isopropyltoluene	na	na	na	nd	na	na	nd	23.9	nd	nd	nd	na
methylene chloride	na	na	na	nd	na	na	nd	**26.1**	nd	nd	nd	5
naphthalene	na	na	na	5.38	na	na	nd	**9.14**	nd	nd	nd	6.2
tetrachloroethene	na	na	na	nd	na	na	nd	**8.51**	nd	nd	nd	5

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
December 4 and 5, 2002
Hercules, Incorporated
Hattiesburg, Mississippi

Analytes	Concentrations in parts per billion (ppb)											
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	TRG[1]
Volatiles - continued												
1,2,3-trichlorobenzene	na	na	na	1.81	na	na	nd	2.55	nd	nd	nd	na
1,2,4-trichlorobenzene	na	na	na	nd	na	na	nd	2.86	nd	nd	nd	70
1,2,4-trimethylbenzene	na	na	na	nd	na	na	nd	1.81	nd	nd	nd	12.3
xylenes (total)	na	na	na	nd	na	na	nd	79	nd	nd	nd	10000
vinyl chloride	na	na	na	nd	na	na	nd	1.62	nd	nd	nd	2
Semi-Volatiles												
4-methylphenol	na	na	na	nd	na	na	nd	13.16	nd	nd	nd	183

1 - Target Remediation Goals are taken from the Tier 1 Target Remedial Goal Table of the Final Regulations Governing Brownfields Voluntary Cleanup and Redevelopment in Mississippi, MDEQ, March 2001.

Bold Text indicates concentrations above applicable TRGs

2 - nd = Analyte not detected at or above the practical quantitation limit.

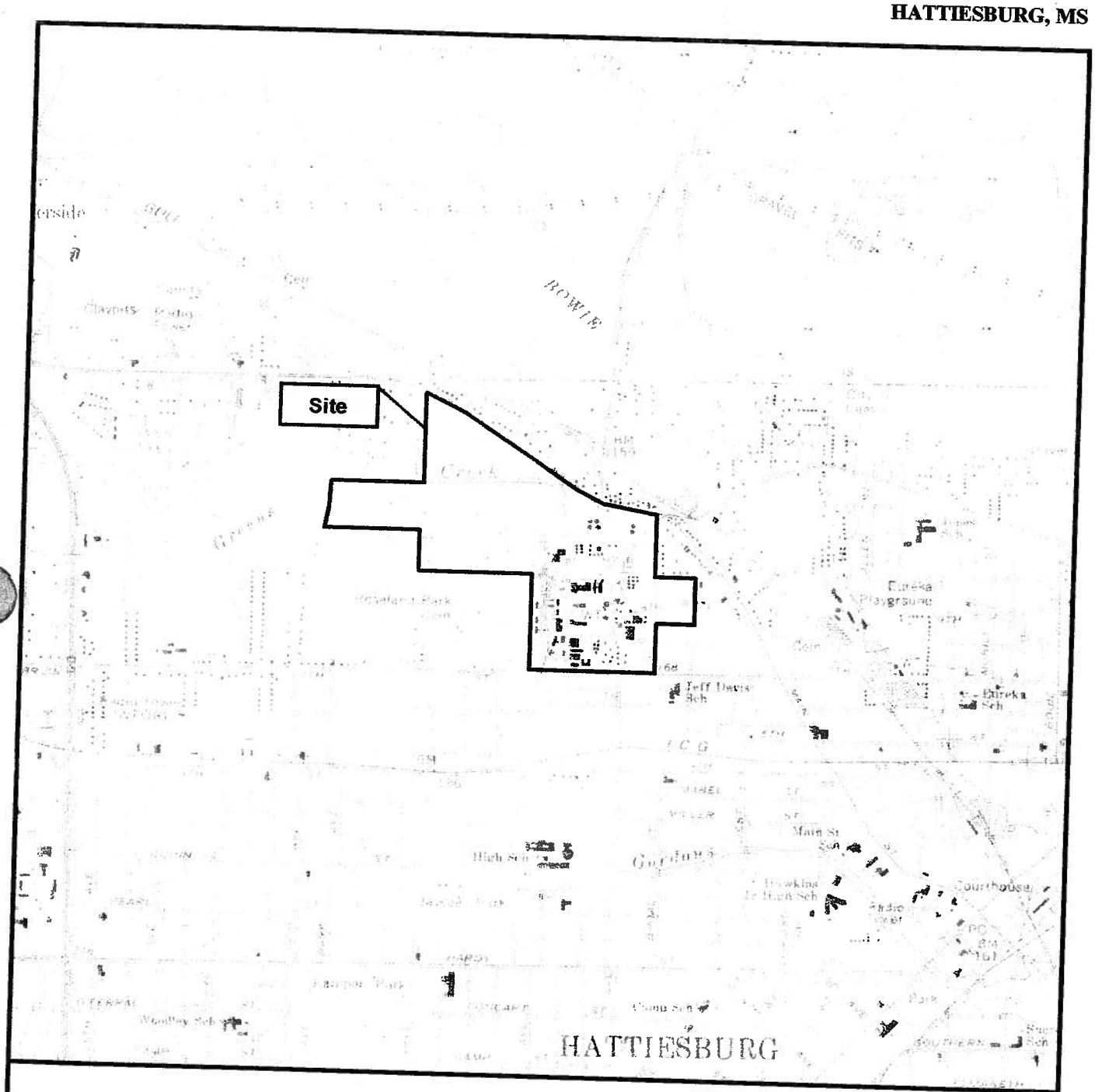
3 - na = Not analyzed

FIGURES

FIGURES

FIGURE 1

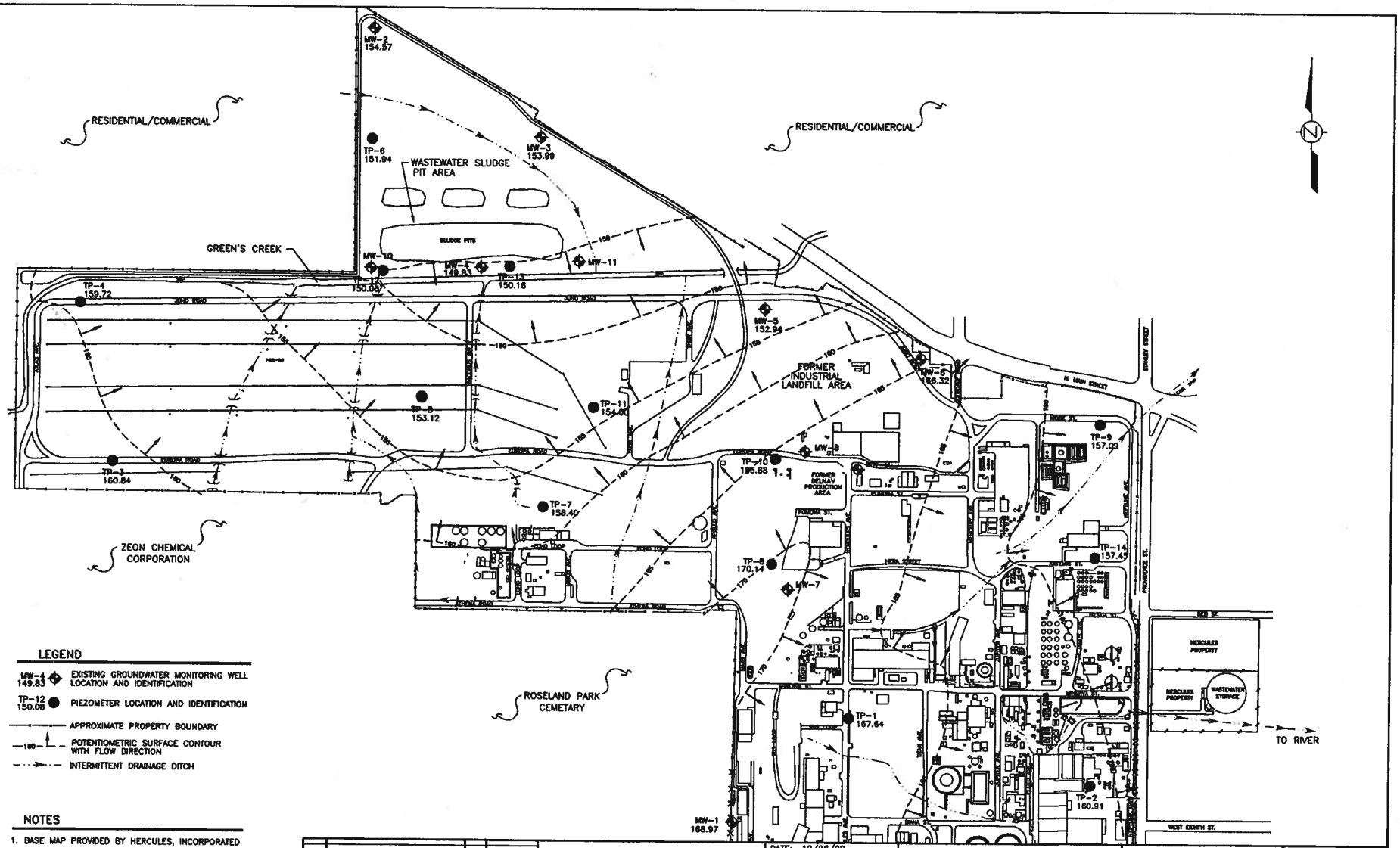
SITE LOCATION MAP
HERCULES, INC.
HATTIESBURG, MS



Source: *Hattiesburg, Miss* U.S.G.S. 7.5' Topographic Map

HER22173

HERCULES



LEGEND

- MW-4 149.83 — EXISTING GROUNDWATER MONITORING WELL LOCATION AND IDENTIFICATION
- TP-12 150.06 — PIEZOMETER LOCATION AND IDENTIFICATION
- APPROXIMATE PROPERTY BOUNDARY
- 160 — POTENTIOMETRIC SURFACE CONTOUR WITH FLOW DIRECTION
- INTERMITTENT DRAINAGE DITCH

NOTES

1. BASE MAP PROVIDED BY HERCULES, INCORPORATED

HERCULES
CHEMICAL SPECIALTIES

DATE:	12/26/02
SCALE:	1"=300'
DRAWN:	N. SISSON
CHECKED:	
REVIEWED:	
PROJECT MANAGER:	

Eco·Systems, Inc.
Consultants, Engineers and Scientists

MONITORING WELL, PIEZOMETER AND POTENTIOMETRIC INFORMATION

HERCULES CHEMICAL CO.
HATTIESBERG, MISSISSIPPI

PROJECT NO.	HER99072
CAD FILE	HER99072-FIG02-A.dwg
DRAWING	1
FIGURE	2

J.N.S. 12/ S:\PROJECTS\HER99072\DWGS\HER99072-FIG02-A.dwg

APPENDICES

APPENDIX A

ANALYTICAL PROTOCOLS

APPENDICES

SAMPLING AND ANALYSIS PROTOCOL FOR THE DETERMINATION OF DIOXATHION IN WATER

Recent results of analyses of well water samples from the Hercules Incorporated plant in Hattiesburg, Mississippi, have exhibited a wide range in the levels of dioxathion reported. Discussions among representatives from the analytical laboratories demonstrated that the samples analyzed to date were not true split samples and that the analytical methods were applied differently. In order to minimize the effects from different water samples and from inconsistent application of the analytical methods, the following protocol has been assembled by agreement between Hercules Incorporated and the Mississippi State Chemical Laboratory. This protocol will be used in a study to determine the proper sampling and analysis methods to be used for all future water monitoring programs at the Hattiesburg plant.

1.) SAMPLE COLLECTION

Water samples will be withdrawn from the well using a peristaltic pump with Teflon tubing. The contents of the bailer will be placed into a large glass or Teflon container (one gallon, or more, in size). The container should have a Teflon-lined screw cap. Successive bailers of water will be removed from the well and placed into the container until there is enough water to supply split samples to each laboratory participating in the study. The contents of the large container will then be mixed thoroughly. After the composited water sample in the large container has been mixed, equal amounts of water will be poured into each sample jar. The sample jars should have Teflon-lined screw caps. This procedure will be repeated for each well.

Each analytical batch of a given matrix (up to 20 samples) will require the analysis of a method blank, Laboratory Control Standard (LCS), Matrix Spiked sample (MS) and Matrix Spike Duplicate (MSD). Alternately , a duplicated sample may be substituted for the (MSD). The MS and the MSD are counted as part of the analytical batch (aka Sample Delivery Group) which may be held open for up to seven (7) days.

Water samples collected from Wells #1, #4 and #5 will be submitted in duplicate to each laboratory. That is, two separate sample jars from Well #1, Well #4 and Well #5 will be filled and sent to each laboratory for analysis.

NOTE: The sample collected for the MS/MSD will require six (6) one-liter samples.

2.) EXTRACTION OF SAMPLES

All samples will be extracted with methylene chloride following the details described in the latest revision of U.S. EPA SW-846 Method 3510 C. The solvent should be exchanged into hexane, and all extracts will be adjusted to a final volume of ten milliliters (10 mL) before analysis.

3.) CLEANUP OF EXTRACTS

In order to minimize interferences in the determination of dioxathion, sample extracts that appear to contain interferences will be cleaned up using the latest revision of U.S. EPA SW-846 Method 3620, Florisil Cleanup. The volume of eluting solvent necessary for quantitative recovery of dioxathion from the Florisil column will be determined in each laboratory using the dioxathion and dioxenethiol reference standards supplied for calibration of the GC methods.

4.) SULFUR CLEANUP

If there is significant interference from sulfur compounds, the extracts may be cleaned up according to U.S. EPA SW-846 Method 3660, copper option.

5.) ANALYSIS OF EXTRACTS

Previous work performed by Bonner Analytical and Testing (BATCO) has revealed that trans dioxathion undergoes thermal degradation in the Gas Chromatograph column therefore the protocol is changed to a lower temperature analytical method. For All sample extracts will be analyzed by High Performance Liquid Chromatography (HPLC)) using a Photo Diode Array (PDA), operated in . U.S. EPA SW-846 Method 8321 A will be used as general guidance for HPLC methodology. . A five-point calibration curve will be used to calculate the results of analyses. The lowest point on the calibration curve should be equal to, or slightly higher than, the limit of detection of the GC-PDA system. The highest point on the calibration curve should be the end of the linear portion of the PDA response profile. All laboratories will follow the QA/QC criteria described in the analytical method. Those results will be stored at each laboratory for review at a later date, if necessary.

Instrumentation

HPLC – Hewlett Packard Model 10980 Series II Liquid Chromatograph with Diode Array Detector
Fluoresence Detector Hewlett Packard Series 1100 HPLC Column: Supelco Discovery C18, 250 mm X 4.6 mm ID, 5 µm Particle Size.

Method Parameters

Mobile Phase : Isocratic, 30% Deionized water and 70 % Acetone
Flow: 1.2 mls/min
Injection Volume: 25 µLs
Run Time: 20 Minutes
Oven Temperature 35 °C
Detector Wavelengths
Diode Array: Excitation at 200, 210 and 270 nms
Fluorescence: Excitation at 250 nms, Emission at 410 nms

Surrogate/Internal Standards: A surrogate will be chosen that does not coelute with any dioxathion isomer. Internal standards may or may not be used.

6.) CONFIRMATION OF ANALYSES

The preferred method for qualitative and quantitative confirmation of dioxathion and dioxenethiol is Liquid Chromatography/Mass Spectra analysis (LC/MS), however the present time Bonner Analytical and Testing does not own an LC/MS instrument. Therefore, for qualitative and quantitative confirmation of the dioxathion results, all sample extracts will be analyzed by Bonner Analytical and Testing using gas chromatography-mass spectrometry (GC-MS) using the latest revision of U.S. EPA SW-846 Method 8270, or an equivalent mass spectrometry system that is deemed appropriate to give equivalent results. A five-point calibration curve will be used to calculate the results of analyses. The lowest point on the calibration curve should be equal to, or slightly higher than, the limit of detection of the GC-MS system. The highest point on the calibration curve should be the end of the linear portion of the MS detector response profile. All laboratories will follow the QA/QC criteria described in the analytical method. Those results will be stored at each laboratory for review at a later date, if necessary. If significant differences are observed between Bonner Analytical & Testing's results and Mississippi States University Chemical Laboratory'results, BATCO will send the extracts of these samples to a third party laboratory to investigate the reasons for these differences.

GC column: 30-meter X 0.25-mm (or 0.32-mm) DB-5 fused silica capillary column, as specified in Paragraph 4.1.2 in U.S. EPA SW-846 Method 8270.

GC oven and injector conditions: As specified in Paragraph 7.3 in SW-846 Method 8270.

The specifications given in Method 8270, Section 4.0, "APPARATUS AND MATERIALS," and Section 5.0, "REAGENTS," will be followed. The guidance in Section 7.0, "PROCEDURE" will be used to perform the GC separations and GC/MS identification and quantitation. Specific criteria for peak identification are given in Section 7.6 of the method. The characteristic ions, both primary and secondary ions, listed in Table 1 of the method will be used. For cis and trans dioxathion and dioxenthiol, the primary ion is m/z 97 with secondary ions at m/z 125, 270, and 153. Instrument tuning criteria are given in Table 3 of the method. For the Internal Standard, chrysene-d_{12} is recommended because it meets the retention time criteria set forth in Section 7.3.2.

7.) GENERAL COMMENTS

a.) All samples will be extracted and analyzed within the normal holding times for organophosphorus compounds.

b.) The dioxathion standard to be used by all laboratories will be supplied by the Hercules Incorporated.

c.) Water samples spiked with cis or trans dioxathion or dioxenethiol will be prepared by the Mississippi State Department of Environmental Quality (MSDEQ) personnel and distributed to each laboratory for inclusion in this study.

d.) Within three weeks of receipt of samples, all results of analyses and all confirmatory results will be reported to MSDEQ, who will collate them and distribute the results to the participating laboratories.

e.) A meeting will be held to review the results of analyses and to decide the next step in the implementation of the analytical methods to be used in monitoring well water samples from the Hercules Incorporated Hattiesburg plant.

f.) After its approval of this sampling and analysis protocol, MSDEQ will determine the time frame for the completion of all sampling and analysis activities and will set the date and time of the review meeting.

g.) Only results greater than or equal to the Limit of Quantitation will be reported. The numerical sum of the cis and trans isomers of dioxathion will be reported as dioxathion. Dioxenethiol will be reported as separate compound.

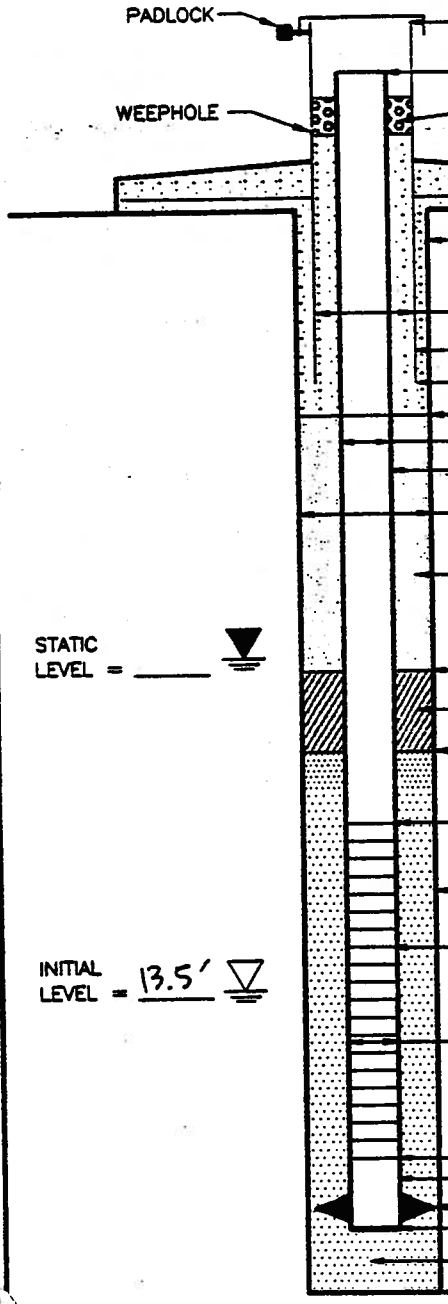
APPENDIX B

BORING LOGS AND WELL CONSTRUCTION DIAGRAMS

MONITORING WELL COMPLETION FORM

PROJECT NAME Hercules
LOCATION Hattiesburg, MS
DATE COMPLETED 2/22/00
DRILLER G + E Services
GEOLOGIST Ryan

PAGE 1 OF 1
WELL NO. MW-7
DRILLING METHOD HSA
METHOD OF DEVELOPMENT



HEIGHT OF TOP OF SURFACE CASING ABOVE GROUND SURFACE
ELEVATION/HEIGHT OF TOP OF RISER PIPE
FILLER MATERIAL
SIZE AND TYPE OF APRON
PAD ELEVATION
GROUND SURFACE ELEVATION
TYPE OF SURFACE SEAL Portland Cement with Sand
INSIDE DIAMETER OF SURFACE CASING 4"
TYPE OF SURFACE CASING 4" x 4" x 5' Hinged Metal Shroud
DEPTH OF SURFACE CASING BELOW GROUND 2.4'
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE 1'
INSIDE DIAMETER OF RISER PIPE 2"
TYPE OF RISER PIPE PVC
DIAMETER OF BOREHOLE 6 3/4"
TYPE OF BACKFILL Pure Gold Bentonite Gel
DEPTH OF TOP OF SEAL (PRE/POST HYDRATION) 6'
TYPE OF SEAL Bentonite Chips
DEPTH OF TOP OF SAND PACK (INITIAL/POST SURGE/FINAL) 8'
DEPTH OF TOP OF SCREENED SECTION 10.4'
TYPE OF SAND PACK 20/40 Filter Pack
TYPE OF SCREENED SECTION PVC Factory Slotted Pipe
OPENING SPACING 10 Slot
OPENING SIZE 0.01"
INSIDE DIAMETER OF SCREENED SECTION 2"
DEPTH OF BOTTOM OF SCREENED SECTION 20.4'
LENGTH OF BLANK SECTION N/A
CENTRALIZER
DEPTH OF BOTTOM OF PLUGGED BLANK SECTION 20.4'
TYPE OF BACKFILL BELOW OBSERVATION PIPE N/A
DEPTH OF BOREHOLE 20.8'

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Environmental Engineers and Scientists

BORING LOG

SHEET 1 OF ___

PROJECT NAME: Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER:
GEOLOGIST: J Ryan
CLASSIFICATION SCHEME:
DRILLER: G+E Services
DRILL METHOD: HSA
WEATHER: Sunny + WARM (62°)

BORING IDENTIFICATION: MW-7
BORE HOLE DIAMETER: 8"
BORING START TIME: 1045 DATE: 2-22-00
BORING COMPLETED TIME: 1159 DATE: 2-22-00
FINAL BORING DEPTH: 20'

GROUNDWATER
INITIAL DEPTH:
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS:
VOLUME:

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL PID/Blows/6"	LITHOLOGY
	2		
	4		
	6		
	8		
	10		
10"	13.9	3/15 50/6"	SP
	12		
13"	10.8	14/30 37/30	SP
	14		
19"	5.9	6/12 18/16	SM
	16		
18"	20.2	3/3 10/28	SM
	18		
Full	0.1	8/3 6/10	2.25' 3.25' 3.75
	20		
	15		

No Sampling 0-10' (see TP-8 Log)

DAMP, MOIST, Med-dense, tan-brown, No odor, f.-Med grn, poorly sorted w/ gravel, Sa w/Si

wet-sat, Dense, tan-H.brn, f-med

SAT, Med-dense, (Salmon tint), v.f-med, Si Sa (14'-17.5) trace gravel

Coarsens, Med-crs, Sa w/ Gravel, Sa (17.5-18.

18.9'

DRY, stiff, tan w/gray mottling, clay w/Si

TD = 20'

Eco-Systems, Inc.
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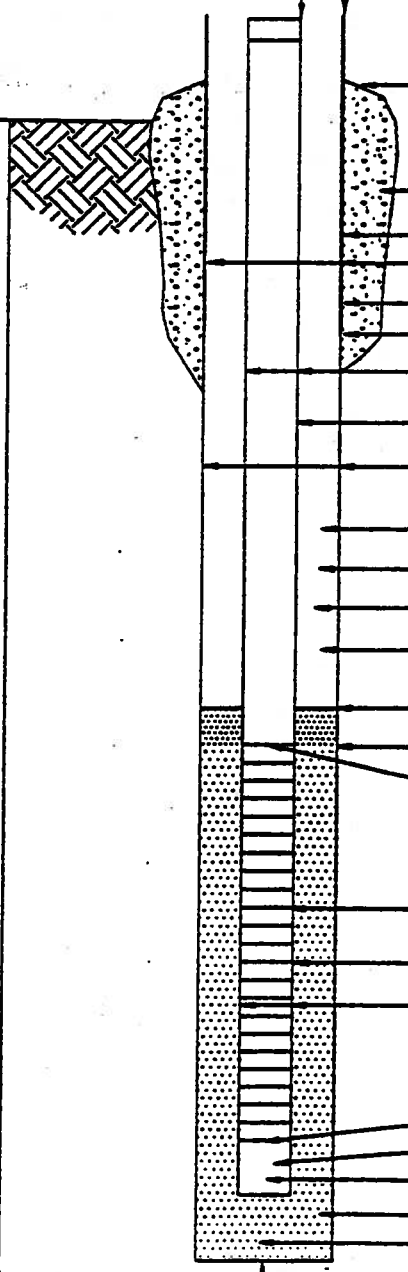
MONITORING WELL COMPLETION FORM

PROJECT NAME Hercules
LOCATION Hattiesburg, MS
DATE COMPLETED 2/22 ORIGINAL DEPTH
DRILLER G+E Services DRILL METHOD HSA
GEOLOGIST J Ryan DATE 2/22/00

PAGE 1 OF 1
WELL NO. MW-8
ORIGINAL WATER LEVEL
DEPTH INTERVAL



SEE BORING LOG FOR STRATIGRAPHY

ELEVATION OF TOP OF SURFACE CASING/RISER PIPE 4.0'

HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE – NA

TYPE OF SURFACE SEAL Portland Cement w/ Sand

DEPTH OF SURFACE SEAL BELOW GROUND SURFACE 2½"

INSIDE DIAMETER OF SURFACE CASING 4"

TYPE OF SURFACE CASING 4" x 4" x 5' Hinged Metal Sleeve

DEPTH OF SURFACE CASING BELOW GROUND 2.4"

INSIDE DIAMETER OF RISER PIPE 2.0"

TYPE OF RISER PIPE PVC

DIAMETER OF BOREHOLE 6 3/4"

TYPE OF BACKFILL Pure Gold Bentonite Grout

ELEVATION / DEPTH TOP OF SEAL

TYPE OF SEAL Bentonite Chips

ELEVATION / DEPTH BOTTOM OF SEAL 2.1"

DEPTH OF TOP OF SAND PACK 4.0"

TYPE OF SAND PACK 20/40 Filter Pack

ELEVATION / DEPTH TOP OF SCREENED SECTION 6.0"

TYPE OF SCREENED SECTION PVC slotted Pipe

DESCRIBE OPENINGS 10 slot

INSIDE DIAMETER OF SCREENED SECTION 0.01

ELEVATION / DEPTH BOTTOM OF SCREENED SECTION 16.0"

LENGTH OF BLANK SECTION 0.3"

ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION 16.3"

ELEVATION/DEPTH BOTTOM OF SAND COLUMN –

TYPE OF BACKFILL BELOW OBSERVATION PIPE –

ELEVATION/DEPTH OF HOLE 16.3"

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SHEET 1 OF ___

BORING LOG

PROJECT NAME: Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER:
GEOLOGIST: J. Ryan
CLASSIFICATION SCHEME:
DRILLER: CLE Services
DRILL METHOD: HSA
WEATHER: Warm, Sunny, Windy

BORING IDENTIFICATION: MW-8
BORE HOLE DIAMETER: 6"
BORING START TIME: 10:10 DATE: 2/22/00
BORING COMPLETED TIME: 1635 DATE: 2-22-00
FINAL BORING DEPTH: 16.3'

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	GROUNDWATER	FREE PRODUCT
				INITIAL DEPTH ___	THICKNESS ___
				DEPTH AFTER ___ MINUTES ___	VOLUME ___

5
10
15

No Sampling
(See TP-10 Log)
• Installed ~7' west of TP-10

- Set MW-8 ~6-16'

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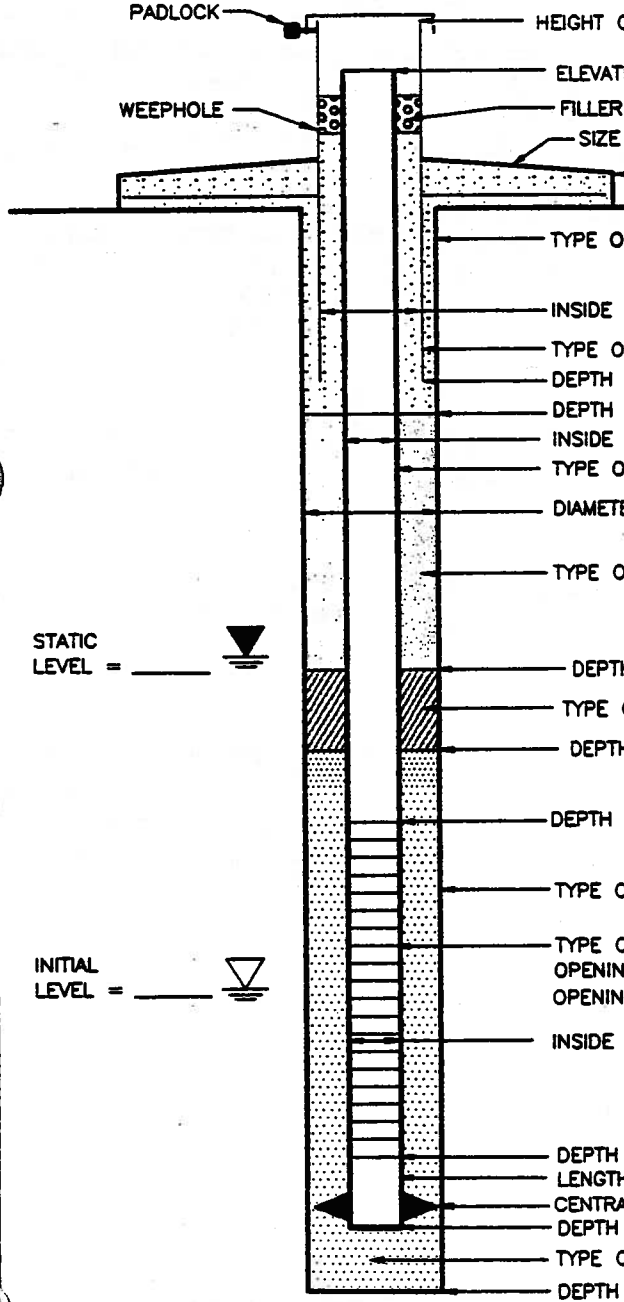
MONITORING WELL COMPLETION FORM

PROJECT NAME Hercules
LOCATION Hattiesburg, MS
DATE COMPLETED 2/28/00
DRILLER G + E Services
GEOLOGIST

PAGE ____ OF ____
WELL NO. MW-9
DRILLING METHOD HSA
METHOD OF DEVELOPMENT



HEIGHT OF TOP OF SURFACE CASING ABOVE GROUND SURFACE ____
ELEVATION/HEIGHT OF TOP OF RISER PIPE 2.8'
FILLER MATERIAL NA
SIZE AND TYPE OF APRON NA
PAD ELEVATION NA
GROUND SURFACE ELEVATION ____
TYPE OF SURFACE SEAL Portland Cement w/ sand
INSIDE DIAMETER OF SURFACE CASING 4"
TYPE OF SURFACE CASING 4" x 4" x 5' Hinged Metal Shroud
DEPTH OF SURFACE CASING BELOW GROUND 2.4'
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE 1'
INSIDE DIAMETER OF RISER PIPE 2"
TYPE OF RISER PIPE PVC
DIAMETER OF BOREHOLE 6 3/4"
TYPE OF BACKFILL Pure Gold Bentonite Gel
DEPTH OF TOP OF SEAL (PRE/POST HYDRATION) 3'
TYPE OF SEAL Bentonite chips
DEPTH OF TOP OF SAND PACK (INITIAL/POST SURGE/FINAL) 5.0'
DEPTH OF TOP OF SCREENED SECTION 7.2'
TYPE OF SAND PACK 20/40 Filter Pack
TYPE OF SCREENED SECTION PVC Factory Slotted Pipe
OPENING SPACING 10 Slot
OPENING SIZE 0.01"
INSIDE DIAMETER OF SCREENED SECTION 2"
DEPTH OF BOTTOM OF SCREENED SECTION 17.2'
LENGTH OF BLANK SECTION 0.3'
CENTRALIZER
DEPTH OF BOTTOM OF PLUGGED BLANK SECTION 17.5'
TYPE OF BACKFILL BELOW OBSERVATION PIPE N/A
DEPTH OF BOREHOLE 17.5'

Eco•Systems, Inc.
Environmental Engineers and Scientists

BORING LOG

SHEET 1 OF ___

PROJECT NAME Hercules
PROJECT LOCATION Hattiesburg, MS
PROJECT NUMBER
GEOLOGIST J. Ryan
CLASSIFICATION SCHEME
DRILLER G+E Services
DRILL METHOD HSA
WEATHER Sunny, Warm (70°), Windy

BORING IDENTIFICATION MW-9
BORE HOLE DIAMETER 8"
BORING START TIME 1445 DATE 2/22/00
BORING COMPLETED TIME 1518 DATE 2-22-00
FINAL BORING DEPTH 17.5'

GROUNDWATER
INITIAL DEPTH
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS
VOLUME

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
	2			No Sampling (0-5')
	4			
2' (full)	6 6.4	3/6 ~~7/14~~		Sandy-Clay, med-stiff to stiff, mottled coloring (brown, red, grey), sand content increases w/ depth, no odor, dam
	8			
14"	10 2.9	2/2 4/8		mst ~~to wet~~, firm, gray-tan w/ orange laminae, SaSi (10-11.6') w/ vf. Sa, wet, Loose, VSa Si
	12			
	14			
20"	16 2.5	7/13 13/7	SP: CH	SAT, Med-dense, white-tan, Grav, Sand (f-crs) 16.6' 16.6' DRY, stiff, brn-tan, CL w/ Si, trace SaSi stringers
	18			
	20			Set MW-9 (10' Screen) TD=17.5'
	15			

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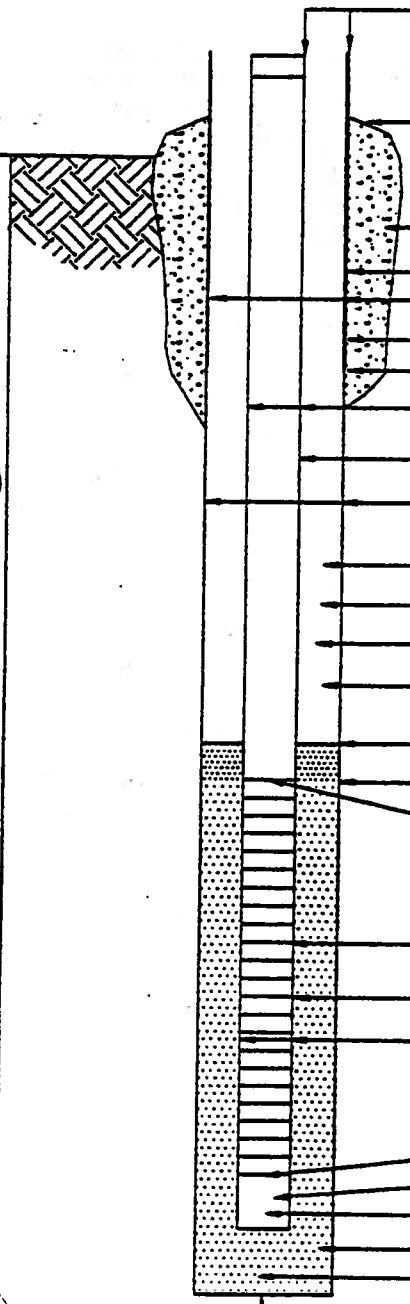
Environmental Engineers and Scientists

MONITORING WELL COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 2/23
ORIGINAL DEPTH:
DRILLER: GtE Services
DRILL METHOD: HSA
GEOLOGIST: J Ryan
DATE: 2/23/00

PAGE 1 OF 1
WELL NO. MW-10
ORIGINAL WATER LEVEL:
DEPTH INTERVAL:



SEE BORING LOG FOR STRATIGRAPHY

ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: 3.3'
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: NA
TYPE OF SURFACE SEAL: Portland Cement w/ Sand
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: 1'
INSIDE DIAMETER OF SURFACE CASING: 4"
TYPE OF SURFACE CASING: 4" x 4' x 5' Hinged Metal Shovel
DEPTH OF SURFACE CASING BELOW GROUND: 2.9"
INSIDE DIAMETER OF RISER PIPE: 2"
TYPE OF RISER PIPE: PVC
DIAMETER OF BOREHOLE: 6 3/4"
TYPE OF BACKFILL: Pure Gold Bentonite Gel
ELEVATION / DEPTH TOP OF SEAL:
TYPE OF SEAL: Bentonite Chips
ELEVATION / DEPTH BOTTOM OF SEAL: 2.0"
DEPTH OF TOP OF SAND PACK: 4.0"
TYPE OF SAND PACK: 20/40 Filter Pack
ELEVATION / DEPTH TOP OF SCREENED SECTION: 6.7"
TYPE OF SCREENED SECTION: PVC slotted Pipe
DESCRIBE OPENINGS: 10 slot
INSIDE DIAMETER OF SCREENED SECTION: 0.01"
ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 14.7"
LENGTH OF BLANK SECTION:
ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 14.7"
ELEVATION/DEPTH BOTTOM OF SAND COLUMN:
TYPE OF BACKFILL BELOW OBSERVATION PIPE: N/A
ELEVATION/DEPTH OF HOLE: 14.7"

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SHEET 1 OF ___

BORING LOG

PROJECT NAME: Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER:
GEOLOGIST: J Ryan
CLASSIFICATION SCHEME:
DRILLER: G+E Services
DRILL METHOD: HSA
WEATHER:

BORING IDENTIFICATION: MW-10
BORE HOLE DIAMETER: 8"
BORING START TIME: 9:55 DATE: 2/23/00
BORING COMPLETED TIME: 10:07 DATE: 2/23/00
FINAL BORING DEPTH: 14'

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY
	5		
	10		
	15		

GROUNDWATER
INITIAL DEPTH
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS
VOLUME

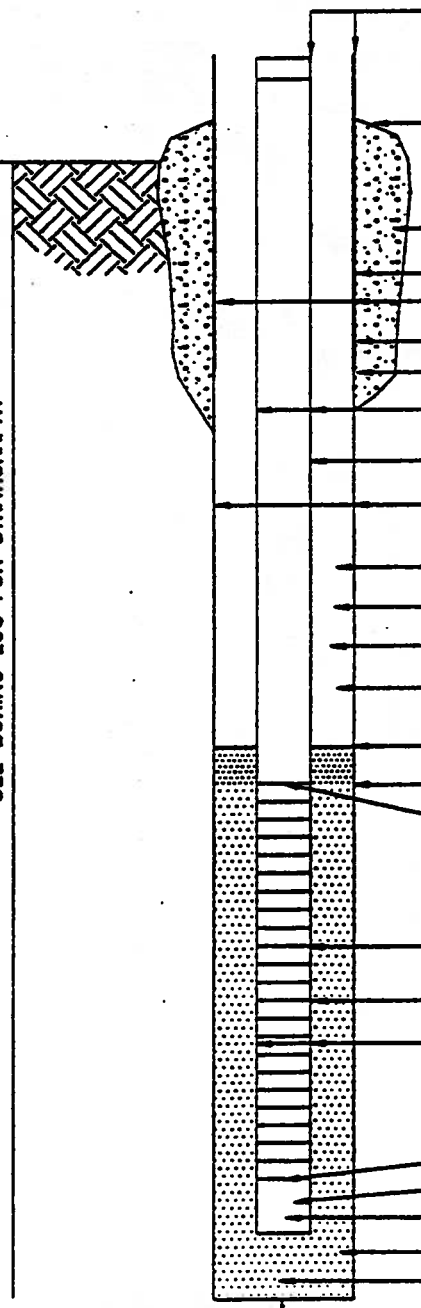
No Sampling (refer to TP-12)

Eco-Systems, Inc.
Environmental Engineers and Scientists

MONITORING WELL COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 2/23
DRILLER: ~~J Ryan~~ G+E
GEOLOGIST: J Ryan
ORIGINAL DEPTH:
DRILL METHOD: HSA
DATE: 2/23/00

PAGE 1 OF 1
WELL NO. MW-11
ORIGINAL WATER LEVEL:
DEPTH INTERVAL:



SEE BORING LOG FOR STRATIGRAPHY

ELEVATION OF TOP OF SURFACE CASING/RISER PIPE:
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE:
TYPE OF SURFACE SEAL: Portland Cement w/ Sand
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: 1'
INSIDE DIAMETER OF SURFACE CASING: 4"
TYPE OF SURFACE CASING: 4" x 4" x 5' Hinged Metal Shovel
DEPTH OF SURFACE CASING BELOW GROUND: 2.4'
INSIDE DIAMETER OF RISER PIPE: 2"
TYPE OF RISER PIPE: PVC
DIAMETER OF BOREHOLE: 6 3/4"
TYPE OF BACKFILL: Pure Gold Bentonite Gel
ELEVATION / DEPTH TOP OF SEAL:
TYPE OF SEAL: Bentonite Chips
ELEVATION / DEPTH BOTTOM OF SEAL: 1.0"
DEPTH OF TOP OF SAND PACK: 3.0"
TYPE OF SAND PACK: 20/40 Filter Pack
ELEVATION / DEPTH TOP OF SCREENED SECTION: 6.7"
TYPE OF SCREENED SECTION: PVC Slotted Pipe
DESCRIBE OPENINGS: 10 slot
INSIDE DIAMETER OF SCREENED SECTION: 0.01
ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 14"
LENGTH OF BLANK SECTION:
ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 14"
ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 1
TYPE OF BACKFILL BELOW OBSERVATION PIPE:
ELEVATION/DEPTH OF HOLE: 14"

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Environmental Engineers and Scientists

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SHEET 1 OF ___

BORING LOG

PROJECT NAME: Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER:
GEOLOGIST: J Ryan
CLASSIFICATION SCHEME:
DRILLER: G+E Services
DRILL METHOD: HSA
WEATHER: Cloudy and Mild

BORING IDENTIFICATION: MW-11
BORE HOLE DIAMETER: 8"
BORING START TIME: 8:05 DATE: 2/23/00
BORING COMPLETED TIME: 8:15 DATE: 2/23/00
FINAL BORING DEPTH: 14'

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY
	5		
	10		
	15		

GROUNDWATER
INITIAL DEPTH:
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS:
VOLUME:

No Sampling (refer to TP-13)

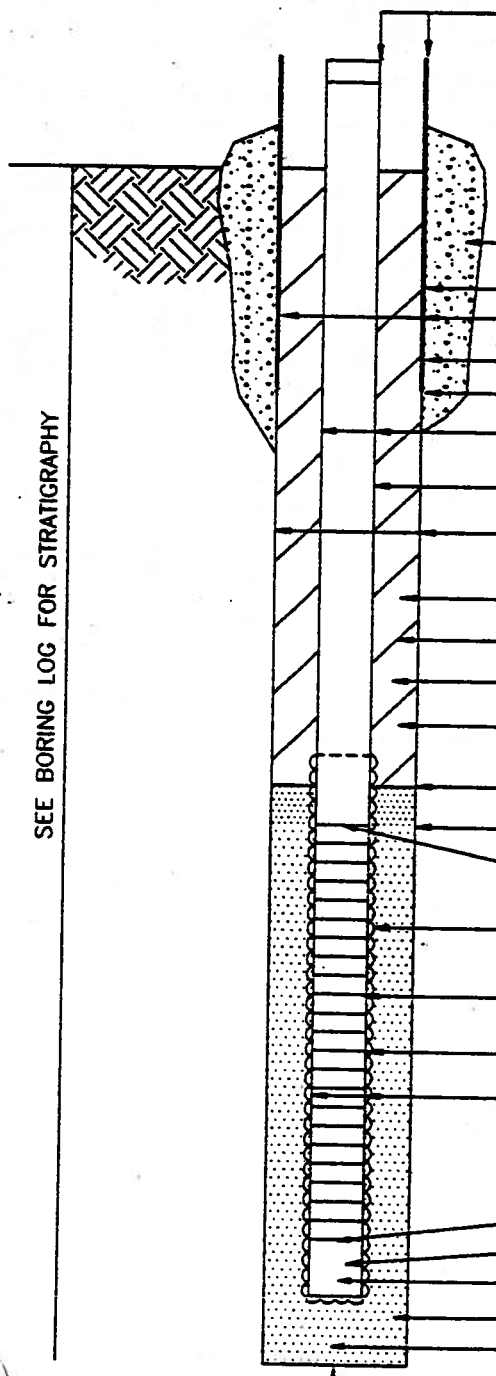
Eco-Systems, Inc.
Environmental Engineers and Scientists

TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/28/99
DRILLER: G+E Services
GEOLOGIST: J Ryan
INSPECTED BY:

BOREHOLE DEPTH:
DRILL METHOD: HSA
DATE:

PAGE 1 OF 1
WELL NO. TP-1
BOREHOLE WATER LEVEL: ~6'
STATIC WATER LEVEL: ~6.3' bls.
SCREEN INTERVAL: 6.8-16.8'



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: ~~173.2'~~ 172.18
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: NA / 3.2'
TYPE OF SURFACE SEAL: NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA
INSIDE DIAMETER OF SURFACE CASING: NA
TYPE OF PROTECTIVE CASING: NA
DEPTH OF PROTECTIVE CASING BELOW GROUND: NA
INSIDE DIAMETER OF RISER PIPE:
TYPE OF RISER PIPE: 1" PVC
DIAMETER OF BOREHOLE: 6"
TYPE OF BACKFILL: High-Solid Bentonite Grout
ELEVATION / DEPTH TOP OF SEAL: 3'
TYPE OF SEAL: Bent. chips
ELEVATION / DEPTH BOTTOM OF SEAL: 5'
DEPTH OF TOP OF SAND PACK: 5'
TYPE OF SAND PACK: 20/40 Silica Sand Native 12-17' 20/40 4.5-12'
ELEVATION / DEPTH TOP OF SCREENED SECTION: 6.8'
FILTER SOCK: No!
TYPE OF SCREENED SECTION: 1" PVC
DESCRIBE OPENINGS: 10-Slot
INSIDE DIAMETER OF SCREENED SECTION: 1"
ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 16.8'
LENGTH OF BLANK SECTION: 2"
ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 17'
ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 17'
TYPE OF BACKFILL BELOW OBSERVATION PIPE: Native
ELEVATION/DEPTH OF HOLE: 17.0'

Eco-Systems, Inc.
Environmental Engineers and Scientists

S.M. 0 39 10:27 M:\DRWG2\FORMS\FRM005

BORING LOG

SHEET 1 OF 1

PROJECT NAME: Task 2 - RI Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER: HER-99
GEOLOGIST: Ryan
CLASSIFICATION SCHEME: USCS
DRILLER: G+E Services
DRILL METHOD: HSA w/ S-spoon
WEATHER: Sunny + Hot (88°)

BORING IDENTIFICATION: TP-1
BORE HOLE DIAMETER: 6"
BORING START TIME: 1355 DATE: 4-28-99
BORING COMPLETED TIME: 1418 DATE: 4-28-99
FINAL BORING DEPTH: 17'

GROUNDWATER
INITIAL DEPTH
DEPTH AFTER ____ MINUTES ____

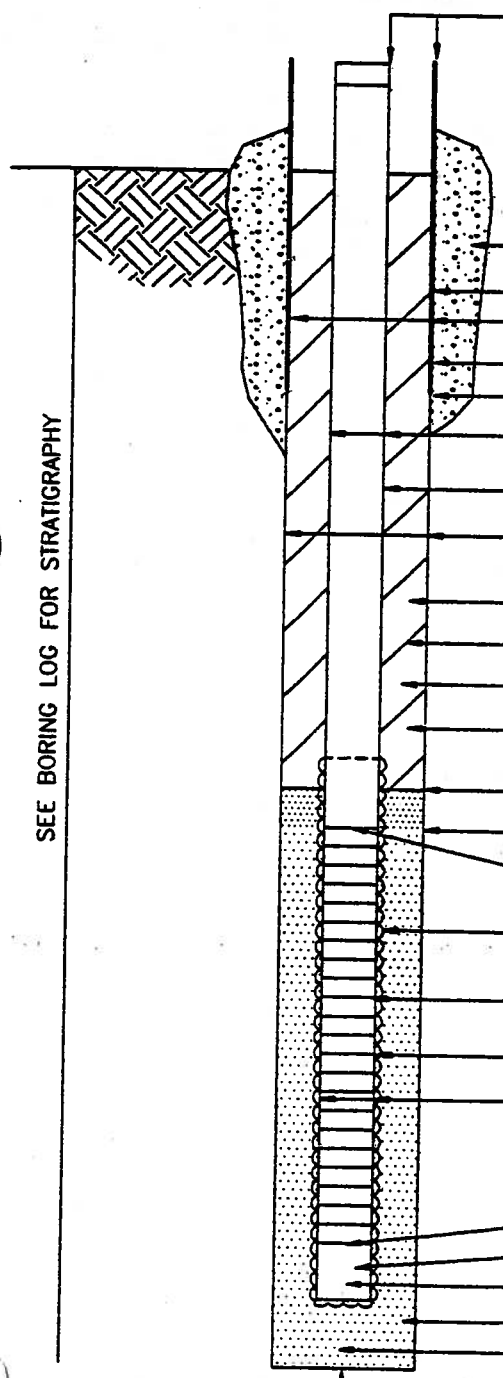
FREE PRODUCT
THICKNESS
VOLUME

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
NS	2	Fill	NS	DAMP, firm, med-gray, Auger to 4' for obstructions (cuttings) ~fill~ (0-3') CL w/vf. sa + gravel
	4			
21"	0.0	1/2 3/4		DAMP, med-stiff gray w/ blue-green mottling, SaSiCL (vf.-f).
	6	WH/3		
18"	8	7/13		SAT, Loose, tan, 7' SiSa (vf)
15"		WH/4 5/7		med-Dense V.Si
	10			
23"	12	3/13 23/32		Dense trace Gravel (f-med) (No Sampling 12-15)
NS	14	NS	NS	
18"	16	8/6 8/12		SAT, Loose-med, DRY, V. stiff, greenish gray, CL tr Si 17.2'
	18			• Set TP-2 TD = 17.0'
	20			• CAVE to 12' bls.
				• 20/40 to 5.0'
				• Seal to 3.0' (Hydrate).
	15			

Eco-Systems, Inc.
Environmental Engineers and Scientists

TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED:
DRILLER: G&E
GEOLOGIST: Ryan
INSPECTED BY:
BOREHOLE DEPTH: 17.0'
DRILL METHOD: HSA
DATE: 4-28-99
PAGE 1 OF 1
WELL NO. TP-2
BOREHOLE WATER LEVEL: 8'
STATIC WATER LEVEL:
SCREEN INTERVAL: 7-17'



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: ~~3.0'~~ 171.72

HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: NA / 3.0'

TYPE OF SURFACE SEAL: NA

DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA

INSIDE DIAMETER OF SURFACE CASING: NA

TYPE OF PROTECTIVE CASING: NA

DEPTH OF PROTECTIVE CASING BELOW GROUND: NA

INSIDE DIAMETER OF RISER PIPE: 1"

TYPE OF RISER PIPE: 1" PVC

DIAMETER OF BOREHOLE: 6"

TYPE OF BACKFILL: High-Solids Slurry-Bentonite ~~Chips~~ - Hydrated

ELEVATION / DEPTH TOP OF SEAL: 3'

TYPE OF SEAL: Bentonite Chips

ELEVATION / DEPTH BOTTOM OF SEAL: 4.5'

DEPTH OF TOP OF SAND PACK: 4.5'

TYPE OF SAND PACK: 20/40 Sand (to 13'), Native 13-17'

ELEVATION / DEPTH TOP OF SCREENED SECTION: ~~16.8'~~ 6.8'

FILTER SOCK: No

TYPE OF SCREENED SECTION: 10 Slot PVC

DESCRIBE OPENINGS: 10 Slot

INSIDE DIAMETER OF SCREENED SECTION: 1"

ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 16.8'

LENGTH OF BLANK SECTION: 2'

ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 17.0'

ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 17.0'

TYPE OF BACKFILL BELOW OBSERVATION PIPE: Native Sand

ELEVATION/DEPTH OF HOLE: 17.0'

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Environmental Engineers and Scientists

S.M. 09 10:27 M:\DRWG2\FORMS\FRM005

BORING LOG

SHEET 1 OF ___

PROJECT NAME: TASK 2 - RI HERCULES
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER: HER-99
GEOLOGIST: RYAN
CLASSIFICATION SCHEME: USCS
DRILLER: G&E SERVICES, Inc.
DRILL METHOD: HSA w/ S. Spoons
WEATHER: Sunny & Hot (88°)

BORING IDENTIFICATION: TP-2
BORE HOLE DIAMETER: 2" → 6"
BORING START TIME: 1135 DATE: 4-28-99
BORING COMPLETED TIME: 1212 DATE: 4-28-99
FINAL BORING DEPTH: 17.0'

GROUNDWATER
INITIAL DEPTH: ~8'
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS ___
VOLUME ___

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
20"	0.0 / 2	2/3, 3/3		DAMP-DRY, Loose, Brown, organics w/ sand, v.f. SaCL (6"-
22"	0.0 / 4	6/9, 13/15	SM	Med-dense, Lt. brn, v. SiSa (vf-f.
21"	0.0 / 6	21/10, 9/12	SM	MOIST, w/ gray mottling, v.f. SiSa tr.
23"	0.0 / 8	13/15, 17/18	SM	WET, tan laminae, @6.5' SiSa (vf)
22"	0.0 / 10	18/14, 14/15	SM	SAT, trace gravel
21"	12	12/14, 16/18	SM	f-med, w/ gravel
NS	14	NS	NS	No Sampling 12-15' Drill out w/ HSA (heaving)
20"	16	3/12, 10/10	SP	15' SAT, Loose, tan-white, Gravelly Sa w/ Si 17'
	18			
	20			
	15			

- Set TP-2 from ~6.5-16.5' TD=17.0'
- Backfill w/ native sand to ~13'
- 20/40 Sand to ~4.5'
- Pellets to ~0.5'

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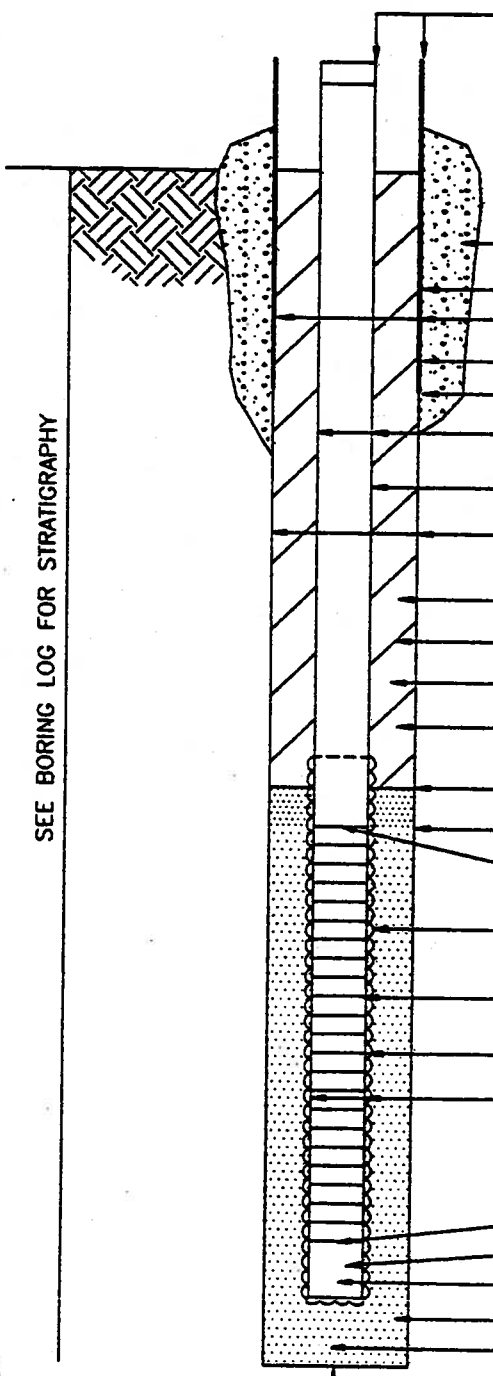
Environmental Engineers and Scientists

TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/28/99
DRILLER: TRC Services
GEOLOGIST: J Ryan
INSPECTED BY:
BOREHOLE DEPTH:
DRILL METHOD: HSA
DATE:

PAGE 1 OF 1
WELL NO. TP-3
BOREHOLE WATER LEVEL: ~8'
STATIC WATER LEVEL:
SCREEN INTERVAL: 9.6-14.6'



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: 169.74

HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: NA/2.5'

TYPE OF SURFACE SEAL: NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA
INSIDE DIAMETER OF SURFACE CASING: NA
TYPE OF PROTECTIVE CASING: NA
DEPTH OF PROTECTIVE CASING BELOW GROUND: NA
INSIDE DIAMETER OF RISER PIPE:
TYPE OF RISER PIPE: 1" PVC
DIAMETER OF BOREHOLE: 6"
TYPE OF BACKFILL: High Solids Bentonite Grout
ELEVATION / DEPTH TOP OF SEAL: 3.0'
TYPE OF SEAL: Bentonite Chips
ELEVATION / DEPTH BOTTOM OF SEAL: 8.0'
DEPTH OF TOP OF SAND PACK: 8.0'
TYPE OF SAND PACK: 20/40 Sand (no native)
ELEVATION / DEPTH TOP OF SCREENED SECTION: 9.5'
FILTER SOCK: No!
TYPE OF SCREENED SECTION: 10 slot 1" PVC
DESCRIBE OPENINGS: 10 slot
INSIDE DIAMETER OF SCREENED SECTION: 1"
ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 14.6'
LENGTH OF BLANK SECTION: Flush
ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 14.6'
ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 16.0'
TYPE OF BACKFILL BELOW OBSERVATION PIPE: sand 20/40
ELEVATION/DEPTH OF HOLE: 16.0'

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Environmental Engineers and Scientists

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BORING LOG

SHEET 1 OF ___

PROJECT NAME Task 2 - RI Hercules
PROJECT LOCATION Hattiesburg, MS
PROJECT NUMBER HER-99
GEOLOGIST Ryan
CLASSIFICATION SCHEME USCS
DRILLER G+E Services
DRILL METHOD HSA w/ S-spoons
WEATHER Sunny Hot (88°)

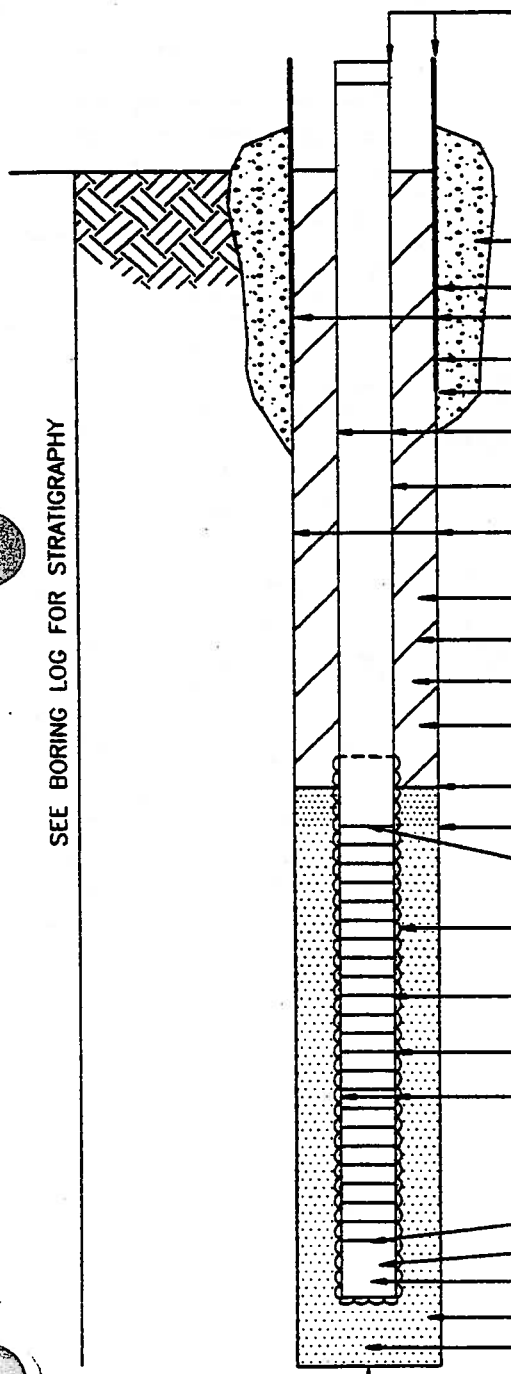
BORING IDENTIFICATION TP-3
BORE HOLE DIAMETER 6"
BORING START TIME 1500 DATE 4-28-99
BORING COMPLETED TIME 1527 DATE 4-28-99
FINAL BORING DEPTH 16'

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	GROUNDWATER: INITIAL DEPTH ___ DEPTH AFTER ___ MINUTES ___	FREE PRODUCT: THICKNESS ___ VOLUME ___
NS	2		NS	NO Sampling 0-4'	
Full	4 / 0.0 / 6	2/4 4/12		DAMP, Med, H-gray+brn V. CLSa 4-5.1' / Loose, tan, SiSa (5.1')	
	8			NO Sampling (6-9')	
22"	10	12/15 19/5	SM	SAT, Med-dense, tan w/ white, Sa w/ Si (f-med) tr. gravel	
	12			NO Sampling	
18"	14 / 16	3/4 5/5		SAT, as above (14-14.8'), SiSa tr. gravel / SRV, Med-St-stiff, buff-tan, SiCl tr. lignite.	
	18			Set TP-3 to ~~10-15~~ 9.6'-14.6' TD=16.0'	
	20				
	15				

Eco-Systems, Inc.
Environmental Engineers and Scientists

TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/28/99
DRILLER: G+E Services
GEOLOGIST: Ryan
INSPECTED BY:
BOREHOLE DEPTH:
DRILL METHOD: HSA
DATE:
PAGE: 1 OF 1
WELL NO.: TP-4
BOREHOLE WATER LEVEL: ~4'
STATIC WATER LEVEL:
SCREEN INTERVAL: 5-10'



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: 163.64
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: 2.5'
TYPE OF SURFACE SEAL: NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA
INSIDE DIAMETER OF SURFACE CASING: NA
TYPE OF PROTECTIVE CASING: NA
DEPTH OF PROTECTIVE CASING BELOW GROUND: NA
INSIDE DIAMETER OF RISER PIPE:
TYPE OF RISER PIPE: 1" PVC
DIAMETER OF BOREHOLE: 6"
TYPE OF BACKFILL: High Solid Bentonite Grout
ELEVATION / DEPTH TOP OF SEAL: 1.6'
TYPE OF SEAL: Bentonite Chips
ELEVATION / DEPTH BOTTOM OF SEAL: 4'
DEPTH OF TOP OF SAND PACK: 4'
TYPE OF SAND PACK: 20/40 Sand (No Native)
ELEVATION / DEPTH TOP OF SCREENED SECTION: 5'
FILTER SOCK: No!
TYPE OF SCREENED SECTION: 10-Slot 1" PVC
DESCRIBE OPENINGS: 10-Slot
INSIDE DIAMETER OF SCREENED SECTION: 1"
ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 10'
LENGTH OF BLANK SECTION: 2" Flush
ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 10'
ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 14'
TYPE OF BACKFILL BELOW OBSERVATION PIPE: SAND 20/40
ELEVATION/DEPTH OF HOLE: 14'

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Environmental Engineers and Scientists

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BORING LOG

SHEET 1 OF ___

PROJECT NAME: Task 2 - RI Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER: HER-99
GEOLOGIST: Ryan
CLASSIFICATION SCHEME: USCS
DRILLER: G+E Services
DRILL METHOD: HSA w/ S-spoons
WEATHER: Sunny + hot (88°)

BORING IDENTIFICATION: TP-4
BORE HOLE DIAMETER: 6"
BORING START TIME: 1602 DATE: 4-28-99
BORING COMPLETED TIME: 1620 DATE: 4-28-99
FINAL BORING DEPTH: 14'

GROUNDWATER
INITIAL DEPTH ___
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS ___
VOLUME ___

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
				Damp, firm, brown, V-CL Sa (vf sn
NS	2		NS	No Sampling (observe cuttings) (0-5')
	5			v. damp, loose, tan, SiSa ~4'
17"		6/7		v. SiSa
	6	7/6		moist, firm, gray-tan, v. SaCL w/ Si (vf sn).
	8	NS	NS	No Sampling 7-10'
22"	10	7/7	CL	DRY, stiff (crumbly), green-gray, Calcareous Clay br. Silt.
	12	7/7		v. stiff, w/ brn mottling
		7/4		
	14	7/10		
				TD = 14.0'
	16			
	17			~~TD = 17.0'~~
	10			
	15			

- Sand zone has pinched in this direction.
- Set 5' screen 5-10' b/s.

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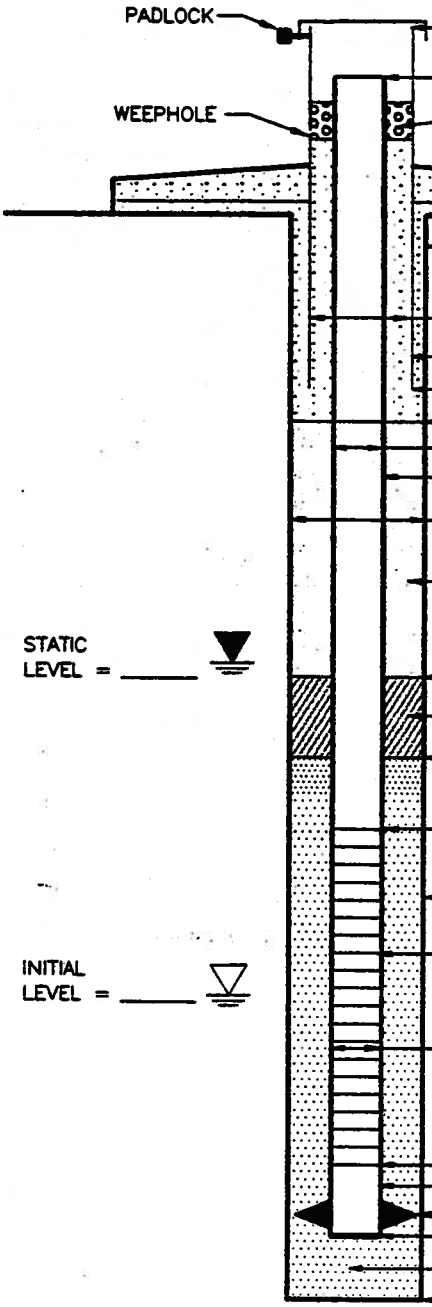
MONITORING WELL COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/29/99
DRILLER: G+E Services
GEOLOGIST: R Sartor

PAGE 1 OF 1
WELL NO. TP-5
DRILLING METHOD
METHOD OF DEVELOPMENT



HEIGHT OF TOP OF SURFACE CASING ABOVE GROUND SURFACE: 460.54
ELEVATION/HEIGHT OF TOP OF RISER PIPE: NA/2.6'
FILLER MATERIAL: NA
SIZE AND TYPE OF APRON: NA
PAD ELEVATION: NA
GROUND SURFACE ELEVATION: NA
TYPE OF SURFACE SEAL: NA
INSIDE DIAMETER OF SURFACE CASING: NA
TYPE OF SURFACE CASING: NA
DEPTH OF SURFACE CASING BELOW GROUND: NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA
INSIDE DIAMETER OF RISER PIPE: 1"
TYPE OF RISER PIPE: 1" PVC
DIAMETER OF BOREHOLE: 6"
TYPE OF BACKFILL: High Solids Bentonite Grout
DEPTH OF TOP OF SEAL (PRE/POST HYDRATION): 6'
TYPE OF SEAL: Bentonite Chips
DEPTH OF TOP OF SAND PACK (INITIAL/POST SURGE/FINAL): 7'
DEPTH OF TOP OF SCREENED SECTION: 9'
TYPE OF SAND PACK: 20/40 Sand (1' of native)
TYPE OF SCREENED SECTION: 10-slot screen
OPENING SPACING: 10-slot
OPENING SIZE
INSIDE DIAMETER OF SCREENED SECTION: 1"
DEPTH OF BOTTOM OF SCREENED SECTION: 14'
LENGTH OF BLANK SECTION: Flush
CENTRALIZER
DEPTH OF BOTTOM OF PLUGGED BLANK SECTION: 14'
TYPE OF BACKFILL BELOW OBSERVATION PIPE: Native
DEPTH OF BOREHOLE: 15

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Environmental Engineers and Scientists

BORING LOG

SHEET 1 OF ___

PROJECT NAME: Task 2-RI Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER: HER-99
GEOLOGIST: Ryan
CLASSIFICATION SCHEME: USCS
DRILLER: G+E Services
DRILL METHOD: HSA w/ S-Spoons
WEATHER: Sunny + hot

BORING IDENTIFICATION: TP-5
BORE HOLE DIAMETER: 6"
BORING START TIME: 1700 DATE: 4/29/99
BORING COMPLETED TIME: 1715 DATE: 4/29/99
FINAL BORING DEPTH: 15

GROUNDWATER
INITIAL DEPTH: 9'
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS ___
VOLUME ___

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	moisture density	odor	color	description
18"	2	3/3 4/4		damp loose	no	Black	S. SA w/coarse sand globs
			NS	no samp 2-5			
20"	5 7	2/7 4/6		damp stiff	no	gray orange mottling	S. Cl
			NS	no sampling 7-10 water @ -9'			
18'	10 12	7/11 11/12		saturated loose	no	tan	C/SA w/si
			NS	no sampling 12-13 ~~no sampling 12-15~~			RS
20"	13 15	2/7 7/8		saturated loose	no	tan	S. SA (9-14') ~~to~~ S. Cl (14'-15')

3-15

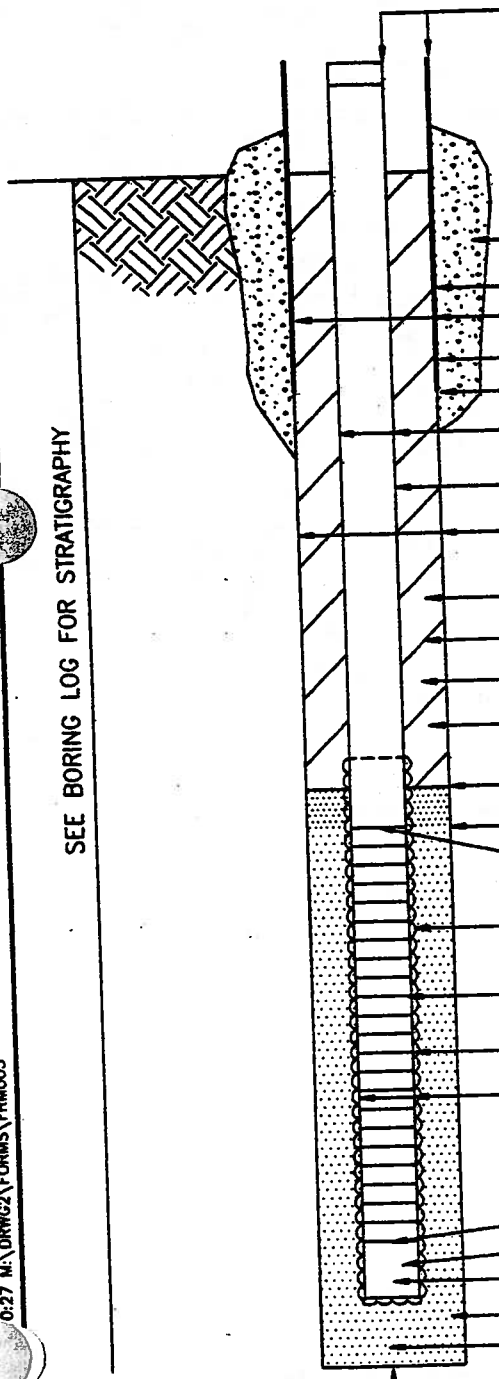
- TD @ 15'
- Set T.P-5 screen @ 9-14'
- Cave in to 13'
- 20/40 to 7'
- Seal to 6'

Eco-Systems, Inc.
Environmental Engineers and Scientists

TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/28/95
DRILLER: GTF Services
GEOLOGIST: Ryan
INSPECTED BY:
BOREHOLE DEPTH:
DRILL METHOD: HSA
DATE:

PAGE 1 OF 1
WELL NO. TP-6
BOREHOLE WATER LEVEL:
STATIC WATER LEVEL:
SCREEN INTERVAL:



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: 158.63
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: NA/
TYPE OF SURFACE SEAL: NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA
INSIDE DIAMETER OF SURFACE CASING: NA
TYPE OF PROTECTIVE CASING: NA
DEPTH OF PROTECTIVE CASING BELOW GROUND: NA
INSIDE DIAMETER OF RISER PIPE: 1"
TYPE OF RISER PIPE: 1" PVC
DIAMETER OF BOREHOLE: 6"
TYPE OF BACKFILL: High-Solid Bentonite Grout
ELEVATION / DEPTH TOP OF SEAL: 2'
TYPE OF SEAL: Bentonite Chips
ELEVATION / DEPTH BOTTOM OF SEAL: 7.0
DEPTH OF TOP OF SAND PACK: 7.0'
TYPE OF SAND PACK: 20/40 Sand
ELEVATION / DEPTH TOP OF SCREENED SECTION: 10'
FILTER SOCK: NO!
TYPE OF SCREENED SECTION: 10-slot Screen
DESCRIBE OPENINGS: 10-slot
INSIDE DIAMETER OF SCREENED SECTION: 1"
ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 15'
LENGTH OF BLANK SECTION: NA
ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: Flush
ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 15'
TYPE OF BACKFILL BELOW OBSERVATION PIPE: 20/40 Sand
ELEVATION/DEPTH OF HOLE: 17'

Eco-Systems, Inc.
Environmental Engineers and Scientists

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BORING LOG

SHEET 1 OF ___

PROJECT NAME: Task 2 - RI Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER: HER-99
GEOLOGIST: Ryan
CLASSIFICATION SCHEME: USCS
DRILLER: G+E Service's
DRILL METHOD: HSA w/ S-spoons
WEATHER: sunny + hot (88°)

BORING IDENTIFICATION: TP-6
BORE HOLE DIAMETER: 6"
BORING START TIME: 1655 DATE: 4-28-99
BORING COMPLETED TIME: 1725 DATE: 4-28-99
FINAL BORING DEPTH: 17'

GROUNDWATER
INITIAL DEPTH ___
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS ___
VOLUME ___

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
14"		1/3 4/6		DRY, soft, dk brn, Silt w/ CL
	2			DAMP, stiff-v.st, lt brn w/ mottling, SiCL tr. gravel
18"		3/4 4/4		
	4			V. DAMP, Med, olive-brn, SaCL tr. gravel
22"		5/7 7/7		
	6			wet- ~~DAMP~~, ~~Med~~ Med-dense olive-brn, SaCL tr. gravel
22"		10/11 27/22		SAT, tan-white (Sa) SiSd tr. gravel
	8			(f-med grained) w/ gravel
20"		10/14 14/14		
	10			No Sampling 10-15'
	12			
	14			
10"	16	2/6 10/17		V. DAMP, Med-stiff, gray-green V. SaCL w/ Si
	18			TD = 17'
	20			
	15			

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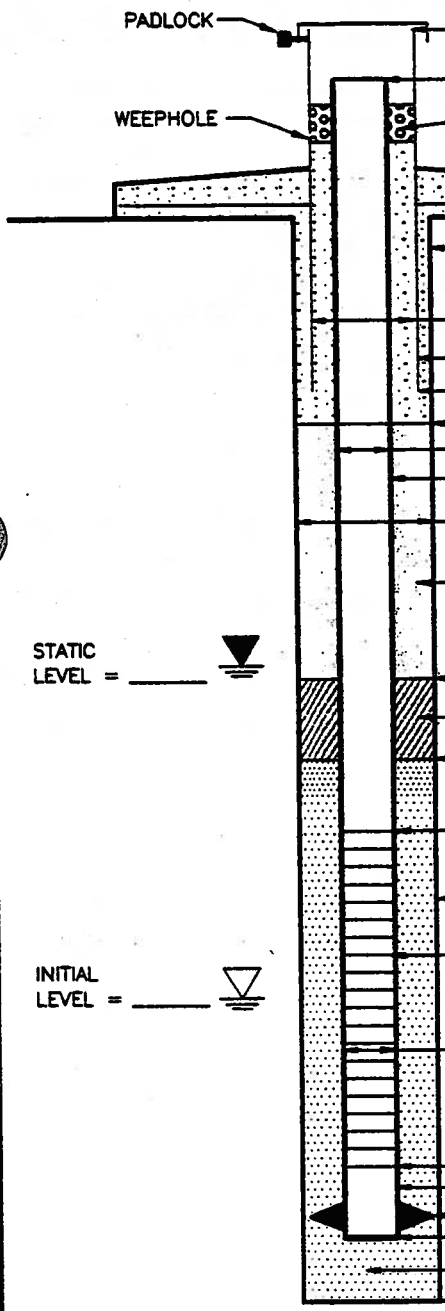
Environmental Engineers and Scientists

MONITORING WELL COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/28/95
DRILLER: GtE Services
GEOLOGIST: J Ryan

PAGE 1 OF 1
WELL NO. TP-7
DRILLING METHOD
METHOD OF DEVELOPMENT



HEIGHT OF TOP OF SURFACE CASING ABOVE GROUND SURFACE: 167.17
ELEVATION/HEIGHT OF TOP OF RISER PIPE:
FILLER MATERIAL: NA
SIZE AND TYPE OF APRON: NA
PAD ELEVATION: NA
GROUND SURFACE ELEVATION: NA
TYPE OF SURFACE SEAL: NA
INSIDE DIAMETER OF SURFACE CASING: NA
TYPE OF SURFACE CASING: NA
DEPTH OF SURFACE CASING BELOW GROUND: NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: 1'
INSIDE DIAMETER OF RISER PIPE: 1"
TYPE OF RISER PIPE: 1" PVC
DIAMETER OF BOREHOLE: 6"
TYPE OF BACKFILL: High-Solid Bentonite Grout
DEPTH OF TOP OF SEAL (PRE/POST HYDRATION): 3'
TYPE OF SEAL: Bentonite Chips
DEPTH OF TOP OF SAND PACK (INITIAL/POST SURGE/FINAL): 4.8'
DEPTH OF TOP OF SCREENED SECTION: 5'3"
TYPE OF SAND PACK: 20/40 Sand (bottom 1' native)
TYPE OF SCREENED SECTION: 10-slot screen
OPENING SPACING: 10-slot
OPENING SIZE:
INSIDE DIAMETER OF SCREENED SECTION: 1"
DEPTH OF BOTTOM OF SCREENED SECTION: ~10'3"
LENGTH OF BLANK SECTION: ~~10'3~~ 5'
CENTRALIZER
DEPTH OF BOTTOM OF PLUGGED BLANK SECTION: 10'3"
TYPE OF BACKFILL BELOW OBSERVATION PIPE: Native Sands
DEPTH OF BOREHOLE: 12'

Eco-Systems, Inc.
Environmental Engineers and Scientists

BORING LOG

SHEET 1 OF ___

PROJECT NAME: Task 2 - RI Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER: HER-99
GEOLOGIST: Ryan/Sartor
CLASSIFICATION SCHEME: USCS
DRILLER: G+E Services
DRILL METHOD: HSA w/ S-Spoons
WEATHER: Sunny hot

BORING IDENTIFICATION: TP-7
BORE HOLE DIAMETER: 6"
BORING START TIME: 1605 DATE: 4-29-99
BORING COMPLETED TIME: 1620 DATE: 4-29-99
FINAL BORING DEPTH: 12'

GROUNDWATER
INITIAL DEPTH: 6'
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS ___
VOLUME ___

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
0-2 12	12 / 2	2/2 5/5		moisture Damp, density loose, odor no, color brown, Dry C/S, w/peat deposits
				no sam plus 2-5
-7 16"	2 / 7	2/6 9/11		Damp loose no gray (vf-f) SaS, w/brown w/CL
				No Sam plus 7-10 (from) water @ 6' SiSA @ 10'
22"	18 / 12	4/4 4/8		Damp medium stiff odor insand gray w/ brown S, Cl @ 11' w/peat

- TD @ 12'
- Convert to TP-7
- Cave in to 9'
- 20/40 to 4.0'
- Seal to 3.0'

10

15

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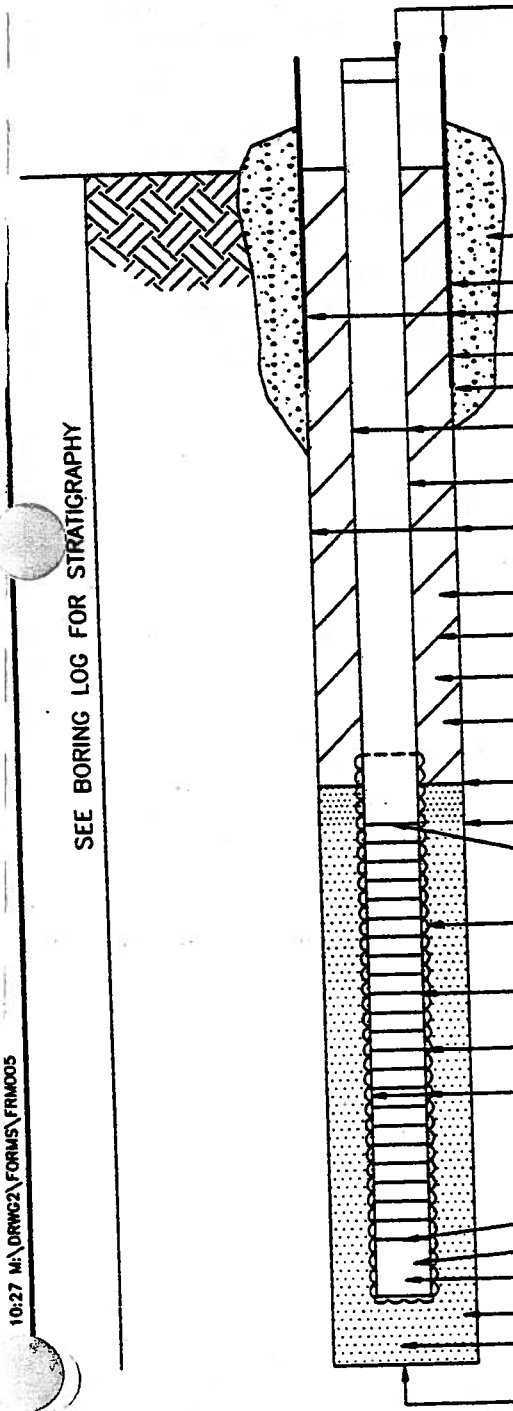
Environmental Engineers and Scientists

TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/29/99
DRILLER: G+E Services
GEOLOGIST: R Sartor
INSPECTED BY:

BOREHOLE DEPTH:
DRILL METHOD: HSA
DATE:

PAGE 1 OF 1
WELL NO. TP-8
BOREHOLE WATER LEVEL:
STATIC WATER LEVEL:
SCREEN INTERVAL: 12.5-17.5



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: 183.75
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: NA
TYPE OF SURFACE SEAL: NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA
INSIDE DIAMETER OF SURFACE CASING: NA
TYPE OF PROTECTIVE CASING: NA
DEPTH OF PROTECTIVE CASING BELOW GROUND: NA
INSIDE DIAMETER OF RISER PIPE: 1"
TYPE OF RISER PIPE: 1" PVC
DIAMETER OF BOREHOLE: 6"
TYPE OF BACKFILL: High solids Bentonite Grout
ELEVATION / DEPTH TOP OF SEAL: 9'
TYPE OF SEAL: Bentonite Chips
ELEVATION / DEPTH BOTTOM OF SEAL: 10'
DEPTH OF TOP OF SAND PACK: 10'
TYPE OF SAND PACK: 20/40 Sand as an filter material
ELEVATION / DEPTH TOP OF SCREENED SECTION: 12.5'
FILTER SOCK: no!
TYPE OF SCREENED SECTION: 10-slot screen
DESCRIBE OPENINGS: 10-slot
INSIDE DIAMETER OF SCREENED SECTION: 1"
ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 17.5
LENGTH OF BLANK SECTION: Flush
ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 17.5
ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 18.5
TYPE OF BACKFILL BELOW OBSERVATION PIPE: 20/40 Sand
ELEVATION/DEPTH OF HOLE: 18.5

Eco-Systems, Inc.
Environmental Engineers and Scientists

S.M. 02/ 10:27 M:\DRWG2\FORMS\FRM005

BORING LOG

SHEET 1 OF ___

PROJECT NAME: Task 2-RI Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER: HER-99
GEOLOGIST: Ryan/Sartor
CLASSIFICATION SCHEME: USCS
DRILLER: G+E Services
DRILL METHOD: HSA w/ S-spoons
WEATHER: Sunny/Hot

BORING IDENTIFICATION: TP-8
BORE HOLE DIAMETER: 6"
BORING START TIME: 1450 DATE: 4/29/99
BORING COMPLETED TIME: 1521 DATE: 4/29/99
FINAL BORING DEPTH: 18.5'

GROUNDWATER
INITIAL DEPTH: 13'
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS ___
VOLUME ___

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	Description
18"	0 / 2	4/7 6/4		moisture density odor color Damp medstiff no odor orang brown Fill-6" C/S, -
	4		NS	No sampling 2-5
18"	6	2/3 7/11		Damp medstiff no odor gray w/redmottling S.Cl
	8		NS	no sampling 7-10
10"	10 / 12	44/50		moist Med-dense ~~loose~~ no odor orange brown (f-m) S. Sand/gravel
	14		NS	no sample 11-15 (water @ 13)
18"	16	13/17 24/17		Saturated Med-dense ~~loose~~ no odor tan light (f-m) S. Sand/c/t gravel
	18½		NS	no sampling 17-18.5
	10	5/5 9/12		Damp, ~~dense~~ stiff, no odor gray S.Cl
	15			

-2
7
0-12 (1ft)
15-17
18.5-20.5

- Completed @ 15.2 @ 18.5'
- Convert to TP-8, screen @ 12.5-17.5'
- Cave in to 18'
- 20/40 to 10'
- Seal to 9'

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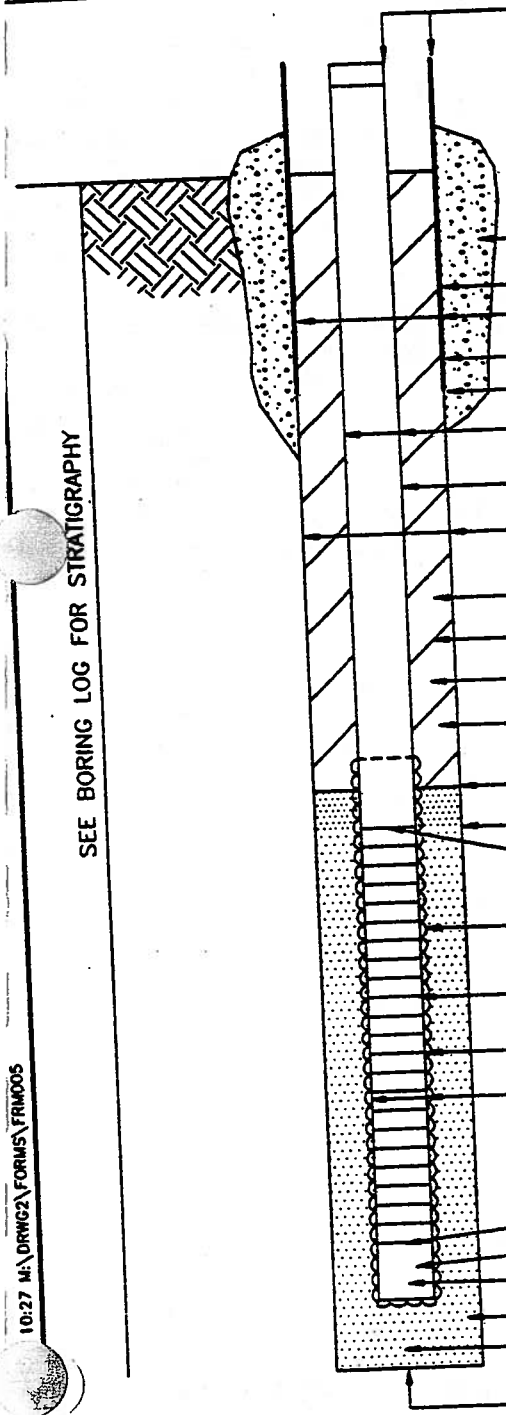
Environmental Engineers and Scientists

TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/29/99
DRILLER: GTE Services
GEOLOGIST: RS Carter
INSPECTED BY:

BOREHOLE DEPTH:
DRILL METHOD: HSA
DATE:

PAGE: 1 OF 1
WELL NO.: TP-9
BOREHOLE WATER LEVEL:
STATIC WATER LEVEL:
SCREEN INTERVAL: 4-9'



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: 163.44
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: NA
TYPE OF SURFACE SEAL: NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA
INSIDE DIAMETER OF SURFACE CASING: NA
TYPE OF PROTECTIVE CASING: NA
DEPTH OF PROTECTIVE CASING BELOW GROUND: NA
INSIDE DIAMETER OF RISER PIPE: 1"
TYPE OF RISER PIPE: 1" PVC
DIAMETER OF BOREHOLE: 6"
TYPE OF BACKFILL: High Solids Bentonite Grout
ELEVATION / DEPTH TOP OF SEAL: 2'
TYPE OF SEAL: Ben Chips
ELEVATION / DEPTH BOTTOM OF SEAL: 3'
DEPTH OF TOP OF SAND PACK: 3'
TYPE OF SAND PACK: 20/40 (Native)
ELEVATION / DEPTH TOP OF SCREENED SECTION:
FILTER SOCK: No.
TYPE OF SCREENED SECTION: 10-slot
DESCRIBE OPENINGS: 10-slot
INSIDE DIAMETER OF SCREENED SECTION: 1"
ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 9'
LENGTH OF BLANK SECTION: Flush
ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 9'
ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 10'
TYPE OF BACKFILL BELOW OBSERVATION PIPE: Native
ELEVATION/DEPTH OF HOLE: 10'

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S.M. 02/ 10:27 M:\DRWG2\FORMS\FRM005

BORING LOG

SHEET 1 OF ___

PROJECT NAME: Task 2 - RI Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER: AER-99
GEOLOGIST: Ryan / Sartor
CLASSIFICATION SCHEME: USCS
DRILLER: G+E Services
DRILL METHOD: HSA w/ S-spoons
WEATHER: Sunny / Hot

BORING IDENTIFICATION: TP-9
BORE HOLE DIAMETER: 6"
BORING START TIME: 1815 DATE: 4/29/99
BORING COMPLETED TIME: ___ DATE: ___
FINAL BORING DEPTH: ___

GROUNDWATER
INITIAL DEPTH: -4
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS: ___
VOLUME: ___

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
18"	2	2/2 2/2		damp loose no odor Black/gray S.Sa/gravel no sampling 2-5 water @ 4'
10"	5, 7	1/1 1/1		damp to moist stiff no odor gray w/mottling S.Cl No Sample 7-10
20"	10, 12, 14	2/3 4/6		damp stiff no graphite S.Cl no sampling 12-15
20	15, 17, 18, 19	2/3 10/11		damp stiff no gray/green S.Cl no sampling 17-20
20	10	4/9 12/14		damp dense no grey Cl w/silt
	15			+ Drill new boring to 10 ft bgs screen @ 4-9' · Set TP-9 · Cave in to 8' · 20/40 to 3' · Seal to 2'

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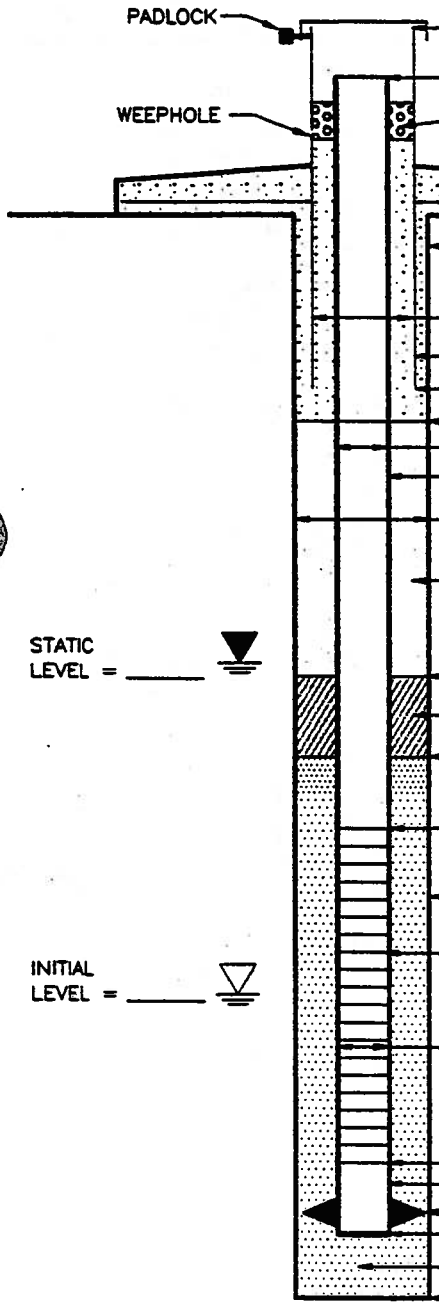
MONITORING WELL COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/29/99
DRILLER: G+E Services
GEOLOGIST: R Sartor

PAGE 1 OF 1
WELL NO. T1-10
DRILLING METHOD
METHOD OF DEVELOPMENT
8-14.5'



HEIGHT OF TOP OF SURFACE CASING ABOVE GROUND SURFACE
ELEVATION/HEIGHT OF TOP OF RISER PIPE 179.69/2'
FILLER MATERIAL NA
SIZE AND TYPE OF APRON NA
PAD ELEVATION NA
GROUND SURFACE ELEVATION NA
TYPE OF SURFACE SEAL NA
INSIDE DIAMETER OF SURFACE CASING NA
TYPE OF SURFACE CASING NA
DEPTH OF SURFACE CASING BELOW GROUND NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE 4½'
INSIDE DIAMETER OF RISER PIPE 1"
TYPE OF RISER PIPE 1" PVC
DIAMETER OF BOREHOLE 6"
TYPE OF BACKFILL
DEPTH OF TOP OF SEAL (PRE/POST HYDRATION)
TYPE OF SEAL Bentonite Chips
DEPTH OF TOP OF SAND PACK (INITIAL/POST SURGE/FINAL) 5½"
DEPTH OF TOP OF SCREENED SECTION 8'
TYPE OF SAND PACK 20/40 Sand Pack (Native)
TYPE OF SCREENED SECTION 10-slot PVC
OPENING SPACING 10-slot
OPENING SIZE
INSIDE DIAMETER OF SCREENED SECTION 1"
DEPTH OF BOTTOM OF SCREENED SECTION 14.5'
LENGTH OF BLANK SECTION Flush
CENTRALIZER
DEPTH OF BOTTOM OF PLUGGED BLANK SECTION 14.5'
TYPE OF BACKFILL BELOW OBSERVATION PIPE Native
DEPTH OF BOREHOLE 17

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BORING LOG

SHEET 1 OF ___

PROJECT NAME Task 2 - RI Hercules
PROJECT LOCATION Hattiesburg, MS
PROJECT NUMBER HBR-99
GEOLOGIST Sartor
CLASSIFICATION SCHEME USCS
DRILLER G+E Services
DRILL METHOD HSA w/ S-spoons
WEATHER Sunny/Hot

BORING IDENTIFICATION TP-10
BORE HOLE DIAMETER 6"
BORING START TIME 1058 DATE 4-29-99
BORING COMPLETED TIME 1115 DATE 4-29-99
FINAL BORING DEPTH 17 ~~16.5'~~

GROUNDWATER
INITIAL DEPTH ~11"
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS ___
VOLUME ___

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
22"	0.0 / 2	3/4 6/5		Dry loose Brown/Black (vf-f) S.Sa (Fill)
12"	0.0 / 4	6/6 3/3		Damp (f-m)
12"	1.0 / 6	3/3 6/3		Moist Firm -5' unnatural odor Gray Silt w/clay
14"	2.0 / 8	3/4 4/4		Moist Loose gray/tan (vf-f) S.Sa
12"	5.4 / 10	3/4 4/5		moist Loose
10"	25 / 12	7/9 12/12		wet (saturated) medium dense tan (f-m) G.Sa ~~w/gravel~~ RS
20"	138 / 14	10/10 14/17		saturated
				no sample 14-14.5
20"	16	1/1 4/5		~~saturated~~ damp stiff gray w/tan mottling ~~(f-m) GrSa w/silt~~ S.Cl w/Gm
	18			
	10			
	15			

- Completed @ 1115 @ 16.5' TD (14.5-17')
- Convert to TP-10 (8-14.5')
- 20/40 to 5 1/2'
- Seal to 4 1/2'
- 1' of Cave in to 13.5'

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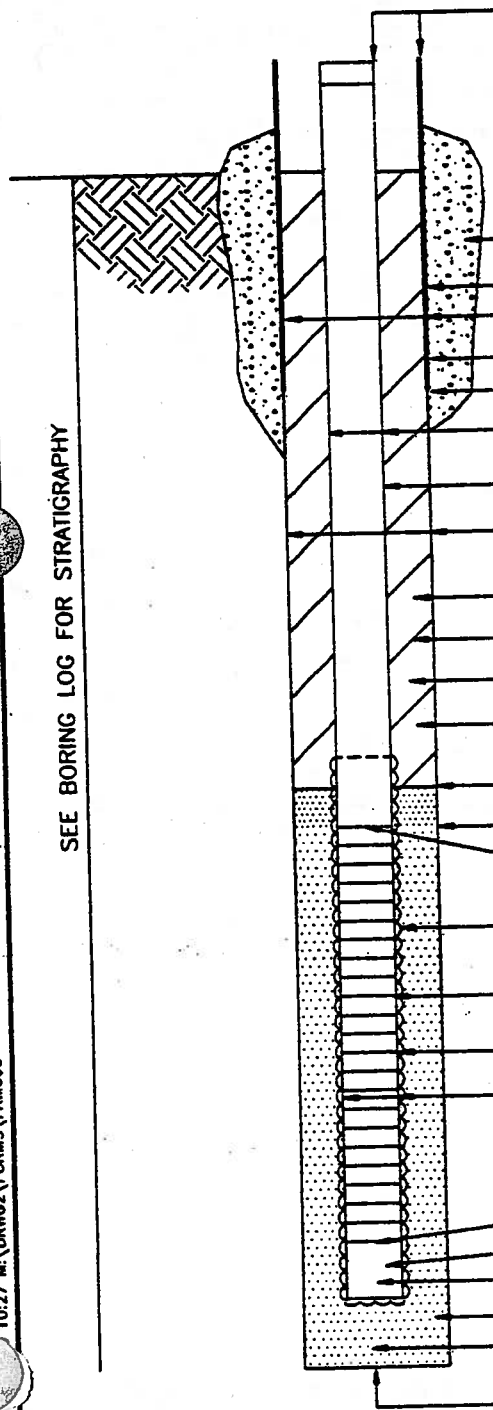
TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/29/99
DRILLER: GTE Services
GEOLOGIST: R Sartor
INSPECTED BY:
BOREHOLE DEPTH:
DRILL METHOD: HSA
DATE:
PAGE 1 OF 1
WELL NO. TP-11
BOREHOLE WATER LEVEL:
STATIC WATER LEVEL:
SCREEN INTERVAL: 8-13



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: 162.26

HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: NA

TYPE OF SURFACE SEAL: NA

DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA

INSIDE DIAMETER OF SURFACE CASING: NA

TYPE OF PROTECTIVE CASING: NA

DEPTH OF PROTECTIVE CASING BELOW GROUND: NA

INSIDE DIAMETER OF RISER PIPE: 1"

TYPE OF RISER PIPE: PVC

DIAMETER OF BOREHOLE: 6"

TYPE OF BACKFILL: High Solids Bentonite Grout

ELEVATION / DEPTH TOP OF SEAL: 5.5

TYPE OF SEAL: Bent Chips

ELEVATION / DEPTH BOTTOM OF SEAL: 6.5

DEPTH OF TOP OF SAND PACK: 6.5'

TYPE OF SAND PACK: 20/40 Sand (4' of fallback)

ELEVATION / DEPTH TOP OF SCREENED SECTION: 8'

FILTER SOCK: No!

TYPE OF SCREENED SECTION: 10 slot

DESCRIBE OPENINGS: 10 slot screen

INSIDE DIAMETER OF SCREENED SECTION: 1"

ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 13'

LENGTH OF BLANK SECTION: Flush

ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 13'

ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 15'

TYPE OF BACKFILL BELOW OBSERVATION PIPE: Native

ELEVATION/DEPTH OF HOLE: 15'

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S.M. 02/ 10:27 M:\DRWG2\FORMS\FRM005

BORING LOG

SHEET 1 OF ___

PROJECT NAME Task 2 - RI Hercules
PROJECT LOCATION Hattiesburg, MS
PROJECT NUMBER AER-99
GEOLOGIST Ryan
CLASSIFICATION SCHEME USCS
DRILLER G+E Services
DRILL METHOD HSA w/ S-Spoons
WEATHER sunny/hot

BORING IDENTIFICATION TP-11
BORE HOLE DIAMETER 6"
BORING START TIME 1735 DATE 4/29/99
BORING COMPLETED TIME 1735 DATE 4/29/99
FINAL BORING DEPTH 15'

GROUNDWATER
INITIAL DEPTH 7.5'
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS ___
VOLUME ___

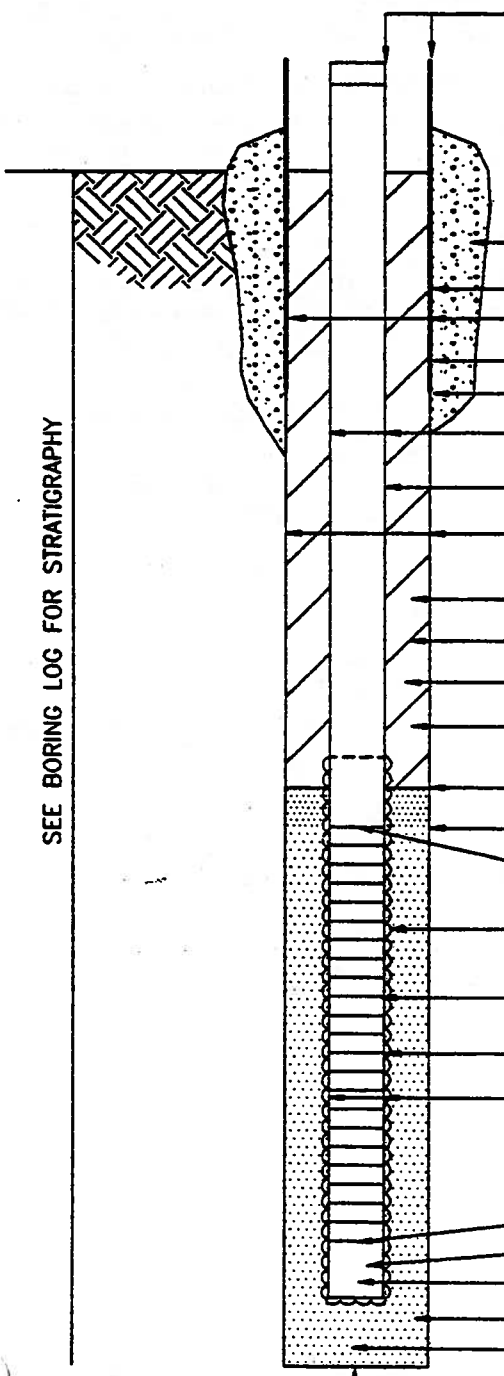
RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
20'	2 3 4 5	3/1 2/4	NS	no damp loose no odor Black S.Sa/gravel no sample 5-7
5-7 12"	7 8 9 10	2/2 4/5	NS	moist loos no odor tan S.Sa/gravel water @ 8.5 no sampling 7-10
10-12 22"	12	3/3 5/9		saturated loose no odor gray wtn S.Sa/gravel
20"	14	7/7 15/15		saturated tan no odor gray S.Cl.

- Completed @ 15 ft bgs
- TP-11 screen @ 8-13'
- Cave in to 9'
- 20/40 to 6.5'
- Seal to 5.5'

Eco-Systems, Inc.
Environmental Engineers and Scientists

TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg, MS
DATE COMPLETED: 4/29/95
DRILLER: G+E Services
GEOLOGIST: R Sartor
INSPECTED BY:
BOREHOLE DEPTH:
DRILL METHOD: HSA
DATE:
PAGE 1 OF 1
WELL NO. TP-12
BOREHOLE WATER LEVEL: ~7'
STATIC WATER LEVEL:
SCREEN INTERVAL: 5-13'



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: 159.95
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: 2.5'
TYPE OF SURFACE SEAL: NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA
INSIDE DIAMETER OF SURFACE CASING: NA
TYPE OF PROTECTIVE CASING: NA
DEPTH OF PROTECTIVE CASING BELOW GROUND: NA
INSIDE DIAMETER OF RISER PIPE: 1"
TYPE OF RISER PIPE: 1" PVC
DIAMETER OF BOREHOLE: 6"
TYPE OF BACKFILL: High Solids Bentonite Grout
ELEVATION / DEPTH TOP OF SEAL: 3'
TYPE OF SEAL: Bentonite chips
ELEVATION / DEPTH BOTTOM OF SEAL:
DEPTH OF TOP OF SAND PACK: Native to 8' bgs, 20/40 Sand to 6"
TYPE OF SAND PACK: 20/40 Sand
ELEVATION / DEPTH TOP OF SCREENED SECTION: 5'
FILTER SOCK: 1/cs
TYPE OF SCREENED SECTION: 10-slot 1" PVC
DESCRIBE OPENINGS: 10-slot
INSIDE DIAMETER OF SCREENED SECTION: 1"
ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 13'
LENGTH OF BLANK SECTION: Flush
ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 13'
ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 17'
TYPE OF BACKFILL BELOW OBSERVATION PIPE: Native
ELEVATION/DEPTH OF HOLE: 17'

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S.M. 02 10:27 M:\DRWG2\FORMS\FRM005

BORING LOG

SHEET 1 OF ___

PROJECT NAME: Task 2 - RI Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER: HER-99
GEOLOGIST: Ryan / Sartor
CLASSIFICATION SCHEME: USCS
DRILLER: G+E Services
DRILL METHOD: HSA w/ S-spoons
WEATHER: sunny / hot

BORING IDENTIFICATION: TP-12
BORE HOLE DIAMETER: 6"
BORING START TIME: 925 DATE: 4-29-99
BORING COMPLETED TIME: 0945 DATE: 4-29-99
FINAL BORING DEPTH: 17'

GROUNDWATER
INITIAL DEPTH: ~7'
DEPTH AFTER ___ MINUTES ___

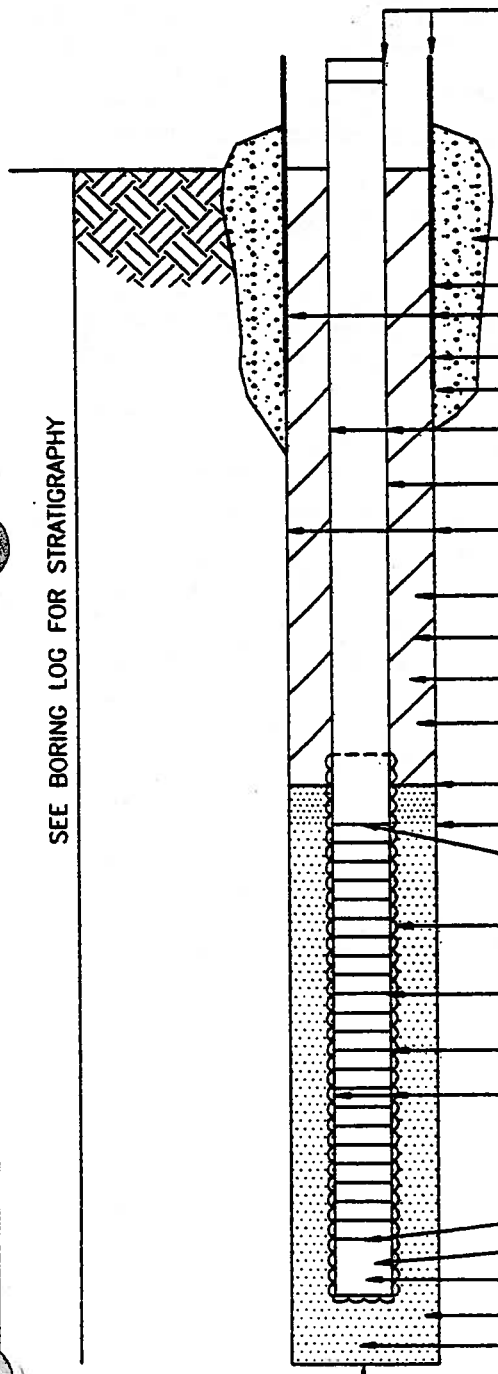
FREE PRODUCT
THICKNESS ___
VOLUME ___

	RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
0-2	22"	~~2.7~~ 2	3/3 3/3		Damp Loose brown/tan orange (fi) ~~S.Sa~~ GISA w/cl
2-4	~~20~~"	~~0.5~~ 4	2/3 3/4		No Sampling to tan orange ~~S~~ vf-f S. Sand
4-6	~~18~~"	~~.6~~ 6	3/6 6/6		tan w/ vf-f S. Sa brgy
	NS	8		NS	no sampling 6-10'
	22"	10 .4 12	5/9 12/13		saturated ~~loose~~ loose tan (f-mf) S. Sand w/ gravel
		14		NS	no sampling 12-15 @ 13' (driller said top clay).
	16"	16	6/7 8/10		Damp med stiff to stiff gray w/ orange/tan S.Cl
		18			TD=17'
		20			• Convert to TP-12 fro 5'-13'
					• Native to 8'
					• 20/40 to 4'
					• Seal to 3'
		15			

Eco-Systems, Inc.
Environmental Engineers and Scientists

TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME: Hercules
LOCATION: Hattiesburg MS
DATE COMPLETED: 4/29/99
DRILLER: GtE Services
GEOLOGIST: J Ryan
INSPECTED BY:
BOREHOLE DEPTH:
DRILL METHOD: HSA
DATE:
PAGE 1 OF 1
WELL NO. TP-13
BOREHOLE WATER LEVEL: ~5'
STATIC WATER LEVEL:
SCREEN INTERVAL: 4-11'



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE: 156.99
HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE: 3'
TYPE OF SURFACE SEAL: NA
DEPTH OF SURFACE SEAL BELOW GROUND SURFACE: NA
INSIDE DIAMETER OF SURFACE CASING: NA
TYPE OF PROTECTIVE CASING: NA
DEPTH OF PROTECTIVE CASING BELOW GROUND: NA
INSIDE DIAMETER OF RISER PIPE: 1"
TYPE OF RISER PIPE: 1" PVC
DIAMETER OF BOREHOLE: 6"
TYPE OF BACKFILL: High Solids Bentonite Grout
ELEVATION / DEPTH TOP OF SEAL: 2'
TYPE OF SEAL: Bentonite Chips
ELEVATION / DEPTH BOTTOM OF SEAL: 3'
DEPTH OF TOP OF SAND PACK: 3' 20/40 Sand (No Name)
TYPE OF SAND PACK:
ELEVATION / DEPTH TOP OF SCREENED SECTION: 4'
FILTER SOCK: Yes
TYPE OF SCREENED SECTION: 10-slot 1" PVC
DESCRIBE OPENINGS: 10-slot
INSIDE DIAMETER OF SCREENED SECTION: 1"
ELEVATION / DEPTH BOTTOM OF SCREENED SECTION: 11'
LENGTH OF BLANK SECTION: Flush
ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION: 11'
ELEVATION/DEPTH BOTTOM OF SAND COLUMN: 14'
TYPE OF BACKFILL BELOW OBSERVATION PIPE: Sand 20/40
ELEVATION/DEPTH OF HOLE: 14'

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S.M. 09 10:27 M:\DRWG2\FORMS\FRM005

BORING LOG

SHEET 1 OF ___

PROJECT NAME Task 2 - RI Hercules
PROJECT LOCATION Hattiesburg, MS
PROJECT NUMBER HER-99
GEOLOGIST Sartor
CLASSIFICATION SCHEME USCS
DRILLER G+E Services
DRILL METHOD HSA w/ S-spoons
WEATHER sunny/hot

BORING IDENTIFICATION TP-13
BORE HOLE DIAMETER 6"
BORING START TIME 810 DATE 4-29-99
BORING COMPLETED TIME 835 DATE 4-29-99
FINAL BORING DEPTH 14'

GROUNDWATER
INITIAL DEPTH ~5'
DEPTH AFTER ___ MINUTES ___

FREE PRODUCT
THICKNESS ___
VOLUME ___

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	
18"	0.6	5/4	SC	DRY, Loose, brn-gray, CLSa (0-2')
	2	5/6		
19"	1.0	4/4	SC	✓ Damp Loose Light (brn/tan), CLSa w/gravel (2'-5')
	4	4/4		
8"	16.4	4/4	SM	Saturated (5') Med-dense (vf-f) S, Sa w/trace gravel (5'-7')
	6	3/5		
18"	0.4	6/17	SP	(f-med) Gravelly Sand w/Si (7-10)
	8	16/18		
12"	1.1	3/5	SP	Loose (f) VGravelly Sand w/Si & Cl (7'-)
	10	6/12		
10"	0.1	3/2	CL	Damp Stiff brown w/gray mottling S, Cl ~~10-10.5'~~
	12	4/7		
14"	0.0	2/5	CL	
	14	3/8		
	16			
	18			
	20			
	15			

TD = 14'

- Convert to TP-13 from 4-11'.
- Add filter sock + 20/40 from TD.
-

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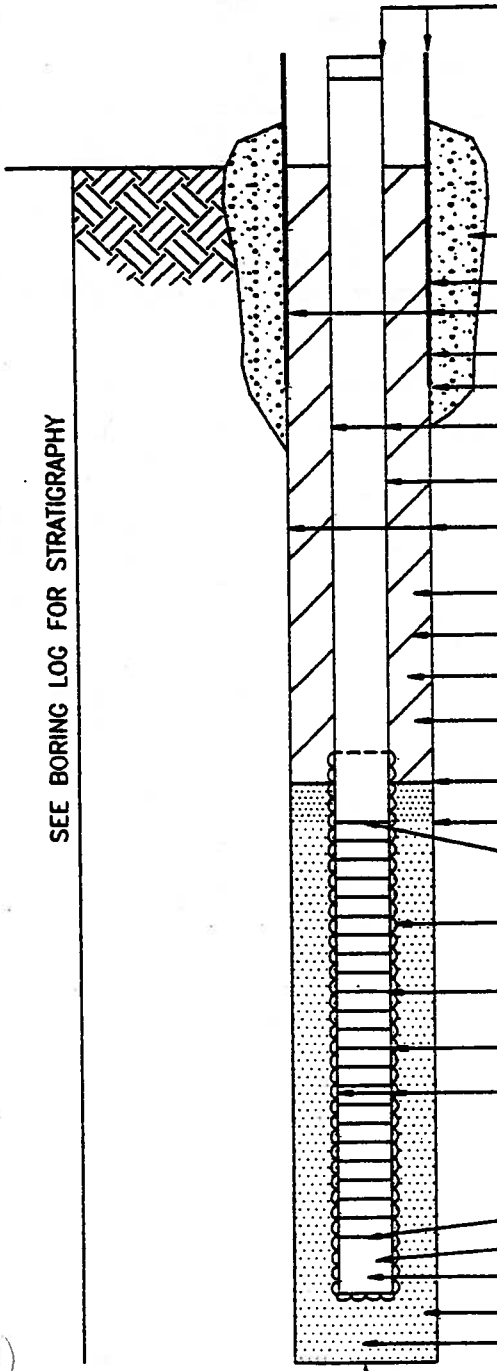
TEMPORARY MONITORING POINT COMPLETION FORM

PROJECT NAME Hercules
LOCATION Hattiesburg, MS
DATE COMPLETED 5/10/99
DRILLER G&E Services
GEOLOGIST J Ryan
INSPECTED BY
BOREHOLE DEPTH
DRILL METHOD HSA
DATE
PAGE 1 OF 1
WELL NO. TP-14
BOREHOLE WATER LEVEL
STATIC WATER LEVEL
SCREEN INTERVAL



ELEVATION OF TOP OF SURFACE CASING/RISER PIPE 164.34

HEIGHT OF TOP OF SURFACE CASING/RISER PIPE ABOVE GROUND SURFACE 2.6'

TYPE OF SURFACE SEAL NA

DEPTH OF SURFACE SEAL BELOW GROUND SURFACE NA

INSIDE DIAMETER OF SURFACE CASING NA

TYPE OF PROTECTIVE CASING NA

DEPTH OF PROTECTIVE CASING BELOW GROUND NA

INSIDE DIAMETER OF RISER PIPE 1"

TYPE OF RISER PIPE PVC

DIAMETER OF BOREHOLE 6"

TYPE OF BACKFILL High Solids Bentonite Grout

ELEVATION / DEPTH TOP OF SEAL 1'

TYPE OF SEAL Bentonite Pellets

ELEVATION / DEPTH BOTTOM OF SEAL 3'

DEPTH OF TOP OF SAND PACK 5.0'

TYPE OF SAND PACK 20/40 Sand

ELEVATION / DEPTH TOP OF SCREENED SECTION 7.6'

FILTER SOCK Yes

TYPE OF SCREENED SECTION 10-slot 1" PVC

DESCRIBE OPENINGS 10-slot

INSIDE DIAMETER OF SCREENED SECTION 1"

ELEVATION / DEPTH BOTTOM OF SCREENED SECTION 12.6"

LENGTH OF BLANK SECTION Flush

ELEVATION/DEPTH BOTTOM OF PLUGGED BLANK SECTION 12.6"

ELEVATION/DEPTH BOTTOM OF SAND COLUMN 14'

TYPE OF BACKFILL BELOW OBSERVATION PIPE Native

ELEVATION/DEPTH OF HOLE 14"

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BORING LOG

SHEET 1 OF ___

PROJECT NAME: Task 2 - RI Hercules
PROJECT LOCATION: Hattiesburg, MS
PROJECT NUMBER: HER-95
GEOLOGIST: Ryan
CLASSIFICATION SCHEME: USCS
DRILLER: G+E Services
DRILL METHOD: HSA w/ s-spoons
WEATHER: ___

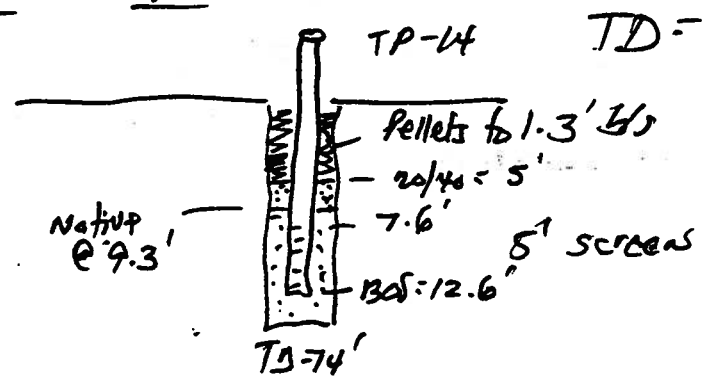
BORING IDENTIFICATION: TP-14
BORE HOLE DIAMETER: 3"
BORING START TIME: 1630 DATE: 5-10-99
BORING COMPLETED TIME: 1650 DATE: 5-10-99
FINAL BORING DEPTH: ___

RECOVERY (INCHES)	DEPTH IN FEET	SYMBOL	LITHOLOGY	GROUNDWATER	FREE PRODUCT
				INITIAL DEPTH: ~7'	THICKNESS: ___
				DEPTH AFTER ___ MINUTES ___	VOLUME: ___

DEPTH IN FEET			
2	DAMP, moist (@2)	firm,	brown, black-stained -
4	Damp (3.5)	Loose,	lt. brn,
6	moist (5'),	firm,	brown,
8	wet-sat, SAT	Loose,	Lt. brn,
10			tan
12			
14			
16			
10			
15			

CLSa
Fill w. clSa (1.5'-3.1)
SiSa tr. cl (3.1'-5)
SiSa (5'-7')
SiSa f-med (trace gravel) 7'-
w/ gravel @ 10.5'

TD = 14'



Eco-Systems, Inc.
Environmental Engineers and Scientists

APPENDIX C

SAMPLE COLLECTION LOGS

Eco-Systems, Inc.
onmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-1
Site Location: Hattiesburg, Mississippi

Start Date: 10/14/2002 Finish Date: 10/14/2002
Sample Technician: Charles Coney and Rodney Sartor
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 17
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 11.47
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 1.9

Water Level Measurements		
Date	Time	Water Level (TOC)
10/14/2002	9:31	5.53

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
10/14/2002 10:20	2	6.19	125.6	20.5	13.7			
10:30		6.14	74.9	20.7	13.7			
10:40		6.05	140.2	20.8	13.2			
11:02		6.06	129.5	22.5	13.3			
11:15		5.91	127.0	22.5	14.3			

Sample Identification:

Weather Conditions During Sampling:

Comments:

ure: Date:

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
10/14/2002	11:30		

Eco-Systems, Inc.

onmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules

Project Number: HER99072

Boring ID: MW-4

Site Location: Hattiesburg, Mississippi

Start Date: 10/14/2002 Finish Date: 10/14/2002

Sample Technician: Charles Coney and Rodney Sartor

Purge/Sample Method: Peristaltic Pump

Well Diameter: 2"

Total Depth of Well: 15

Approximate Depth of Water Column

(h= TD of well - water level [TOC]): 4.60

Calculated Well Volume ($V=6hd^2$)

(V = vol in gal; D = well diam. in ft): 0.8

Water Level Measurements		
Date	Time	Water Level (TOC)
10/14/2002	12:24	10.40

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
10/14/2002 12:40	0.5	6.07	644.0	22.7	7.18			
12:50	1.0	6.16	621.0	21.7	5.03			
12:55	1.25	6.12	566.0	21.7	4.67			

Sample Identification:

Weather Conditions During Sampling:

Comments:

ure: Date:

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
10/14/2002	13:05		

Eco-Systems, Inc.
Environmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-5
Site Location: Hattiesburg, Mississippi

Start Date: 10/14/2002 Finish Date: 10/14/2002
Sample Technician: Charles Coney and Rodney Sartor
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 15
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 6.3
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 1.1

Water Level Measurements		
Date	Time	Water Level (TOC)
10/14/2002	13:47	8.7

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
10/14/2002 14:05		6.68	484.0	26.2	3.28			
14:16		6.78	483.0	25.8	2.35			
14:20		6.72	396.0	25.5	2.52			
14:22		6.71	896.0	25.2	1.69			
14:25	2.5	6.72	560.0	25.1	1.61			
14:30	3.5	6.64	734.0	25.3	1.43			
14:34		6.64	428.0	24.9	2.87			
14:37		6.6	555.0	24.6	1.60			
14:41	4	6.54	325.0	24.6	1.67			
14:44		6.51	294.0	24.7	2.28			
14:46	4.5	6.62	416.0	24.4	1.61			
14:49	4.75	6.47	442.0	24.6	1.76			

Sample Identification:

Weather Conditions During Sampling:

Comments:

ure: Date:

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
10/14/2002	14:50		

Eco-Systems, Inc.
...onmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-6
Site Location: Hattiesburg, Mississippi

Start Date: 10/14/2002 Finish Date: 10/14/2002
Sample Technician: Charles Coney and Rodney Sartor
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 18
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 9.95
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 1.7

Water Level Measurements		
Date	Time	Water Level (TOC)
10/14/2002	15:52	8.05

WELL DEVELOPMENT/PURGING DATA								
Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
10/14/2002 16:00		6.72	110.6	24.9	1.93			
16:03		5.75	118.5	24.6	1.58			
16:05		5.68	104.2	24.5	1.26			
16:08		5.56	147.7	24.4	1.26			
16:09		5.61	120.2	24.2	1.09			
16:11		5.57	181.7	24.0	1.26			
16:13		5.63	80.0	23.9	1.48			
16:15		5.55	170.0	24.0	1.30			
16:17		5.57	186.8	24.2	1.18			
16:19		5.49	184.8	24.1	1.05			

Sample Identification:

Weather Conditions During Sampling:

Comments:

...ure: Date:

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
10/14/2002	16:22		

Eco-Systems, Inc.
Environmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-1
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02
Finish Date: 12/4/02
Sample Technician: Charles Coney
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 20.5
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 15.35
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 2.6

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	9:10	5.15

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/4/02 10:04	2.5	6.70	198.1	19.1	9.4	1.36		
10:21	5.0	6.70	181.5	19.6	8.9	0.91		
10:42	7.5	6.71	170.8	20.4	9.0	0.69		

Sample Identification: MW-1

Weather Conditions During Sampling: cloudy and warm, low 60's

Comments: _Delivered sample directly to Glenn Jones of Bonner Laboratory_

Signature: Spencer Trickell Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/4/02	10:45	1 L Amber	none

Eco-Systems, Inc.
Environmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-2
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02 Finish Date: 12/4/02
Sample Technician: Charles Coney
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 20.5
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 14.95
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 2.5

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	15:18	5.55
	15:21	5.70
	15:25	5.70

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/4/02 15:25	0.25	5.77	104.6	19.8	5.6	3.40		
15:30	0.5	5.76	103.4	19.8	5.8	2.72		
15:35	0.75	5.68	103.1	19.7	6.7	2.52		
15:40	1.0	5.60	102.9	19.8	4.1	1.98		

Sample Identification: MW-2

Weather Conditions During Sampling: very cloudy, breezy, lower 60's

Comments: Delivered samples directly to Bonner Analytical

Signature: Spencer Trichell Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/4/02	15:45	1 L amber	none

Eco-Systems, Inc.
Environmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-3
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02 Finish Date: 12/4/02
Sample Technician: Charles Coney
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 18
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 11.75
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 2.0

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	14:35	6.25
	14:42	6.25

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/4/02 14:42	0.5	6.70	122.3	19.8	16	2.90		
14:45	0.75	6.70	131.6	19.5	8.8	2.47		
14:50	1	6.70	119.6	19.5	7.4	2.22		
14:55	1.5	6.70	118.2	19.4	8.2	2.02		

Sample Identification: MW-3

Weather Conditions During Sampling: very cloudy, breezy, lower 60's

Comments: Delivered sample directly to Bonner Laboratory

Signature: Spencer Trichell Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/4/02	15:00	1 L amber	none

Eco-Systems, Inc.
Environmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-4
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02 Finish Date: 12/5/02
Sample Technician: Charles Coney
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 18.5
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 8.58
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 1.5

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	10:27	9.92
12/5/02	12:45	9.67
12/5/02	12:55	9.71

WELL DEVELOPMENT/PURGING DATA								
Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/5/02 12:55	0.2	6.22	382.0	19.6	7.3	0.87		
13:00	0.3	6.20	367.0	20.0	6.3	0.61		
13:05	0.4	6.18	363.0	20.1	3.4	0.57		
13:10	0.5	6.17	360.0	20.2	2.9	0.51		

Sample Identification: MW-4

Weather Conditions During Sampling: cloudy, breezy, lower 40's

Comments: Delivered sample directly to Bonner Laboratory

Signature: Spencer Trichell Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/5/02	13:15	1L ambers	none
		40 mL septa vials	HCl

Eco-Systems, Inc.
Environmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-5
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02 Finish Date: 12/5/02
Sample Technician: Charles Coney
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 18.5
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 10.45
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 1.8

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	11:10	8.05
12/5/02	13:50	7.40
12/5/02	14:02	8.14

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/5/02 14:02	0.25	6.82	621	15.2	10	0.49		
14:07	0.75	6.83	319	15.5	9.1	0.43		
14:12	1	6.83	619	15.3	7.3	0.38		
14:17	1.25	6.83	622	15.3	5.4	0.37		

Sample Identification: MW-5

Weather Conditions During Sampling: cloudy, breezy, lower 40's

Comments: Sample was relinquished directly to Bonner Laboratory

Signature: Spencer Trishell Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/5/02	14:20	1L ambers	none

Eco-Systems, Inc.
onmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-6
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02
Finish Date: 12/5/02
Sample Technician: Charles Coney
Purge/Sample Method: Peristaltic Pump, volume based
Well Diameter: 2"
Total Depth of Well: 23.25
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 15.52
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 2.6

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	11:07	7.73

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/5/02 14:57	2.6	5.47	163	20.4	5.4	1.82		
15:10	5.2	5.46	165	20.6	7.3	1.70		
15:25	7.8	5.50	167	20.5	4.6	1.75		

Sample Identification: MW-6

Weather Conditions During Sampling: cloudy, breezy, lower 40's

Comments: Sample was relinquished directly to Bonner Analytical

Signature: Spencer Trichell Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/5/02	15:30	1L ambers	none

Eco-Systems, Inc.
...nmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-7
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02 Finish Date: 12/4/02
Sample Technician: Spencer Trichell
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 22.5
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 8.89
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 1.5

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	11:53	13.61
12/4/02	15:50	13.68

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/4/02 15:50	1.5	4.33	160	21.3	2.0	3.50		
16:00	1.75	4.27	180	20.5	1.7	2.75		
16:05	2.0	3.78	160	20.2	1.9	2.50		
16:08	2.25	3.80	150	21.4	1.7	3.10		
16:13	2.5	3.78	150	21.1	1.9	2.40		

Sample Identification: MW-7

Weather Conditions During Sampling: raining, warm, lower 60's

Comments: Sample was relinquished directly to Bonner analytical

Signature: Spencer Trichell Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/4/02	16:20	1L ambers	none
		40mL septa vials	HCl

Eco-Systems, Inc.
Environmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-8
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02 Finish Date: 12/5/02
Sample Technician: Charles Coney
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 20
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 5.91
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 1.0

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	9:35	14.09

WELL DEVELOPMENT/PURGING DATA								
Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/5/02 10:57	0.3	5.93	545	21.4	1.0	0.63		
11:02	0.40	5.93	543	21.6	1.10	0.6		
11:07	0.50	5.92	543	21.7	0.95	0.55		
11:12	0.60	5.92	545	21.8	1.00	0.52		

Sample Identification: MW-8, MS, and MSD

Weather Conditions During Sampling: cloudy, breezy, lower 40's

Comments: _Relinquished samples directly to Bonner Laboratory

Signature: Spencer Trichell Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/5/02	15:50	40 mL septa vials	HCl
		1L ambers	none

Eco-Systems, Inc.
Environmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-9
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02
Finish Date: 12/5/02
Sample Technician: Charles Coney
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 20
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 8.65
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 1.5

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	11:05	11.35
12/5/02	9:20	11.32
12/5/02	9:41	11.34

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/5/02 9:31	0.25	5.25	151	13.1	3.4	1.55		
9:36	0.35	5.16	147	14.2	3.2	0.81		
9:41	0.45	5.15	152	13.8	3.7	0.76		
9:46	0.55	5.80	510	16.1	0.9	0.75		
9:51	0.65	5.81	526	15.2	1.1	0.67		
9:56	0.75	5.82	532	14.3	1.1	0.71		
10:01	0.85	5.8	545	15.5	1.0	0.47		
10:06	1	5.82	557	16.7	1.0	0.65		

Sample Identification: MW-9

Weather Conditions During Sampling: cloudy, breezy, lower 40's

Comments: _Samples relinquished directly to Bonner Analytical_

Signature: Spencer Trichab Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/5/02	10:15	40 mL septa vials	HCl
		1L ambers	none

Eco-Systems, Inc.
Environmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-10
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02 Finish Date: 12/4/02
Sample Technician: Charles Coney
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 18.5
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 8.77
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 1.5

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	10:18	9.73
	16:00	9.75
	16:11	20:24

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/5/02 16:14	0.25	5.34	50.1	19.8	37	0.84		slightly turbid at first
16:20	0.5	5.41	49.3	20.1	34	0.60		
16:25	0.75	5.39	47.3	19.7	23	0.62		
16:30	1.0	5.35	46.1	19.6	16	0.68		
16:35	1.25	5.39	45.6	19.5	12	0.74		

Sample Identification: MW-10

Weather Conditions During Sampling: raining, lower 60's

Comments: Samples relinquished directly to Bonner Laboratory

Signature: Spencer Trichell Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/4/02	16:38	40 mL septa vials	HCl
		1L amber	none

Eco-Systems, Inc.
Environmental Engineers and Scientists

Groundwater Sample Collection Log

Project Name: Hercules
Project Number: HER99072
Boring ID: MW-11
Site Location: Hattiesburg, Mississippi

Start Date: 12/4/02
Finish Date: 12/4/02
Sample Technician: Charles Coney
Purge/Sample Method: Peristaltic Pump
Well Diameter: 2"
Total Depth of Well: 17
Approximate Depth of Water Column
(h= TD of well - water level [TOC]): 9.95
Calculated Well Volume ($V=6hd^2$)
(V = vol in gal; D = well diam. in ft): 1.7

Water Level Measurements		
Date	Time	Water Level (TOC)
12/4/02	10:38	7.05

WELL DEVELOPMENT/PURGING DATA

Date/Time	Cumulative Volume (gal)	pH	Specific Conductivity (umohs)	Temperature (Celsius)	Turbidity (NTU)	D.O. (mg/l)	ORP (mv)	Comments
12/5/02 11:47	0.25	6.71	347	20.2	6.1	0.66		
11:52	0.5	6.70	319	19.8	6.5	0.57		
12:00	1	6.70	300	19.7	7.3	0.41		
12:03	1.25	6.70	300	19.6	6.5	0.45		

Sample Identification: MW-11

Weather Conditions During Sampling: cloudy and warm

Comments: _Samples were relinquished directly to Bonner Laboratory_

Signature: Spencer Trickell Date: 12/17/02

GROUNDWATER SAMPLE CONTAINERS			
Date	Time	Sample Container	Preservative
12/4/02	12:10	1L amber	none
		40 mL septa vials	HCl

APPENDIX D

LABORATORY ANALYTICAL REPORTS

Mississippi State Chemical Laboratory

DR. KEVIN L. ARMBRUST
State Chemist

Results are presented for the analysis of dioxathion in four well water samples. The only previous experience the laboratory has had with this compound was to perform experiments to qualitatively identify its structural isomers on two occasions. The compounds were characterized by their UV and IR spectra, and were chromatographed both by liquid and gas chromatography (LC and GC). Some infusion and LC experiments with standards were done. No quantitative methods were developed. An extraction method was chosen that is amenable to recovering residues of many pesticides. The samples were buffered and the pH adjusted to 8.0 followed by three extractions with methylene chloride. The extracts were combined and then exchanged into acetonitrile containing internal standard for analysis by HPLC/UV and HPLC/MS. Sample extracts were maintained at 4°C.

The UV and MS data were taken simultaneously from the same injections of samples. The instrument used was a micromass Quattro Micro. The analytical column was an Alltech Altima C-18 (5u), 4.6mm X 250mm and maintained at 35°C. The mobile phase was 75:25 acetonitrile:water, isocratic at 1.0 ml/min. Two UV wavelengths were monitored for the entire run, but residues were quantitated from the 254 nm data for the internal standard and for dioxenethion. Concentrations of cis- and trans-dioxathion were determined from the 200 nm data.

Samples were introduced into the MS by atmospheric pressure chemical ionization at 300°C. The flow rate for the nebulizing gas was 400 L/hr. The ion chosen for quantitation was m/z 270.

Results and quantitation levels are reported for samples based on a signal-to-noise ratio of 5:1 for both detection techniques.

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HPLC/UV RESULTS

MSCL No.	26,523	26,524	26,525	26,526A	26,526B	Laboratory Blank Water	Lower Level of Quantitation
Sample ID	MW-1	MW-4	Rinsate	MW-5	MW-5 Duplicate		
Volume	1,000 ml	1,000 ml	625 ml	1,000 ml	1,000 ml	1,000 ml	
	PARTS PER BILLION						
Cis-dioxathion	ND*	ND	ND	ND	ND	ND	1.0
Trans-dioxathion	1.5	ND	ND	10	4.3	ND	1.0
Dioxenethion	ND	25	ND	ND	ND	ND	0.30

*ND = None Detected

	Spiking Level	Laboratory Spiked Water	Percent Recovery	Spiked MW-5 Replicate	Average MW-5 Replicates	Net Level Found	Percent Net Recovery
	PARTS PER BILLION						
Cis-dioxathion	42	47	112	36	ND	36	85.7
Trans-dioxathion	42	43	102	40	7.2	33	78.6
Dioxenethion	53	69	130	87	ND	87	164

HPLC/MS RESULTS

MSCL No.	26,523	26,524	26,525	26,526A	26,526B	Laboratory Blank Water	Lower Level of Quantitation
Sample ID	MW-1	MW-4	Rinsate	MW-5	MW-5 Duplicate		
Volume	1,000 ml	1,000 ml	625 ml	1,000 ml	1,000 ml	1,000 ml	
	PARTS PER BILLION						
Cis-dioxathion	ND	ND	ND	ND	ND	ND	0.21
Trans-dioxathion	ND	ND	ND	0.92	1.0	ND	0.21
Dioxenethion	ND	32	ND	ND	ND	ND	0.53

	Spiking Level	Laboratory Spiked Water	Percent Recovery	Spiked MW-5 Replicate	Average MW-5 Replicates	Net Level Found	Percent Net Recovery
	PARTS PER BILLION						
Cis-dioxathion	42	64	152	45	ND	45	107
Trans-dioxathion	42	101	240	59	0.5	58	138
Dioxenethion	53	84	158	50	ND	50	94.3

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Your World ... for a Safer Tomorrow

YOUR COMPANY NAME: [illegible]
YOUR COMPANY ADDRESS: 613 [illegible]
[illegible]
NAME OF PERSON TO CONTACT: [illegible]
CONTACT PERSON'S PHONE: [illegible] 95 - 2260 FAX:
CONTACT PERSON'S EMAIL:

CLIENT PROJECT NO.	CLIENT P.O.#	CLIENT PROJECT NUMBER

LABORATORY USE
Turn Around Time
Project Number

	SAMPLE DESCRIPTION	DATE	TIME	MATRIX	PARAMETERS FOR ANALYSIS: [illegible]							NUMBER OF CONTAINERS	PRESERVATION	File ID
1	MW-1	10/10/02	1130	Liquid	X							2	4°C	BT
2	MW-4	10/10/02	1300	Liquid	X							2	4°C	BT
3	[illegible]	10/10/02	1305	Liquid	X							2	4°C	BT
4	MW-5 MS MSD	10/10/02	1450	Liquid	X							6	4°C	BT
5														BT
6														BT
7														BT
8														BT
9														BT
10														BT

SAMPLE COLLECTOR/RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	150ct02	1100					

METHOD OF SHIPMENT (If Any)	RELINQUISHED BY:	DATE	TIME	RECEIVED FOR BATCO BY:	DATE/TIME
FEDEX Airbill # 8369 1634 5850					

REMARKS:

☐ REQUEST BATCO TO DISPOSE OF ALL SAMPLE REMAINDERS
_____ (Signature)
IF SAMPLE IS DETERMINED TO BE HAZARDOUS, A MINIMUM ADDITIONAL CHARGE OF $30.00 PER SAMPLE WILL BE ASSESSED.

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03/22/01

Bonner Analytical Testing Company

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CASE NARRATIVE: Hercules

Semi-volatiles(BNA analysis)

Samples were collected on December 4th and 5th from Hercules in Hattiesburg, MS. They were received at BATCO on December 5, 2002 and included monitoring wells 7, 8, 9, 10, and 11. A duplicate sample, a matrix spike/matrix spike duplicate, and a rinsate blank were also collected for BNA analysis.

Samples were extracted on December 10, 2002 according to EPA SW-846 method 3510C and analyzed according to EPA SW-846 method 8270C on December 11, 2002. No complications were observed during the extraction process or in the analysis of the samples.

No compounds listed in method 8270 were found in the samples except for 4-methylphenol, which was observed in BT80874 and the duplicate sample. The concentration of 4-methylphenol in BT80874 was 13.16 ppb and the concentration in the duplicate sample was 12.76 ppb.

A DFTPP standard was run on the GC/MS to ensure the machine was functioning properly. A six-point curve was also installed prior to the injection of the Hercules samples. The concentrations of the curve range from 10 ppm to 100 ppm. The percent RSD for all compounds in the curve was below 15%. Also, calibration verifications were run during the sequence for QA/QC purposes. Both the DFTPP standard and the calibration verifications passed. Also, all SPCC and CCC compounds passed according to method 8270C.

Authorized by: _____
Michael S. Bonner, PhD.

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CASE NARRATIVE: Hercules, Hattiesburg MS.

Volatile Organic Analyses:

Samples were collected on October 14, 2002 from Hercules in Hattiesburg MS. They were received at BATCO on October 15, 2002 and included monitoring wells 5 and 6. A trip blank was also collected for volatile organic analyses.

Samples were analyzed for volatile organic compounds, VOC's, utilizing a 5890 Series II Hewlett Packard Gas Chromatograph (GC), and a Perkin-Elmer Ion Trap Detector. These samples were run within the fourteen-day holding time window according to EPA SW846 Method 8260B, which began on October 27, 2002. All QA/QC criteria were with in the limits as set forth in EPA SW846 Method 8260B.

No compounds listed on the target analyte list for EPA SW846 Method 8260B were found in the samples collected from Hercules in monitoring wells 5 and 6. The trip blank collected also contained any of the said compounds or showed signs of co-eluting interferences.

A BFB standard was run on the HP-5890 GC to verify the detector, Ion Trap Detector, was tuned and properly functional. A five point calibration curve was obtained from dilutions of a working standard, 8260 calibration mix, which proved to pass linearity in accordance to EPA Method 8260B. Initial and continuing calibration verifications were acquired, analyzed, and passed during the sequence of the sample run. All Quality Assurance and Control measures were met in accordance to Method 8260B.

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Table 1. Continued

Compound	MW-4	MW-8	MW-9	MW-11	Duplicate
1,3-dichlorobenzene	ND	3.75 ppb	ND	ND	ND
1,4-dichlorobenzene	ND	3.80 ppb	ND	ND	ND
1,2-dichloroethane	ND	20.0 ppb	ND	3.11 ppb	ND
Cis-1,2-dichloroethene	ND	19.0 ppb	ND	ND	ND
Ethyl benzene	ND	55.6 ppb	ND	ND	ND
Isopropylbenzene	1.26 ppb	4.60 ppb	2.48 ppb	ND	1.01ppb
p-isopropyltoluene	ND	23.9 ppb	ND	ND	ND
Methylene chloride	ND	26.1 ppb	ND	ND	ND
Naphthalene	5.38 ppb	9.14 ppb	ND	ND	7.34ppb
Tetrachloroethene	ND	8.51 ppb	ND	ND	ND
1,2,3-trichlorobenzene	1.81 ppb	2.55 ppb	ND	ND	2.73ppb
1,2,4-trichlorobenzene	ND	2.86 ppb	ND	ND	2.17ppb
1,2,4-trimethylbenzene	ND	1.81 ppb	ND	ND	ND
Xylenes (total)	ND	79.0 ppb	ND	ND	ND
Vinyl chloride	ND	1.62 ppb	ND	ND	ND

A BFB standard was run on the HP-5890 GC to verify the detector, Ion Trap Detector, was tuned and properly functional. A five point calibration curve was obtained from dilutions of a working standard, 8260 calibration mix, which proved to pass linearity in accordance to EPA Method 8260B. Initial and continuing calibration verifications were acquired, analyzed, and passed during the sequence of the sample run. All Quality Assurance and Control measures were met in accordance to Method 8260B.

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CASE NARRATIVE: Hercules, Hattiesburg MS.

Volatile Organic Analyses:

Samples were collected on December 4th and 5th, 2002 from Hercules in Hattiesburg MS. They were received at BATCO on December 5, 2002 and included monitoring wells 4, 7, 8, 9, 10, and 11. A duplicate sample, a matrix spike, matrix spike duplicate, a rinsate blank, and two trip blanks were also collected for volatile organic analyses.

Samples were analyzed for volatile organic compounds, VOC's, utilizing a 5890 Series II Hewlett Packard Gas Chromatograph (GC), and a Perkin-Elmer Ion Trap Detector. These samples were run within the fourteen-day holding time window according to EPA SW846 Method 8260B, which began on December 13, 2002. All QA/QC criteria were with in the limits as set forth in EPA SW846 Method 8260B.

Monitoring wells 4, 8, 9, and 11 and the sample duplicate were found to contain volatile organic compounds listed on the target analyte list, with monitoring well 8 having the highest levels of VOC compounds. Table 1 of this narrative lists the compounds observed from the said samples.

Table 1. Concentration Levels of Volatile Compounds for Samples Tested.

Compound	MW-4	MW-8	MW-9	MW-11	Duplicate
1,1-Dichloroethene	ND	17.0 ppb	5.92 ppb	ND	ND
Benzene	14.0 ppb	6900 ppb	9.15 ppb	114 ppb	11.2 ppb
Trichloroethene	ND	5.80 ppb	ND	ND	ND
Toluene	ND	28.0 ppb	ND	ND	ND
Chlorobenzene	1.81 ppb	290 ppb	ND	ND	1.14 ppb
Bromodichloromethane	ND	6.84 ppb	ND	ND	ND
Bromomethane	ND	4.07 ppb	ND	ND	ND
Carbon Tetrachloride	10.0 ppb	16,000 ppb	ND	ND	5.53 ppb
Chloroethane	63.0 ppb	66.0 ppb	ND	ND	64.8 ppb
Chloroform	ND	1800 ppb	ND	ND	ND
Chloromethane	1.72 ppb	39.2 ppb	ND	ND	1.19 ppb
Dibromochloromethane	ND	4.45 ppb	ND	ND	ND
1,2-dichlorobenzene	ND	2.71 ppb	ND	ND	ND

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CASE NARRATIVE: Hercules, Hattiesburg MS.

Semi-volatiles (Dioxathion Analysis)

Samples were collected and received by BATCO on October 14, 2002. A total of 6 water samples were received and analyzed for the presence of Dioxathion. These samples included monitoring wells 1,4, and 5 plus a rinsate and two matrix spikes. The sequence run included a Lab Control Sample, Method Blank, and a sample duplicate, as well as the fore mentioned samples.
A Dioxathion Calibration working standard was prepared from the individual Dioxenethion, Dioxathion (cis) and Dioxathion (trans) isomers obtained from Sigma-Aldrich Chemicals. Dilutions were made from the working standard to obtain a six-point curve (0.4 to 10 ppm) utilizing a HP-1090 HPLC and HP-Chem software. A Diode-Array Detector, DAD, was used to obtain the data. Table 1 illustrates the retention times, linearity correlation coefficient and the MDL's.

Table 1-Calibration Data

Dioxathion Isomer	Retention Times @ 210 nm (min)	Calibration of Linearity Correlation Coefficient	Method Detection Limits (ppb)
Dioxenethion	4.510	0.9996	0.220
Dioxathion (cis)	8.580	0.9995	0.480
Dioxathion (trans)	9.216	0.9978	0.300

Samples were extracted on 10/21/02 using an EPA SW846 Method 3520C for Continuous Liquid-Liquid separatory funnel extractions. Methylene chloride was the extracting solvent and exchanged to acetonitrile at 1-mL final volume. The samples were then analyzed on10/22/02, using the HP-1090 HPLC under the same method as the calibration. Calibration verifications were analyzed before and after the sample batch. All quality assurance criteria based on guidelines given in SW-846 Method 8000B was met. Table 2 illustrates the raw data obtained in this analysis.

Table 2-Raw Data

Lab ID	Description	Dioxenethion	Dioxathion (cis)	Dioxathion(trans)
BT80054	Monitor Well #1	ND	ND	ND
BT80055	Monitor Well #4	19.2ppb	4.80ppb	1.61ppb
BT80055D	Monitor Well #4 Dup	20.7ppb	4.71ppb	1.75ppb
BT80056	Rinsate	ND	ND	ND
BT80057	Monitor Well #5	5.09ppb	1.70ppb	1.44ppb

Authorized by: _____
Michael S. Bonner, PhD.

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CASE NARRATIVE: Hercules

Semi-volatiles(BNA analysis)

Samples were collected on October 14, 2002 from Hercules in Hattiesburg, MS. They were received at BATCO on October 15, 2002 and included monitoring wells 5 and 6. A matrix spike and matrix spike duplicate were also collected for BNA analysis.

Samples were extracted on October 21, 2002 at 0900 according to EPA SW-846 method 3510C and analyzed according to EPA SW-846 method 8270C on November 6, 2002. No complications were observed during the extraction process or in the analysis of the samples.

No compounds listed in method 8270 were found in either of the monitoring wells. Lab control and MS/MSD recoveries for surrogate and target compounds were acceptable according to in-house criteria set by EPA SW-846 Method 8000B, section 8.7.

A DFTPP standard was run on the GC/MS to ensure the machine was functioning properly. A six-point curve was also installed prior to the injection of the Hercules samples. The concentrations of the curve range from 10 ppm to 100 ppm. The percent RSD for all compounds in the curve was below 15%. Also, calibration verifications were run during the sequence for QA/QC purposes. Both the DFTPP standard and the calibration verifications passed. Also, all SPCC and CCC compounds passed according to method 8270C.

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CASE NARRATIVE: Hercules, Hattiesburg MS.

Semi-volatiles (Dioxathion Analysis)

Samples were collected and received by BATCO on December 4 and December 5, 2002. A total of 6 water samples were collected on December 4 and a total of 9 samples were collected on December 5, 20002. These samples included monitoring wells 1-11, a duplicate sample, plus a rinsate blank and two matrix spikes for a total of 15 samples. The sequence run included a Laboratory Control Sample, and a Method Blank as quality assurance measures, as well as the fore mentioned samples.

A Dioxathion Calibration working standard was prepared from the individual Dioxenethion, Dioxathion (cis) and Dioxathion (trans) isomers obtained from Sigma-Aldrich Chemicals. Dilutions were made from the working standard to obtain a six-point curve (0.4 to 10 ppm) utilizing a HP-1090 HPLC and HP-Chem software. A Diode-Array Detector, DAD, was used to obtain the data. Table 1 illustrates the retention times, linearity correlation coefficient and the MDL's.

Table 1-Calibration Data

Dioxathion Isomer	Retention Times @ 210 nm (min)	Calibration of Linearity Correlation Coefficient	Method Detection Limits (ppb)
Dioxenethion	4.434	0.9994	0.220
Dioxathion (cis)	8.375	0.9999	0.480
Dioxathion (trans)	9.033	0.9996	0.300

Samples were extracted on 12/11/02 using an EPA SW846 Method 3510C for Separatory Funnel Liquid-Liquid Extraction. Methylene chloride was the extracting solvent and exchanged to acetonitrile at 1-mL final volume. The samples were then analyzed on12/12/02, using the HP-1090 HPLC under the same method as the calibration. Calibration verifications were analyzed before and after the sample batch. All quality assurance criteria based on guidelines given in SW-846 Method 8000B was met. Table 2 illustrates the raw data obtained in this analysis.

Table 2-Raw Data

Lab ID	Description	Dioxenethion	Dioxathion (cis)	Dioxathion (trans)	Surrogate Recovery
BT80863	Monitor Well #1	ND	ND	ND	83.2%
BT80864	Monitor Well #11	50.3ppb	5.00ppb	ND	99.4%
BT80865	Monitor Well #3	ND	ND	ND	90.0%
BT80866	Monitor Well #2	ND	ND	ND	87.6%
BT80867	Monitor Well #10	ND	ND	ND	88.0%
BT80868	Monitor Well #7	9.57ppb	ND	ND	79.6%
BT80870	Monitor Well #9	5.90ppb	12.8ppb	ND	146%
BT80871	Monitor Well #4	12.9ppb	3.34ppb	ND	85.8%
BT80872	Monitor Well #5	ND	ND	ND	82.2%
BT80873	Monitor Well #6	1.12ppb	ND	ND	76.0%
BT80874	Monitor Well #8	94.3ppb	ND	53.9ppb	409%
BT80875	Monitor Well #8 MS*	98.9ppb	5.35ppb	58.4ppb	414%
BT80876	Monitor Well #8 MSD*	98.5ppb	5.05ppb	57.9ppb	386%
BT80877	Rinsate Blank	ND	ND	ND	89.4%
BT80879	Sample Duplicate	12.1ppb	3.23ppb	ND	79.2%

*Spiked with 5ppb of each isomer

All samples were spiked with naphthalene (surrogate) prior to extraction. The surrogate was added to follow the extraction efficiency of the method. Two samples MW-8 and MW-9 had very high surrogate recoveries, 146% and 409%, respectively. These two samples were analyzed by GC/MS to confirm that the recoveries were due to naphthalene and not another interfering compound. Future analyses of these wells should include an alternate surrogate compound that does not co-elute with other peaks in the sample.

Authorized by: _____
Michael S. Bonner, PhD.

YOUR COMPANY NAME: Hercules

YOUR COMPANY ADDRESS: 613 7th St
Hattiesburg, MS 39401

NAME OF PERSON TO CONTACT: Charlie Jordan

CONTACT PERSON'S PHONE: (601) 936-4440 FAX:

CONTACT PERSON'S EMAIL:

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CLIENT PROJECT NO.	CLIENT P.O.#	CLIENT PROJECT NUMBER

LABORATORY USE

Turn Around Time

Project Number: C05456

	SAMPLE DESCRIPTION	DATE	TIME	MATRIX	Dioxathion	Semi-Vol	VOA					NUMBER OF CONTAINERS	PRESERVATION	File ID
1	MW-1	12/4/02	1045	Liquid	X							2		BT80863
X 2	MW-11	12/4/02	1210	Liquid	X	X	X					7		BT80864
3	MW-3	12/4/02	1500	Liquid	X							2		BT80865
4	MW-2	12/4/02	1545	Liquid	X							2		BT80866
X 5	MW-10	12/4/02	1640	Liquid	X	X	X					7		BT80867
6	MW-7	12/4/02	1620	Liquid	X	X	X					7		BT80868
7	Trip Blank	12/3/02	1604	Liquid			X					3		BT80869
8														BT
9														BT
10														BT

SAMPLE COLLECTOR/RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Jon Hall	12-4-02	17:20	Glenn Jones	Glenn Jones	12/5/02	0905	

METHOD OF SHIPMENT (If Any)	RELINQUISHED BY:	DATE	TIME	RECEIVED FOR BATCO BY:	DATE/TIME
				Charlie Rinks	12-5-02 0805

REMARKS:

☐ REQUEST BATCO TO DISPOSE OF ALL SAMPLE REMAINDERS

(Signature)

IF SAMPLE IS DETERMINED TO BE HAZARDOUS, A MINIMUM ADDITIONAL CHARGE OF $30.00 PER SAMPLE WILL BE ASSESSED.

REVISION NO 1.2
03/22/01

YOUR COMPANY NAME: Hercules

YOUR COMPANY ADDRESS: 613 7th St
Hattiesburg MS 39401

NAME OF PERSON TO CONTACT: Charlie Jordan

CONTACT PERSON'S PHONE: FAX:

CONTACT PERSON'S EMAIL:

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TOTAL P.03

CLIENT PROJECT NO.	CLIENT P.O.#	CLIENT PROJECT NUMBER

LABORATORY USE

Turn Around Time

Project Number: 005456

	SAMPLE DESCRIPTION	DATE	TIME	MATRIX	Dioxins/Furans	Semi-VOA	VOA					NUMBER OF CONTAINERS	PRESERVATION	File ID
*	1 MW-9	12/5/02	1019	Liquid	X	X	X					7		BT80870
	2 MW-4	12/5/02	1315	Liquid	X		X					5		BT80871
	3 MW-5	12/5/02	1426	Liquid	X							2		BT80872
	4 MW-6	12/5/02	1930	Liquid	X							2		BT80873
*	5 MW-8	12/5/02	~~1619~~ 1610	Liquid	X	X	X					7		BT80874 13.16
*	6 MS	12/5/02	1610	Liquid	X	X	X					7		BT80875
*	7 MSD	12/5/02	1610	Liquid	X	X	X					7		BT80876
*	8 Rinsate Blank	12/5/02	1525	Liquid	X	X	X					7		BT80877
	9 Trip Blank	12/3/02	1600	Liquid			X					3		BT80878
*	10 Dup	12/12/02	1315	Liquid	X	X*	X					~~7~~ 6		BT80879 12.76

SAMPLE COLLECTOR/RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Charlie V. Jordan	05DEC02	1658	[illegible]				

METHOD OF SHIPMENT (If Any)	RELINQUISHED BY:	DATE	TIME	RECEIVED FOR BATCO BY:	DATE/TIME
				Laurie Ruiko	12-6-02 0800

REMARKS: * Semi-Voa Dup collected at 1610

☐ REQUEST BATCO TO DISPOSE OF ALL SAMPLE REMAINDERS.

(Signature)

IF SAMPLE IS DETERMINED TO BE HAZARDOUS, A MINIMUM ADDITIONAL CHARGE OF $30.00 PER SAMPLE WILL BE ASSESSED.

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