Installation of Six Monitoring Wells

at

Hercules, Inc. 613 West 7th Street Hattiesburg, Ms

presented to:

Charles Jordan, Environmental Supervisor Hercules, Inc. Hattiesburg, MS

July 31, 1997

by

Michael S. Bonner, Ph.D.

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INTRODUCTION

At the request of the Mississippi Department of Environmental Quality (MDEQ), Hercules, Inc. of Hattiesburg, MS will install, develop, purge and sample six permanent monitoring wells in the following locations shown on the attached B&V - Figure 2.

The MDEQ will be notified 2 weeks prior to commencement of work.

1.0 MONITORING WELL INSTALLATION

Six two inch by twenty foot PVC monitoring wells shall be installed utilizing hollow stem drilling technology. Well depths shall be advanced deeper within the shallow saturated zone if groundwater is not encountered within the first twenty feet.

A screened interval of ten feet having a 0.01" slot shall be used. The screened interval shall extend a minimum of three feet above the groundwater interface. Casing shall be flush thread design.

Filter pack meeting the following specifications shall be tremied into the annulus to a depth of two feet above the screened interval:

Particle Size in Inches	Allowable
>0.039"	35% Max.
<0.039 - ≥0.01	50% Min.
<0.01	0.5% Max.

Following the filter pack, a two foot layer of fine sand (mason) shall be applied via tremie. If the zone is saturated, two feet of 10% hydrated bentonite shall be tremied, followed by 90/10 grout to the surface. An elevation data marker shall be placed in the grout at the surface as a reference point. If the zone is unsaturated, the bentonite seal will be omitted. Hydration time for bentonite shall be a minimum of 8 hours or the manufacturer's recommended hydration time—whichever is greater. Grout shall be allowed to cure for a minimum of 24 hours prior to installation of the surface pad and protective riser equipped with security locks.

Each well shall be equipped with four 3" pipes installed to a depth of 30" at the corners of each pad and grouted in place. Protective pipes shall be filled with grout and painted as specified.

The well casing will be allowed to extend a minimum of 18" above ground surface and shall be equipped with a locking cap, protective casing and a 2'x2'x4" concrete pad. The wells shall be surveyed with longitude and latitude reported along with elevation above sea level (± 0.01 ft.).

The following boring/well construction log information will be included where applicable:

- Well identification #
- Date/time of well construction
- Borehole diameter and well casing diameter
- Well depth ±0.01 ft.
- Casing length

- Casing materials
- Casing and screen joint type
- Screened interval(s)
- Screen materials
- Screen slot size/design
- Filter pack material and size
- Calculated and actual filter pack volume
- Filter pack placement method
- Annular sealant composition
- Annular sealant placement method
- Calculated and actual annular sealant volume
- Surface sealant composition
- Surface seal placement method
- Calculated and actual surface sealant volume
- Surface seal design
- Well development procedure
- Turbidity measurement
- Type/design of protective casing
- Well cap and lock
- Ground surface elevation (±0.01 ft.)

- Survey reference point elevation on well casing (±0.01 ft.)
- Top of monitoring well casing elevation (±0.01)
- Top of protective steel casing elevation (±0.01 ft.)

2.0 WELL DEVELOPMENT

Completed wells will be allowed to cure a minimum of 24 hours prior to development.

Prior to well development, water depth will be determined to ±0.01 ft. Following completion, each well shall be developed by pumping and/or bailing, as deemed most appropriate utilizing the surge block technique. The well will be developed until a turbidity of < 5 NTU's is achieved. As a minimum, the well will be allowed to completely recharge prior to purging.

3.0 PURGING

The object of purging shall be to remove five well volumes at a rate similar to the recharge rate in order that turbidity effects are minimized. The following steps shall be used:

- 1. Establish the water depth and well depth to ±0.01 ft.
- 2. Remove liquid from the surface and bottom hole to determine whether organic phases exist.
- 3. Determine pH, temperature, conductivity and turbidity prior to purging the well.
- 4. Remove five well volumes at a rate of 0.2 to 0.3 liter/min. utilizing a peristaltic pump if groundwater is within 28 feet of surface. Alternately, if groundwater is deeper, purging may be accomplished by means of centrifuged pump, bladder pump or bailer. (Purging by bailer must be done with caution so as not to disturb the well filter pack).

5. After removing 5 well volumes pH, temperature, conductivity and turbidity must be determined twice within 20 minutes. These data points should be ±10% and further, the turbidity must be <5 NTU's. If turbidity is not <5 NTU's, remove additional well volumes as necessary.

In the event the well is purged dry, the following protocol should be followed:

- 1. Allow the well to recover.
- 2. If the well has not fully recovered within two hours but has sufficient water for testing then:
 - a. Test the well for pH, temperature, conductivity and turbidity.
 - b. Test the well again within 20 minutes for the same parameters.
 - c. Collect samples as outlined in the sample collection process.
- 3. If pH, temperature and conductivity are not ±10% and/or turbidity is >5 NTU and if data reflect elevated levels of any pollutant of concern, consider repurging and sampling the well.

4.0 SAMPLING

Sampling should commence as soon as the well recovers but no later than two hours after purging is completed. Samples shall be collected utilizing disposable Teflon bailers. Analytical parameters shall include the attached Compound List of volatile organics (Method 8260).

VOA samples shall be collected in duplicate in 40 ml vials preserved with hydrochloric acid to a pH of <2. VOA samples must contain no air bubbles. Three replicates of samples shall be collected at one designated well for QA/QC analysis.

5.0 ANALYTICAL PROTOCOL

All analyses will conform to the methodologies outlined in EPA/SW846 current edition.

6.0 QA/QC

One equipment blank, one matrix spike (MS) and one matrix spike duplicate (MSD) shall be analyzed for each event. One trip blank for VOA only shall be analyzed for each sampling event.

6.1 TRIP BLANK (VOLATILE)

Trip blank (volatile) duplicate samples shall be prepared in the laboratory utilizing deionized water and bottles from the batches to be used in the field collection and decontamination procedures. The trip blank will be taken in the field and returned to the laboratory in the same environment as the samples.

6.2 EQUIPMENT BLANK (RINSATE BLANK)

Following decontamination of the drilling equipment, carefully transfer about two liters of analyte-free deionized water to a new disposable Teflon bailer. Allow the contents of the bailer to

drain over a piece of the decontaminated hollow stem into an analyte-free stainless steel bowl.

Transfer the rinsate water to appropriate sample containers. Label and archive the rinsate blank as outlined.

7.0 SAMPLE ARCHIVAL

Following sample collection, affix a completed label to each container. Cover the label with clear tape to protect from moisture. Place the sample bottle in a zip-lock bag and wrap the container in bubble wrap. Write the sample ID number on the outside of the bubble wrap with a permanent marker, then secure the bubble-wrapped container with clear tape.

8.0 DECONTAMINATION AND RESIDUALS MANAGEMENT

Borehole cuttings will be left in place at the well site unless VOA readings indicate gross contamination (>50ppm FID readings). In the event gross contamination is encountered, cuttings will be drummed on site and analyzed for disposal.

Well development, purge and decontamination water will be placed in the Hercules treatment facility for disposal, provided levels do not exceed toxicity characteristics.

The hollow stem, drill rod, and associated tools will be decontaminated before each well is advanced. The procedure shall be as follows:

- 1. Pressure wash with steam and potable water
- 2. Brush with phosphate-free detergent to remove any additional debris
- 3. Pressure wash with steam and potable water
- 4. Rinse with analyte-free water

9.0 HEALTH AND SAFETY

- 1. All personnel shall have received 40 hours of OSHA training and shall have current update training.
- 2. Hercules, Inc. shall provide any additional safety briefings deemed appropriate for the scope of this project.
- 3. During boring, developing and purging operations, FID readings shall be recorded to ensure that a safe environment is maintained.
- 4. Elevated (>50 ppm) FID readings shall mandate respiratory protection, cease and desist operations, and re-evaluation by project director, project supervisor, project health and safety officers, and Hercules personnel.
- 5. Any injuries or potentially unsafe conditions shall be reported immediately to the health and safety officer and then to the project supervisor and project director.

10.0 PERSONNEL

Project Director - Michael S. Bonner, Ph.D.

Project Supervisor - David Carter

Health and Safety Officer - Christopher M. Bonner

Hercules, Inc. Contact - Charles Jordan, Environmental Supervisor

11.0 WELL ABANDONMENT

Assuming that the wells are found to be free of analytes of concern, Hercules will have the option of abandoning the wells by then cutting the risers off at ground level and filling the casing with 90/10 grout to surface. Calculated and actual grout used will be recorded to ensure that the wells are properly sealed.



Monitoring Well Installation Sampling & Analysis

at

Hercules, Inc. 613 West 7th Street Hattiesburg, Ms

presented to:

Charles Jordan, Environmental Supervisor Hercules, Inc. Hattiesburg, MS

December 8 - 15, 1997

by

Michael S. Bonner, Ph.D.

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INTRODUCTION

At the request of Mr. Charlie Jordan, Environmental Supervisor with Hercules Inc. of Hattiesburg, MS, Bonner Analytical Testing Company installed six monitoring wells and subsequently developed, purged and sampled these wells during the period of December 8-15, 1997. Samples were analyzed for thirteen heavy metals, volatile organics, semivolatile organics, pesticides, and PCBs.

Details relating to the project were presented in the work plan approved by the Mississippi Department of Environmental Quality (MDEQ) and Hercules Incorporated dated July 31, 1997.

1.0 MONITORING WELL INSTALLATION

Six two inch I.D. flush thread schedule 40 PVC monitoring wells were installed. The well locations (MW-1 through MW-6) are designated in the site map located in Appendix C. Boreholes were advanced utilizing hollow stem drilling technology. Well depths ranged between fifteen and twenty feet below land surface (BLS). A ten foot screened interval was used in each well. Screened slots were 0.01 inches.

Wells were completed as follows:

- 1. Coarse sand was tremied to the top of the screened interval.
- 2. Fine sand was tremied to two feet above the screened interval.
- 3. Hydrated 10% Bentonite was tremied one to two feet above the fine sand.
- 4. 90/10 grout was tremied to one foot BLS.
- 5. After 24 hours the well was completed.

6. The well was completed to surface with concrete to include a 2'x2'x4"concrete pad with elevation marker, protective casing with locks, four 3 inch protective pipes filled with concrete and then painted.

Pertinent information relating to boring, well construction, purging and sampling are presented in Table 1 and Appendices A - F.

2.0 WELL DEVELOPMENT

Wells were allowed to cure a minimum of 24 hours prior to development. Wells were developed by a combination of bailing, pumping and surging.

MW-1 was designated as the background well. This well bailed dry after removal of 5.5 gallons of water. The turbidity was > 100 NTUs at this point. However, upon recovery, and after purging, a turbidity of 13.9 NTU was achieved.

MW-5 could not be developed below a 19 NTU turbidity due to a persistent yellow color. The remaining wells MW-2, MW-3, MW-4 and MW-6 were developed to a final turbidity below 5 NTUs.

3.0 PURGING

Prior to purging and immediately after removing the well cap, each well was tested for organic vapors using a field organic vapor analyzer equipped with a flame ionization detector.

MW-4 and MW-5 produced vapor space readings greater than 100,000 ppm. The remaining wells gave no response.

Next, each well was gauged from the north side top of casing to assess depth to water and well depth to +0.01'. Prior to purging pH, temperature, conductivity and turbidity were determined.

After the removal of five well volumes pH, temperature, conductivity and turbidity measurements were repeated twice more within 20 minutes. All wells produced water that was stable within ±10% as required. However, MW1 and MW5 produced turbidity values of 13.0 and 24.4 NTU's, respectively. MW-1 and MW-5 were purged further, removing 5 additional well volumes. However, the turbidities remained elevated at 13.9 and 25.1 NTU's, respectively.

4.0 SAMPLING

Samples were collected immediately following the purging process utilizing disposable Teflon bailers. Samples were collected for volatile organics method SW846/8260, semi volatile organics method SW846/8270, pesticide/PCB method SW846/8081 and thirteen heavy metals utilizing the appropriate EPA/200 series protocol as outlined in the work plan.

5.0 ANALYSIS

All samples were analyzed for volatile organics utilizing the 8260 standard list of compounds. The remaining 8260 compound list was evaluated as TICs. Semivolatile organics, Method 8270, were evaluated using the standard list and the remaining compound list was evaluated as TICs. The results of these analyses are presented in Appendix D.

TABLE 1 BOREHOLE AND WELL CONSTRUCTION DATA

Well (D#		2.0	3.4
4			
Date of Construction	12-09-97	12-09-97	12-09-97
Borehole & Well Casing			
Diameter Well Depth	2"	2"	2"
+0.01 ft.	17′	17′	15'
Casing Length	7′	7'	5′
Casing Materials	PVC Schedule 40	PVC Schedule 40	PVC Schedule 40
Casing & Screen Joint Type	Flush Thread	Flush Thread	Flush Thread
Screened Intervals	10′	10'	10'
Screen Materials	PVC Flushthread	PVC Flushthread	PVC Flushthread
Screen Slot			
Size/ Design Filter Pack Material & Size	0.01 Sand <0.1" (<5%)	0.01 Sand <0.1" (<5%)	0.01 Sand <0.1" (<5%)
Filter Fack Material & Size	0.01"-0.039" (>50%) >0.039" (<35%)	0.01"-0.039" (>50%) >0.039" (<35%)	0.01"-0.039" (>50%) >0.039" (<35%)
Calculated/Actual Filter Pack Volume	4.42 ft ³	4.08 ft ³	4.42 ft ³
Filter Pack Placement Method	Tremmie	Tremmie	Tremmie
Annular Sealant Composition	Bentonite/90:10 Grout	Bentonite/90:10 Grout	Bentonite/90:10 Grout
Annular Sealant Placement Method	Tremmie	Tremmie	Tremmie
Calculated/Actual Annular Sealant Vol.	0.34 ft³	0.85 ft ³	0.17 ft ³
Surface Sealant Composition	3,000 PSI Concrete	3,000 PSI Concrete	3,000 PSI Concrete
Surface Seal Placement Method	Tremmie	Tremmie	Tremmie
Calculated/Actual Surface Sealant Vol.	0.34 ft ³	0.17 ft ³	0.17 ft ³
Surface Seal Design Well Development	2x2x4' Pad	2x2x4' Pad	2x2x4' Pad Bailing, Pumping & Surge
Procedure	Bailing, Pumping & Surge Block	Bailing, Pumping & Surge Block	Block
Turbidity Measurement	13.9 NTU	1.9 NTU	0.5 NTU
Type/Design of Protective Casing	3" x 3" rectangular steel	3" × 3" rectangular steel	3" x 3" rectangular steel
Well Cap & Lock	Yes	Yes	Yes
Ground Surface Elevation (+0.01)			
Survey Reference Point			***************************************
Elevation on Well Casing (+0.01 ft.)		(8	
Top of Well Casing Elevation (+0.01)			
Top of Protective Steel			
Casing Elevation (+0.01 ft.)			

BOREHOLE AND WELL CONSTRUCTION DATA

Well ID #	4	-5	6
Date of Construction	12-09-97	12-08-97	12-08-97
Borehole & Well Casing Diameter	2"	2*	2"
Well Depth			
+ 0.01 ft.	15.0′	15'	1,8'
Casing Length	5′	5′	8'
Casing Materials	PVC Schedule 40	PVC Schedule 40	PVC Schedule 40
Casing & Screen Joint Type	Flush Thread	Flush Thread	Flush Thread
Screened Intervals	10'	10'	10′
Screen Materials	PVC Flushthread	PVC Flushthread	PVC Flushthread
Screen Slot Size/ Design	0.01	0.01	0.01
Filter Pack Material & Size	Sand <0.1" (<5%) 0.01"-0.039" (>50%) >0.039" (<35%)	Sand <0.1" (<5%) 0.01"-0.039" (>50%) >0.039" (<35%)	Sand <0.1" (<5%) 0.01"-0.039" (>50%) >0.039" (<35%)
Calculated/Actual Filter Pack Volume	4.25 ft ³	4.25 ft ³	
Filter Pack Placement Method	Tremmie	Tremmie	4.08 ft ³ Tremmie
Annular Sealant Composition	Bentonite/90:10 Grout	Bentonite/90:10 Grout	Bentonite/90:10 Grout
Annular Sealant Placement Method	Tremmie	Tremmie	Tremmie
Calculated/Actual Annular Sealant Vol.	0.17 ft³	0.17 ft³	0.34 ft ³
Surface Sealant Composition	3,000 PSI Concrete	3,000 PSI Concrete	3,000 PSI Concrete
Surface Seal Placement Method	Tremmie	Tremmie	Tremmie
Calculated/Actual Surface Sealant Vol.	0.17 ft ³	0.17 ft ³	0.34 ft ³
Surface Seal Design	2x2x4' Pad	2x2x4' Pad	2x2x4' Pad
Well Development Procedure	Bailing, Pumping & Surge Block	Bailing, Pumping & Surge Block	Bailing, Pumping & Surge Block
Turbidity Measurement	0.8 NTU	25.1 NTU	0.3 NTU
Type/Design of Protective Casing	3" x 3" rectangular steel	3" x 3" rectangular steel	3" x 3" rectangular steel
Well Cap & Lock	Yes	Yes	Yes
Ground Surface Elevation (+ 0.01)			
Survey Reference Point Elevation on Well Casing (+0.01 ft.)			
Top of Well Casing Elevation (+0.01)			
Top of Protective Steel Casing Elevation (+0.01 ft.)			

APPENDIX A

Bonner Analytical Testing Company 2703 Oak Grove Road, Hattiesburg, MS 39402 Phone: (601) 264-2854 Fax: (601) 268-7084

Driller Permit #: <u>0-527</u> Client: <u>Hercules</u> Address: <u>Hattiesb</u>			o.: 1 Surface Elevation: ed: 12/9/97 LS/Top of Casing: d: 12/9/97 Well Installed on Completion: YES
KEY: Concrete	∰ Grout	Bentor	nite Seal Sand Pack Screen
Lithologic Description Riser 3.46 0-1.5' Top Soil	Depth (Feet) Ground Level 1.0	Well Design	Well Loc: Section: 4 Township: 4N Range: 13W Well Usage:
1.5 - 8' Tan Silty Clay 8 - 10' Wet Sandy Clay	3.5 5.0		Development Method Bailer
10 - 11.5' Wet Sand and Some Clay 11.5 - 13 Wet Silty Sand	7.0		Airlift Nitrogen Submersible Pump Other: Peristaltic Pump Well Dev. Time: Volume:
Very Consolidated	17.0		Well Construction Materials: Protective Cover: Manhole Protective Casing Other: Riser Material: PVC Flushthread
			Well Diameter: 2" Screen Material: PVC Flushthread Screen Slot Size: 0.01 Bentonite Plug: Grout:
			Sand: Quantity: 5 Bags @100 lbs ea of #2 1 Bag @ 100 lbs ea of #1 Initial Water Level: 7.82' Water Level at Development: 7.82'

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Driller Permit #: <u>0-527</u> Client: <u>Hercules</u> Address: <u>Hattiesb</u>		Date Starte	d: 12/9/97 Surface Elevation: LS/Top of Casing: d: 12/9/97 Well Installed on Completion: YES
KEY: Concrete	∰ Grout	Benton	nite Seal Sand Pack Screen
Lithologic Description	Depth (Feet) Ground Level 0.5	Well Design	Well Loc: Section: 4 Township: 4N
3.48' Riser	2.5		Range: 13W Well Usage:
0 - 2.5' Black Top Soil 2.5 - 4.0' Tan Silty Clay	7.0		Development Method
4-5' Silty Sand 5 - 8' Moist Sand			Bailer Airlift Nitrogen Submersible Pump
8-10' Wet Sand 10 - 13.5' Water/Silt/Sand			Well Dev. Time: Volume:
13.5 - 14.5' Water/Silt/Sand and Small Rocks	17.0		Well Construction Materials:
14.5 - 17' Water/Silt/Sand			Protective Cover: Manhole Protective Casing Other:
			Riser Material: PVC Flushthread Well Diameter: 2" Screen Material: PVC Flushthread Screen Slot Size: 0.01
			Bentonite Plug: Grout:
			Sand: Quantity: 4 Bags @100 lbs ea of #2 1 Bag @ 100 lbs ea of #1 Initial Water Level: 6.83'
	35		Water Level at Development: 6.83'

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Driller Permit #: <u>0-527</u> Client: <u>Hercule</u> Address: <u>Hattiest</u>			d: 3 d: 12/9/97 d: 12/9/97	Surface El LS/Top of Well Installed on Con	Casing:
KEY: Concrete	[2] Grout	Benton	ite Seal	Sand Pack	Screen
Lithologic Description	Depth (Feet) Ground Level 0.50	Well Design	Se Towr	I Loc: ction: 4 nship: 4N ange: 13W	
3.99' Riser	1.5 2.0			sage:	
0 - 1.5' Top Soil 1.5 - 4' Silt (Sandy) 4 - 8' Moist Sandy Silt Some Clay	5.0		C	Development Metho Bailer Airlift	od
8 - 9.5' Wet Silty Sand 9.5 - 14 Water/Silt/Sand				Nitrogen Submersible Other: Peri	
14.5' Very Consolidated Clay			Well Dev.	Time: plume:	
	15.0		Protective (Rise Wel Scree Screer	Protective Conther: er Material: PVC Flushti I Diameter: 2" en Material: PVC Flushti n Slot Size: 0.01 conite Plug: Grout: 3 Bags @ 10 1 Bag @ 100	asing hread
	35		1	at Development: 7.37'	

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Driller Permit #: <u>0-527</u> Client: <u>Hercule</u> Address: <u>Hattiesb</u>		Date Starte	do.: 4 ed: 12/9/97 ed: 12/9/97		Casing:
KEY: Concrete	∰ Grout	Bento	nite Seal	Sand Pack	Screen
Lithologic Description	Depth (Feet) Ground Level 1.5	Well Design	Sec Town	Loc: ction: 4 ship: 4N	
3.49' Riser	2.5			ange: <u>13W</u> sage:	
0-4' Top Soil (Black)					
4 - 5' Grey Silty Sand	5.0		D	evelopment Metho	d
5-7' Grey Sand 7 - 11 ' Tan Sand 11 - 13' Moist Light Grey Sand Some Silt/Small Rocks 13 - 15' Moist Silt & Consolidated Clay	15.0		Voi	Bailer Airlift Nitrogen Submersible Other: Peris	staltic Pump
		I	Well Co	nstruction Materia	ls:
				over: Manhole Protective Ca Other: Other: Material: PVC Flushth	
				n Material: PVC Flushth Slot Size: 0.01	read
			Bento	onite Plug:	
			Sand:	Quantity: 5 Bags @ 10 1 Bag @ 100	
	35		Initial Water Water Level a	Level: 10.93'	

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Driller Permit #: <u>0-527</u> Client: <u>Hercule</u> Address: <u>Hattiesb</u>			Elevation: of Casing: ompletion: YES
KEY: Concrete	Grout	Bentonite Seal Sand Pack	Screen
Lithologic Description 3.59' Riser 0 - 5' Fill & Debris	Depth (Feet) Ground Level 1.5 2.5	Well Loc: Section: 4 Township: 4N Range: 13W Well Usage:	
6 -7.5' Tan Moist Grity Clay 7.5 - 9' Tan Silty Moist Soft Sand 9 - 11.5' Tan Wet Silty Sand 11.5 - 15' Silty Water	5.0		ole Pump ristaltic Pump
	15.0	Well Dev. Time: Volume: Well Construction Mater	
	20.5	Protective Cover: Manhole Protective Other:	Casing
	25.0	Riser Material: PVC Flush Well Diameter: 2" Screen Material: PVC Flush Screen Slot Size: 0.01	
	30.0	Bentonite Plug: Grout: Sand: Quantity: 4 Bags @ 1.5 Bags @	100 lbs ea of #2) 100 lbs ea #4
	35	Initial Water Level: 10.12' Water Level at Development: 10.12	

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Driller Permit #: <u>0-527</u> Client: <u>Hercules</u> Address: <u>Hattiesb</u>		Date Started	c: 6 Surface Elevation: LS/Top of Casing: Well Installed on Completion: YES
KEY: Concrete	∰ Grout	Benton	ite Seal Sand Pack Screen
Lithologic Description 5.25' Riser	Depth (Feet) Ground Level 1.0	Well Design	Well Loc: Section: 4 Township: 4N Range: 13W
0-2' Brown Fill Top Soil	5.0		Well Usage:
2 - 4' Tan Top Soil 4 - 5' Light Tan Sand 5 - 8' Light Tan Sand 8 - 10 ' Light Tan Grity Clay 10 - 11' Light Tan Wet Sandy Clay 11 - 13' Light Tan Wet Sandy Clay	8.0		Development Method Bailer Airlift Nitrogen Submersible Pump Other: Peristaltic Pump Well Dev. Time: Volume: Well Construction Materials:
13 - 15' Light Brown Wet Sandy Clay 15 - 17' Wet Consolidated Clay 17 - 18' Heavy Consolidated Clay	18.0		Protective Cover: Manhole Protective Casing Other: Other: Riser Material: PVC Flushthread Well Diameter: 2" Screen Material: PVC Flushthread Screen Slot Size: 0.01 Bentonite Plug: Manhole Protective Casing Other: Othe
	35		Grout: Sand: Quantity: 4 Bags @ 100 lbs ea of #2 1 Bag @ 100 lbs ea of #4 Initial Water Level: 9.56' Water Level at Development: 9.56'

APPENDIX B

Bonner Analytical Testing Company

2703 Oak Grove Road, Hattlesburg, MS 39402

Phone: (601) 264-2854 Fax: (601) 268-7084

CLIENT: HERCULES

DATE: 12-13/15-97

LOCATION: Hercules Landfill and Sludge Pit

Monitoring Well #1	Time	pH S.U.	Temp degrees C	Conductivity micromhos/cm	Turbidity NTU	REMARKS
Total Depth TOC 20.46'	1645	5.34	18.5	51	55	FID = 0 ppm
Depth to Water TOC 7.82'	1655	5.52	19.8	83	13.5	
Well Depth BLS 17.00'	1705	5.66	19.9	89	13.0	Sampled @ 1710 Bailed 11 Gallons
Quan. Per Volume 2.15 Gallons	1720	5.65	19.9	92	*13.9	Bailed 11 Gallons add'l
LNAPL - NO DNAPL - NO		,				

Monitoring Well #2	Time	рН S.U.	Temp degrees C	Conductivity micromhos/cm	Turbidity NTU	REMARKS
Total Depth TOC 20.48'	1550	5.67	16.9	112		FID = 0 ppm
Depth to Water TOC 6.83'	1600	5.63	17.6	110	1.9	
Well Depth BLS 17.00'	1610	5.69	17.5	112	1.9	
Quan. Per Volume 2.32 Gallons						Sampled @ 1620 Bailed 12 Gallons
LNAPL - NO DNAPL - NO				8		

Monitoring Well #3	Time	pH S.U.	Temp degrees C	Conductivity micromhos/cm	Turbidity NTU	REMARKS
Total Depth TOC 18.96'	1515	5.36	17.6	60	4.4	FID = 0 ppm
Depth to Water TOC 7.37'	1520	5.22	16.8	50	0.4	
Well Depth BLS 15.00'	1535	5.18	16.8	50	0.5	
Quan. Per Volume 1.97 Gallons						Sampled @ 1540 Bailed 10 Gallons
LNAPL - NO DNAPL - NO						

*Turbidity exceeds 5 NTU; Remove 5 additional well volumes

Well Volume = 0.17 * Water Column in Feet.

LNAPL - Light Non Aqueous Phase Liquid

DNAPL - Dense Non Aqueous Phase Liquid

TOC - Top of Casing (North Side)

BLS - Below Land Surface

Bonner Analytical Testing Company

2703 Oak Grove Road, Hattiesburg, MS 39402

Phone: (601) 264-2854 Fax: (601) 268-7084

CLIENT: HERCULES

DATE: 12-13/15-97

LOCATION: Hercules Landfill and Sludge Pit

Time	pH S.U.	Temp degrees C	Conductivity micromhos/cm	Turbidity NTU	REMARKS
NA	5.34	18.5	350	1.7	FID > 100,000 ppm
NA	6.08	19.7	520	0.9	
NA	6.12	19.6	510	0.8	
	6.21	19.5			Bailed 7 Gallons
	NA NA	NA 5.34 NA 6.08 NA 6.12	S.U. degrees C NA 5.34 18.5 NA 6.08 19.7 NA 6.12 19.6	S.U. degrees C micromhos/cm NA 5.34 18.5 350 NA 6.08 19.7 520 NA 6.12 19.6 510	S.U. degrees C micromhos/cm NTU NA 5.34 18.5 350 1.7 NA 6.08 19.7 520 0.9 NA 6.12 19.6 510 0.8

Monitoring Well #5	Time	pH S.U.	Temp degrees C	Conductivity micromhos/cm	Turbidity NTU	REMARKS
Total Depth TOC 18.59'	1133	6.62	19.5	580	42	FID >100,000 ppm
Depth to Water TOC 10.12'	1140	6.5	19.9	520	26.1	
Well Depth BLS 15.00'	1155	6.41	19.5	520	24.4	Sampled @ 1210 Bailed 7.5 Gallons
Quan. Per Volume 1.44 Gallons	1210	6.4	19.5	515	*25.1	Bailed 7.5 Gallons add'i
LNAPL - NO DNAPL - NO						

Monitoring Well #6	Time	pH S.U.	Temp degrees C	Conductivity micromhos/cm	Turbidity NTU	REMARKS
Total Depth TOC 23.25'	1630	5.88	21.5	198	2.9	FID = 0 ppm
Depth to Water TOC 9.56'	1640	5.91	21.2	185	0.3	
Well Depth BLS 18.00'	1655	6.06	21.4	170	0.3	
Quan. Per Volume 2.32 Gallons						Sampled @ 1500 Bailed 12 Gallons
LNAPL - NO DNAPL - NO						

*Turbidity exceeds 5 NTU; Remove 5 additional well volumes

Well Volume = 0.17 x Water Column in Feet.

LNAPL - Light Non Aqueous Phase Liquid

DNAPL - Dense Non Aqueous Phase Liquid

TOC - Top of Casing (North Side)

BLS - Below Land Surface

APPENDIX C

HATTIESBURG, MS
MONITORING WELL LOCATIONS

APPENDIX D

BONNER ANALYTICAL TESTING COMPANY

2703 OAK GROVE ROAD HATTIESBURG, MS 39402 PH. (601) 264-2854

Client: HERCULES

File Number: BT42539-42541 Sample Date/Time:

Collected By: DOC Date/Time Rec'd: 12-16-97 @ 1120

Analyte/Method #	MW-1 	MW-2	MW-3	MDL	Date/Time/Analyst
Antimony/200.7	ND	ND	ND	0.02	01-12-98/1121/JMR
Arsenic/200.15	0.0067	0.0022	ND	0.002	01-13-98/1633/JMR
Beryllium/200.7	0.0076	ND	ND	0.001	01-12-98/1121/JMR
Cadmium/213.1	ND	ND	ND	0.04	12-22-97/1129/GMR
Chromium/200.7	0.116	ND	ND	0.01	01-12-98/1121/JMR
Copper/200.7	0.075	ND	ND	0.01	01-14-98/1211/JMR
Lead/239.1	0.132	ND	ND	0.02	12-22-97/1024/GMR
Mercury/245.2	ND	ND	ND	0.0004	01-14-98/1510/GMR
Nickel/200.7	0.052	ND	ND	0.01	01-12-98/1121/JMR
Selenium/200.15	ND	ND	ND	0.002	01-13-98/1633/JMR
Silver/272.1	ND	ND	ND	0.06	12-23-97/0903/GMR
Thallium/200.7	ND	ND	ND	0.025	02-13-98/1234/JMR
Zinc/289.1	0.190	ND	ND	0.02	12-18-97/1448/GMR

Data reported in mg/L unless otherwise noted. All analyses performed in accordance with 40 CFR 136 and amendments.

MDL = Method Detection Limit.

Certified by:

Michael S. Bonner, Ph.D.

BONNER ANALYTICAL TESTING COMPANY

2703 Oak Grove Road Hattiesburg, MS 39402 Ph. (601) 264-2854

Client: HERCULES

File Number: BT42542-42544 Sample Date/Time:

Collected By: DOC Date/Time Rec'd: 12-16-97 @ 1120

Analyte/Method #	MW-4	MW-5	MW-6	MDL	Date/Time/Analyst
					8
Antimony/200.7	ND	ND	ND	0.02	01-12-98/1121/JMR
Arsenic/200.15	0.1536	0.1035	ND	0.002	01-13-98/1633/JMR
Beryllium/200.7	0.014	ND	ND	0.001	01-12-98/1121/JMR
Cadmium/213.1	ND	ND	ND	0.04	12-22-97/1129/GMR
Chromium/200.7	0.223	0.046	0.015	0.01	01-12-98/1121/JMR
Copper/200.7	0.154	ND	ND	0.01	01-14-98/1211/JMR
Lead/239.1	ND	ND	ND	0.02	12-22-97/1024/GMR
Mercury/245.2	0.0007	0.0007	0.0007	0.0004	01-14-98/1510/GMR
Nickel/200.7	0.312	0.025	ND	0.01	01-12-98/1121/JMR
Selenium/200.15	ND	ND	ND	0.002	01-13-98/1633/JMR
Silver/272.1	ND	ND	ND	0.06	12-23-97/0903/GMR
Thallium/200.7	ND	ND	ND	0.025	02-13-98/1234/JMR
Zinc/289.1	0.361	0.089	ND	0.02	12-18-97/1448/GMR

Data reported in mg/L unless otherwise noted. All analyses performed in accordance with 40 CFR 136 and amendments.

MDL = Method Detection Limit.

Certified by:

Michael S. Bonner, Ph.D.

BONNER ANALYTICAL TESTING COMPANY

2703 OAK GROVE ROAD HATTIESBURG, MS 39402 PH. (601) 264-2854

Client: HERCULES

File Number: BT42545-42546 Sample Date/Time:

Collected By: DOC Date/Time Rec'd: 12-16-97 @ 1120

Analyte/Method #	Trip Blank	Equipment Blank	MDL Date/Time	/Analyst
~~~~~				
Antimony/200.7	ND	ND	0.02 01-12-98	/1121/JMR
Arsenic/200.15	ND	ИD	0.002 01-13-98	/1633/JMR
Beryllium/200.7	ND	ND	0.001 01-12-98	/1121/JMR
Cadmium/213.1	ND	ND	0.04 12-22-97	/1129/GMR
Chromium/200.7	ND	ND	0.01 01-12-98	/1121/JMR
Copper/200.7	ND	ND	0.01 01-14-98	/1211/JMR
Lead/239.1	ND	ND	0.02 12-22-97	/1024/GMR
Mercury/245.2	ND	ND	0,0004 01-14-98	/1510/GMR
Nickel/200.7	ND	ND	0.01 01-12-98	/1121/JMR
Selenium/200.15	ND	ND	0.002 01-13-98	/1633/JMR
Silver/272.1	ND	ND	0.06 12-23-97	/0903/GMR
Thallium/200.7	ND	ND	0.025 02-13-98	/1234/JMR
Zinc/289.1	ND	ND	0.02 12-18-97	/1448/GMR

Data reported in mg/L unless otherwise noted. All analyses performed in accordance with 40 CFR 136 and amendments.

MDL = Method Detection Limit.

Certified by:

Michael S. Bonner, Ph.D.

Certified by Michael S. Bonner, Ph.D.

BONNER ANALYTICAL TESTING COMPANY

= Matrix Spiking Compounds

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Decachlorobiphenyl	SURROGATE COMPOUNDS	1P. Aldrin * 2P. Alpha-BHC 3P. Beta-BHC * 4P. Gamma-BHC * 5P. Detta-BHC 6P. Chlordane 7P. 4.4'-DDT * 8P. 4.4'-DDE 9P. 4.4'-DDE 11P. Alpha-Endosulfan 11P. Beta-Endosulfan 12P. Beta-Endosulfan 13P. Endrin * 13P. Endrin * 15P. Endrin Sulfate 14P. Endrin * 15P. Endrin Epoxide 16P. Heptachlor * 17P. Heptachlor Epoxide 16P. PCB1242 21P. PCB1254 20P. PCB1254 20P. PCB1256 22P. PCB1256 24P. PCB1016 25P. Toxaphene	1 2	Client: <u>Hercules</u> Sample ID: <u>MW-1</u> File #_ <u>BT42539</u>
		0.05 0.05 0.05 0.05 0.05 0.10 0.10 0.10	MDL ug/L (ppb)	
21.53	Detected Amount	33333333333333333333333333333333333333	Detected Amount ug/L (ppb)	
20.00	Spiked Amount		SAMPLE S Amount ug	Collected: Extracted: Analyzed:
107.65	% Recovery		Spike % Recovery	12/15/97 12/18/97 12/23/97 Date
18.25	Detected Amount	888888888888888888888888888888888888888	Detected Amount ug/L (ppb)	17:30 9:45 1:42 Time
20,00	Spiked Amount		Amount ug R	DOC RML RML Analyst
91,25	% Recovery		Spike % Recovery	
21.68	Detected Amount	192.4 212.8 421.9 456.5 461.1 214.5	Detected Amount ug/L (ppb)	
20.00	Spiked Amount	250.0 250.0 500.0 500.0 250.0	Amount F	
108.40	% Recovery	76.96 85.12 84.38 91.30 92.22 85.80	Spike % Recovery	Sai Extracti Ana
21.58	Detected Amount	220.8 239.5 446.3 499.5 503.6 212.4	MATRIX Detected Amount ug/L (ppb)	Sample Type: Water Extraction Method SW846 3510 Analysis Metho SW846 8081A
20.00	Spiked Amount	250.0 250 0 500 0 500 0 250.0	MATRIX SPIKE DUPLICATE stected Spike mount Amount % (ppb) ug Recove	Water SW846 35 SW846 80
107 90	% Recovery	95 80 95 80 89 26 99 90 100 72 84 96	Spike % Recovery	10 B1A

BONNER ANALYTICAL TESTING COMPANY
QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
PESTICIDE/POLYCHLORINATED BIPHENYLS - ECD ANALYSIS DATA

Certified by Michael S. Bonner, Ph.D.
BONNER ANALYTICAL TESTING COMPANY

= Matrix Spiking Compounds

	100								T	<u> </u>
Decachlorobiphenyl	SURROGATE COMPOUNDS	17P. Heptachlor Epoxide 18P. PCB1242 19P. PCB1254 20P. PCB1221 21P. PCB1232 22P. PCB1248 23P. PCB1260 24P. PCB1016 25P. Toxaphene	16P. Heptachlor *			6P. Chlordane 7P. 4,4-DDT • 8P. 4,4-DDE		1P. Aldrin •	COMPOUNDS	Client: Hercules Sample ID: MW-2 File #: BT42540
		0.10 0.50 0.50 0.50 1.00 1.00	0.10	000	0.10 0.10	0.50 0.10 0.10	0 0 0 0	2 S S S	MDL ug/L (ppb)	
20.37	Detected Amount	88888888	88	888	888	888	8888	88	Detected Amount ug/L (ppb)	
20.00	Spiked Amount								SAMPLE S Amount ug	Collected: Extracted: Analyzed:
101.85	% Recovery								Spike % Recovery	12/15/97 12/18/97 12/23/97 Date
18.25	Detected Amount	88888888	88	888	888	888	8888	88	Detected Amount ug/L (ppb)	16:20 9:45 2:29 Time
20.00	Spiked Amount						·		METHOD BLANK d Spik t Amount ug Re	RML RML Analyst
91.25	% Recovery			<u> </u>					Spike % Recovery	
21.68	Detected Amount		214.5	461.1	456.5	421.9	212.8	192.4	Detected Amount ug/L (ppb)	
20.00	Spiked Amount		250.0	500.0	500.0	500.0	250.0	250.0	Amount Pug F	
108,40	% Recovery		85.80	92.22	91.30	84.38	85,12	76.96	Spike % Recovery	Sa Extracti Ana
21.58	Detected Amount		212.4	503,6	499.5	446.3	239.5	220.8	MATRIX Detected Amount ug/L (ppb)	mple Type: ion Method lysis Metho
20.00	Spiked Amount		250 0	500.0	500.0	500.0	250.0	250.0	MATRIX SPIKE DUPLICATE stected Spike mount mount Amount (ppb) ug Recove	Sample Type: Water Extraction Method SW846 3510 Analysis Metho SW846 8081A
107.90	% Recovery		84 96	100.72	99.90	89 26	95.80	88.32	Spike Spike % Recovery	10 31A

BONNER ANALYTICAL TESTING COMPANY
QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
PESTICIDE/POLYCHLORINATED BIPHENYLS - ECD ANALYSIS DATA

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= Matrix Spiking Compounds

Decachlorobiphenyl	SURROGATE COMPOUNDS	1P. Aldrin * 2P Alpha-BHC 3P. Beta-BHC * 5P. Detta-BHC 6P. Chlordane 7P. 4,4*-DDT * 8P. 4,4*-DDT * 11P. Alpha-Endosulfan 12P. Beta-Endosulfan 13P. Endosulfan Sulfate 14P. Endrin * 15P. Endrin Aldehyde 16P. Heptachlor * 17P. Heptachlor Epoxide 18P. PCB1254 20P. PCB1254 20P. PCB1232 22P. PCB1248 23P. PCB1260 24P. PCB1016 25P. Toxaphene	COMPOUNDS	Client: <u>Hercules</u> Sample ID: <u>MW-3</u> File #: <u>BT42541</u>
		0.05 0.05 0.05 0.05 0.10 0.10 0.10 0.10	MDL ug/L	
19.76	Detected Amount	888888888888888888888888888888888888888	Detected Amount ug/L (ppb)	
20.00	Spiked Amount		SAMPLE Amount ug	Collected: Extracted: Analyzed:
98.80	% Recovery		Spike %	12/15/97 12/18/97 12/23/97 Date
18.25	Detected Amount	888888888888888888888888888888888888888	ME Detected Amount ug/L (ppb)	15:40 9:45 3:17 Time
20.00	Spiked Amount		METHOD BLANK d Spit Amount ug R	DOC RML RML Analyst
91.25	% Recovery		Spike Spike % Recovery	
21,68	Detected Amount	192.4 212.8 421.9 456.5 461.1 214.5	Detected Amount ug/L (ppb)	
20.00	Spiked Amount	250.0 250.0 500.0 500.0 250.0	Amount oug f	
108,40	% Recovery	76.96 85.12 84.38 91.30 92.22 85.80	Spike Spike Recovery	Sa Extract Ana
21_58	Detected Amount	220.8 239.5 446.3 499.5 503.6 212.4	MATRIX Detected Amount ug/L (ppb)	Sample Type Water Extraction Method SW846 3510 Analysis Metho SW846 8081A
20.00	Spiked Amount	250.0 250.0 500.0 500.0 250.0	MATRIX SPIKE DUPLICATE stected Spike mount 4 ug/L Amount % (ppb) ug Recove	Water SW846 35 SW846 808
107.90	% Recovery	95,80 95,80 89 26 99 90 100 72 84 96	JPLICATE Spike Spike % Recovery	10 31A

BONNER ANALYTICAL TESTING COMPANY
QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
PESTICIDE/POLYCHLORINATED BIPHENYLS - ECD ANALYSIS DATA

Decachlorobiphenyi  = Matrix Spiking Compounds	SURROGATE COMPOUNDS				9P. 4.4-DDD 10P. Dieldrin * 11P. Alpha-Endosulfan 12P. Beta-Endosulfan	6P. Chlordane 7P. 4,4*-DDT * 8P. 4,4*-DDE	1P. Aldrin * 2P. Alpha-BHC 3P. Beta-BHC 4P. Gamma-BHC * 5P. Detta-BHC	COMPOUNDS	Client: <u>Hercules</u> Sample ID: <u>MW-4</u> File #: <u>BT42542</u>
		0.50 1.00 0.50	0.10	0 0 0	0.00.00	0.50 0.10	0.00.00	MDL (ddd)	
14,50	Detected Amount	8888888	8888	388	8888	888	8888	Detected Amount ug/L (ppb)	
20.00	Spiked Amount							SAMPLE S Amount ug	Collected: Extracted: Analyzed:
72.50	% Recovery							Spike % Recovery	12/12/97 12/18/97 12/23/97 Date
18.25	Detected Amount	8888888	8888	388	8888	888	8888	Detected Amount ug/L (ppb)	13:10 9:45 4:05 Time
20.00	Spiked Amount							METHOD BLANK d Spik t Amount ug R	DOC RML RML Analyst
91.25	% Recovery							Spike Spike Recovery	
21.68	Detected Amount		214,5	461.1	456.5	421.9	192.4 212.8	Detected Amount ug/L (ppb)	
20,00	Spiked Amount		250.0	500.0	500,0	500.0	250.0 250.0	Amount ug F	
108 40	% Recovery		85 80	92.22	91.30	84.38	76.96 85 12	Spike Spike Recovery	Sar Extractio Anal
21.58	Detected Amount		212.4	503,6	499.5	446.3	220.8	MATRIX Detected Amount ug/L (ppb)	nple Type on Method sysis Metho
20.00	Spiked Amount		250.0	500.0	500.0	500.0	250,0 250,0	MATRIX SPIKE DUPLICATE stected Spike mount amount wg/L Amount wg (ppb) ug Recove	Sample Type <u>Water</u> Extraction Method <u>SW846 3510</u> Analysis Metho <u>SW846 8081A</u>
107 90	% Recovery		84 96	100,72	99 90	89.26	88,32 95,80	JPLICATE Spike % Recovery	0 1A

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BONNER ANALYTICAL TESTING COMPANY
OUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
PESTICIDE/POLYCHLORINATED BIPHENYLS - ECD ANALYSIS DATA

Matrix Spiking Compounds

Deci	SUR	25P.	24P.	23P	22P	21P.	20P	19P	18P	17P	16P	15P.	14P	13P.	12P.	11P	Ę	9P.	8P	7P.	 왕	SP :	<del>-</del>	<u>۔۔</u>	<u>۔</u>	<del>1</del>		ဥ			Τ	Odi	
Decachlorobiphenyl	SURROGATE COMPOUNDS	Toxaphene	PCB1016							Heptachlor Epoxide	Heptachlor *															Aldrin *		COMPOUNDS				File #: <u>BT42543</u>	Client, Hercules
		1.00	0,50	1.00	1.00	0.50	0.50	1.00	0.50	0.10	0.05	0.0	0 10	0.10	0.10	0.10	0.10	0.05	0.10	0.10	0 50	S 8	2		0 5	0.05	(ppb)	. P. F.	5			ļ	ı
17.58	Detected Amount	S	S	8	S	NO	Š	N O	8	N N	8	8	3	N O	Z O	Z I	Z O	N i	S I	2	3	2 6	3	3 3	5 6	5	(ppb)	ng/L	Delected				
20.00	Spiked Amount																										ng	Amount		SAMPLE		Analyzed:	Collected
87.90	% Recovery																										Recovery	%	Opine			12/23/97 Date	12/12/97
18.25	Detected Amount	8	NO O	8	8	8	8	8	8	8	8	8	5	8	8	N i	8	8	8	<b>8</b> 8	5 i	<del>8</del> 8	3 (	3 3	3 6	Ś	(ppb)	ng/L	Amount	- A		4:52 Time	9.00
20.00	Spiked Amount																										5	Amount	]	ME HOD BLANK		RML	DOC
91,25	% Recovery																										Recovery	%	Opine				
21,68	Detected Amount										214.5	i	461.1			98	456.5		į	421.9		212	212 B		192.4	3	(ppb)	ng/L	Detected				
20 00	Spiked Amount										250.0	90.0	5000			4	500.0			5000		2.00.0	2500		0.002	3500	<b>-</b>	Amount	,	MATRIX SPIKE			
108 40	% Recovery										85.80	1	93			o e	91.30			84 38		1,	85 13		6.96	76.06	Recovery	*	Spike			Ana	Sa
21.58	Detected Amount										212.4	000,0	503.6			ं	499.5		į	446.3		2000	2056		8,027	300	(ppb)	ng/L	Detected	MATRIX		lysis Metho	mple Type
20 00	Spiked Amount										250.0	000,0	5000			ं	500 0			500 0		2000	2500		0.007	3600	6	Amount		MATRIX SPIKE DUPLICATE		Analysis Metho SW846 8081A	Water
107 90	% Recovery										84.96		100.72				99 90			89 76		00.00	9 3 3		88.32	80 33	Recovery	%	opike	LICATE		10 B1A	

BONNER ANALYTICAL TESTING COMPANY
QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
PESTICIDE/POLYCHLORINATED BIPHENYLS - ECD ANALYSIS DATA

= Matrix Spiking Compounds

Decachlorobiphenyl	SURROGATE COMPOUNDS	1P. Aldrin * 2P. Alpha-BHC 3P. Beta-BHC 4P. Gamma-BHC * 5P. Detta-BHC 6P. Chlordane 7P. 4,4*-DDT 8P. 4,4*-DDD 10P. Dieldrin * 11P. Alpha-Endosulfan 12P. Beta-Endosulfan 13P. Endrin Sulfate 14P. Endrin * 15P. Endrin Aldehyde 16P. Heptachlor * 17P. Heptachlor Epoxide 18P. PCB 1242 21P. PCB 1254 20P. PCB 1252 22P. PCB 1260 23P. PCB 1260 23P. PCB 1260 23P. PCB 1260 24P. PCB 1016	COMPOUNDS	Client: Hercules Sample ID: MW-6 File #: <u>BT42544</u>
		0.05 0.05 0.05 0.05 0.10 0.10 0.10 0.10	MDL ug/L	11
19.36	Detected Amount	888888888888888888888888888888888888888	Detected Amount ug/L (ppb)	
20.00	Spiked Amount		SAMPLE SAMPLE Amount	Collected: Extracted: Analyzed:
96.80	% Recovery		Spike % Recovery	12/12/97 12/18/97 12/23/97 Date
18.25	Detected Amount	888888888888888888888888888888888888888	ME Detected Amount ug/L (ppb)	13:10 9:45 5:40 Time
20.00	Spiked Amount		METHOD BLANK t Spik t Amount ug R	RML RML Analyst
91.25	% Recovery		Spike Spike % Recovery	
21.68	Detected Amount	192.4 212.8 421.9 456.5 214.5	My Detected Amount ug/L (ppb)	
20 00	Spiked Amount	250.0 250.0 500.0 500.0 250.0	Amount ug Rec	
108 40	% Recovery	76 96 85.12 91.30 92.22 85.80	pike % Recovery	Sai Extracti Anal
21 58	Detected Amount	220 B 239 5 446 3 499 5 503 6 212 4	MATRIX Detected Amount ug/L (ppb)	Sample Type Water Extraction Method SW846 3510 Analysis Metho SW846 8081A
20 00	Spiked Amount	250 0 250 0 500 0 500 0 250 0	MATRIX SPIKE DUPLICATE stected Spike mount Manual M	Water SW846 351 SW846 808
107 90	% Recovery	95.80 95.80 89.26 99.90 100.72 84.96	JPLICATE Spike % Recovery	0 1A

BONNER ANALYTICAL TESTING COMPANY
QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
PESTICIDE/POLYCHLORINATED BIPHENYLS - ECD ANALYSIS DATA

= Matrix Spiking Compounds

Decachiorobiphenyl	SURROGATE COMPOUNDS	25P. Toxaphene	24P. PCB1016	23P . PCB1260		21P. PCB1232	20P. PCB1221	19P. PCB1254		17P. Heptachlor Epoxide				13P. Endosulfan Sulfate				9P. 4,4'-DDD	8P 4,4'-DDE	7P. 4,4'-DDT •	_					1P. Aldrin •		COMPOUNDS				FIE #: DI 42343	Cample IC. The Diagra	Client: Hercules
		1.00	0.50	1,00	1.00	0.50	0.50	1.00	0.50	0.10	0.05	0.10	0,10	0.10	0.10	0.10	0.10	0.05	0.10	0,10	0.50	0.05	0.05	0.05	B.	S	(ppb)	ng/L	<u></u>				l	1
21.91	Detected Amount	8	Š	8	Š	Š	Š	8	8	Š	8	- 8	8	8	8	8	8	8	8	8	8	8	8	8	5	8	(ppb)	ng/	Amount	Detected				
20.00	Spiked Amount											•															-g	Amount		,	SAMPLE	Analyzeo.	- Kuldelen	Collected
109,55	% Recovery																										Recovery	*		Spike		Date	12/10/3/	12/12/97
18,25	Detected Amount	8	8	8	8	N D	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	5	8	(ppb)	ng/L	Amount		MM	Time	2 4	O AF
20,00	Spiked Amount																							•			6	Amount		S	METHOD BLANK	Analyst		000
91.25	% Recovery																										Recovery	%		Snike	<b>X</b>			
21.68	Detected Amount										214.5		461.1			8	456.5			421.9			212.8			192.4	(ppb)	ng/L	Amount	Detected	<u> </u>			
20,00	Spiked Amount										250.0		500.0			8	500.0			500.0			250.0			250.0	6	Amount		9	MATRIX SPIKE			
108,40	% Recovery										85.80		92.22			5	91_30			84,38			85 12			76.96	Recovery	*		Silve		2	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Sal
21,58	Detected Amount						7				212.4		503.6			j)	499.5			446.3		ě	239 5			220 8	(ppb)	ng/L	Amount	Data-day	MATRIX	Asia Menor	or wichide	Sample Type Water
20,00	Spiked Amount										250.0		500.0			-	500.0			500 0			250 0			250 0	6	Amount		200	MATRIX SPIKE DUPLICATE	SVV846 BUB	CC OHOVAC	Water
107.90	% Recovery										84.96	1	100.72			9	99.90			89 26		21	95 80			88 32	Recovery	*		Solice	ICATE			1

BONNER ANALYTICAL TESTING COMPANY
QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
PESTICIDE/POLYCHLORINATED BIPHENYLS - ECD ANALYSIS DATA

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•	0	ıν	NNNNNN		φ
= Matrix Spiking Compounds	Decachlorobiphenyl	SURROGATE COMPOUNDS	1P. Aldrin * 2P Alpha-BHC 3P. Beta-BHC 4P. Gamma-BHC * 5P. Delta-BHC 6P. Chlordane 7P. 4,4*-DDT * 8P. 4,4*-DDT * 8P. 4,4*-DDT * 11P. Alpha-Endosulfan 12P. Beta-Endosulfan 12P. Beta-Endosulfan 13P. Endrin * 11P. Alpha-Endosulfan 13P. Endrin * 15P. Endrin Sulfate 14P. Endrin * 15P. Endrin Aldehyde 16P. Heptachlor * 17P. Heptachlor Epoxide 16P. PCB1242 21P. PCB1232 22P. PCB1232 22P. PCB1236 23P. PCB1260 24P. PCB12160 24P. PCB12160 24P. PCB12160 24P. PCB12160 24P. Toxaphene	COMPOUNDS	Client: <u>Hercules</u> Sample 10: <u>Equipment Blank</u> File #: <u>B142546</u>
			0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05	MDL ug/L (ppb)	, ,
	20,42	Detected Amount	888888888888888888888888888888888888888	Detected Amount ug/L (ppb)	
	20.00	Spiked Amount	9	SAMPLE Amount ug	Collected: Extracted: Analyzed:
	102_10	% Recovery		Spike % Recovery	12/15/97 12/18/97 12/23/97 Date
	18.25	Detected Amount	888888888888888888888888888888888888888	ME Detected Amount ug/L (ppb)	9:45 7:15 Time
	20,00	Spiked Amount		Amount ug R	DOC RML RML Analyst
	91.25	% Recovery		Spike Spike % Recovery	
	21.68	Detected Amount	192.4 212.8 421.9 461.1 214.5	Detected Amount ug/L (ppb)	
	20.00	Spiked Amount	250.0 250.0 500.0 500.0 250.0	Amount ug Rec	
	108,40	% Recovery	76.96 85.12 91.30 92.22 85.80	pike % Recovery	Sa Extracti Ana
	21,58	Detected Amount	220. 8 239. 5 446. 3 499. 5 503. 6 212. 4	MATRIX Detected Amount ug/L (ppb)	Sample Type: Water Extraction Method SW846 3510 Analysis Metho SW846 8081A
	20,00	Spiked Amount	250.0 250.0 500.0 500.0 250.0	MATRIX SPIKE DUPLICATE etected Spike mount Amount % (ppb) ug Recove	Water SW846 351 SW846 808
	107.90	% Recovery	88. 32 95. 80 89. 26 99. 90 100. 72 84. 96	JPLICATE Spike % Recovery	110

BONNER ANALYTICAL TESTING COMPANY
QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA
PESTICIDE/POLYCHLORINATED BIPHENYLS - ECD ANALYSIS DATA

n-Propyibenzene	Naphthalene	Methylene chloride	n-isopropyiberzene	Hexacniorodutadiene	Ethyl benzene	t-1,3-Dichloropropene	c-1,3-Dichloropropene	1,1-Dichloropropene	2,2-Dichloropropane	1,3-Dichloropropane	1.2-Dichloropropane	trans-1,2-Dichloroethene	cis-1.2-Dichloroethene	1,1-Dichloroethane	Dichlorodifluoromethane	1,4-Dichlorobenzene	1.3-Dichlorobenzene	1 2-Dichlorchenzene	1,2-Dibromoethane	1,2-Dibromo-3-chloropropane	Dibromochloromethane	4-Chlorotoluene	2-Chlorotoluene	Chloromethane	Chloroethane	Carbon Tetrachloride	tert-Butylbenzene	sec-Butylbenzene	n-Butylbenzene	Bromethane	Bromodichloromethane	Bromochloromethane	Bromobenzene	Chlorobenzene	Tolinga	Benzene	1,1-Dichloroethene		Compound Name				File #: BT42539	ocation: MW - 1	Client: HERCULES
103-65-1	91-20-3	75-09-2	98-82-8	87-68-3	100-41-4	10061-02-6	10061-01-5	563-58-6	594-20-7	142-28-9	78-87-5	156-60-5	156-59-2	75-34-3	75-71-8	106-46-7	541-73-1	95-50-1	106-93-4	96-12-8	124-48-1	106-43-4	95-49-8	74-87-3	/5-00-3 66 67 3	56-23-5	98-06-6	135-98-8	104-51-8	74-83-9	75-27-4	74-97-5	108-86-1	108-90-7	108-88-3	79-01-6	75-35-4		Number	CAG				•	
1.50	3 00	2.50	2 200	2.00	2.50	2.00	2.00	2.00	2.00	2.50	2.50	2.50	2.50	2.00	2.00	2.00	2.00	2.50	2.00	4.00	2.00	1.50	3.00	300	3.00	2.00	3.00	2,50	1.50	1.50	2.00 50	2.00	2.50	2.00	2.50	3 2 2	2.00	(ppb)	ng/L	5					
N C	2 6	2 6	2 2		S	N D	N O	S	N	N D	N O	N I	8 8	Z Z	S	B	N i	3 8	5 8	8	8	N D	8	5 8	5 5	Z	8	B	Z i	8 8	5 6	8	B	8 8	5 8	5 2	N N	(ppb)	ug/L	Detected	,			•	
			•		•	-																								¥3								ug	Amount	٥	SAMPLE				
																																						Recovery	%	DIKE			Analyzed:	Received	Collected:
	2 6	N d	3 6	2	S	N N	S	N O	Z O	N D	N D	N I	8 8		N O	Z O	Z i	<b>Z</b> 2	Z Z	S	N	N D	N i	3 3	5 6	8	S	N D	N i	8 8	3 8	N O	S	8 i	3 8	5 8	N N	(ppb)	ug/L	Detected		Date	12/18/97	12/16/97	12/15/97
							-																				_											ñ	Amount		BLANK	Time	12:20	11:20	17:30
								•				_															85								•			Recovery	%	- opike	1	Analyst	CRR	RWO	BATCO
NO (	Z :	Z ;	3 2	5 2		NO	NO	NO	N	N D	Z D	Z	8 8	8 8	N	B	S	5 3	5 8	B	B	N D	S i	3 3	5 E		8	B	N i	8 8	5 6	8	N D	52.9	53.1	η (7 2. α 4. α	52.2	(ppb)	ng/L	Detected	MA				
	-								-																							<del></del>		250.0	250.0	250.0	250.0	ng	Amount		MATRIX SPIKE (BT42541)				
																-								**									2	105.8	106.0	104,8	104.4	Recovery	%	- opike	(BT42541)			Anal	'n
NO		Z ;	5 6	5 6	Z Z	8	N D	N	N	N	S	S	8 8	2 0	S	N	8 i	2 2	Š	S	N	N	N i		5 6		Š	N D	Z i	8 8	5 8	N O	N	54.0	53.0	51.5	51.3	(ppb)	ug/L	Detected	MATR		0	Analysis Method:	Sample Type:
	_					-																												250.0	250.0	250.0	250.0	ng	Amount	],	MATRIX SPIKE DUP (BT42541)		0200	8260	Water
1																							_											108.0	106.0	103.0	102.6	Recovery	%	pike	P (BT42541)				

Dibromofluoromethane Toluene-d8 4-Bromofluorobenzene	Surrogate Compounds	1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,2,3-Trichlorobenzene 1,2,4-Trichloroethane 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichlorofluoromethane 1,2,3-Trichloropropane 1,2,3-Trichloropropane 1,2,3-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene	Compound Name	Client: HERCULES Location: MWV - 1 File #: BT42539
1868-53-7 2037-26-5 460-00-4		630-20-6 79-34-5 127-18-4 87-61-6 120-82-1 71-55-6 79-00-5 75-69-4 96-18-4 95-63-6 108-67-8 75-01-4 1330-20-7	CAS Number	
		2.50 2.50 2.00 2.00 2.50 2.50 2.50 2.50	MDL ug/L (ppb)	
49.5 44.9 47.0	Detected Amount	888888888888888	Detected Amount ug/L (ppb)	' '
250.0 250.0 250.0	Spiked Amount		SAMPLE S Amount ug	
99.0 89.8 94.0	% Recovery		Spike % Recovery	Collected: Received: Analysis:
46.6 49.2 49.7	Detected Amount		Detected Amount ug/L (ppb)	12/15/97 12/16/97 12/18/97 Date
250.0 250.0 250.0	Spiked Amount	9	BLANK S Amount ug	17:30 11:20 12:20 Time
93.2 98.4 99.4	% Recovery		Spike % Recovery	BATCO RWC CRR Analyst
46.0 46.1 47.9	Detected Amount	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Detected Amount ug/L (ppb)	
250.0 250.0 250.0	Spiked Amount		Amount ng R	]¥ 51
92.0 92.2 95.8	% Recovery		Spike Spike % Recovery	
46.7 45.9 48.9	Detected Amount		] ⊒ 8	Sample Type: Analysis Method:
250.0 250.0 250.0	Spiked Amount		Amount Reco	Water 8260
93.4 91.8 97.8	% Recovery		Spike Spike % Recovery	

Certified by:

Michael S. Bonner,Ph. D.
Bonner Analytical Testing Company

## VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: HERCULES		File#: BT	42539
Sample Matrix : Water		Lab Sample	e ID : MW-1
Sample Collection Date	e : 12/15/97		
Sample Analysis Date :	12/18/97	GC Column	Length: 105 M
Dilution Factor: 1		GC Column	n ID: 0.53 mm
8			
Sample Weight/ Volume	e: 5.0 (g/mL) mL		
Number TICs Found :	0	Concentrat	ion Units: ug / L (PPB)
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION

n-Propylbenzene	Naphthalene	Methylene chloride	n-lsopropytherizerie	Hexachlorobutadiene	Ethyl benzene	t-1,3-Dichloropropene	c-1,3-Dichloropropene	1 1-Dichloropropane	12.2-Dichloropropane	1,2-Dichloropropane	trans-1,2-Dichloroethene	cis-1,2-Dichloroethene	1.2-Dichloroethane	Dichlorodifluoromethane	1,4-Dichlorobenzene	1,3-Dichlorobenzene	1.2-Dichlorobenzene	Discompensare	1,2-Dibromo-3-chloropropane	Dibromochloromethane	4-Chlorotoluene	2-Chlorotoluene	Chloromethane	Chloroform	Chlorothana	tert-Butylbenzene	sec-Butylbenzene	n-Butylbenzene	Bromorethane	Bromodichloromethane	Bromochloromethane	Bromobenzene	Chlorobenzene	Tolican	Benzene	1,1-Dichloroethene	Composition				118 #. 11-12-10	Location: MVV - 2	Client: HERCULES
103-65-1	91-20-3	75-09-2	98-82-6	87-68-3	100-41-4	10061-02-6	10061-01-5	563-58-6	594-20-7	/8-8/-5	156-60-5	156-59-2	107-06-2	75-71-8	106-46-7	541-73-1	95-50-1	74-95-3	96-12-8	124-48-1	106-43-4	95-49-8	74-87-3	66-67-3	75-00-3	98-06-6	135-98-8	104-51-8	74-83-9	75-27-4	74-97-5	108-86-1	108-90-7	108-88-3	71-43-2	75-35-4	2	CAS					
1.50	3 00	2.50	2 20	2.00	2.50	2.00	2.00	2.00	200	2.50	2.50	2.50	2.00	2.00	2.00	2.00	2.50	2.50	4 6	2.00	1.50	3.00	3.00	2 2	3 00	3.00	2.50	1.50	1 20	2.00	2.00	2.50	2.00	3 N.O.	2.00	2.00	(ppb)	MDL					
N C	Z	2 2	2 2	, .	N O	Ž D	8	8 6	5 6	5 6	8	8	8 8	5 6	B	ND	8 8	2 2	5 2	5 8	N D	S	8 8	8 8	3 3	5 8	8	8	2 2	5 6	8	N O	8 8	2 2	8	N	(ppb)	Amount	Detected				
								-3.54.8	7-2			150	820				-	•												2010							- Bn	A	S	SAMPLE			
																																					Recovery	<b></b>	pike		Cilalyzed.	Received:	Collected:
	S i	S 6	3 3	Z	Z Z	ND	Z i	- N	2 2		8	8	8 8	5 6	N	ND	8 8	5 6	5 6	5 8	N O	S	8 8	2 2	2 2	5 8	NO	8	8 8	3 8	ND	8		3 2	8	S	(ppb)	Amount	Detected		Date	12/16/97	12/15/97
<u> </u>																						<del>-107</del>		71	1000	-82										2000	- Gu	A	6	BLANK	Time	11:20	16:20
																								1													Recovery	<b>R</b>	Spike		Analyst	RWC	
ND	N I	S G	2 2	2 2	S O	ND	N i	N C	8 8	5 6	8	8	8 8	5 6	8	S	8 8	3 8	5 2	5 S	N D	N	8 8	8 8	3 8	5 8	S	8	8 8	5 6	8	N	52.9	53.1	52.4	52.2	(ppb)	Amount	Detected	MA			
															•										-		-						250.0	250.0	250.0	250.0	g R	A	S	MATRIX SPIKE (BT42541)			
						•															•												105.8	105.0	104.8	104.4	Recovery	۶	Spike	(BT42541)		Ana	
ND	N O	N i	8 8	5 6	S	N O	N	N i	2 2	2 2		N D	N d	3 8	N O	ND	N i	5 8	5 6		NO O	N	N i	Z Z	8 8	5 5	N O	N I	8 8	5 6	NO	ND	54.0	53.0	51.5	51.3	(ppb)	Amount	Detected	MATR		Analysis Method:	Sample Type:
						<b>.,</b> .		_																									250.0	250.0	250.0	250.0	Dg .	A 3	cted Spike	X SPIKE DL		8260	Water
1					-								-		•								·						_				108.0	108.0	103.0	102.6	Recovery	۶	pike	IP (BT42541			

Dibromofluoromethane Toluene-d8 4-Bromofluorobenzene	Surrogate Compounds	Styrene 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane 1etrachloroethene 1,2,3-Trichlorobenzene 1,1,1-Trichloroethane 1,1,1-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloromethane 1,1,2-Trichloromethane 1,2,3-Trichloropropane 1,2,3-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene	Compound Name	Client: HERCULES Location: MW - 2 File #: BT42540
1868-53-7 2037-26-5 460-00-4		100-42-5 630-20-6 79-34-5 127-18-4 87-61-6 120-82-1 71-55-6 79-00-5 75-69-4 96-18-4 95-63-6 108-67-8 75-01-4 1330-20-7	CAS Number	
		2.00 2.50 2.00 2.00 2.50 2.50 2.50 2.50	MDL ug/L (ppb)	
47.5 48.4 45.3	Detected Amount		Detected Amount ug/L (ppb)	6.4
250.0 250.0 250.0	Spiked Amount		SAMPLE S Amount ug	
95.0 96.8 90.6	% Recovery		Spike %	Collected: Received: Analysis:
46.6 49.2 49.7	Detected Amount		Detected Amount ug/L (ppb)	12/15/97 12/16/97 12/18/97 Date
250.0 250.0 250.0	Spiked Amount		BLANK S Amount ug	16:20 11:20 13:21 Time
93.2 98.4 99.4	% Recovery	_	Spike %	BATCO RWC CRR Analyst
46.0 46.1 47.9	Detected Amount		Detected Amount ug/L (ppb)	
250.0 250.0 250.0	Spiked Amount		MATRIX SPIKE Spike Armount ng Re	
92.0 92.2 95.8	% Recovery		Spike Spike % Recovery	Anal
46.7 45.9 48.9	Detected Amount		Detected Amount ug/L (ppb)	Sample Type: Analysis Method:
250.0 250.0 250.0	Spiked Amount		Amount % Reco	Water 8260
93.4 91.8 97.8	% Recovery		Spike Spike % Recovery	88 - ER

Certified by:

Michael S. Bonner, Ph. D.
Bonner Analytical Testing Company

## VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client : HERCULES		File#: BT	42540	
Sample Matrix: Water		Lab Sampl	e ID: MW-2	4
Sample Collection Date		-		
Sample Analysis Date		GC Colum	n Length: 105 M	
Dilution Factor: 1			n ID: 0.53 mm	
Dilution Factor.		<u> </u>	0.00	
Sample Weight/ Volum	e: 5.0 (g/mL) mL			
Number TICs Found :	0	Concentra	tion Units: ug / L (PPB)	
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRAT	ION
		-		
		<u> </u>		
		<del></del>		
			-	
				<u> </u>
		_		

n-Propyibenzene	Naphthalene	Methylene chloride	p-isopropyitoluene	Isopropyibenzene	Hexachlorobutadiene	t-1,3-Dichloropropene	c-1,3-Dichloropropene	1,1-Dichloropropene	2,2-Dichloropropane	1,3-Dichloropropane	1,2-Dichloropropane	trans-1,2-Dichloroethene	cis-1.2-Dichloroethene	1.1-Dichloroethane	Dichlorodifluoromethane	1,4-Dichlorobenzene	1.3-Dichlorobenzene	1 2-Dichlorchanzana	1,2-Dibromoethane	1,2-Dibromo-3-chloropropane	Dibromochloromethane	4-Chlorotoluene	2-Chlorotoluene	Chloromethane	Chloroethane	Carbon Tetrachloride	tert-Butylbenzene	sec-Butylbenzene	n-Butylbenzene	Bromotorm	Bromodichloromethane	Bromochloromethane	Bromobenzene	Chlorobenzene	Inchloroethene	Benzene	1,1-Dichloroethene	:	Compound Name			File #: BT42541	Location: MW - 3	Client: HERCULES
103-65-1	91-20-3	75-09-2	99-87-6	98-82-8	87-68-3	10061-02-6	10061-01-5	563-58-6	594-20-7	142-28-9	78-87-5	156-60-5	156-59-2	107-06-3	75-71-8	106-46-7	541-73-1	95-50-1	106-93-4	96-12-8	124-48-1	106-43-4	95-49-8	74-87-3	/5-00-3	56-23-5	98-06-6	135-98-8	104-51-8	74.83.0	75-27-4	74-97-5	108-86-1	108-90-7	79-01-6	71-43-2	75-35-4		Number	}			э.	
1.50	3.00	2.50	2.00	2.50	200	2.00	2.00	2.00	2.00	2.50	2.50	2.50	2.50	3.00	2.00	2.00	2.00	2 50	2.00	2.00	2.00	1.50	3.00	3.00	3 6	2.00	3.00	2.50	1.50	3 2	2.00	2.00	2.50	2.00	2 20	2.00	2.00	(ppb)	ug/L	<u>.</u>				
ND	S	B	Z :	2 2	3 8	5 2	2		N O	N	N	8	8 8	5 8	8	NO O	Z i	5 6	5 6	, N	8	N	N D	8 8	3 8	Z	8	8	8 8	3 2	8	8	Š	8 8	2 2	8	B	(ppb)	Amount ug/L	Detected				
							_													<u> </u>						<u></u>												gu	Amount		SAMPLE			
								_								-										-												Recovery	*	Spike		Analyzed:	Received:	Collected:
ND	S	S	N :	S d	2 2				S O	N	N O	N O	Z Z	5 6	- 8	Š	N i	2 2	5 6		8	N D	N O	8 8	5 8	5 8	N	N i	8 8	5 6	5 8	N	Š	N d	5 6	8	N	(ppb)	Amount ug/L	Detected		12/18/97 Date	12/16/97	12/15/97
														-							•										_							ű	Amount	6	BLANK	14:22 Time	11:20	15:40
										-						•	-								,	*												Recovery	%	Spike		CRR	RWC	BATCO
ND	N O	Z O	N O	N i		5 6	2		8	N	B	S	S	3 2	Š	B	Z i	3 3	5 6	2	8	N N	N O	8 8	5 6	5 6	8	Z O	8 8	5 6	5 8	S	N O	52.9	52.0	52.4	52.2	(ppb)	Amount ug/L	Detected	MA			
	-										•								-															250.0	250.0	250.0	250.0	ng	Amount		MATRIX SPIKE (BT42541)			
					•											•					-										•			105.8	100.C	104.8	104.4	Recovery	%	Spike	(BT42541)		Ana	"
ND	Z O	N O	N D	Z i	2 2	2	5 6		N O	S	B	N	N C	3 8	8	S	N i	8 8	5 6		5 6	N	N	8 8	2 2	Z	N N	Š	Z	5 6	5 6	N D	Z O	54.0	53.0	51.5	51.3	(ppb)	ug/L	Detected	MATR		Analysis Method:	Sample Type:
																																		250.0	250.0	250.0	250.0	ng D	Amount	S	MATRIX SPIKE DUP (BT42541)		8260	Water
1																																		108.0	200	103.0	102.6	Recovery	%	Pike	P (BT42541			

Client: HERCULES Location: MW - 3 File #: BT42541					Collected: Received: Analysis:	12/15/97 12/16/97 12/18/97 Date	15:40 11:20 14:22 Time	BATCO RWC CRR Analyst			S. Analy	Sample Type: Analysis Method:	Water 8260	
	_			SAMPLE			BLANK			MATRIX SPIKE	KE	W	MATRIX SPIKE DUP	5
			Detected	S	Spike	Detected	S	Spike	Detected	S	Spike	Detected	Sp	Spike
	CAS	MDL	Amount			Amount			Amount			Amount		
Compound Name	Number	ug/L	ug/L	Amount	%	ug/L	Amount	%	ug/L	Amount	8	ug/L	Amount	
		(ppb)	(ppb)	ğ	Recovery	(ppb)	g	Recovery	(ppb)	ng	Recovery	(ppb)	ng	Recovery
Styrene	100-42-5	2.00	ND			ND			ND			ND		
1,1,2-Tetrachloroethane	630-20-6	2.50	ND			N			N D			ND		
,1,2,2-Tetrachloroethane	79-34-5	2.50	N			N			ND			ND		
Tetrachloroethene	127-18-4	2.00	Š			B			N D			ND		
I,2,3-Trichlorobenzene	87-61-6	2.00	N O			ND			ND			ND		
,2,4-Trichlorobenzene	120-82-1	2.50	Š			B			B			N		
1,1,1-Trichloroethane	71-55-6	2.00	8			N			B			Z O		
1,1,2-Trichloroethane	79-00-5	2.50	S			B			B		•	N		
Trichlorofluoromethane	75-69-4	2.00	8			B			N			NO		
1,2,3-Trichloropropane	96-18-4	1.50	S			8			N			8		
1,2,4-Trimethylbenzene	95-63-6	2.00	8			B			N			S		
1,3,5-Trimethylbenzene	108-67-8	3.00	N O			S			S			N		
Vinyl chloride	75-01-4	2.50	8			B			N O			S		
Xylenes (total)	1330-20-7	4.00	Š			8			N O			ND		
			Detected	Spiked	%	Detected	Spiked	%	Detected	Spiked	%	Detected	Spiked	%
Surrogate Compounds			Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery
Dibromofluoromethane	1868-53-7		47.8	250.0	95.6	46.6	250.0	93.2	46.0	250.0	92.0	46.7	250.0	93.4
Toluene-d8	2037-26-5		50.4	250.0	100.8	49.2	250.0	98.4	46.1	250.0	92.2	45.9	250.0	91.8
4-Bromofluorobenzene	460-00-4		48.0	250.0	96.0	49.7	250.0	99.4	47.9	250.0	95.8	48.9	250.0	97.8

Certified by:

Michael S. Bonner, Ph. D.

Bonner Analytical Testing Company

## VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: HERCULES		File #: BT	42541
Sample Matrix: Wate	r	Lab Sample	e ID : MW-3
Sample Collection Dat			
Sample Analysis Date		GC Column	Length: 105 M
Dilution Factor: 1			n ID: 0.53 mm
Sample Weight/ Volun	ne: 5.0 (g/mL) mL		
Number TICs Found :	0	Concentrat	ion Units: ug/L (PPB)
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
			:
		<u> </u>	
<u>.</u>			
	-		

n-Propyipenzene	Naphthalene	Methylene chloride	p-isopropyitoluene	Isopropylbenzene	Hexachlorobutadiene	Ethyl benzene	t-1.3-Dichloropropene	c-1.3-Dichloropropene	1 1-Dichloropropane	1,3-Dichioropropane	1,2-Dichloropropane	trans-1,2-Dichloroethene	cis-1,2-Dichloroethene	1,1-Dichloroethane	Dichlorodifluoromethane	1,4-Dichlorobenzene	1,3-Dichlorobenzene	1,2-Dichlorobenzene	Dibromethane	1.2-Dibromo-S-chloropiopane	1 3-Dibromo-3-chloropropage	Discompositione	2-Chlorotoluene	Chloromethane	Chloroform	Chloroethane	Carbon Tetrachloride	tert-Butylbenzene	n-Butylbenzene	Bromomethane	Bromoform	Bromodichloromethane	Bromochloromethane	Chlorobenzene	Toluene	Trichloroethene	1,1-Dichloroethene		Compound Name				File #: BT42542	Location: MW - 4	Client: HERCULES
103-65-1	91-20-3	75-09-2	99-87-6	98-82-8	87-68-3	100-41-4	10061-02-6	10061-01-5	8-85-185 1-02-160	594-20-7	78-87-5	156-60-5	156-59-2	107-06-2	75-71-8	106-46-7	541-73-1	95-50-1	74-95-3	106-93-4	06-12-8	124-48-1	95-49-8	74-87-3	66-67-3	75-00-3	56-23-5	98-06-6	135-08-8	74-83-9	75-25-2	75-27-4	74-97-5	108-90-7	108-88-3	79-01-6	75-35-4		Number	CAS			•	٠,	
1.50	3.00	2.50	2.00	2.50	2.00	2.50	2.00	2.00	2 2.0	2 20	2.50	2.50	2.50	2.00	2.00	2.00	2.00	2.50	2.50	3 E	2 2	200	3.00	3.00	2.00	3.00	2.00	3.00	3 1. 50 C	1.00	2.50	200	2 20	2.00	2.50	2.50	2 2. 28 8	(ppb)	)/E	MDL					
NC	8	N	ND	N	B	N D	Z	8 8	3 6	3 3	3 2	8	8	8 8	5 8	8	B	S i	8 8	2 2	2 2	3 3	3 2	8	NO	B	8	8 8	5 8	8	B	S i	5 3	Z	N	8	S 8	(ppb)	)g/L	Amount	Detected				
																																					•••	Ę	Amount		S	SAMPLE			
			1											27.63				/(===0					A-1-															Recovery	%		Spike		Analyzed:	Received:	Collected:
200		S	S	N D	N	N O	N D	8 8	5 8	3 3	2	- E	N D	8 8	Z	8	N	8		5 6	5 6	5 3	5 6	8 8	N	ND	N i	8 8	3 3	B	B	N i	 	5 6	N	8	S 8	(ppb)	ig/L	Amount	Detected		12/18/97 Date	12/16/97	12/12/97
25 3	•								•					-																						_		5	Amount		S	BL ANK	19:56 Time	11:20	13:10
								•								-		•												•								Recovery	8		Spike		CRR Analyst	RWC	ВАТСО
200	Š	, N	Z O	N D	NO	N D	N D	N i	- N	3 8		 5 8	N D	8 8	5 8		NO	8		8 8	8 6	8 8	5 6		N N	N O	S i	Z i	3 8	N	B	N :	8 8	52.9	53.1	52.5	52.2 52.4	(ppp)	) lg/L	Amount	Detected	AW			
-											•							-						-				-						250.0	250.0	250.0	250.0 250.0	ng	Amount	(5)	9	MATRIX SPIKE (BT42541)			
													-		-															•				105.8	106.2	105.0	104.4	Kecovery	8		Spike	(BT42541)		Ana	,,
2	5 6			20	N D	N	N	N i	S i	2 2	2 2		ND	8 8	3 2	 5 8	N D	N D	N i	8 8	<b>S</b> i	8 8	5 6		S	NO	N.	S i	3 8	- -	NO	N O	8 8	, U4.	53.1	53.0	51.3	(ppo)	) gu	Amount	Detected	MATR		Analysis Method:	Sample Type:
7												_																						250.0	250.0	250.0	250.0	ng	Amount		cted Spike	IX SPIKE DU		8260	Water
										-													•											108.0	106.2	106.0	102.6	Kecovery	%		DKe	P (BT42541)			

Certified by:

Michael S. Bonner, Ph. D.

Bonner Analytical Testing Company

## VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client : HERCULES	File #: BT42542
Sample Matrix : Water	Lab Sample ID : MW-4
Sample Collection Date : 12/12/97	
Sample Analysis Date: 12/18/97	GC Column Length: 105 M
Dilution Factor: 1	GC Column ID: 0.53 mm
Sample Weight/ Volume: 5.0 (g/mL) mL	
Number TICs Found: 2	Concentration Units: ug / L (PPB)

CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
67-64-1	Acetone	10.6	169
78-93-3	MEK	17.2	182
	<del></del>	-	
		<del></del>	
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		+	
		1	
		1 - 1	
		<del>-  </del>	

	n-Propvibenzene	Naphthalene	Methylene chloride	p-isopropyltoluene	Isopropylbenzene	Hexachlorobutadiene	t-1,3-Dichloropropene	c-1,3-Dichloropropene	1,1-Dichloropropene	2,2-Dichloropropane	1,3-Dichloropropane	1,2-Dichloropropane	trans-1,2-Dichloroethene	cis-1.2-Dichloroethene	1 2-Dichloroethane	1 1-Dicklorosthana	Dichlorodiffuctorethane	1,3-Dichlorobenzene	1,2-Dichlorobenzene	Dibromomethane	1,2-Dibromoethane	1,2-Dibromo-3-chloropropane	Dibromochloromethane	4-Chlorotoluene	2-Chlorotoluene	Chloromethane	Chloroform	Chloroethane	Carbon Tetrachloride	sec-butylbenzene	n-Butylbenzene	Bromomethane	Bromoform	Bromodichloromethane	Bromochloromethane	Cnlorobenzene	Toluene	Trichloroethene	Benzene	1 1-Dichloroethene	Compound value					File #: 8142543	Charles MW - 5	Client: HERCULES
100-00-1	103.65.1	91-20-3	75-09-2	99-87-6	98-82-8	87-68-3	10061-02-6	10061-01-5	563-58-6	594-20-7	142-28-9	78-87-5	156-60-5	156-59-2	107-06-2	75-34-3	75-71-8	106-46-7	95-50-1	74-95-3	106-93-4	96-12-8	124-48-1	106-43-4	95-49-8	74-87-3	66-67-3	75-00-3	56-23-5	08-08-8	104-51-8	74-83-9	75-25-2	75-27-4	74-97-5	108-90-7	108-88-3	79-01-6	71-43-2	75-35-4	Maritimer	CAS			ji	<b>.</b>		
	1 5	3.00	2.50	2.00	2.50	٥ د د د	2.00	2.00	2.00	2.00	2.50	2.50	2.50	2.50	2 2	3 8	3 2	3 2	2.50	2.50	2.00	4.00	2.00	1.50	3.00	3.00	2.00	3.00	2.00	3 2.50	1.50	1.00	2.50	2.00	2.00	2.5	2.50	2.50	2.00	8	(ppb)	<u> </u>						
ā	<b>2</b> ;	N I	N D	11.0	8 8	5 8	5 8	N	N	ND	N	N	N i	S G	3 8	5 6	3 8	5 2	Z Z	N	ND	N	S	ND	N	N	N i	- -	3 8	5 6	S	B	8	Si	8 8	5 6	5 B	B	8	5	(ppb)	Amount	Detected					
					•				-																-												-				- En		S	SAMPLE				
Ī																																									Recovery	2	Spike		•	Analyzed:	Collected.	Callactad.
Page	5 6	S (	N I	N :	8 8	3 6	 5 6	N	N D	N	S	B	N i	S d	3 3	5 6	5 6	5 6	8	N N	N D	B	N D	N D	S S	S i	Z i	Z i	3 3	5 6	8	N D	S i	2 6	3 3	2	S	N D		5	(ppb)	Amount	Detected		Date	12/18/97	12/16/07	42/42/07
1 of 2									•														-																		ug	•	S	BLANK	Time	18:53	1 2	9
															•		•																								Recovery	:	Spike		Analyst	CRR		DATA C
3	5 6	3	N i	N i	8 8	5 8	8	N	N N	N	N N	S	S i	2 6	3 3	5 6	5 6	5 6	Z Z	N O	B	B	N	N	N I	Z i	Z C	8 8	5 6	5 8	B	N D	Z (	3 6	5 2	52.9	53.1	52.5	52.4	53 3	(ppb)	Amount	Detected	MA				
											-																									250.0	250.0	250.0	250.0	250.0	ng	•	6	MATRIX SPIKE (BT42541)				
			•																												,					105.8	106.2	105.0	104.8	04.4	% Recovery		Spike	(BT42541)		Ana	<b>&gt;</b>	_
2	5 6	- -	N :	8	8 8		- N	N D	ND	N	S	N D	S d	5 8	3 6	5 6	5 6	5 8	N N	N O	N	N	B	B	S i	 8 6	8 8	8 8	3 6		B	N D	2 6	3 6	5 6	54.0	53.1	53.0	51.5	71.0	(ppb)	Amount	Detected	MATR		Analysis Method.	Sample Type	Cample Type
											-		_																	-						250.0	250.0	250.0	250.0	3500	Amount ng		S	X SPIKE DU		8260	Water	
7			-				•		-						-													-								108.0	106.2	106.0	103.0	3	% Recovery		Spike	MATRIX SPIKE DUP (BT42541)		0.1		

4-Bromofluorobenzene	Toluene-d8	Dibromofluoromethane	Surrogate Compounds		Xylenes (total)	Vinyl chloride	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene	1,2,3-Trichloropropane	Trichlorofluoromethane	1,1,2-Trichloroethane	1,1,1-Trichloroethane	1,2,4-Trichlorobenzene	1,2,3-Trichlorobenzene	Tetrachioroethene	1,1,2,2-Tetrachloroethane	1,1,1,2-Tetrachloroethane	Styrene		Compound Name				Client: HERCULES Location: MW - 5 File #: BT42543
460-00-4	2037-26-5	1868-53-7			1330-20-7	75-01-4	108-67-8	95-63-6	96-18-4	75-69-4	79-00-5	71-55-6	120-82-1	87-61-6	127-18-4	79-34-5	630-20-6	100-42-5		Number	CAS			
					4.00	2.50	3.00	2.00	1.50	2.00	2.50	2.00	2.50	2.00	2.00	2.50	2.50	2.00	(ppb)	ug/L	M M M			
49.2	49.5	45.3	Amount	Detected	N D	N D	B	N O	N	ND	B	ND	NO NO	ND	B	B	ND	ND	(ppb)	ug/L	Amount	Detected		
250.0	250.0	250.0	Amount	Spiked															g	Amount		qs.	SAMPLE	
98.4	99.0	90.6	Recovery	8															Recovery	%		Spike		Collected: Received: Analysis:
49.7	49.2	46.6	Amount	Detected	B	ND	ND	N	N	N	N D	ND	N D	N	ND	N	ND	ND	(ppb)	ug/L	Amount	Detected		12/12/97 12/16/97 12/18/97 Date
250.0	250.0	250.0	Amount	Spiked															Ę,	Amount		S	BLANK	9:00 11:20 18:53 Time
99.4	98.4	93.2	Recovery	Ŗ															Recovery	%		Spike		BATCO RWC CRR Analyst
47.9	46.1	46.0	Amount	Detected	N D	S	N	B	N D	S	8	N D	N	N	N	N	N	ND D	(ppb)	ug/L	Amount	Detected		
250.0	250.0	250.0	Amount	Spiked															ng	Amount		S	MATRIX SPIKE	
95.8	92.2	92.0	Recovery	20						_				_		_			Recovery	%		Spike	KE	A
48.9	45.9	46.7	Amount	Detected	N	S	N D	ND	S	N	N	N O	N	N D	N O	N O	S	S	(ppb)	ug/L	Amount	Detected	×	Sample Type: Analysis Method.
250.0	250.0	250.0	Amount	Spirit															g	Amount		dS.	MATRIX SPIKE DUP	Water 8260
97.8	91.8	93.4	Recovery	r 															Recovery	8		Spike	E DUP	

Certified by:

Michael S. Bonner, Ph. D. Bonner Analytical Testing Company

## VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: HERCULES		File#: BT	42543	
Sample Matrix: Water		Lab Sample	e ID:MW-5	٠.
Sample Collection Date	e : 12/12/97			
Sample Analysis Date	<del></del> -	GC Column	n Length: 105 M	
Dilution Factor: 1		GC Columi	n ID: 0.53 mm	
Sample Weight/ Volum	e: 5.0 (g/mL) mL			
Number TICs Found :	0	Concentrat	ion Units: ug/L (PPB)	
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION	NC
	-			
			1	_
	· · · · · · · · · · · · · · · · · · ·			

	Naphthalene	Methylene chloride	p-Isopropyltoluene	Isopropylbenzene	Hexachlorobutadiene	Ethyl honzona	c-1,3-Dichloropropene	1,1-Dichloropropene	2,2-Dichloropropane	1,3-Dichloropropane	1,2-Dichloropropane	trans-1,2-Dichloroethene	cis-1,2-Dichloroethene	1.2-Dichloroethane	Dichlorodiluoromethane	1,4-Dichlorobenzene	1,3-Dichlorobenzene	1,2-Dichlorobenzene	Dibromomethane	1,2-Dibromoethane	1.2-Dibromo-3-chloropropane	14-Chiorotoiuene	2-Chlorotoluene	Chloromethane	Chloroform	Chloroethane	Carbon Tetrachloride	sec-Butylbenzene	n-Butylbenzene	Bromomethane	Bromodicnioromethane	Bromochloromethane	Bromobenzene	Chlorobenzene	Toluene	Tricklorosthone	1,1-Dichloroethene		Compound Name				File #: 8T42544	Location: MW - 6	Client: HERCULES
100-00-	91-20-3	75-09-2	99-87-6	98-82-8	87-68-3	100-01-02-6	10061-01-5	563-58-6	594-20-7	142-28-9	78-87-5	156-60-5	156-59-2	107-06-2	75-71-8	106-46-7	541-73-1	95-50-1	74-95-3	106-93-4	96-12-8	124-48-1	95-49-8	74-87-3	66-67-3	75-00-3	56-23-5	135-98-8	104-51-8	74-83-9	75-25-2	74-97-5	108-86-1	108-90-7	108-88-3	79.01-6	75-35-4		Number	CAS				Ę	
	3.00	2.50	2.00	2.50	2.00	3.50	2.00	2.00	2.00	2.50	2.50	2.50	2.50	2	2.00	2.00	2.00	2.50	2.50	2.00	4.00	3 . 2 2	3.00	3.00	2.00	3.00	2.00	3.50	1.50	1.00	2.50	2.00	2.50	2.00	2.50	3.50	2.00	(ppb)	ug/L	MDF					
ā	5	8	N	S	8 8	5 6	5 S	S	8	N	Š	N D	N i	3 8	5 6	8	N D	8	8	8	8 6	5 8	Š	S	N	N :	8 8	5 6	8	8	8 8	8	B	8	8 8	5 6	N.	(ppb)	ug/L	Amount	Detected			·	
																																			•			ű	Amount		S	SAMPLE			
																																						Recovery	%		Spike		Analyzed:	Received:	Collected:
Page	N O	B	N	N I	Z	2 2	2	S	N	N	N	N i	S d	2 2	8	N N	N	N	N	Z i	2 6	Ž	N N	N	N O	S i	3 3		8	N i	3 8	Z O	N D	8 8	3 3	5 6	S	(ppb)	ug/L	Amount	Detected		12/18/97 Date	12/16/97	12/12/97
1 of 2		-						_																										•				Бñ	Amount		S	BLANK	15:23 Time	11:20	13:10
																																						Recovery	%		Spike		CRR Analyst	RWC	ВАТСО
200	S	S	N	N i	8 8	5 6	N N	N	B	N	N D	N i	S d	3 2	S	B	N	8	N N	8 8	2 2	5 6	N	8	S	<u>.</u>	3 2	5 8	8	8 8	5 6	8	8	52.9	53.U	52.4	52.2	(ppb)	ug/L	Amount	Detected	MA			
		-			-																			•	•									250.0	250.0	250.0	250.0	DG.	Amount		S	MATRIX SPIKE (BT42541)			
						•		11																										105.8	1000	104.8	104.4	Recovery	8		Spike	(BT42541)		Ana	
200	S O	NO	N D	N i	2 2		N N	ND	N D	Z D	Z i	Z i	2 6	5 0	8	N D	Š	N (	N i		3 6	5 8	N O	N D	N I	N i	3 3	- 5 6	N D	N Z	 5 6	N	N O	54.0	53.0	51.5	51.3	(ppb)	ng/L	Amount	Detected	MATRIX		Analysis Method:	Sample Type:
																							•											250.0	250.0	250.0	250.0	ng	Amount			SPIKE		8260	Water
7																																		108.0	106.0	103.0	102.6	Recovery	%		Spike	P (BT42541)			

Toluene-d8 4-Bromofluorobenzene	Surrogate Compounds	Styrene 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,2,3-Trichlorobenzene 1,2,4-Trichloroethane 1,1,1-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,2,3-Trichloropropane 1,2,4-Trimethylbenzene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride Xylenes (total)	Compound Name	Client: HERCULES Location: MWV - 6 File #: BT42544
2037-26-5 460-00-4		100-42-5 630-20-6 79-34-5 127-18-4 87-61-6 120-82-1 71-55-6 79-00-5 75-69-4 96-18-4 95-63-6 108-67-8 75-01-4 1330-20-7	CAS Number	
		2.00 2.50 2.50 2.00 2.00 2.00 2.50 2.50	MDL ug/L (ppb)	
49.1 49.3 49.2	Detected Amount	88888888888888888	Detected Amount ug/L (ppb)	1 1
250.0 250.0 250.0	Spiked Amount		SAMPLE Sp Amount ug	
98.6 98.4 98.4	% Recovery		Spike %	Collected: Received: Analysis:
49.2 49.7	Detected Amount	8888888888888888	Detected Amount ug/L (ppb)	12/12/97 12/16/97 12/18/97 Date
250.0 250.0 250.0	Spiked Amount		BLANK S Amount	13:10 11:20 15:23 Time
98.4 98.4 99.4	% Recovery		Spike % Recovery	BATCO RWC CRR Analyst
46.1 46.1 47.9	Detected Amount	8888888888888888	Detected Amount ug/L (ppb)	163
250.0 250.0 250.0	Spiked Amount		Amount ng R	
92.2 95.8	% Recovery		Spike Spike % Recovery	Ana
45.9 48.9	Detected Amount	8888888888888888	Detected Amount ug/L (ppb)	Sample Type: Analysis Method:
250.0 250.0 250.0	Spiked Amount		Amount Reco	Water 8260
91.8 97.8	% Recovery		Spike Spike % Recovery	**

Certified by:

Michael S. Bonner,Ph. D.

Bonner Analytical Testing Company

## VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: HERCULES		File#: BT	42544
Sample Matrix: Water	·	Lab Sample	e ID: MW-6
Sample Collection Date	e : 12/12/97		
Sample Analysis Date		GC Column	Length: 105 M
Dilution Factor: 1		GC Column	n ID: 0.53 mm
Dilution Factor: 1			
Sample Weight/ Volum	e: 5.0 (g/mL) mL		
Number TICs Found :	0	Concentrat	ion Units: ug / L (PPB)
			5
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
	-		

n-Propylbenzene	Methylene chloride	p-Isopropyltoluene	Isopropylbenzene	Hexachiorobutadiene	t-1,3-Dichloropropene	c-1,3-Dichloropropene	1,1-Dichloropropene	2,2-Dichloropropane	1.3-Dichloropropane	1.2-Dichloropropane	trans-1.2-Dichloroethene	1,2-Dichloroethane	1,1-Dichloroethane	Dichlorodifluoromethane	1,4-Dichlorobenzene	1,2-Dichlorobenzene	Dibromomethane	1,2-Dibromoethane	1,2-Dibromo-3-chloropropane	Dibromochloromethane	A-Chlorotoiuene	Chloromethane	Chloroform	Chloroethane	Carbon Tetrachloride	Sec-Buyibenzene	n-Butylbenzene	Bromomethane	Bromodicnioromethane	Bromochloromethane	Bromobenzene	Chlorobenzene	Toluene	Benzene	1,1-Dichloroethene		Compound Name			File #: 8142545	Location: Trip Blank	Client: HERCULES
103-65-1	75-09-2	99-87-6	98-82-8	87-68-3	10061-02-6	10061-01-5	563-58-6	594-20-7	142-28-9	78-87-5	156-60-5	158-50-2	75-34-3	75-71-8	106-46-7	95-50-1	74-95-3	106-93-4	96-12-8	124-48-1	105434	74-87-3	66-67-3	75-00-3	56-23-5	98-08-6	104-51-8	74-83-9	75-25-2	75 27 4	108-86-1	108-90-7	108-88-3	79-01-6	75-35-4		Number	CAS			•	
1.50	2.50 3.00	2.00	2.50	2.00	2.00	2.00	2.00	2.00	2.50	2.50	2.50	2.50	2.00	2.00	2.00	2.50	2.50	2.00	4.00	2.00	<u>.</u>	3 2	2.00	3.00	2.00	3 00	1.50	1.00	2.50	3 6	2.50	2.00	2.50	2.50	2.00	(ppb)	ug/∟	5				
N G	 5 6	Š	8	88	5 8	8	ND	8	Z	Z i	8 8	3 2	8	N O	8	3 3	8	N D	N D	8	5 8	5 8	8	8	8 8	3 3	5 8	B	8 8	ž	8	B	- 8 8	5 2	DN	(ppb)	ug/L	Amount				
																				-				-												В'n	Amount		SAMPLE			
															****																	-		•		Recovery	%	Opine	255	Analyzed:	Received:	Collected:
	3 8	8	N i	8 8	- N	Š	8	N D	N I	<u>z</u> ;	8 6	5 6	8	N	S i		8	8	N	8	3 8	5 6	8	N O	8 8	3 6	5 8	N D	8 8	5 6	8	Š	N i	5 8	N	(ppb)	ug/L	Amount		12/18/97 Date	12/16/97	12/12/97
		-									-					_																				Бñ	Amount		BLANK	16:50 Time	11:20	
													•				•											-								Recovery	%	Opine		CRR Analyst	RWC	BATCO
NO.	3 8	S	Z O	88	5 6	8	N O	N	S	N i	S d	5 6	- 5 8	8	8	5 8	S	8	N	8	3 8	3 8	5 S	8	8	2 3	5 6	8	88	5 6	5 6	52.9	53.1	52.5	52.2	(ppb)	ug/L	Amount	MA			
		_																														250.0	250.0	250.0	250.0	ng	Amount		MATRIX SPIKE (BT42541)			
																		•			•											105.8	106.2	105.0	104.4	Recovery	%	Opina	(BT42541)		Ana	"
ND	S 6	N N	N D	88	2 2	 -	N D	N	Š	S	N i	2 2	5 8	N	N			Š	N O	N i	8 8	3 8		N	N i	8 8	3 8	N O	88	5 6	5 B	54.0	53.1	53.0	51.3	(ppb)	ug/L	Amount	MATRIX		Analysis Method:	Sample Type:
									•																							250.0	250.0	250.0	250.0	ng	Amount		SPIKE		8260	Water
	•																															108.0	106.2	106.0	102.6	Recovery	*	CING	DUP (BT42541)			

Client: HERCULES Location: Trip Blank File #: BT42545	2		Detected	SAMPLE Sp	Collected: Received: Analysis: Spike	12/12/97 12/16/97 12/18/97 Date	0:00 11:20 16:50 Time BLANK Sp	BATCO RWC CRR Analyst	Detected	MATRIX SPIKE	An An	Sample Type: Analysis Method: Detected Amount	Sample Type: alysis Method:  M Detected Amount	ethod: Water ethod: 8260  MATRIX SPIKE DUP scred Spike ount
	CAS	<u>S</u>	Detected	Sp	ike	Detected Amount	Sp	iike	Detected Amount	S	ike	> 0	Detected Amount	
Compound Name	Number	(ppb)	ug/L (ppb)	Amount ug	% Recovery	ug/L (ppb)	Amount ug	% Recovery	ug/L (ppb)	Amount	% Recovery		ug/L (ppb)	ug/L Amount (ppb) ng
Styrene	100-42-5	2.00	NO			O			S				8	S O
1,1,1,2-Tetrachloroethane	630-20-6	2.50	N			N			8				5 6	-
1,1,2,2-Tetrachloroethane	79-34-5	2.50	B			NO			S				8	-
[etrachloroethene	127-18-4	2.00	N			S			N				5 6	
1,2,3-Trichlorobenzene	87-61-6	2.00	R			S			8				5 6	
1,2,4-Trichlorobenzene	120-82-1	2.50	ND			S			8				5 6	
I,1,1-Trichloroethane	71-55-6	2.00	ND			S			- N				5 6	
1,1,2-Trichloroethane	79-00-5	2.50	ND			N			8				5 6	
Trichlorofluoromethane	75-69-4	2.00	ND			8			8				5 6	_
1,2,3-Trichloropropane	96-18-4	1.50	ND			B			8				5 6	
1,2,4-Trimethylbenzene	95-63-6	2.00	N			S			8				5 6	
1,3,5-Trimethylbenzene	108-67-8	3.00	ND			S			- -				5 6	-
Vinyl chloride	75-01-4	2.50	ND			S			Š				Š	-
Xylenes (total)	1330-20-7	4.00	ND			B	-		N				Z	N
	+		Detected	Spiked	%	Detected	Spiked	%	Detected	Spiked	%	ō	Detected	stected Spiked
Surrogate Compounds			Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	≱	Amount	L
Dibromofluoromethane	1868-53-7		48.8	250.0	97.6	46.6	250.0	93.2	46.0	250.0	92.0		46.7	
Toluene-d8	2037-26-5		47.2	250.0	94.4	49.2	250.0	98.4	46.1	250.0	92.2	_	45.9	
4-Bromofluorobenzene	460-00-4		45.9	250.0	91.8	49.7	250.0	99.4	47.9	250.0	95.8		48.9	48.9 250.0

Certified by:

Michael S. Bonner, Ph. D.

Bonner Analytical Testing Company

## VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: HERCULES		FIIE # : B14	12545	
Sample Matrix : Water		Lab Sample	e ID: Trip Blank	4
Sample Collection Date	: 12/12/97			
Sample Analysis Date :		GC Column	Length: 105 M	
Dilution Factor: 1		GC Column	ID: 0.53 mm	
Sample Weight/ Volume	e: 5.0 (g/mL) mL			
Number TICs Found :	0	Concentrati	on Units: ug / L (PPB)	
	,	<del></del>		
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION	٧
				_
			Tr Tr	
			<del></del>	
	· · · · · · · · · · · · · · · · · · ·			
		l l	1	

	n-Propylbenzene	Naphthalene	Methylene chloride	p-Isopropyltoluene	Isopropylbenzene	Hexachlorobutadiene	Ethyl benzene	t-1,3-Dichloropropene	c-1,3-Dichloropropene	1,1-Dichloropropene	2,2-Dichloropropane	1,3-Dichloropropane	1,2-Dichloropropane	trans-1,2-Dichloroethene	cis-1,2-Dichloroethene	1.2-Dichloroethane	1 1-Dichloroethane	Dichlorodifluoromethane	11 A-Dichlorobenzene	1 3-Dichlorobenzene	1 2-Dichlorohenzene	Discompathana	1.2-Dibromoethane	1 3-Dibromo-3 chloropropage	14-Chlorocoluene	2-Chlorotoluene	Chloromethane	Chloroform	Chloroethane	Carbon Tetrachloride	tert-Butylbenzene	sec-Butylbenzene	n-Butylbenzene	Bromomethane	Bromodicniorometrarie	Bromochloromethane	Bromobenzene	Chlorobenzene	Toluene	Trichloroethene	Benzene		Compound Name					File #: BT42546	Location: Equipment Blank	Client: HERCULES	
.00	103-65-1	91-20-3	75-09-2	99-87-6	98-82-8	87-68-3	100-41-4	10061-02-6	10061-01-5	563-58-6	594-20-7	142-28-9	78-87-5	156-60-5	156-59-2	107-06-2	75-34-3	75-71-8	106-46-7	541-73-1	95-50-1	74-95-3	106-93-4	06-12-8	124-48-1	100 A3 A	74-67-3	66-67-3	75-00-3	56-23-5	98-06-6	135-98-8	104-51-8	74-83-9	75-25-2	75 37 4	108-86-1	108-90-7	108-88-3	79-01-6	71-43-2	75.35.4		CAS			i :		Ξ,		
	1 50	3.00	2.50	2.00	2.50	2.00	2.50	2.00	2.00	2.00	2.00	2.50	2.50	2.50	2.50	2.00	2.00	2.00	2.00	9 9	2 50	20 6	2 :0	2 2	3 - 20 -	5 6	3 2	2.00	3.00	2.00	3.00	2.50	1.50	1.00	2.50	3 5	2.50	2.00	2.50	2.50	2.00	3	(dqq)	<u>P</u>							
	z	N D	N D	N D	N D	N D	N O	N	N	R	N D	N D	S	8	N D	8	N N	8	8 8	2 :	8 8	<u>z</u> ;	8 8	2 6	5 8	5 6	5 6	5 6	8	; 8	N	B	B	8	8 8	5 6	5 6	N	8	B	8	2	(ppb)	Amount	Detected						
																																											- Bn	A	S	SAMPLE					
																																											Recovery	۶	Spike			Analyzed:	Received:	Collected:	
0	- N	Z O	N	N O	N D	N D	N O	ND	N D	N	N O	N D	N O	B	N	S	8	N O	Z i	<u> </u>	S i	<u>.</u>	8	2 6	2 6	5 6	5 6	5 2	200	8	B	ND	N	N i	8 8	3 8	5 6	8	N O	Š	S G	5	(ppb)	Amount	Detected		Date	12/18/97	12/16/97	12/15/97	
2			-																-		-												-								•		- Bu	<b>A</b>	60	BLANK	1 11110	17:51	11:20		
								•																																			Recovery	۶	Spike		Anaiysi	CRR	RWC	BATCO	
	<u></u>	Š	N	ND	N O	N D	N	NO	N O	N	8 O	N	N	NO	N	S	S O	B	N i	N I	N i	N i	N I	B i		3 8	3 6	5 6	5 2	5 6	N D	- N	N	S i	8 8	5 8	5 8	52.9	53.1	52.5	52.4	50 7	(ppb)	Amount	Detected	MAT					
														-																								250.0	250.0	250.0	250.0	250.0	рg	Amount		MATRIX SPIKE (BT42541)					
											_									-																		105.8	106.2	105.0	104.8	104 4	Recovery	 &	Spike	(BT42541)			Ana		,
	N O	N O	Š	Z O	N D	N D	Z O	N	N		N O	S	N D	8	N D	N	S	S	S	<u>N</u>	N O	<u>.</u>	8	Z O	Z i	S 6	2 2	5 6	5 6	5 6	Š	8	N O	N	Z i	3 6	5 8	. v4.	53.1	53.0	51.5	51.3	(ppb)	Amount	Detected	MATRI			Analysis Method:	Sample Type:	
												_			- "		•					·																250.0	250.0	250.0	250.0	250.0	DG.	Amount	o o	X SPIKE DU			8260	Water	
	)							,			_				_					_ ·•		•																108.0	106.2	106.0	103.0	102.6	Recovery	*	Spike	MATRIX SPIKE DUP (BT42541)				*1	

Client: HERCULES Location: Equipment Blank File #: BT42546					Collected: Received: Analysis:	12/15/97 12/16/97 12/18/97 Date	11:20 17:51 Time	RWC CRR Analyst			Analy	Analysis Method:	Water 8260	
				SAMPLE			BLANK			MATRIX SPIKE	A .	<u>×</u>	MATRIX SPIKE DUP	
			Detected	JS	Spike	Detected		Spike	Detected	ds.	Spike	Detected	JS JS	Spike
	CAS	MDL	Amount			Amount			Amount			Amount		
Compound Name	Number	ug/L	ug/L	Amount	%	ug/L	Amount	8	ug/L	Amount	%	ug/L	Amount	%
		(ppb)	(ppb)	ß	Recovery	(ppb)	g	Recovery	(ppb)	g	Recovery	(ppb)	gr	Recovery
Styrene	100-42-5	2.00	S			S			S			8		
1,1,1,2-Tetrachloroethane	630-20-6	2.50	Š			N			Š			N		
1,1,2,2-Tetrachloroethane	79-34-5	2.50	B			N D			ND			8		
Tetrachloroethene	127-18-4	2.00	B			ND			N			8		
1,2,3-Trichlorobenzene	87-61-6	2.00	B			B			Š			S		
1,2,4-Trichlorobenzene	120-82-1	2.50	ND			8	•		8			S		
1,1,1-Trichloroethane	71-55-6	2.00	R			ND			N D			N		
1,1,2-Trichloroethane	79-00-5	2.50	ND			S			S			S		
Trichlorofluoromethane	75-69-4	2.00	B			B			N			S		
1,2,3-Trichloropropane	96-18-4	1.50	ND			B			N D			S		
1,2,4-Trimethylbenzene	95-63-6	2.00	B			N D			N N			S		
1,3,5-Trimethylbenzene	108-67-8	3.00	R			B			Š			8		
Vinyl chloride	75-01-4	2.50	B			N D			N			N		
Xylenes (total)	1330-20-7	4.00	N D			Š			N D		:	ND		
			Detected	Spiked	%	Detected	Spiked	%	Detected	Spiked	%	Detected	Spiked	%
Surrogate Compounds	-		Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery
Dibromofluoromethane	1868-53-7		48.6	250.0	97.2	46.6	250.0	93.2	46.0	250.0	92.0	46.7	250.0	93.4
Toluene-d8	2037-26-5		46.1	250.0	92.2	49.2	250.0	98.4	46.1	250.0	92.2	45.9	250.0	91.8
4-Bromofluorobenzene	460-00-4		49.0	250.0	98.0	49.7	250.0	99.4	47.9	250.0	95.8	48.9	250.0	97.8

Certified by:

Michael S. Bonner,Ph. D. Bonner Analytical Testing Company

## VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: HERCULES		File #: BT4	42546
Sample Matrix : Water		Lab Sample	e ID: Equipment Blank
Sample Collection Date	: 12/15/97		
Sample Analysis Date :		GC Column	n Length: 105 M
Dilution Factor: 1			r1D → 0:53 mm
Dilution Factor.	<u> </u>		
Sample Weight/ Volume	e: 5.0 (g/mL) mL		
Number TICs Found :	0	Concentrat	ion Units: ug / L (PPB)
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
=			
			<del> </del>

•					:		,					r.		
Client: Hercules					Collected:	12/15/97	17:30	ВАТСО			5	Sample Type:	Water	
File #: BT42539					Analyzed:	1/9/98	2:34	CMB			Analy	Analysis Method:	8270	
					:	Date	Time	Analyst			3	8		
				8142539			BLANK	3		Matrix Spike		Matr	Matrix Spike Duplicate	cate
			Detected	dS	Spike	Detected	S	Spike	Detected	Spike	ike	Detected	Sp	Spike
3	CAS	MDL	Amount			Amount			Amount			Amount		
Compound Name	Number	) <b>6</b> /L	J/gu	Amount	*	ng/L	Amount	*	ng/ul	Amount	*	ng/ul	Amount	*
		(ppb)	(ppb)	å	Recovery	(ppb)	ű	Recovery	in the	5	Recovery	in the	5	Recovery
Phenol	108-95-2	5.2	S			Š			89.18	300.00	29.73	99.51	300.00	33.17
Bis(2-chloroethyl)ether	111-44-4	6.9	8			Š			N D			Š	1000	_
2-Chlorophenol	95-57-8	5.7	Š			S			187.53	300.00	62,51	210.70	300.00	70.23
1,3-Dichlorobenzene	541-73-1	8.3	8			S			B			NO		
1,4-Dichlorobenzene	106-46-7	6.1	8			S			85.60	200.00	42.80	100.12	200.00	50.06
Benzyl Alcohol	100-51-6	14.8	8			8			S			8		_
2-Mathylahard	95-90-1	л с ъ С	3 8			5 6			5 6			3 8		
Ris (2-chloroisopropulather	108-80-1	æ (	3 8			3 8			5 6			3 8		
4-Methylphenol	106-44-5	6.7	8			S i			8 8			S G		
Hexachioroethane	67-72-1	6.0	Š			N			N O			Š		
N-Nitroso-di-N-propylamine	621-64-7	9.7	8			8			136.46	200.00	68.23	160.56	200.00	80.28
Nitrobenzene	98-95-3	9.2	5 8			8			. S					= <del></del>
3 A-Dimethylaharol	105-67-0		3 8			5 6			3 8			3 8		
2-Nitrophenol	68-75-5	9.1	8 8			8 8			8 8			S d		
Benzoic Acid	65-85-0	22.3	Š			8			Š			8		
Bis(2-chloroethoxy)methane	111-91-1	8.8	N O			N D			N D			S		
2,4-Dichtorophenol	120-83-2	5.2	5 8			5 8			S	3	2	8 8		:
1,2,4-lichloropenzene	91-20-3	י ני ני	5 8			5 6			2. C.	200.00	47.01	109.42	200.00	54./
4-Chloroaniline	106-47-8	8.5	8 8			8 8			8 8			8 a		
Hexachlorobutadiene	87-68-3	9.4	S			N D			S			ND		
4-Chloro-3-methylphenol	59-50-7	7.7	Š			Š			234.19	300.00	78.06	260.60	300.00	86.87
2-Methylnaphthalene	91-57-6	7.5	Š			N D			S			S		
Hexachlorocyclopentadiene	77-47-4	9.6	8 8			8 8			8			8		
2,4,6-irichlorophenol	88-05-2	<b>,</b> .	Š			5 6			5 2			5 8		
2-Chloropaphthalana	91-58-7	5.7	2 6			8 8			3 8			3 8		
2-Nitroaniline	88-74-4	12.0	S i			8			S i			S i		
Dimethylphthalate	131-11-3	8.2	ND D			N O			Š			N O		
Acenaphthylene	208-96-8	9.0	N D			N D			S			N D		
2,6-Dinitrotoluene	606-20-2	9.2	8			N			S			N D		
3-Nitroaniline	99-09-2	16.0	8			S			S			S		
Acenaphthene	83-32-9	9.0	5 8						121.78	200.00	60.89	144.73	200,00	72,37
A.Nitrophenol	100-02-7	20 F	3 3			3 3			112 70	300	37 57	107.40	300 000	35 80
Dibenzofuran	132-64-9	8 6	8			S d			N I			N i	0	0
2,4-Dinitrotoluene	121-14-2	8.3	8			N i			147.75	200.00	73.88	161.78	200.00	80.89
Diethylphthalate	84-66-2	9.9	S	92		N D			S		Y	N O	33	×
Fluorene	86-73-7	9.8	N D			Š			8			N D		
4-Chlorophenyl-phenylether	100 01 6	9 6	5 8			5 8			3 8			5 2		
A S. Digitro-2-mathylphenol	F34.52-1	13 0.	5 6	-		3 8			3 8			5 5		
4,0-Unitro-2-methylphenol	534-52-1	12.2	2			20			N			20		

Page 1 of 2

Client: Hercules					Collection:	12/15/97	17:30	BATCO			Se Extracti	Sample Type: Extraction Method:	Water 3510b	
File #: BT42539					Analysis:	1/9/98	2:34	CMB			Analy	Analysis Method:	8270	
						Date	Time	Analyst						
				8142539			BLANK			Matrix Spike		Mat	Matrix Spike Duplicate	cate
			Detected	Spike	ike	Detected		Spike	Detected	St	Spike	Detected	Spike	ike
	CAS	ΝÞ	Amount			Amount			Amount			Amount	ř	
Compound Name	Number	ug/t	ug/L	Amount	ሄ	ug/L	Amount	ጽ	ng/ut	Amount	*	ng/ul	Amount	*
		(ppb)	(ppb)	5	Recovery	(ppb)	g	Recovery	in the	ű	Recovery	in the	£	Recovery
									extract			extract		
N-Nitrosodiphenylamine	86-30-6	7.5	B			8			Š			ND		
4-Bromophenyi-phenylether	101-55-3	7.0	8			S			S			S		
Hexachlorobenzene	118-74-1	8.0	8			NB B			Š			S		
Pentachlorophenol	87-86-5	12.5	8			ND			311.90	300.00	103.97	307.08	300.00	102.36
Phenanthrene	85-01-8	7.1	8			ND			8			NO		
Anthracene	120-12-7	8.0	8			S			Š			S		
Di-n-butylphthalate	84-74-2	7.8	8	_		8			N			S		
Fluoranthene	206-44-0	5.7	8			8			S			S		
Pyrene	129-00-0	7.9	8			S			174.39	200.00	87.20	180.67	200.00	90.34
Butylbenzylphthalate	85-68-7	9.9	8			B			S			8		
Benzo(a)anthracene	56-55-3	7.7	8			8			S			8		
3,3'-Dichlorobenzidiene	91-94-1	16.5	ND			8			S			8		
Chrysene	218-01-9	7.8	S			S			S			8		
8is(2-ethylhexyl)phthaiate	117-81-7	9.1	NO.			8			B			8		
Di-n-octylphthalate	117-84-0	9.4	8	3		8			S			Š	)	
Benzo(b) fluoranthene	205-99-2	6.8	NO			8			Š			8		
Benzo(k)fluoranthene	207-08-9	4.9	B			S			Š			8		
Benzo(a)pyrene	50-32-8	5.9	NO			8			8			8		_
indeno(1,2,3-c,d)pyrene	193-39-5	7.8	8			8			Š			8		_
Dibenzo(a,h)anthracene	53-70-3	9.0	8			8			Š			Š		_
Benzo(g,h,i)perylene	191-24-2	10.0	Š			S			B			Š		
			Detected	Spiked	*	Detected	Spiked	*	Detected	Spiked	8	Detected	Spiked	*
Surrogate Compounds			Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Атоипт	Recovery
2-Fluorophenol			70.41	200.00	35.21	92.22	200.00	46.11	112.36	200.00	56.18	123.26	200.00	61.63
Phenol-d5			53.29	200.00	26.65	64.71	200.00	32.36	78.94	200.00	39.47	87.05	200.00	43.53
Nitrobenzene-d5	·		85.94	100.00	85.94	74.74	100.00	74.74	97.18	100.00	97.18	104.82	100.00	104.82
2-Fluorobiphenyl			63.85	100.00	63.85	65.54	100.00	65.54	86.97	100.00	66.97	104.67	100.00	104.67
2,4,6-Tribromophenot			169.97	200.00	84.99	226.16	200.00	113.08	273.28	200.00	136.64	286.69	200.00	143.35
Terphenyl-d14			91.50	100.00	91.50	132.90	100.00	132.90	127.66	100.00	127.66	125.04	00.00	125.04

Micheal S. Bonner,Ph. D. Bonner Analytical Testing Company

Certified by:

## SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: Hercules, Inc.		File#: BT	42539
Sample Matrix : Water			e ID: MW-1
Sample Collection Dat			
Sample Analysis Date	: 01-09-98 @ 0234	GC Colum	n Length: 30 M
Dilution Factor: 1.02		GC Colum	n ID: 0.25 mm
Sample Weight/ Volun	ne: 980 mL	Method Co	de: 8270
Number TICs Found :		Concentrat	tion Units: ug/L (PPB)
Trumpor Troot Cana.	<u> </u>		
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
			<b></b>
			<b></b>

											ņ	1 T		
Client: Hercules					Collected	12/15/97	16:20	BATCO			Extract	Extraction Method	Water	
Location: MW-Z					Analyzed:	1/9/98	3:27	CMB			Analy	Analysis Method:	8270	
File #: 0142340						Date	Time	Analyst						
				BT42540			BLANK			Matrix Spike		Matr	Matrix Spike Duplicate	cate
			Detected	Spike	ike	Detected	S	Spike	Detected	Spike	ike	Detected	dS	ike
	CAS	MD.	Amount			Amount			Amount			Amount		!
Compound Name	Number	ug/L	ug/L	Amount	*	ug/L	Amount	*	ng/ui	Amount	*	ng/ul	Amount	*
		(ppb)	(ppb)	5	Recovery	(ppb)	5	Recovery	in the	6	Recovery	in the	ű	Recovery
Phenol	108-95-2	5.2	NO			S			89.18	300.00	29.73	99.51	300.00	33.17
Bis(2-chloroethyl)ether	111-44-4	6.9	ND.			8			8			N O		
2-Chlorophenol	95-57-8	5.7	Š			S			187.53	300.00	62.51	210.70	300.00	70.23
1,3-Dichlorobenzene	541-73-1	8.3	N D			Š	-		S			8		
1,4-Dichlorobenzene	106-46-7	6.1	8			N.			85.60	200.00	42.80	100.12	200.00	50.06
Benzyl Alcohol	100-51-6	14.8	S			N			8			8		
1,2-Dichlorobenzene	95-50-1	6.0	B			S			8			3 8		
2-Methylphenol	95-48-7	5.6	8			S			- 8			3 8		_
Bis(2-chloroisopropyl)ether	108-60-1	8.8	8			8			5 8			5 8		_
4-Methylphenol	106-44-5	8.7				5 8			5 6		_	3 8		_
Hexachloroethane	67-72-1	0.8	Ž			3 3			136.46	200.00	68.23	160.56	200.00	80.28
N-Nitroso-a-N-propylamine	08.05.3	B 9.	3 6			3 8			S	1	3	N.	-	
Narobenzene	78-59-1	9 0	8 8			8			N i			N D		
2.4-Dimethylphenol	105-67-9	6.0	S			S	•		N			N D		
2-Nitrophenol	88-75-5	9.1	8			N			N D			5		
Benzoic Acid	65-85-0	22.3	B			S			2			3 6		
8is(2-chloroethoxy)methane	111-91-1	8.8	8		_	3 8	-		5 2			3 8		
2,4-Dichlorophenol	120-83-2	5.2	5 6			3 8			95.21	200.00	47.61	109.42	200.00	54.71
1,2,4- Heritor Contrains	200	n (	3 6			5			2			8		
A-Chlorospiline	106-47-8	ED 0	2 6			S i	-		8			N D		
Hexachlorobutadiene	87-68-3	9.4	S			N D			8			S		
4-Chloro-3-methylphenol	59-50-7	7.7	S	-		8			234.19	300.00	78.06	260.60	300.00	86.87
2-Methylnaphthaiene	91-57-6	7.5	S			N D			5 B	•		3 8		
Hexachlorocyclopentadiene	77-47-4	8.6	8			3 8			5 6			3 8	•	
2,4,6-Trichlorophenol	88-06-2		5 6			5 6			3 8			8 8		
2,4,5-Irichiorophenol	91-58-7	5.7	8 8			8 8		•	8			8		
2-Nitroaniline	86-74-4	12.0	N i			8		•	8			8		
Dimethylphthalate	131-11-3	8.2	S			N			N O			8		
Acenaphthylene	208-96-8	9.0	S			Š	-		8			. S		
2,6-Dinitrotoluene	606-20-2	9.2	N O			8			 -			5 8		
3-Nitroaniline	99-09-2	16.0	8			8		-	2 20	3	6 0 0	10073	300	77 27
Acenaphthene	83-32-9	8.3	3 8			3 8			NO 121./0	200.00	00.00	2 1	200,00	, 2, 3,
2,4-Dinitrophenol	100-03-7	8 i.	2 2		-	3 8			112.70	300.00	37.57	107.40	300.00	35.80
Dihenzofuran	132-64-9	00 g 4. d	8			NO 1			Š	3	9	N D		
2,4-Dinitrotoluene	121-14-2	8.3	S			S			147.75	200.00	73,88	161,78	200.00	80.89
Diethylphthalate	84-66-2	9.9	NO			8			8 8			3 8		
Fluorene	86-73-7	9.8	8			3 6		<del>.</del>	3 8			3 8		-
4-Chlorophenyl-pnenyletner	100-01-6	a a.	3 8			8 8			8 8			N i		-
4-Nitroaniline	534-53-1	3 ? 3	3 8			2 6			N I			S		
4,0-Dinitro-Z-methylphenoi	334-32-1	12.2	200			-			-	-				

Page 1 of 2

					Collection.	12/15/97	16.20	RATCO			ស	Sample Type:	Water	
Location: MW-2			·		Extraction:	12/19/97	9:00	CMB			Extracti	Extraction Method	3510b	
File #: BT42540			•		Analysis:	1/9/98	3:27	CMB			Analy	Analysis Method	8270	
						Date	Time	Analyst						
				BT42540			BLANK			Matrix Spike		Matr	Matrix Spike Duplicate	cate
			Detected	gs	Spike	Detected	Spike	ke	Detected	15	Spike	Detected	Spike	ike
	CAS	MDL	Amount			Amount			Amount			Amount		
Compound Name	Number	۳g/L	ug/L	Amount	*	ug/L	Amount	¥	ng/ut	Amount	*	ng/ul	Amount	*
		(ppb)	(ppb)	5	Recovery	(ppb)	ě	Recovery	in the	ě	Recovery	in the	ş	Recovery
									extract			extract		
N-Nitrosodiphenylamine	86-30-8	7.5	S			8			8			8		
4-Bromophenyl-phenylether	101-55-3	7.0	S			ND			8			S		
Hexachlorobenzene	118-74-1	8.0	8			ND			8			8		
Pentachlorophenol	87-86-5	12.5	S			B			311.90	300.00	103.97	307.08	300.00	102.36
Phenanthrene	85-01-8	7.1	S			S			S		•	S		
Anthracene	120-12-7	8.0	8			8			S			Š		
Di-n-butylphthalate	84-74-2	7.8	8			N			N			S		
Fluoranthene	206-44-0	5.7	8			8			Š			8		
Pyrene	129-00-0	7.9	Š			8			174.39	200.00	87.20	180.67	200.00	90.34
Butyibenzyiphthalate	85-68-7	9.9	8			8			B			S		
Benzo(a)anthracene	56-55-3	7.7	8			S			B			8		
3,3'-Dichlorobenzidiene	91-94-1	16.5	S			8			NO			S		_
Chrysane	218-01-9	7.8	8	·		N D			N O			N		_
Bis(2-ethylhexyl)phthalate	117-81-7	9.1	8			S			8			S		_
Di-n-octylphthalate	117-84-0	9.4	S			NO			S			S		.=
Benzo(b)fluoranthene	205-99-2	6.8	8			S			8			8		
Benzo(k)fluoranthene	207-08-9	4.9	N			S			Š			Š		
Benzo(a)pyrene	50-32-8	5.9	N O			S			8			ND		
Indeno(1,2,3-c,d)pyrene	193-39-5	7.8	S			8			8			Š		
Dibenzo(a,h)anthracene	53-70-3	9.0	8			S			S			ND		
Benzo(g,h,i)perylene	191-24-2	10.0	Š			8			S			S		
			Detected	Spiked	8	Detected	Spiked	*	Detected	Spiked	8	Detected	Spiked	8
Surrogate Compounds			Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery
2-Fluorophenol			112.84	200.00	56.42	92.22	200.00	46.11	112.36	200.00	56.18	123.26	200,00	61.63
Phenol-d5			81.20	200.00	40.60	64.71	200.00	32.36	78.94	200.00	39.47	87.05	200.00	43.53
Nitrobenzene-d5			101.23	100.00	101.23	74.74	100.00	74.74	97.18	100.00	97.18	104.82	100.00	104.82
2-Fluorobiphenyl			82.84	100.00	82.84	65.54	100.00	65.54	86.97	100.00	86.97	104.67	100.00	104.67
2,4,6-Tribromophenol			253.26	200.00	126.63	226.16	200.00	113.08	273.28	200.00	136.64	286.69	200.00	143.35
Terphenyl-d14			122.74	100.00	122.74	132.90	100.00	132.90	127.66	100.00	127.66	125.04	100.00	125.04

Certified by:

Micheal S. Bonner,Ph. D. Bonner Analytical Testing Company

## SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client : Hercules, Inc.		File #: BT42540	
Sample Matrix : Water		Lab Sample ID: MW-2	
Sample Collection Dat			
Sample Analysis Date: 01-09-98 @ 0327		GC Column Length: 30 M	
Dilution Factor: 1.03		GC Column ID: 0.25 mm	
Dilution 1 dotor : 1100			
Sample Welght/ Volume : 968 mL		Method Code: 8270	
Number TICs Found: 0		Concentration Units: ug / L (PPB)	
Nulliber 11037 outld.			
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
		<del>_</del>	
		<del></del>	
		<del></del>	
		<del></del>	
		1	

CAS   MOIL   Amount   Marco   Marco	Client Learning					Collected:	12/15/97	15:40	ВАТСО			Ş	Sample Type:	Water	
C.A.S   MD   Departed   STATES   STATES   CASE	Location: MW-3					Extracted:	12/19/97	9:00	CMB			Extracti	on Method	3510b	
Color   Colo	File #: <u>BT42541</u>					Andryzeu.	Date	Time	Analyst				8		
CAS   MAIL   Amount   Sale   May   Amount   Sale   May   Amount   Sale   May   Amount   Sale   Amount   Sale		_		į	BT42541			BLANK			Matrix Spike		Matr	Matrix Spike Duplicate	ate
CAS   MOL   Amount   S.   Am				Detected	ds	ke	Detected		pike	Detected	Sp	ke	Detected	Spike	ke
Number		CAS	MDL	Amount		?	Amount		R	Amount	2	f	Amount na/ul	Amount	æ
108-95-2   5.2	Compound Name	Number	(ppb)	(ppb)	ug	Recovery	(ppb)	gu	Recovery	in the	- G	Recovery	in the	gu	Recovery
111444   6.5   NO   NO   NO   NO   NO   NO   NO   N		109-05-3	5	20			S			89.18	300.00	29.73	99.51	300.00	33.17
Section   Sect	Bis(2-chloroethyl)ether	111-44-4	6.9	8 8			8			S			8	3	3
5447-33   8.3	2-Chlorophenol	95-57-8	5.7	Z O			8			187.53	300.00	62.51	210.70	300.00	70.23
106-467   16.1	1,3-Dichlorobenzene	541-73-1	8.3	8	***		8			S N	3	3	3 2	3000	50.06
1005/16   14.8   MU   MU   MU   MU   MU   MU   MU   M	1,4-Dichlorobenzene	106-46-7	6.1	S			8			85.60	200.00	42.00	Z .	200.00	
109401   100	Benzyl Alcohol	100-51-6	14.8	8 8			3 8			Z 2			8 8		
106465   3.3   ND	1.2-Dichlorobenzene	95-48-7	5 O	8 8			8 8			8			S		
106445   8.7   ND   ND   ND   ND   ND   ND   ND   N	Bis(2-chloroisopropyl)ether	108-60-1	8.8	8			Š	-		N O			8		
me         677-721         8.0         NID         NID         NID         NID         136-86         200.00         68-23         160-56         170-70         170-70         180-70         68-23         160-56         160-56         170-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180-70         180	4-Methylphenol	106-44-5	8.7	8			8			5 8			3 8		
Pridiphymanian 99-96-3 8.2 ND	Hexachloroethane	67-72-1	8.0	5 8			8 8			136.46	200.00	68.23	160.56	200.00	80.28
No.   No.	N-Nitroso-ot-N-propylamine	22-05-7	B :	3 8	-		8			8			N		
105-67-9   6.0   ND   ND   ND   ND   ND   ND   ND   N	Isophorone	78-59-1	9.2	8			S		•	N O			S		
SBF-75-5   S-1	2,4-Dimethylphenol	105-67-9	6.0	8			5 S			3 8			88		
111-91-1   8.8	2-Nitrophenoi	65-85-0	22 :	2 6			S			S			S		_
120-93-2   5.2	8is(2-chloroethoxy)methane	111-91-1	8.8	N D			N D			8			8		
robenzene         120-82-1         9.4         ND	2,4-Dichlorophenol	120-83-2	5.2	N			8			2 2	3	A 7 6 1	200	300 00	36 47
No.   No.	1,2,4-Trichlarobenzene	120-82-1	9.4	 5 8			3 8		•	ND 1	200.00	#/.0	ON T	00.00	30.77
No.   No.	Naphthalene	106-47-8	о о о с	3 8			8			N I			S		
nol         59-50-7         7.7         N/D	Hexachlorobutadiene	87-68-3	9.4	Š			Š			N			8	3	
diame         71-57-6         7.5         ND	4-Chioro-3-methylphenol	59-50-7	7.7	Š			8			234.19	300.00	78.06	260.60	300.00	00.0
Material   Material	2-Methylnaphthalene	91-57-6	7.5	8			5 8			5 6			3 8		
95-95-7 5.7 ND 91-58-7 5.7 ND 131-11-3 8.2 ND 100-02-7 8.6 ND 121-14-2 8.3 ND 100-02-7 9.8 ND 100-02-7 9.8 ND 100-02-7 9.8 ND 100-02-7 9.8 ND 100-02-8 8.3 ND 100-01-6 8.7 ND N	Hexachlorocyclopentadiene	88.06.7	o 0.	5 8			3 8	-		S 6			Š		
Signature   Sign	2,4,6-Trichlorophenol	95-95-4	7.1	8 8			S (			N			Š	-	
88-74-4 12.0 ND ND ND ND 131-11-3 8.2 ND ND ND ND ND 131-11-3 8.2 ND	2-Chloronaphthalene	91-58-7	5.7	N			Š			S		•	S		
131-11-3   8.2   ND	2-Nitroaniline	88-74-4	12.0	8			- 5 8			5 6			2 2		
No	Dimethylphthalate	131-11-3	0 00				3 8			8 8			ND		
99-09-2 16.0 ND ND ND 121.78 200.00 60.89 144.73 ND	2.6-Dinitrotoluene	606-20-2	9.2	8 8			N i			8			S		
83-32-9 9.0 ND	3-Nitroaniline	99-09-2	16.0	S O			NO			N N	3	5	ND	300	72 37
S1-28-5   14.2   ND	Acenaphthene	83-32-9	9.0	S			5 S			121.78	200.00	00.09	N .	200.00	
132-64-9 8.4 ND	2,4-Dinitrophenol	51-28-5	14.2	3 8			3 8			112.70	300.00	37.57	107.40	300.00	35.80
121-14-2   8.3   ND   147.75   200.00   73.88   161.78	4-Nitrophenol	132-64-9	9 0	2 2			8 8			S .	0	9.	NO.	-	3
84-66-2 9.9 ND	2,4-Dinitrotoluene	121-14-2	8.3	N i		ii ii	Š			147.75	200.00	73.88	161,78	200.00	80.89
86-73-7 9.8 ND	Diethylphthalate	84-66-2	9.9	N D			; 8			3 8			3 8		-
100-01-6 8.7 ND	Fluorene	86-73-7	9 69	 5 6			3 3			2 2			S d		
534-52-1 12-2 ND ND ND	4-Chlorophenyl-phenyletner	100-01-6	8.7	2 2			8 8			8	_		S		
	4.6-Dinitro-2-methylphenol	534-52-1	12.2	S i			ND			B			ND		

Page 1 of 2

Client: Hercules Location: MW-3 File #: BT42541					Collection: Extraction: Analysis:	12/15/97 12/19/97 1/9/98 Date	15:40 9:00 4:20 Time	CMB CMB Analyst			Se Extracti Analy	Sample Type: Extraction Method: Analysis Method:	Water 3510b 8270	
				BT42541			BLANK			Matrix Spike		Matr	Matrix Spike Duplicate	cate
	CAS	<u> </u>	Detected	Spike	ike	Detected	Sp	Spike	Detected	Sp	Spike	Detected	, p	Spike
Compound Name	Number	E ?	ug/L	Amount	*	ug/L	Amount	æ	ng/ul	Amount	*	ng/ul	Amount	*
		(ppb)	(ppb)	5	Recovery	(ppb)	ű	Recovery	in the	5	Recovery	in the	5	Recovery
	36 30 6	35	5			5			extract			extract		
A-Bromonhanyl-phanylether	101-55-3	7.0	8			B			8			8		
Hexachlorobenzene	118-74-1	8.0	8			8			S			Š		
Pentachlorophenol	87-86-5	12.5	ND			8			311.90	300.00	103.97	307.08	300.00	102.36
Phenanthrane	85-01-8	7.1	8			B			8			8		
Anthracene	120-12-7	8.0	Š			8			8			8 8		
Di-n-butylphthalate	84-74-2	7.8	8			8			8					
Fluoranthene	208-44-0	5.7	8			8			Z	3	2	2	3	3
Pyrene	129-00-0	7.9	8			8			174.39	200.00	87.20	180.67	200.00	90.34
Butylbenzylphthelate	85-68-7	9 19	3			5 6			5 6			3 8		
Benzo(a)anthracene	56-55-3	7.7	8			5 8			3 6			3 8		
3,3'-Dichlorobenzidiene	91-94-1	16.5	8			3 8			5 6			5 6		
Chrysene	218-01-9	7.8				3 8			5 6			3 8		
Bis(2-ethylhexyllphthalate	117-81-7	9	5 8			5 6			3 8			<b>3</b> 8		
Di-n-octylphthalate	117-84-0	4	3 8			5 6			5 6			5 6		
Benzo(b)fluoranthene	205-99-2	6.8	8			3 8			5 8			5 8		
Benzo(k)fluoranthene	207-08-9	4.9	8			3			2			5 3		
Benzo(a)pyrene	50-32-8	5.9	8			2			3 8	•		3 3		
Indeno(1,2,3-c,d)pyrene	193-39-5	7.8	8			2			5 8			5 6		
Dibenzo(a,h)anthracene	53-70-3	9.0	S			N			3			5 6		_
Benzo(g,h,i)perylene	191-24-2	10.0	8			N D			2			2		
			Detected	Spiked	*	Detected	Spiked	%	Detected	Spiked	*	Detected	Spiked	*
Surrogate Compounds			Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery
2-Fluorophenal			85.22	200.00	42.61	92.22	200.00	46.11	112.36	200.00	56.18	123.26	200.00	61.63
Phenol-d5			70.90	200.00	35,45	64.71	200.00	32.36	78.94	200.00	39.47	87.05	200.00	43.53
Nitrobenzene-d5			79.35	100.00	79.35	74.74	100.00	74.74	97.18	100.00	97.18	104.82	100.00	104.82
2-Fluorobiphenyl			75.11	100.00	75.11	65.54	100.00	65.54	86.97	100.00	86.97	104.67	300.00	104.67
2,4,6-Tribromophenol	<del></del> -		280.03	200.00	140.02	226.16	200.00	133.08	127 66	100.00	127.66	125.04	100.00	125.04
Ternhenvird 14			90.55	00.00	139.39	132.30	0.00	102.30	127.00			10.00		-

Certified by:

Micheal S. Bonner,Ph. D.
Bonner Analytical Testing Company

Page 2 of 2

## SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: Hercules, Inc.		File#: BT	42541
Sample Matrix : Wate	<u> </u>	Lab Sample	e ID: MW-3
Sample Collection Dat			
Sample Analysis Date		GC Column	Length: 30 M
			n ID: 0.25 mm
Dilution Factor: 1.01		GC Colum	110. 0.23 11111
Sample Weight/ Volun	ne: 990 mL	Method Co	de: 8270
Number TICs Found :		Concentrat	ion Units: ug / L (PPB)
realiser free country.			
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
	,		
			, <u>, , , , , , , , , , , , , , , , , , </u>
			<u> </u>
		_	

							Ì						!	
Client: Hercules					Collected:	12/12/97	13:10	BATCO			Ş	Sample Type: _	Water	
Location: MW-4					Extracted:	12/19/97	9:00	CMB			Extracti	Extraction Method:	3510b	
FIIE #: B142542					Analyzeo	Date	Time	Analyst			, i	Chickens Memory	0/20	
				BT42542			BLANK			Matrix Spike		Matr	Matrix Spike Duplicate	ate
			Detected	Spike	ike	Detected	ls.	Spike	Detected	Spike	ke	Detected	Spi	Spike
	CAS	MDL	Amount		!	Amount		!	Amount	•	!	Amount	•	!
Compound Name	Number	(ppb)	(ppb)	Bn	% Recovery	(ppb)	ug	Recovery	in the	- Pu	Recovery	in the	- Gn	Recovery
	200	2	5			5			extract	300 00	20 72	extract	300 00	33 17
Bis (2-chloroethyl)ether	111-44-4	6.9	8 8			8 8			N 8	300.00	27.87	ND -	300.00	33.17
2-Chlorophenol	95-57-8	5.7	8			B			187.53	300.00	62.51	210.70	300.00	70.23
1,3-Dichlorobenzene	541-73-1	8. 3	Š			8			S			S		}
1,4-Dichlorobenzene	106-46-7	6.1	N O			S			85.60	200.00	42.80	100.12	200.00	50.06
Benzyl Alcohol	100-51-6	14.8				5 8			5 8			5 6		
2-Mathylphanol	95-48-7	un o	8 8			8 8			 			N i		
Bis (2-chloroisopropyl) ether	108-60-1	8.8	8			B			S			N D		
4-Methylphenol	106-44-5	8.7	8			N			S			B		
Hexachloroethane	67-72-1	9.0 9.7	3 8			3 8			136.46	200.00	68.23	160.56	200.00	80.28
Nitrobenzene	98-95-3	8.2	8			8			N			N O	š	
Isophorone	78-59-1	9.2	8			Š			N D			NO		
2,4-Dimethylphenol	105-67-9	6.0	3 8			3 8		_	5 8			3 3		
Benzoic Acid	65-85-0	22.3	S i			8	•		B			8		
Bis(2-chloroethoxy)methane	111-91-1	8.8	N D			Š			8			B		
2,4-Dichlorophenol	120-83-2	5.2	8			8			8	3		NO.	3	5
1,2,4-Trichlorobenzene	120-82-1	9,4	5 8			3 8			ND 1	200.00	47.01	109.42	200.00	94.71
4-Chloroaniline	106-47-8	GD (0	<u> </u>			N C	•		8			S i		
Hexachlorobutadiene	87-68-3	9.4	ND			S			S			NO.		
4-Chloro-3-methylphenol	59-50-7	7.7	;			8 8			234.19	300.00	/8.06	260.60	300.00	86.87
Hexachiorocyclopentadiene	77-47-4	8.6	8 8	- 1		2 2			8 8			S 6		
2,4,6-Trichlorophenol	88-06-2	9.1	N N	•		N D			S			8		
2,4,5-Trichlorophenol	95-95-4	7.1	S			S			8			8 8		
2-Chioronaphthalene	91-58-7	5.7	3 8			3 8	-		3 3			8 8		
Dimethylphthalate	131-11-3	8.2	N			N D			N D			S		
Acenaphthylene	208-96-8	9.0	S			N O			8			8		
2,6-Dinitrotoluene	606-20-2	9.2	, N		-	S			8		-	5 8		
Acenanhthene	83-32-9	ο . ω .	8 8			3 3			121.78	200.00	60.89	144.73	200.00	72.37
2,4-Dinitrophenol	51-28-5	14.2	8			8 8			8			Š	10	19
4-Nitrophenol	100-02-7	8.6	S			ND ND			112.70	300.00	37.57	107,40	300.00	35,80
Dibenzofuran	132-64-9	Ω 4 ι	3 8			5 5			147 75	3000	73 88	161 78	300 00	80 R9
Diethylphthalate	84-66-2	9 6	8 8			8 8			NO S			N C		
Fluorene	86-73-7	9.8	Š			Š			N			N D		
4-Chlorophenyl-phenylether	7005-72-3	. G	3 8			5 6			2 6			5 6	•	
4.6-Dinitro-2-methylphenol	534-52-1	12.2	8 8			N 6			S i	•		S :		

Page 1 of 2

Client: Hercules					Collection:	12/12/97	13:10	ВАТСО			ı S	Sample Type:	Water	
Client: nercules					Collection	10121121		2				7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Location: MW-4					Extraction:	12/19/97	9:00	CMB			Extracti	Extraction Method:	35106	
File #: BT42542					Analysis:	1/9/98	9:50	CMB			Anaiy	Analysis Method:	8270	
						Date	Time	Analyst						
				BT42542			BLANK			Matrix Spike		Matri	Matrix Spike Duplicate	ate
			Detected	Spike	ke	Detected		Spike	Detected	1S	Spike	Detected	Spike	ke
	CAS	MD.	Amount			Amount			Amount			Amount		
Compound Name	Number	ug/L	ug/L	Amount	¥	ug/L	Amount	፠	ng/ut	Amount	*	ng/ui	Amount	*
		(ppb)	(ddd)	5	Recovery	(ppb)	5	Recovery	in the	£	Recovery	in the	Бã	Recovery
									extract			extract		
N-Nitrosodiphenylamine 8	86-30-6	7.5	ND			ND			ND			8		
Ther .	101-55-3	7.0	8			8			8			S		
	118-74-1	8.0	8			8			Š			Š		
	87-86-5	12.5	8			Š			311.90	300.00	103.97	307.08	300.00	102.36
	85-01-8	7.1	S			S			Š			Š		
	120-12-7	8.0	ND			Š			8			B		
thalate	84-74-2	7.8	8			8			8			N		
	206-44-0	5.7	Š			S		_	S			8		
	129-00-0	7.9	B			8			174.39	200.00	87.20	180.67	200.00	90.34
nzylphthalate	85-68-7	9.9	8			S			S			8		
	56-55-3	7.7	S			S			N			8		
ene	91-94-1	16.5	N			8			8			8		
	218-01-9	7.8	8			ND			S			8		
/hexyi)phthalate	117-81-7	9.1	8			ND			N			8		
	117-84-0	9.4	8			ND			8			S		
<u> </u>	205-99-2	6.8	N			S			S			8		
	207-08-9	4.9	8			Š			S			8		
	50-32-8	5.9	B			S			S			8		
Indeno(1,2,3-c,d)pyrene	193-39-5	7.8	8			Š			S			8		
	53-70-3	9.0	8			Š			N D			8		
Benzo(g,h,i)perylene 1	191-24-2	10.0	8			8			Š			S		
			Detected	Spiked	8	Detected	Spiked	*	Detected	Spiked	8	Detected	Spiked	8
Surrogate Compounds			Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery
2-Fluorophenol			120.63	200.00	60.32	92.22	200.00	46.11	112.36	200.00	56.18	123.26	200.00	61.63
Phenol-d5			100.76	200.00	50.38	64.71	200.00	32.36	78.94	200.00	39.47	87.05	200.00	43.53
Nitrobenzene-d5			121.10	100.00	121.10	74.74	100.00	74.74	97.18	100.00	97.18	104.82	100.00	104.82
2-Fluorobiphenyl			88.75	100.00	88.75	65.54	100.00	65.54	86.97	100.00	86.97	104.67	100.00	104.67
2,4,6-Tribromophenal			303.45	200.00	151.73	226.16	200.00	113.08	273.28	200.00	136.64	286.69	200.00	143.35
Terphenyl-d14			164.21	100.00	164.21	132.90	100.00	132.90	127.66	100.00	127.66	125.04	00.00	125.04

Centified by:

Micheal S. Bonner,Ph. D.

Bonner Analytical Testing Company

Page 2 of 2

## SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: Hercules, Inc.	File #: BT42542
Sample Matrix: Water	Lab Sample ID : MW-4
Sample Collection Date: 12-12-97 @ 1310	
Sample Analysis Date: 01-09-98 @ 0950	GC Column Length: 30 M
Dilution Factor: 1.05	GC Column ID: 0.25 mm
Sample Weight/ Volume : 950 mL	Method Code: 8270
Number TICs Found: 1	Concentration Units: ug / L (PPB)

CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
78-34-2	Dioxathion or degredation products thereof	23.65	19.37 ug/L
	products thereof		
			ļ
<del></del>			
		ļ	
	<del></del>	<u> </u>	
<del></del>		<del></del>	
	<u> </u>		<del>                                     </del>
	<u> </u>		<del> </del>
<u></u>	<del>                                     </del>	<b></b>	
	<del></del>		

9:00	43 Analyzed: 1/9/95 10:43 Date Time	BT42543 BLANK	Spike Detected	Amount	er ug/L ug/L Amount %	(ppb) (ppb) ug Recovery (ppb) ug	108-95-2 5.2 ND ND	0.9 NO	95-57-8 5.7 ND	1260e 541-73-1 8.3 ND	106-46-7 6.1 ND	100-51-6 14.8 ND	1280e 95-50-1 6.0 ND	95-48-7 5.6 ND	ropyliather   108-60-1   8.8   ND	106-44-5 8.7 ND	8.0 ND	9.7 NO	98-95-3	105 B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B 7 D B		65-85-0 22.3 ND	(hoxy)methane 111-91-1 8.8 ND	120-83-2 5.2 ND	robenzene 120-82-1 9.4 ND	91-20-3 8.5 NO	106-47-8 8.5 NO	8/-08-3 9.4	mol 59-50-7 7.7 NO	91-57-6 7.5	9.1 ND	95-95-4 7.1 ND	91-58-7 5.7 ND	88-74-4 12.0 ND	elate 131-11-3 8.2 ND	208-96-8 9.0 ND	le 606-20-2 9.2 ND	99-09-2 16.0 ND	8.3 ND	8.3 ND	100-02-7 8.6 ND		NO :		86-73-7 9.8 ND	86-73-7 9.8 ND 7005-72-3 8.3 ND	86-73-7 9.8 ND 98-7005-72-3 8.3 ND 98-7005-72-3 8.3 ND 98-7005-72-3 ND 98-7 ND ND 98-7 ND
	Time Analyst	BLANK	Spike			ug Recovery			-												-														•	_										<u> </u>	<u></u>
			Detected	Amount	ng/ul	in the	89.18	8	187.53	S	85.60	8	8	8	8	5 8		136.46	8 8	N i	ND	8	8	2 2	ND -	5 6	8 8	234 19	20.10	8 8	8	Š	S	B	S	S	N	8	121.78		2.3	147.75	8		8	8 8	888
		Matrix Spike	Spike		Amount	п	300.00		300.00		200.00						300	200.00						30000	200.00			300.00	00.00									3	200.00	3	00.00	200.00					
Extracti			ke		¥	Recovery	29.73		62.51	; }	42.80						50 33	00.23		_				47 61	47.0			78.06										3	00.05	27 57	0,10	73.88				-	
Extraction Method.		Matr	Detected	Amount	ng/ul	in the	99.51	8	210.70	8	100.12	5 6	2	3 8	3 8	5 2	180 58	ND :00:00	8 8	S	N D	8	3 8	109 43	ON .42	8 8	S i	260.60	Z C	8	- 8	ND	8	8	 8 8	8 8	8	NO	- <del> </del>	107.40	NO G	161.78	B	S	Z	;	8
3510b		Matrix Spike Duplicate	S		Amount	- G	300.00		300.00	3	200.00						300	200.00			-	•		700 00	200.00			300.00										3	200.00	3000		200.00		_			
•	•	licate	Spike	:	æ	Recovery	33.17	5	70.23	3	50.06						20 20 20 20 20 20 20 20 20 20 20 20 20 2							54.71				86.87	!									7 7 7	. 6.0	35 BO		80.89					

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Client: Hercules			·		Collection: Extraction:	12/12/97	9:00	BATCO CMB			SExtract	Sample Type: Extraction Method:		Water 3510b
File #: BT42543					Analysis:	1/9/98	10:43	CMB			Analy	Analysis Method:	П	8270
						Date	Time	Analyst						
		i		BT42543			BLANK			Matrix Spike		Mat	×	Matrix Spike Duplicate
			Detected	Spike	ike	Detected	qs	Spike	Detected	ls.	Spike	Detected		Spike
	CAS	MDL	Amount			Amount			Amount			Amount		
Compound Name	Number	ug/L	rg/L	Amount	*	ug/L	Amount	*	ng/ul	Amount	×	ng/ul	Ā	Amount
		(ppb)	(ppb)	ßn	Recovery	(ppb)	5	Recovery	in the	£	Recovery	in the	_	5
	86.30.6	76	5			5			extract			extract	1	
A-Bromopheovi-phenylether	101-55-3	7.0	8 8			8 8			8 1			S i		
Lange Company of the	118-74-1		3 ;			5 ;			2			5		
Pentachlorophenol	87-86-5	12.5	N G			S			311.90	300.00	103.97	307.08	300.00	8
Phenanthrene	85-01-8	7.1	Š			8			Š			N		
Anthracene ·	120-12-7	8.0	S			8			8			NO.		
Di-n-butylphthalate	84-74-2	7.8	Š			8			ND			N		
Fluoranthene	206-44-0	5.7	8			S			8			NO		
Pyrene	129-00-0	7.9	B			8			174.39	200.00	87.20	180.67	200.00	ŏ
Butylbenzylphthalate	85-68-7	9.9	S			Š			8			2		
Benzo(a)anthracene	56-55-3	7.7	Š			8			8			2		
3,3'-Dichlorobenzidiene	91-94-1	16.5	Š			8			5 8			5 8	•	
Chrysene	218-01-9	7.8	8			3			 6			3 2		
Bis(2-ethylhexyl)phthalate	117-81-7	9.1	S			8			8			8		
Di-n-octylphthalate	117-84-0	9.4	8			8			8			8	_	
Benzo(b) fluoranthene	205-99-2	6.8	N			NO.			8	-		8		
Benzo(k) fluoranthene	207-08-9	4.9	8			8			S			B		
Benzo(a)pyrene	50-32-8	5.9	8			S			S			8		
Indeno(1,2,3-c,d)pyrene	193-39-5	7.8	8			8			8			S		
Dibenzo(a,h)anthracene	53-70-3	9.0	8	•		8			B			S		
Benzo(g,h,i)perylene	191-24-2	10.0	8			8			8			8		
			Detected	Spiked	8	Detected	Spiked	*	Detected	Spiked	*	Detected	Spiked	۳
Surrogate Compounds			Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Ē
2-Fluorophenol			137.50	200.00	68.75	92.22	200.00	46.11	112.36	200.00	56.18	123.26	200.00	8
Phenol-d5			97.61	200.00	48.81	64.71	200.00	32.36	78.94	200.00	39.47	87.05	200.00	ŏ
Nitrobenzene-d5			149.10	100.00	149.10	74.74	100.00	74.74	97.18	100.00	97.18	104.82	100.00	8
2-Fluorobiphenyl			110.73	100.00	110.73	65.54	100.00	65.54	86.97	100.00	86.97	104.67	100.00	8
2,4,6-Tribromophenol			337.91	200.00	168.96	226.16	200.00	113.08	273.28	200.00	136.64	286.69	200.00	8
			248.35	100.00	248.35	132.90	100.00	132.90	127.66	100.00	127.66	125.04	100.00	8

Certified by:

Micheal S. Bonner,Ph. D.

Bonner Analytical Testing Company

Page 2 of 2

## SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client : Hercules, Inc.	File #: BT42543
Sample Matrix: Water	Lab Sample ID: MW-5
Sample Collection Date: 12-12-97 @ 0900	
Sample Analysis Date: 01-09-98 @ 1043	GC Column Length: 30 M
Dilution Factor: 1.06	GC Column ID: 0.25 mm
Sample Weight/ Volume : 945 mL	Method Code: 8270
Number TiCs Found: 0	Concentration Units: ug / L (PPB)

CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
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											1			
Client: Hercules			•		Collected:	12/12/97	13:10	BATCO			ı	Sample Type:	Water	
Location: MW-6			•		extracted:	12/19/9/	9:00	CMB			extracti	Analysis Method:	35100	
Fild #. D.142344					Just A year.	Date	Time	Analyst					of the	
				BT42544			BLANK			Matrix Spike		Matr	x Spike Dupli	cate
-			Detected	Spike	ike	Detected	S	Spike	Detected	dS.	â	Detected	Spike	Ř
	CAS	MDL	Amount			Amount			Amount			Amount		
Compound Name	Number	rg/L	ng/L	Amount	፠	ս9/Լ	Amount	*	ng/ul	Amount	*	ng/ul	Amount	æ
		(ppb)	(ppb)	5	Recovery	(ppb)	£	Recovery	in the	Ę	Recovery	in the	gu	Recovery
Phono	108-95-2	5 2	25			3			89 18	300.00	29 73	99.51	300.00	33.17
Bis(2-chloroethyl)ether	111-44-4	6.9	8			S G			N S			NO S		
2-Chlorophenol	95-57-8	5.7	N D			Š	0		187.53	300.00	62.51	210.70	300.00	70.23
1,3-Dichlorobenzene	541-73-1	8.3	Š			8			8			S		
1,4-Dichlorobenzene	106-46-7	6.1	Š			8			85.60	200.00	42.80	100.12	200.00	50.06
Benzyl Alcohol	100-51-6	14.8	S			S			8			8		
1,2-Dichlorobenzene	95-50-1	6.0	S			S	3		8			S		
2-Methylphenol	95-48-7	5.6	S			S	5		8			N		
8is(2-chloroisopropyl)ether	108-60-1	8.8	8			8			8			8		
4-Metnylphenol	67 77 1		5 8			5 6			3 8			3 8		
N.NärosodiNarovamina	621-64-7	9 0.	3 8			5 6			136.46	200.00	68.23	160.56	200.00	80.28
Nitrohanzana	98-95-3	8.2	2			8			8		3	8		
Isophorone	78-59-1	9.2	2			N D			8			Š		
2,4-Dimethylphenol	105-67-9	6.0	S			ND	•		S			S		
2-Nitrophenol	88-75-5	9.1	5 8			5 8			5 8			3 8		
Benzoic Acid	111-91-1	9 £	3 8			5 6			3 8			5 8		
2.4-Dichlorophenol	120-83-2	5 (	8 8			8			8			8		
1,2,4-Trichlorobenzene	120-82-1	9.4	8			Š			95.21	200.00	47.61	109.42	200.00	54.71
Naphthalene	91-20-3	8.5	ND ND			N			Š			S		
4-Chloroaniline	106-47-8	8.5	8			8			8			8		
Hexachlorobutadiene	87-68-3	9.4	8			8			ND		1	200	3	3
4-Chloro-3-methylphenol	59-50-7	7.	3 8	•		Š		-	234.19	300.00	/8.00	200.00	300.00	00.07
2-Methylnaphtnaiene	77-47-4	ט מ	5 8			5 6			3 8			5 8		
2.4.6-Trichlorophenol	88-06-2	9.1	 8 6			8 8			<u>.</u>			S i		
2,4,5-Trichlorophenol	95-95-4	7.1	8			S			S			ND		
2-Chloronaphthalene	91-58-7	5.7	Š			S			S		-	S		
2-Nitroaniline	88-74-4	12.0	8			N O			8			S		
Dimethylphthalate	131-11-3	8.2	8			Š			-	•		8		
Acenaphthylene	208-96-8	9.0	5 6			5 6			3 8			2 2		
2 Nitrospilios	99-09-2	16.0	5 8			3 8			3 8	-		5 6		
Acenaphthene	83-32-9	ص ر دن	8 8			S d			121.78	200.00	60.89	144.73	200.00	72.37
2.4-Dinitrophenol	51-28-5	8.3	2			8			N D			N O		
4-Nitrophenol	100-02-7	8.2	S			8			112.70	300.00	37.57	107.40	300.00	35.80
Dibenzofuran	132-64-9	8.4	20			Š			S	<del>-</del>		N D	!	}
2,4-Dinitrotoluene	121-14-2	8.3	ND			8			147.75	200.00	73.88	161.78	200.00	80.89
Diethylphthalate	84-66-2	9.9	8			8			8 8			8 8		
A-Chicaghand-shandathar	7005 77 7	ب م د	5 6			3 8		.,	3 8			3 8		
4-Nitroaniline	100-01-6	8.7	8 8			8 8			N d			N d		
4,6-Dinitro-2-methylphenol	534-52-1	12.2	ND			NO			S			ND		

Page 1 of 2

Client: Hercules			•		Collection:	12/12/97	13:10	ВАТСО			S	Sample Type:	Water	
Location: MW-6					Extraction:	12/19/97	9:00	CMB			Extracti	Extraction Method.	3510b	
File #: BT42544					Analysis:	1/9/98	5:13	CMB			Analy	Analysis Method:	8270	
						Date	Time	Analyst						
		j		BT42544			BLANK			Matrix Spike		Matr	Matrix Spike Duplicate	ate
			Detected	Spike	Ke	Detected		Spike	Detected	15	Spike	Detected	Spike	Ke
	CAS	M D	Amount			Amount			Amount			Amount		
Compound Name	Number	uo/L	ua/L	Amount	æ	ug/L	Amount	፠	ng/ui	Amount	*	ng/ul	Amount	ጽ
		<del>(dd</del>	(ppb)	5	Recovery	(dqq)	5	Recovery	in the	ű	Recovery	in the	ñ	Recovery
		:	•	,			,		extract			extract		
N-Nitrosodiphenylamine	86-30-6	7.5	S			ND			S			ND		
4-Bromophenyl-phenylether	101-55-3	7.0	8			8			8			8		
Hexachlorobenzene	118-74-1	8.0	Š			S			N O			ND		
Pentachlorophenol	87-86-5	12.5	S			ND			311.90	300.00	103.97	307.08	300.00	102.36
Phenanthrene	85-01-8	7.1	8			N			8			8		
Anthracene	120-12-7	8.0	S			N			S			8		
Di-n-butylphthalate	84-74-2	7.8	N			B			N			S		
Fluoranthene	206-44-0	5.7	S			NB NB			S			NO		
Pyrene	129-00-0	7.9	8			S			174.39	200.00	87.20	180.67	200.00	90.34
Butylbenzylphthalate	85-68-7	9.9	8			Š			S			S		
Benzo(a)anthracene	56-55-3	7.7	8			S			8			S		
3,3'-Dichlorobenzidiene	91-94-1	16.5	N			8			S			S		
Chrysene	218-01-9	7.8	Š			Š			N D			8		
Bis (2-ethylhexyl)phthalate	117-81-7	9.1	š	91		N			N D			B		
Di-n-octylphthalate	117-84-0	9.4	8	4		S			8			S		
Benzo(b)fluoranthene	205-99-2	6.8	S			B			S			8		
Benzo(k)fluoranthene	207-08-9	4.9	8			S			N D			N		
Benzo(a)pyrene	50-32-8	5.9	S			B			N O			N D		
ndeno(1,2,3-c,dlpyrene	193-39-5	7.8	N			S			S			N.		
Dibenzo(a,h)anthracene	53-70-3	9.0	S			S			Š			Š		
Benzo(g,h,i)perylene	191-24-2	10.0	8			8			B			8		
			Detected	Spiked	*	Detected	Spiked	8	Detected	Spiked	*	Detected	Spiked	*
Surrogate Compounds			Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery
2-Fluorophenol			109.30	200.00	54.65	92.22	200.00	46.11	112.36	200.00	56.18	123.26	200.00	61.63
Phenol-d5	-		81.22	200.00	40.61	64.71	200.00	32.36	78.94	200.00	39.47	87.05	200.00	43.53
Nitrobenzene-d5			101.83	100.00	101.83	74.74	100.00	74.74	97.18	100.00	97.18	104.82	100.00	104.82
2-Fluorobiphenyl			87.52	100.00	87.52	65.54	100.00	65.54	86.97	100.00	86.97	104.67	100.00	104.67
2,4,6-Tribramophenol			264.53	200.00	132.27	226.16	200.00	113.08	273.28	200.00	136.64	286.69	200.00	143,35
Terphenyl-d14			141.67	100.00	141.67	132.90	100.00	132.90	127.66	100.00	127.00	120.04	00.00	120,04

Certified by:

Micheal S. Bonner, Ph. D.

Bonner Analytical Testing Company

## SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: Hercules, Inc.		File#: BT	42544
Sample Matrix : Wate	9.	Lab Sample	e ID : MW-6
Sample Collection Dat			
Sample Analysis Date		GC Column	Length: 30 M
Dilution Factor: 1.03		GC Column	n ID: 0.25 mm
Sample Weight/ Volun	ne: 970 mL	Method Co	de: 8270
Number TICs Found :	0	Concentrat	ion Units: ug/L (PPB)
			COT CONCENTRATION
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
			<del></del>
			<u>,</u>
			+

								!						
×											n	Time Time		
Client: Hercules	ļ				Collected:	12/12/97	,	BATCO			Evtract	Sample Type:	Water	
Location: Trip Blank			·		Analyzed:	1/9/98	12:48	CMB			Analy	Analysis Method:	8270	
7 IIG # , D 1 7 2 9 7 9						Date	Time	Analyst						
				BT42545			BLANK			Matrix Spike		Matr	Matrix Splke Duplicate	cate
			Detected	qs	Spike	Detected	ls.	Spike	Detected	Sp	Spike	Detected	Sp	ke
	CAS	MDL	Amount			Amount			Amount			Amount		:
Compound Name	Number	ug/L	ug/L	Amount	*	ug/L	Amount	*	ng/ut	Amount	*	ng/ul	Amount	8
		(ppb)	(ppb)	6	Recovery	(ppb)	5	Recovery	in the	6	Hecovery	extract	5	Recovery
Phenol	108-95-2	5.2	S			8			89.18	300.00	29.73	99.51	300.00	33.17
Bis(2-chloroethyl)ether	111-44-4	6.9	N D	ē		8	•		B			8		}
2-Chiorophenol	95-57-8	5.7	N			S			187.53	300.00	62.51	210.70	300.00	70.23
1,3-Dichlorobenzene	541-73-1	8.3	S			S			S				3	5
1,4-Dichlorobenzene	106-46-7	6.1	8			8			85.60	200.00	42.80	100.12	200.00	50.06
Benzyl Alcohol	100-51-6	14.8	8			8			8			5 8		
1,2-Dichlorobenzene	95-50-1	6.0	Š			3 8			3 8			3 2		
2-Methylphenol	108-60-1	90 C	8 8			8 8			8 8			S		
4-Methylphenol	106-44-5	8.7	S			8			N D			S		
Hexachloroethane	67-72-1	8.0	8			8			NO	300	0	160 E	3000	80 38
N-Nitroso-di-N-propylamine	621-64-7	9.7	2	-		5 8			100.40	200.00	00.20	2	20:00	00:20
Nitrobenzene	98-95-3	0 8. 3 2	3 8			2 2			2 2			8 8		
2 4-Dimethylphenol	105-67-9	6.O	8 8			N i		•	N O			ND		
2-Nitrophenol	88-75-5	9.1	8			N D		-	S			- 8 8		
Benzoic Acid	65-85-0	22.3	8			8 8			5 8			3 8		
Bis(2-chloroethoxy)methane	111-91-1	, co	5 8			2 2	-	-	3 3			8 8		
2,4-Dichlorophenol	120-82-1	9.4	8 8		-	8 8			95.21	200,00	47.61	109,42	200.00	54.71
Naphthalene	91-20-3	8.5	N D	_		N			N _O	_		S		
4-Chloroaniline	106-47-8	8.5	S			S			8			5 8		
Hexachlorobutadiene	87-68-3	9.4				3 8			3 2	300	30.05	360 60	3000	86.87
4-Chloro-3-methylphenol	59-50-7	7.7	3 8			3 2			234.19	300.00	10.00	N 00:00	00.00	00.0
2-Methylnaphthalene	77-47-4	20 \ To U	2 2			2 3			8 8			<b>S</b> 6		
2.4.6-Trichlorophenol	88-06-2	9.1	Ž			N N			8	-		8		
2,4,5-Trichtorophenol	95-95-4	7:1	N D			S			8			8		
2-Chloronaphthalene	91-58-7	5.7	8			3 8			3 2			5 5		
2-Nitroaniline	131-11-3	8.2	3 3			8 8			8 8			2 8		
Acenachthylene	208-96-8	9.0	<u>S</u>			S i			8			N D		
2,6-Dinitrotoluene	606-20-2	9.2	N			8			N			S	-	
3-Nitroaniline	99-09-2	16.0	8			8 8			. NO	3	60 88	144 73	300	77 77
Acenaphthene	83-32-9	o 00 س ن	5 8			5 8			2	200.00	00.09	N .	200.00	72.37
4-Nitrophenol	100-02-7	e 0 50 U				8 8		-	112.70	300.00	37.57	107.40	300.00	35.80
Dibenzofuran	132-64-9	8.4	Š			N O			ND		š	NO O		
2,4-Dinitrotoluene	121-14-2	8.3	S			N			147,75	200.00	73.88	161.78	200.00	80,89
Diethylphthalate	84-66-2	9.9	8			- 8 8						3 8		
4. Chlorophenyl-phenylether	7005-72-3	ມ່ວ	5 8		•	2 2			N d		_	N G		
4-Nitroaniline	100-01-6	8.7	S			ND			N D			N		
4,6-Dinitro-2-methylphenol	534-52-1	12.2	ND			ND			NO			NO		

Page 1 of 2

Client: Hercules Location: Trip Blank					Collection: Extraction:	12/12/97	9:00	BATCO CMB			Sa Extracti	Sample Type: Extraction Method: Analysis Method:	Water 3510b	
File #: BT42545					Analysis:	1/9/98	12:48	CMB			Analy	Analysis Method:	8270	
		t				Date	- me	Analyst					7	
			Datected	Spike	ika	Detected	Solution	Spike	Detected	Spike	ke.	Detected	Spike	Spike
		!	Coracion			00100100			00,00,00					1
	CAS	S P	Amount		ę	Amount		R	Amount	2	<b>R</b>	Amount	2	
Compound Name	NUMBER	מ9/ר	1/Bn	31001	8	- E	2110	2	18/4	7110011	2	, W. C.	7	,
		(ppb)	(ppb)	5	Recovery	(ppb)	£	Recovery	in the	5	Recovery	in the	ę,	Recovery
N-Nitrosodiphenylamine	86-30-6	7.5	S			S			αN			GN		
4-Bromophenyi-phenylether	101-55-3	7.0	8			8			S			S		
Hexachlorobenzene	118-74-1	8.0	N			S			N			8		
Pentachlorophenol	87-86-5	12.5	S			ND ND			311.90	300.00	103.97	307.08	300.00	102.36
Phenanthrene	85-01-8	7.1	8			8			8			S		
Anthracene	120-12-7	8.0	N			B			8			N		
Di-n-butylphthalate	84-74-2	7.8	N			B			8			8		
Fluoranthene	206-44-0	5.7	8			S			8			ND.		
Pyrene	129-00-0	7.9	8			B			174.39	200.00	87.20	180.67	200.00	90.34
Butylbenzylphthalate	85-68-7	9.9	8			8			Š			N		
Benzolalanthracene	56-55-3	7.7	Š			S			8			8		
3,3'-Dichlorobenzidiene	91-94-1	16.5	N D			Š			8			8		
Chrysene	218-01-9	7.8	S			S			S			8		
Bis(2-ethylhexyl)phthalate	117-81-7	9.1	Š			8			S			8		
Di-n-octylphthalate	117-84-0	9.4	Š			8			ND			Š		
Benzo(b)fluoranthene	205-99-2	6.8	S			S			S			N.		
Benzo(k)fluoranthene	207-08-9	4.9	S			8			S			B		
Benzo(a)pyrene	50-32-8	5.9	S			ND			N			8	•	
Indeno(1,2,3-c,dlpyrene	193-39-5	7.8	Š			N			Š			N		_
Dibenzo(a,h)anthracene	53-70-3	9.0	8			S			Š			N		
Benzo(g,h,i)perylene	191-24-2	10.0	8			N			NB			S		
			Detected	Spiked	*	Detected	Spiked	8	Detected	Spiked	*	Detected	Spiked	
Surrogate Compounds			Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery
2-Fluorophenol			72.78	200.00	36.39	92.22	200.00	46.11	112.36	200.00	56.18	123.26	200.00	61.63
Phenol-d5			57.52	200.00	28.76	64.71	200.00	32.36	78.94	200.00	39.47	87.05	200.00	43.53
Nitrobenzene-d5	-		66.07	100.00	66.07	74.74	100.00	74.74	97.18	100.00	97.18	104.82	100.00	104.82
2-Fluorobiphenyl			63.05	100.00	63.05	65.54	100.00	65.54	86.97	100.00	86.97	104.67	100.00	104.67
2,4,6-Tribromophenol	_		250.90	200.00	125.45	226.16	200.00	113.08	273.28	200.00	136.64	286.69	200.00	143.35
Terphenyi-d14			136.72	100.00	136.72	132.90	100.00	132.90	127.66	100.00	127.66	125.04	100.00	125.04

Certified by:

Micheal S. Bonner,Ph. D.

Bonner Analytical Testing Company

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## SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client : Hercules, Inc.		File#: BT	
Sample Matrix : Water	r	Lab Sample	e ID : Trip Blank
Sample Collection Date	- •		
Sample Analysis Date		GC Column	Length: 30 M
Dilution Factor: 1.01			1 ID: 0.25 mm
Dilution Pactor . 1.01			
Sample Weight/ Volum	ne: 990 mL	Method Co	de: 8270
Number TICs Found :		Concentrati	ion Units: ug / L (PPB)
Number 11001 dates.			
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
		I .	•

					College	12/15/07		BATCO			vo.	ample Type	Water	
Client: Hercules			•		Collected	12/15/9/	Š	BAICO			Extract	Extraction Method	35 10h	
File #: BT42546			•		Analyzed:	1/9/98	1:48	CMB			Analy	Analysis Method	8270	
						Date	Time	Analyst						
				BT42546			BLANK			Matrix Spike		Matr	ix Spike Dupli	cate
			Detected	Spike	ke	Detected	S	Spike	Detected	Sc	ike	Detected	d Spike	ike
9	CAS	<b>M</b> DL	Amount			Amount			Amount			Amount		!
Compound Name	Number	ng/L	(ng/L	Amount	Recovery	fact)	Amount	Recovery	ng/ul	Amount	Recovery	in the	Amount	Recovery
		ę po	-	ď	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	į			extract	ď		extract	ė	
Phenol	108-95-2	5.2	N O			N N			89.18	300.00	29.73	99.51	300.00	33.17
2-Chlorophenol	95-57-8	5.7	8	_		S i			187.53	300.00	62.51	210.70	300.00	70.23
1,3-Dichlorobenzene	541-73-1	8.3	Š			N D			N D			S		
1,4-Dichlorobenzene	106-46-7	6.1	N D			NO O			85.60	200.00	42.80	100.12	200.00	50.06
Benzyl Alcohol	100-51-6	14.8	8			8			8			5 8		
2-Methylphenol	95-48-7	55 G	8 8			8 8	•		8 8			8 8		
Bis(2-chloroisopropyl)ether	108-60-1	8.8	S			N			Š			8		
4-Methylphenol	106-44-5	8.7	S			S			S			8		
Hexachloroethane	67-72-1	9.0	3 8			5 6			136 A6	300	8 8 9	160 56	300 00	80.28
Nitrobenzene Nitrobenzene	98-95-3	8.2	8 8			8 8	_		N G	20.00	0.	ND C	20.00	
Isophorone	78-59-1	9.2	8			S		-	B			Z D		
2,4-Dimethylphenol	105-67-9	6.0	8			8			5 B			5 Z		
Renzoic Acid	65-85-0	22.3	2 6			8 8			8 8			8 8		
Bis(2-chloroethoxy)methane	111-91-1	8.8	Š			S			NO.			N O		
2,4-Dichlorophenol	120-83-2	5.2				8 8			S N	3	A7 61	No	300	5471
1,2,4-inchloropenzene	91-20-3	u t	3 8			5 8			33.Z.	200.00	1	NO.	100.00	
4-Chloroaniline	106-47-8	8.5	8			N i			8			N		
Hexachlorobutadiene	87-68-3	9.4	ND			ND			N			S	}	}
4-Chloro-3-methylphenol	59-50-7	7.7	S			8			234.19	300.00	78.06	260.60	300.00	86.87
2-Methylnaphthalene	91-57-6	, D (C	5 6			5 8			3 8			2 2		
2,4,6-Trichlorophenol	88-06-2	9.1	Ž i			ND			N O			Š		
2,4,5-Trichlorophenol	95-95-4	7.1	8			8			8	•		Š		
2-Chloronaphthalene	91-58-7	5 5	5 6			5 8						3 3		
2-Nitroanline Dimethylohthalate	131-11-3	8.2	8 8			8 8			8 8			8 8		
Acenaphthylene	208-96-8	9.0	N i			N			N D		•	N		
2,6-Dinitrataluene	606-20-2	9.2	N			NO			S			8		_
3-Nitroaniline	99-09-2	16.0	5 6			5 8			121 78	300	50 80	144 73	200.00	72.37
2.4-Digitrophenol	51-28-5	14.2	8 8			2 6			N C	200.00	000	ND .		
4-Nitrophenol	100-02-7	8.6	8			NO.			112.70	300.00	37.57	107.40	300.00	35.80
Dibenzofuran	132-64-9	8.4	Š			B			N O	   	<u> </u>	NO	3	)
2,4-Dinitrotoluene	121-14-2	ω	3 8			5 6			147.75	200.00	/3.88	161.78	200.00	80.89
Diethylphthalate	84-56-2	9 (C	5 6			3 8			3 3			2 2		
4-Chlorophenyl-phenylether	7005-72-3	8.3	88			2 6			8			N I		
4-Nitroaniline	100-01-6	8.7	N			N			8					
4,6-Dinitro-2-methylphenol	534-52-1	12.2	S			S			2			200		

Page 1 of 2

Client: Hercules Location: Equipment Blank					Collection:	12/15/97	9:00	BATCO			Si	Sample Type: Extraction Method:	Water 3510b	
File #: BT42546			•		Analysis:	1/9/98	1:48	CMB			Analy	Analysis Method:	8270	
						Date	Time	Analyst						
				BT42546			BLANK			Matrix Spike		Mati	Matrix Spike Duplicate	
			Detected	Spike	ike	Detected	Spike	ke	Detected	Sp	Spike	Detected	Spike	. <del>⊊</del>
	CAS	MDL	Amount			Amount			Amount			Amount		
Compound Name	Number	ug/L	ug/L	Amount	¥	ug/L	Amount	፠	ng/ul	Amount	*	ng/ui	Amount	
	•	(ppb)	(ppb)	5	Recovery	(ppbl	g,	Recovery	in the	6	Recovery	in the	ű	
	96 30 6	7.	5			5			extract			extract		1
A-Bromonhanylanhanylathar	101-55-3	7.0	2 (			N i			8			NO .		
Condition the contract	118-74-1	ָ פ	2			5			2			2		
Pentachlorophenol	87-86-5	12.5	8			8			311.90	300.00	103.97	307.08	300.00	
Phenanthrene	85-01-8	7.1	S	î .		N O			S			N		
Anthracene	120-12-7	8.0	N D			ND			S			N		
Di-n-butylphthalate	84-74-2	7.8	N D			8			S			8		
Fluoranthene	206-44-0	5.7	Š			8			S			Š		
Pyrene	129-00-0	7.9	8			8			174.39	200.00	87.20	180.67	200.00	
Butylbenzylphthalate	85-68-7	9.9	Š			Š			8			S		
Benzo(a)anthracene	56-55-3	7.7	8			B			S		_	8		
3,3'-Dichlorobenzidiene	91-94-1	16.5	S			S			8			S		
Chrysene	218-01-9	7.8	B			N			Š			S		
Bis (2-ethylhexyl)phthalate	117-81-7	9.1	N O			8			Š			S		
Di-n-octylphthalate	117-84-0	9.4	B			S			S			N.		
Benzo(b) fluoranthene	205-99-2	6.8	Š			ND			N			S		
Benzo(k)fluoranthene	207-08-9	4.9	ND			NO			8			S		
Benzo(a)pyrene	50-32-8	5.9	S			S			S			S		-
Indeno(1,2,3-c,d)pyrene	193-39-5	7.8	8			S			S			S		_
Dibenzo(a,h)anthracene	53-70-3	9.0	8			Š			Š			N O		_
Benzo(g,h,i)perylene	191-24-2	10.0	8			S			Š			Z B		
			Detected	Spiked	*	Detected	Spiked	*	Detected	Spiked	*	Detected	Spiked	- 1
Surrogate Compounds			Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery	Amount	Amount	Recovery
2-Fluorophenol			122.22	200.00	61.11	92.22	200.00	46.11	112.36	200.00	56.18	123.26	200.00	
Phenol-d5			90.27	200.00	45.14	64.71	200.00	32.36	78.94	200.00	39.47	87.05	200.00	_
Nitrobenzene-d5			103.68	100.00	103.68	74.74	100.00	74.74	97.18	100.00	97.18	104.82	100.00	
2-Fluorobiphenyl			77.40	100.00	77.40	65.54	100.00	65.54	86.97	100.00	86.97	104.67	100.00	
2,4,6-Tribromophenol			238.85	200.00	119.43	226.16	200.00	113.08	273.28	200.00	136.64	286.69	200.00	
Terphenyl-d14			136.66	100.00	136.66	132.90	100.00	132.90	127.66	100.00	127.66	125.04	100.00	_

Certified by:

Micheal S. Bonner,Ph. D. Bonner Analytical Testing Company

## SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Client: Hercules, Inc.		File#: B7	742546
Sample Matrix: Wate	Γ	Lab Samp	le ID : Equipment Blank
Sample Collection Dat	e: 12-15-97		
Sample Analysis Date	: 01-09-98 @ 0148	GC Colum	n Length: 30 M
Dilution Factor: 1.02		GC Colum	n ID: 0.25 mm
Sample Weight/ Volun	ne: 985 mL	Method Co	ode: 8270
Number TICs Found:	0	Concentra	tion Units: ug/L (PPB)
	<del></del>		
CAS NUMBER	COMPOUND NAME	RT	EST. CONCENTRATION
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YOUR COMPANY ADDRESS

Phone: (601) 264-2854

2703 Oak Grove Road Hattiesburg, MS 39402

Fax: (601) 268-7084

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YOUR COMPANY ADDRESS

Phone: (601) 264-2854

2703 Oak Grove Road Hattiesburg, MS 39402

Fax: (601) 268-7084



## Installation of Six Monitoring Wells

at

Hercules, Inc. 613 West 7th Street Hattiesburg, Ms

presented to:

Charles Jordan, Environmental Supervisor Hercules, Inc. Hattiesburg, MS

July 31, 1997

Michael S. Bonner, Ph.D.

BONNER ANALYTICAL TESTING COMPANY

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## INTRODUCTION

At the request of the Mississippi Department of Environmental Quality (MDEQ), Hercules, Inc. of Hattiesburg, MS will install, develop, purge and sample six permanent monitoring wells in the following locations shown on the attached B&V - Figure 2.

The MDEQ will be notified 2 weeks prior to commencement of work.

## 1.0 MONITORING WELL INSTALLATION

Six two inch by twenty foot PVC monitoring wells shall be installed utilizing hollow stem drilling technology. Well depths shall be advanced deeper within the shallow saturated zone if groundwater is not encountered within the first twenty feet.

A screened interval of ten feet having a 0.01" slot shall be used. The screened interval shall extend a minimum of three feet above the groundwater interface. Casing shall be flush thread design.

Filter pack meeting the following specifications shall be tremied into the annulus to a depth of two feet above the screened interval:

Particle Size in Inches	Allowable
>0.039"	35% Max.
<0.039 - ≥0.01	50% Min.
<0.01	0.5% Max.

Following the filter pack, a two foot layer of fine sand (mason) shall be applied via tremie. If the zone is saturated, two feet of 10% hydrated bentonite shall be tremied, followed by 90/10 grout to the surface. An elevation data marker shall be placed in the grout at the surface as a reference point. If the zone is unsaturated, the bentonite seal will be omitted. Hydration time for bentonite shall be a minimum of 8 hours or the manufacturer's recommended hydration time—whichever is greater. Grout shall be allowed to cure for a minimum of 24 hours prior to installation of the surface pad and protective riser equipped with security locks.

Each well shall be equipped with four 3" pipes installed to a depth of 30" at the corners of each pad and grouted in place. Protective pipes shall be filled with grout and painted as specified.

The well casing will be allowed to extend a minimum of 18" above ground surface and shall be equipped with a locking cap, protective casing and a 2'x2'x4" concrete pad. The wells shall be surveyed with longitude and latitude reported along with elevation above sea level (± 0.01 ft.).

The following boring/well construction log information will be included where applicable:

- Well identification #
- Date/time of well construction
- Borehole diameter and well casing diameter
- Well depth ±0.01 ft.
- Casing length

- Casing materials
- Casing and screen joint type
- Screened interval(s)
- Screen materials
- Screen slot size/design
- Filter pack material and size
- Calculated and actual filter pack volume
- Filter pack placement method
- Annular sealant composition
- Annular sealant placement method
- Calculated and actual annular sealant volume
- Surface sealant composition
- Surface seal placement method
- Calculated and actual surface sealant volume
- Surface seal design
- Well development procedure
- Turbidity measurement
- Type/design of protective casing
- Well cap and lock
- Ground surface elevation (±0.01 ft.)

- Survey reference point elevation on well casing (±0.01 ft.)
- Top of monitoring well casing elevation (±0.01)
- Top of protective steel casing elevation ( $\pm 0.01$  ft.)

## 2.0 WELL DEVELOPMENT

Completed wells will be allowed to cure a minimum of 24 hours prior to development.

Prior to well development, water depth will be determined to ±0.01 ft. Following completion, each well shall be developed by pumping and/or bailing, as deemed most appropriate utilizing the surge block technique. The well will be developed until a turbidity of < 5 NTU's is achieved. As a minimum, the well will be allowed to completely recharge prior to purging.

### 3.0 PURGING

The object of purging shall be to remove five well volumes at a rate similar to the recharge rate in order that turbidity effects are minimized. The following steps shall be used:

- 1. Establish the water depth and well depth to  $\pm 0.01$  ft.
- 2. Remove liquid from the surface and bottom hole to determine whether organic phases exist.
- 3. Determine pH, temperature, conductivity and turbidity prior to purging the well.
- 4. Remove five well volumes at a rate of 0.2 to 0.3 liter/min. utilizing a peristaltic pump if groundwater is within 28 feet of surface. Alternately, if groundwater is deeper, purging may be accomplished by means of centrifuged pump, bladder pump or bailer. (Purging by bailer must be done with caution so as not to disturb the well filter pack).

5. After removing 5 well volumes pH, temperature, conductivity and turbidity must be determined twice within 20 minutes. These data points should be ±10% and further, the turbidity must be <5 NTU's. If turbidity is not <5 NTU's, remove additional well volumes as necessary.

In the event the well is purged dry, the following protocol should be followed:

- 1. Allow the well to recover.
- 2. If the well has not fully recovered within two hours but has sufficient water for testing then:
  - a. Test the well for pH, temperature, conductivity and turbidity.
  - b. Test the well again within 20 minutes for the same parameters.
  - c. Collect samples as outlined in the sample collection process.
- 3. If pH, temperature and conductivity are not ±10% and/or turbidity is >5 NTU and if data reflect elevated levels of any pollutant of concern, consider repurging and sampling the well.

### 4.0 SAMPLING

Sampling should commence as soon as the well recovers but no later than two hours after purging is completed. Samples shall be collected utilizing disposable Teflon bailers. Analytical parameters shall include the attached Compound List of volatile organics (Method 8260).

VOA samples shall be collected in duplicate in 40 ml vials preserved with hydrochloric acid to a pH of <2. VOA samples must contain no air bubbles. Three replicates of samples shall be collected at one designated well for QA/QC analysis.

## 5.0 ANALYTICAL PROTOCOL

All analyses will conform to the methodologies outlined in EPA/SW846 current edition.

## 6.0 QA/QC

One equipment blank, one matrix spike (MS) and one matrix spike duplicate (MSD) shall be analyzed for each event. One trip blank for VOA only shall be analyzed for each sampling event.

## 6.1 TRIP BLANK (VOLATILE)

Trip blank (volatile) duplicate samples shall be prepared in the laboratory utilizing deionized water and bottles from the batches to be used in the field collection and decontamination procedures. The trip blank will be taken in the field and returned to the laboratory in the same environment as the samples.

## 6.2 EQUIPMENT BLANK (RINSATE BLANK)

Following decontamination of the drilling equipment, carefully transfer about two liters of analyte-free deionized water to a new disposable Teflon bailer. Allow the contents of the bailer to

drain over a piece of the decontaminated hollow stem into an analyte-free stainless steel bowl.

Transfer the rinsate water to appropriate sample containers. Label and archive the rinsate blank as outlined.

### 7.0 SAMPLE ARCHIVAL

Following sample collection, affix a completed label to each container. Cover the label with clear tape to protect from moisture. Place the sample bottle in a zip-lock bag and wrap the container in bubble wrap. Write the sample ID number on the outside of the bubble wrap with a permanent marker, then secure the bubble-wrapped container with clear tape.

## 8.0 DECONTAMINATION AND RESIDUALS MANAGEMENT

Borehole cuttings will be left in place at the well site unless VOA readings indicate gross contamination (>50ppm FID readings). In the event gross contamination is encountered, cuttings will be drummed on site and analyzed for disposal.

Well development, purge and decontamination water will be placed in the Hercules treatment facility for disposal, provided levels do not exceed toxicity characteristics.

The hollow stem, drill rod, and associated tools will be decontaminated before each well is advanced. The procedure shall be as follows:

- 1. Pressure wash with steam and potable water
- 2. Brush with phosphate-free detergent to remove any additional debris
- 3. Pressure wash with steam and potable water
- 4. Rinse with analyte-free water

## 9.0 HEALTH AND SAFETY

- 1. All personnel shall have received 40 hours of OSHA training and shall have current update training.
- 2. Hercules, Inc. shall provide any additional safety briefings deemed appropriate for the scope of this project.
- 3. During boring, developing and purging operations, FID readings shall be recorded to ensure that a safe environment is maintained.
- 4. Elevated (>50 ppm) FID readings shall mandate respiratory protection, cease and desist operations, and re-evaluation by project director, project supervisor, project health and safety officers, and Hercules personnel.
- 5. Any injuries or potentially unsafe conditions shall be reported immediately to the health and safety officer and then to the project supervisor and project director.

### 10.0 PERSONNEL

Project Director - Michael S. Bonner, Ph.D.

Project Supervisor - David Carter

Health and Safety Officer - Christopher M. Bonner

Hercules, Inc. Contact - Charles Jordan, Environmental Supervisor