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NSA PANAMA CITY
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CONTAMINATION ASSESSMENT LETTER REPORT ADDENDUM FOR SITE 323 CSS
PANAMA CITY FL
6/24/1997
BROWN AND ROOT ENVIRONMENTAL



Brown & Root Environmental

7113-3.11-72
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0019

BRE/TLH-97-643/7113/7.2.3

REC'D JUN 30 1997

June 24, 1997

Project Number 7113

Mr. John Mitchell
Remedial Project Manager
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Reference: Clean Contract No. N62467-94-D0888
Contract Task Order No. 0008

Subject: Contamination Assessment Report Addendum for Site 323
Coastal Systems Station
Panama City, Florida

Dear Mr. Mitchell:

A Contamination Assessment Report (CAR) response letter dated March 5, 1997, was issued by the Florida Department of Environmental Protection (FDEP) for the subject site. On April 3, 1997 a meeting was held at the FDEP to review the CAR comments and to agree upon a scope of work. Pursuant to the scope of work that was discussed during the April 3 meeting, Brown & Root Environmental (B&R Environmental), on behalf of the Department of the Navy, Southern Division, Naval Facilities Engineering Command, has prepared this CAR Addendum letter report for the subject site. The CAR response letter and a letter summarizing the results of the CAR review meeting, are included as Attachment 1. The scope of work agreed to during the CAR review meeting is addressed below.

1. Confirmation soil borings will be installed at boring locations SB-11 and SB-13 to confirm previous hydrocarbon vapor concentrations reported in soils at the water table/vadose zone (at these locations). If excessive soil contamination is encountered (e.g., greater than 50 ppm on OVA) temporary wells will be installed and groundwater samples collected for laboratory analysis for used oil constituents. If the results from the temporary well samples detect contamination from used oil, additional monitoring wells will be required. No additional soil delineation borings are required to delineate excessively contaminated soil (if present).

On April 21, 1997 B&R Environmental conducted confirmation subsurface soil sampling at site 323. Two soil borings, SB15 and SB16, were advanced using a 3.5 inch inner diameter (ID) stainless steel hand auger. The soil borings were advanced to collect soil headspace hydrocarbon vapor readings near borings SB11 and SB13, which previously registered the highest hydrocarbon vapor readings from soils collected at the water table/vadose zone interface. Organic vapor screening was performed in



accordance with headspace methods described in Chapter 62-770.200 Florida Administrative Code (F.A.C.). The hand auger was decontaminated prior to each boring following Standard Operating Procedures prescribed by the FDEP Quality Assurance Section Document DER-001/92, and adopted by the B&R Environmental Comprehensive Quality Assurance Plan Number 870055G. All decontamination rinse water was containerized in 55-gallon steel drums.

Prior to conducting the soil investigation, a depth to groundwater measurement was collected from the top of well casing of monitoring well PCY-323-MW01 using an electronic water level measuring device. The depth to groundwater beneath the site was measured at 7.70 feet bls on the date of the confirmation subsurface soil investigation. The depth to groundwater measurements collected during the CAR and CAR Addendum investigations indicates the depth of the water table has ranged from 6.30 to 7.70 feet bls. The depth to groundwater measurements are summarized in Table 1.

Confirmation soil boring SB15 was installed adjacent to SB13 and boring SB16 was installed adjacent to boring SB11. Soil samples for hydrocarbon vapor screening were collected from each boring at two foot intervals until the termination of the boring. Each boring was advanced to 7 feet bls which allowed a soil sample to be collected from the top of the water table/vadose zone interface (sample collected from 6 to 7 feet bls).

Results of the soil hydrocarbon vapor assessment identified no vapor concentrations in soil samples collected at 2 and 4 feet bls. Hydrocarbon vapor concentrations of 240 parts per million (ppm) and 40 ppm were detected in soil samples collected at 6 feet bls at SB15 and SB16, respectively. The location of the soil borings are shown on the Soil Hydrocarbon Vapor Concentrations site map provided as Figure 1. The soil sample collection depths and corresponding vapor concentrations are summarized in Table 2, and soil boring logs are included as Attachment 2.

The hydrocarbon vapor concentration detected in soils at boring SB16 indicates the soil vapors at the water table/vadose zone interface have decreased in concentrations to below "excessively contaminated" levels, as defined by Chapter 62-770.200 F.A.C. Due to this decrease in vapor concentration, no temporary monitoring well was installed at the locality of SB11 for groundwater sampling of used oil constituents. However, the detection of "excessively contaminated" soil at the water table/vadose zone interface at SB15 warranted the resampling of monitoring well PCY-323-MW01 for used oil constituents. Monitoring well PCY-323-MW01 is located within the area where the highest concentrations of hydrocarbon vapors were detected and is considered a point source monitoring well for assessing water quality in the area of the former oil/water separator.

On April 21, 1997, B&R Environmental collected an additional groundwater sample from monitoring well PCY-323-MW01 for used oil constituents. Sampling for used oil constituents included analysis by ICP Series for lead, arsenic, cadmium, and chromium, EPA Method 601 for Purgeable Halocarbons, EPA Method 602 for Purgeable Aromatics, EPA Method 610 for Polynuclear Aromatic Hydrocarbons, SW-846 Method 8260 for GC/MS Volatile Organics, SW-846 Method 8270A for GC/MS Semivolatile Organics and EPA Method 418.1 for Total Petroleum Hydrocarbons (TRPH). During the sampling event, depth to water and total depth of the well were measured. Prior to sampling approximately 5 well volumes of water were purged from the well using a peristaltic pump and tygon tubing. The peristaltic pump and tygon tubing apparatus were also used in extracting a groundwater sample from the well. The sample collected was immediately placed on ice, and shipped to Quality Analytical Laboratories in Montgomery, Alabama, for analysis. During the sampling event, quality control samples were prepared and submitted to the



Mr. John Mitchell
FDEP
June 24, 1997 - Page 3

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laboratory as required by the FDEP approved Quality Assurance Guidelines. All decontamination and purge water were containerized in a 55-gallon steel drum.

Groundwater quality results from the April 21, 1997 sampling event detected a Total Volatile Organic Aromatic concentration of 2.6 micrograms per liter (ug/L) and TRPH at 0.15 milligrams per liter (mg/L). Naphthalene and Total Naphthalene were reported at 49 ug/L and 81 ug/L, respectively. Arsenic was reported at a concentration of 1.4 ug/L. All other parameters analyzed were reported below laboratory detection limits. A summary of the groundwater quality results collected during the Contamination Assessment (CA) investigation are presented in Table 3. Groundwater field measurements collected during the April 21 sampling event and the laboratory data sheets are provided as Attachment 3.

2. A figure showing the direction of groundwater flow across the site will be provided. The groundwater flow direction will be interpreted from groundwater flow maps generated at the Naval Base as part of the RCRA Investigation Report.

The groundwater flow across the site is depicted on Figure 1. Groundwater flow is easterly towards St. Andrews Bay located approximately 450 feet east of the site. The direction of groundwater flow across the site is based on interpretation of facility-wide groundwater elevation contours presented in the RCRA Facility Investigation (ABB Environmental Services Inc., RCRA Facility Investigation Report, 1995).

Conclusions and Recommendations

B&R Environmental proposes the site be granted a **No Further Action** (NFA) status based on the following findings from the CAR and CAR Addendum investigations:

- The highest hydrocarbon vapor concentrations detected during the CAR and CAR Addendum investigations were in soils at the water table interface. Depth to water level measurements collected during the investigations indicate the water table/interface has ranged in depth from approximately 6 to 8 feet bls.
- Approximately 16 cubic yards of "excessively contaminated" soil was removed in March 1994, from the excavation which contained the oil/water separator.
- Groundwater in the surficial aquifer has a G-II classification.
- Municipal well fields and surface water intakes were not identified within 0.5-mile radius of the site. Private potable water wells were not identified within 0.25-mile radius of the site.
- Groundwater laboratory analysis from the most recent sampling event for Gasoline and Kerosene Analytical Groups, including used oil constituents, reported concentrations of Total Volatile Organics, TRPH, Naphthalene, Total Naphthalene, and Arsenic at levels which meet the criteria for NFA status as described in Chapter 62-770.600(5) F.A.C. All other petroleum constituents analyzed in groundwater were reported below detection limits and do not exceed FDEP NFA criteria for a G-II aquifer, without wells, as summarized in Table 4.



Mr. John Mitchell
FDEP
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References

ABB Environmental Services, Inc., 1995, RCRA Facility Investigation, Coastal Systems Station
Panama City, Florida.

If you have any questions or comments regarding this assessment, or require further information, please do not hesitate to contact me at (904) 656-5458.

Sincerely,

Approved For Submission By:

Gerald F. Goode 6/24/97

Gerald F. Goode, P.G.
Task Order Manager
Florida License No. 0001276
Brown & Root Environmental
Tallahassee, Florida

Debbie Wroblewski

Debbie Wroblewski
Program Manager
Brown & Root Environmental
Pittsburgh, Pennsylvania

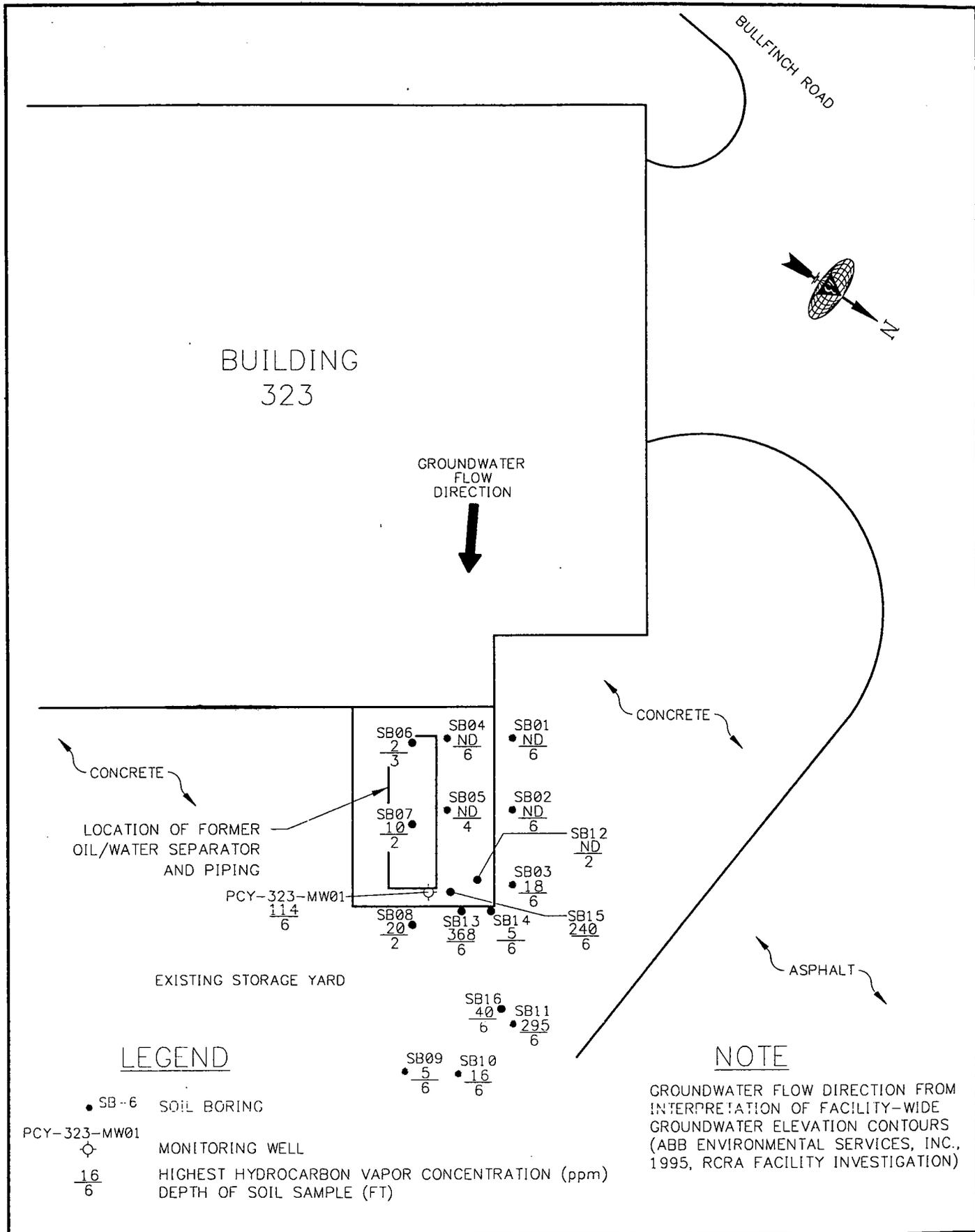
GG/ak

Enclosures (2)

- c: Mr. N. Ugolini, SOUTHDIV (3 copies)
Ms. D. Evens-Ripley, SOUTHDIV (w/o enclosure)
Mr. A. McDonald, Coastal Systems Station (2 copies)
Ms. R. Bauer, B&R Environmental (w/o enclosure)
Mr. M. Perry, B&R Environmental (1 copy)

FIGURE

Figure 1: Soil Hydrocarbon Vapor Concentrations



SITE MANAGER: GFG	CHECKED BY: RMC
DRAWN BY: GMF	DRAWING DATE: 5/27/97
SURVEYED BY:	SURVEY DATE:
SCALE: 1" = 10'	
CAD DWG. NO.: 7113KMO3	PROJ. NO.: 7113


Brown & Root Environmental

FIGURE 1
SOIL HYDROCARBON VAPOR CONCENTRATIONS - SITE 323
 COASTAL SYSTEMS STATION
 PANAMA CITY, FLORIDA

TABLE 4
MAXIMUM ACCEPTABLE GROUNDWATER CONSTITUENT LEVELS
Site 323
Coastal Systems Station, Panama City, Florida
FDEP Facility No. 038518667

Analyte or Analytical Method	Highest Ground Water Constituent Level in Site Monitoring Wells	No Further Action		Monitoring Only			
		G-II Aquifer	G-II Aquifer	G-II Aquifer with wells		G-II Aquifer without wells	
		(with wells)	(without wells)	source	perimeter	source	perimeter
Total BTEX	2.7	50	50	500	50	1000	50
Benzene	<1.0	1	50	250	1	500	50
TRPH	0.15 [^]	5 [^]	5 [^]	50 [^]	5 [^]	100 [^]	5 [^]
Lead	<2.0	50	50	500	50	1 [^]	50
EDB	<0.02	0.02	0.02	0.02	0.02	0.4	0.02
Total Naphs	81	100	100	1000	100	2000	100
EPA 610	<2.1	DL	DL	10xDL	DL	20xDL	DL
EPA 601	<1.0	DW-SRLs	DW-SRLs	10xDW-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs
Arsenic	1.4	50	50	500	50	1 [^]	50
Cadmium	<3.3	10	10	100	10	200	10
Chromium	<2.6	50	50	500	50	1 [^]	50
EPA 624	NCD	DW-SRLs	DW-SRLs	10xDL-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs
EPA 625	NCD	DW-SRLs	DW-SRLs	10xDL-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs

Notes:

All data in µg/L unless otherwise noted

[^] data in mg/L

Source: Monitoring wells near suspected hydrocarbon source
Perimeter: Monitoring wells located at perimeter of plume
TRPH: Total Recoverable Petroleum Hydrocarbons
Total Naphs: Sum of naphthalenes and methylnaphthalenes
DW-SRLs: Drinking Water Standards or Applicable Site Rehabilitation Levels
DL: Detection Limit
NCD: No Constituents Detected

TABLES

Table 1: Depth to Groundwater Measurements

Table 2: Soil Vapor Measurements

Table 3: Summary of Groundwater Quality

Table 4: Maximum Acceptable Groundwater Constituent Levels

TABLE 1
DEPTH TO GROUNDWATER MEASUREMENTS
Site 323
Coastal Systems Station, Panama City, Florida
FDEP Facility No. 038518667

Well Number	Date	Free Product Thickness (feet)	Depth to Water (feet)	Well Screen Interval (feet below land surface)
PCY-323-MW01	06/15/96	0.00	6.62	5 to 15
	07/12/96	0.00	6.30	
	04/21/97	0.00	7.70	

Notes:
All water levels are measured below top of casing.

TABLE 2
SOIL VAPOR MEASUREMENTS
Coastal Systems Station
Site 323
Panama City, Florida
FDEP FACILITY No. 038518667

Soil Boring No.	Date of Measurement	Sample Interval (feet bls)	Headspace Readings (ppm)		
			Total Organic Reading	Carbon Filtered Reading	Net Reading
SB01	06-14-96	2	5	5	ND
		4	ND	-	ND
		6	ND	-	ND
SB02	06-14-96	2	ND	-	ND
		4	ND	-	ND
		6	ND	-	ND
SB03	06-14-96	2	1	ND	1
		4	ND	ND	ND
		6	23	5	18
SB04	06-14-96	2	ND	-	ND
		4	ND	-	ND
		6	ND	-	ND
SB05	06-15-96	2	ND	-	ND
		4	ND	-	ND
		auger refusal at 5 feet bls.			
SB06	06-14-96	2	3	ND	3
		auger refusal at 2.5 feet bls.			
SB07	06-14-96	2	11	1	10
		auger refusal at 3 feet bls.			
SB08	06-14-96	2	20	ND	20
		auger refusal at 3 feet bls.			
SB09	06-14-96	2	ND	-	ND
		4	8	3	5
		auger refusal at 6 feet bls.			
SB10	6-14-96	2	25	10	15
		4	13	8	5
		6	19	3	13
SB11	6-14-96	2	4	ND	4
		4	ND	ND	ND
		6	300	5	295
SB12	6-15-96	2	ND	-	ND
		auger refusal at 2.5 feet bls.			
SB13	6-15-96	2	ND	ND	ND
		4	5	3	2
		6	380	12	368
SB14	7-12-96	2	3	ND	3
		4	5	ND	5
		6	5	ND	5
SB15	4-21-97	2	ND	-	ND
		4	ND	-	ND
		6	240	20	240
SB16	4-21-97	2	ND	-	ND
		4	ND	-	ND
		6	60	20	40
PCY-323-MW01	06-14-96	2	ND	-	ND
		4	ND	-	ND
		6	120	6	115

Notes: - = not analyzed
bls = below land surface
ppm = part per million equivalent methane
Wet soils encountered at approximately 6 to 7 feet bls.

TABLE 3
SUMMARY OF GROUNDWATER QUALITY:
SELECTED PARAMETERS FROM THE GASOLINE AND KEROSENE
ANALYTICAL GROUP
Site 323
Coastal Systems Station, Panama City, Florida
FDEP ID No. 038518667

Well ID	Date Sampled	Benzene (µg/L)	Total VOA (µg/L)	MTBE (µg/L)	DCE (µg/L)	EDB (µg/L)	NAP (µg/L)	Total NAPS (µg/L)	TRPH (mg/L)	Volatile Organics (µg/L)	Semi Volatile Organics (µg/L)	Arsenic Unfiltered Samples (µg/L)	Cadmium Unfiltered Samples (µg/L)	Chromium Unfiltered Samples (µg/L)	Lead Unfiltered Samples (µg/L)
PCY-323-MW01	07/12/96	<1.0	7.6	<1.0	<1.0	<0.02	<4	NCD	1.67	NCD	NCD	3.1	<3.3	3.2	3.5
	4/21/97	<1.0	2.7	<1.0	<1.0	<0.02	²⁾ 49	81	0.15	NCD	²⁾ NCD	1.4	<3.7	<2.7	<2.0
Trip Blank	07/12/96	<1.0	1.7	<1.0	<1.0	NA	NA	NA	NA	NCD	NA	NA	NA	NA	NA
Equipment Blank	07/12/96	<1.0	1.3	<1.0	<1.0	<0.02	¹⁾ NA	¹⁾ NA	<0.05	NCD	NCD	1.2	<3.3	2.6	2.4
	4/21/97	<1.0	<1.0	<1.0	<1.0	<0.02	<2.1	NCD	0.08	NCD	NCD	<1.2	4.2	<2.7	<2.0

NA = not analyzed
Total VOA = total volatile organic aromatics = sum of benzene, toluene, ethylbenzene, and xylenes
MTBE = methyl tert-butyl ether
DCE = 1,2-Dichloroethane
EDB = 1,2-Dibromoethane = ethylene dibromide
NCD = no constituents detected
TRPH = total petroleum hydrocarbons
NAP = naphthalene
Total NAPS = sum of total naphthalene constituents detected in sample

Notes:

- ¹⁾ An equipment blank analysis was not performed for GC Polynuclear Aromatic Hydrocarbons due to a crack in the equipment blank sample bottle received during sample shipment.
- ²⁾ Naphthalene concentration was reported in the semi volatile organic analysis by EPA Method 8270 analysis. Naphthalene concentration reported by EPA Method 610 analysis is presented in the table.

ATTACHMENT 1

**FDEP CAR COMMENT LETTER DATED MARCH 5, 1997
AND
MEETING REVIEW SUMMARY LETTER DATED APRIL 7, 1997**

Department of Environmental Protection

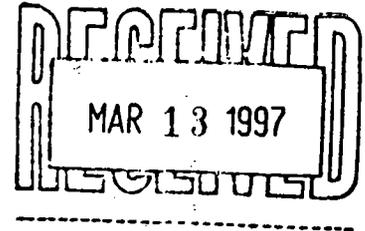
Lawton Chiles
Governor

Twin Towers Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

March 5, 1997

Mr. Nick Ugolini
Code 184(PVC)
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
P.O. Box 190010
North Charleston, South Carolina 29419-9010



RE: Contamination Assessment Report for Site 323
Coastal Systems Station, Panama City, Florida
Facility No. 035118667

Dear Mr. Ugolini:

The Department has completed the technical review of the Contamination Assessment Report (CAR) dated December 1996 (received January 6, 1997), submitted for Site 323. I do not agree with the No Further Action (NFA) proposal for this site. The following comments need to be addressed, and a CAR addendum submitted.

1. Although the groundwater analytical results for monitoring well PCY-323-MW01 was below any action levels, soil borings SB11 and SB13 had OVA readings of 295 ppm and 368 ppm, respectively, in the saturated soils. Also, temporary monitoring well TW02 located at soil boring SB04 had a field screening result of 12.034 $\mu\text{g/L}$ for benzene. We recommend resampling and analysis of SB11 and SB13 and PCY-323-MW01. Additional soil borings should be performed to the north and west of SB11. Should the soil borings continue to indicate excessive contamination (e.g., > 50 ppm OVA), then an additional well should be placed in the location of SB11.
3. There was no groundwater contour map indicating groundwater flow direction. This should be included in all CARs or CAR Addendums submitted in the future.

If I can be of any further assistance with this matter, please contact me at (904) 921-9989.

Sincerely,

John W. Mitchell
Remedial Project Manager

Mr. Nick Ugolini
March 5, 1997
CAR for Site 323
Page 2

cc: Mike Cross, CSS Panama City
Arturo MacDonald, CSS Panama City
Gerald F. Goode, Brown and Root, Tallahassee
Tom Moody, FDEP NW District

TJB

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JJC

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CC CA06998
CC C015768

BRE/TLH-96-605/7113/3.2

April 7, 1997

Mr. John Mitchell
Remedial Project Manager
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Reference Clean Contract No. N62467-94-D0888
 Contract Task Order No. 0008

SUBJECT: Meeting Review of Contamination Assessment Report Comments
 Sites G9, 323 and 333
 Coastal Systems Station, Panama City

Dear Mr. Mitchell:

This letter is to provide a summary of our meeting of April 3, 1997 in which we discussed comments that were issued by the Florida Department of Environmental Protection (FDEP) on the Contamination Assessment Reports for the subject sites. Mr. Nick Ugolini, Remedial Project Manager, for the Navy Southern Division Facilities Engineering Command, participated in the meeting via teleconference. Mr. Paul Calligan of Brown and Root Environmental was also present during the meeting.

The purpose of the meeting was to review the FDEP's CAR comments to insure that field activities would be performed to address each concern. Based on the review of the CAR comments, the following scope of work was agreed upon:

SITE G9

1. Figure 3-1 will be revised to show the OVA readings from the Tank Closure Assessment Report for borings B-1 and B-3 as non detect at 6 feet.
2. Monitor well MW01 will be resampled for TRPH constituents.
3. A groundwater contour map will be prepared from existing groundwater level measurements collected from MW01, TW01, TW02 and TW03.

SITE 323

1. Confirmation soil borings will be installed at boring locations SB-11 and SB-13 to confirm previous hydrocarbon vapor concentrations reported in soils at the water table/vadose zone (at these locations). If excessive soil contamination is encountered (e.g., greater than 50 ppm on OVA) temp wells will be installed and groundwater samples collected for laboratory analysis for used oil constituents. If the results from the temporary well samples detect contamination from

used oil, additional monitoring wells will be required. No additional soil delineation borings are required to delineate excessively contaminated soil (if present).

2. A figure showing the direction of groundwater flow across the site will be provided. The groundwater flow direction will be interpreted from groundwater flow maps generated at the Naval Base as part of the RCRA Investigation Report.

SITE 333

1. An Alternative Remedial Procedure (e.g, overdeveloping wells TW01 and MW04) will be developed to reduce concentrations in TW01 and MW04. After the Alternative Remedial Procedure is implemented, wells TW01 and MW04 will be resampled for used oil constituents.

Please review this summary and advise on any discrepancies. Field activities are tentatively scheduled for the week of April 20, 1997.

Sincerely,



Gerald F. Goode
Task Order Manager

GG/gg

cc: Mr. Nick Ugolini, SOUTHDIV
Mr. Arturo McDonald, Coastal Systems Station
Ms. Debbie Wroblewski, Brown & Root Environmental

ATTACHMENT 2

SOIL BORING LOGS

Borings SB15 and SB16 Conducted April 21, 1997

See Boring location Figure

PROJECT: CTO 0008	BORING NO.: SB15
JOB NO.: 7113	TOTAL DEPTH: 7'
PROJ. MGR: Gerald Goode	LOGGED BY: G. Goode
DRILLING CONTRACTOR: NA	EDITED BY:
DRILL RIG TYPE: NA	
DRILLERS NAME: Gerald Goode	
SAMPLING METHODS: Grab	
DRILLING TECHNIQUE: Hand Auger	
HAMMER WT: NA	DROP: NA
STARTED TIME: 14:00	DATE: 4/21/97
COMPLETED TIME: 19:00	DATE: 4/21/97
BORING DEPTH (R.): 7'	BOREHOLE DIA.: 3"

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE	LITHOLOGIC DESCRIPTION
1		Hand Auger	NA	NA						0		
2	Grab				moist	None	ND	-	ND	1		
3										2	sw	Soil, light gray, fine to medium grained, moist
4	Grab				moist	None	ND	-	ND	3		
5										4	sw	Soil, light gray, fine to medium grained, moist
6	Grab				moist		260	20	240	5		
7					moist	Discol like soil				6	sw	Soil, dark gray, fine to medium grained, slight discolor like soil, met @ 6.5 to 7 ft
										7	E.O.B.	
										8		
										9		
										10		

See Boring location Figure

PROJECT: <u>CTD 0008</u>	BORING NO.: <u>SB16</u>
JOB NO.: <u>7113</u>	TOTAL DEPTH: <u>7'</u>
PROJ. MGR: <u>Gerald Goode</u>	LOGGED BY: <u>G. Goode</u>
DRILLING CONTRACTOR: <u>NA</u>	EDITED BY:
DRILL RIG TYPE: <u>NA</u>	
DRILLERS NAME: <u>Gerald Goode</u>	
SAMPLING METHODS: <u>Grab</u>	
DRILLING TECHNIQUE: <u>Hand Auger</u>	
HAMMER WT: <u>NA</u>	DROP: <u>NA</u>
STARTED TIME: <u>15:00</u>	DATE: <u>4/21/97</u>
COMPLETED TIME: <u>19:00</u>	DATE: <u>4/21/97</u>
BORING DEPTH (ft.): <u>7'</u>	BOREHOLE DIA.: <u>3"</u>

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE	LITHOLOGIC DESCRIPTION:
1		<u>Hand Auger</u>	<u>NA</u>	<u>NA</u>						0		
2	<u>Grab</u>				<u>moist</u>	<u>None</u>	<u>ND</u>	<u>-</u>	<u>ND</u>	1		
3										2	<u>sw</u>	<u>Sand, gray, fine to medium grained, some silt, moist</u>
4	<u>Grab</u>				<u>moist</u>	<u>None</u>	<u>ND</u>	<u>-</u>	<u>ND</u>	3	<u>sw</u>	
5										4	<u>sw</u>	<u>Sand, light brown, fine to medium grained, some silt, moist</u>
6	<u>Grab</u>				<u>moist</u>	<u>fecal like</u>	<u>60</u>	<u>20</u>	<u>40</u>	5	<u>sw</u>	
7					<u>wet</u>					6	<u>sw</u>	<u>Sand, dark gray, fine to medium grained, slight diesel like odor, wet at @6.5 to 7 ft.</u>
										7	<u>E.O.B.</u>	
										8		
										9		
										10		

ATTACHMENT 3

**LABORATORY DATA SHEETS AND GROUNDWATER
SAMPLING AND MEASUREMENT FIELD FORMS**

April 21, 1997 Sampling Event

CATIONS DATA PACKAGE

000001

EPA QUALIFIERS

INORGANIC ANALYSES

- o C (Concentration) Qualifier -- Enter "B" if the reported value obtained was less than the CRDL but greater than or equal to the IDL. Enter "U" if the value was less than the IDL or was not detected.
- o Q Qualifier -- Entries and their meanings are:
 - E - The reported value is estimated because of interference. An explanatory comment must be included under "Comments" on the Cover Page if the problem applies to all samples in this data package or on the individual FORM I if it is an isolated problem.
 - M - Duplicate injection precision was not met (two analyses of the same sample did not agree).
 - N - Spiked sample recovery not within control limits.
 - S - The reported value was determined by the Method of Standard Additions (MSA).
 - W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
 - * - Duplicate analysis not within control limits.
 - + - Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field.

- o M (Method) Qualifier -- Enter one of the following:
 - P - ICP
 - A - Flame AA
 - F - Furnace AA
 - CV - Manual Cold Vapor AA
 - AV - Automated Cold Vapor AA
 - AS - Semi-Automated Spectrophotometric
 - CA - Manual Spectrophotometric
 - T - Titrimetric
 - NR - Analyte was not required by your lab

Sample ID Cross-reference Table

CH2M Hill Lab Sample ID	Client Sample ID	Collect Date	Sample Matrix	Additional Description
DUP = Duplicate; FB = Field Blank; FS = Field Sample; MSD = Matrix Spike Duplicate; MSI = Matrix Spike, Inorganic; MSO = Matrix Spike, Organic				
MD462001	FS MW01-002	04/21/97	Water	323-GW
MD462002	FB MW01-002B	04/21/97	Water	323-GW

The above lab sample ID's and cross reference information apply to samples as received by the laboratory. Modifiers to the lab sample ID may be added for internal tracking purposes. Any modified sample ID will be reflected in the appropriate case narrative only.

CASE NARRATIVE
Cations

Laboratory: CH2M HILL Lab Ref. No.: MD462

Client/Project: Brown & Root Coastal Systems Station

I. Holding Time:

All holding times were met.

II. Digestion Exceptions:

No exceptions were noted.

III. Analysis:

A. Calibration:

All acceptance criteria were met. ICP readbacks of the calibration standards are reported on the Laboratory Control Sample (Form 7) summary sheet.

B. Blanks:

All acceptance criteria were met.

C. ICP Interference Check Sample:

All acceptance criteria were met.

D. Spike Sample(s):

All acceptance criteria were met.

E. Duplicate Sample(s):

All acceptance criteria were met.

F. Laboratory Control Sample(s):

All acceptance criteria were met.

G. ICP and GFAA Serial Dilutions:

ICP serial dilutions are reported on the CLP Form 9. Postspikes were performed for those elements with RPD results >10, and are reported on the CLP Form 5B. GFAA serial dilutions are reported on the CLP Form 14.

H. Other:

None.

IV. Receipt Exceptions:

Any receipt exception will be addressed in a Sample Receipt Exception Report which will be attached to the Chain-of-Custody in this package.

V. Documentation Exceptions:

None.

VI. I certify that this data package is in compliance with the terms and conditions agreed to by the client and Quality Analytical Laboratories, Inc., both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Signed: Jewell W. Smiley Date: 05-16-97
Jewell Smiley/Chemist

GENERAL CHEMISTRY

CASE NARRATIVE
GENERAL CHEMISTRY

QAL Lab Reference No./SDG. MD462

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

All holding times were met.

III. METHOD

The method used is cited in the corresponding Form I.

IV. PREPARATION

Sample preparation proceeded normally, if applicable.

V. ANALYSIS

- A. Calibration : All acceptance criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Spikes: All acceptance criteria were met.
- D. Duplicates: All acceptance criteria were met.
- E. Laboratory Control Samples: All acceptance criteria were met.
- F. Samples: Sample analyses proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Joe Basile DATE: 5/14/97
Joe Basile
General Organic/Inorganic Supervisor

Sample data

Report of Analytical Results

Client Sample ID: MW01-002
 Sample Description: 323-GW
 Sample Matrix: Water
 Site: N/A

Date Collected: 04/21/97 18:10 (Mon)
 Date Received: 04/22/97 10:00 (Tue)

Reference No: MD462
 Lab Sample ID: MD462001

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date/Time of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.15	mg/L	0.05	05/07/97 00:00	EPA418.1

[Signature] (9656)

Sample Receipt Record

Batch Number:

MD462

Date received:

4/22/97

Client/Project:

Brown & Root

VERIFICATION OF SAMPLE CONDITIONS (verify all items)

Observation	YES	NO
Were custody seals intact and on the outside of the cooler?	✓	
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Was there ice in the cooler? Enter temperature of temperature blank or icewater: 4 °C	✓	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples)

Sample No	Nutrients pH < 2	Metals pH < 2	Volatiles pH < 2	Cyanide pH > 12	Other (specify) TPT	Other (specify)
01		<2	<2		<2 Adj	
02		<2	<2		<2 Adj	
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

LOGIN AND pH VERIFICATIONS PERFORMED BY

Paul Smalley

Date

Date

QC data

Matrix Spike Sample Recovery
GENERAL CHEMISTRY

Lab Reference No./SDG: MD462

Sample matrix: WATER
% Solids (if soil):

Lab Sample ID: MD462001S
Client Sample ID: MW01-002S

Analytical Parameter	Control Limit % Rec	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	% Rec.	Conc. Units
Total Petroleum Hydrocarbons	80-120	1.833	0.146	2.054	82.1	mg/L

COMMENTS:

Duplicates
GENERAL CHEMISTRY

Lab Reference No./SDG: MD461

Sample matrix: WATER

% Solids (if soil):

Lab Sample ID: MD462001D

Client Sample ID: MW01-002D

Analytical Parameter	Control Limit	Sample (S)	Duplicate (D)	RPD	Conc. Units
Total Petroleum Hydrocarbons	20	0.146	0.126	14.7	mg/L

COMMENTS:

Laboratory Control Sample
GENERAL CHEMISTRY

Lab Reference No./SDG: MD462

Analytical Parameter	Conc. Units	True	Found	% Rec	True	Found	% Rec	Limits
Total Petroleum Hydrocarbons	mg/L	2.054	2.034	99.0				82-110

COMMENTS:

Organic Data Qualifiers

- A -- This qualifier indicates that a TIC is a suspected aldol-condensation product.
- B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests that the data user evaluate these compounds and their amounts carefully.
- C -- The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- D -- This qualifier is used for all compounds identified in an analysis at a secondary dilution factor. "D" qualifiers are used only for the samples reported at more than one dilution factor.
- E -- This flag indicates that the value reported exceeds the linear calibration range for that compound. Therefore, the sample should be reanalyzed at an appropriate dilution. The "E" qualified amount is an estimated concentration, and the results of the dilution will be reported on a separate Form I.
- I -- This qualifier indicates that the reporting limit adjacent to the "I" qualifier has been raised. It is used when chromatographic interference prohibits detection of a compound at a level below the concentration expressed on the Form I.
- J -- Indicates an estimated value. It is used when the data indicates the presence of a target compound below the reporting limit or the presence of a Tentatively Identified Compound (TIC).
- N -- This qualifier indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the "N" qualifier is not used.
- P -- This qualifier is used for pesticide/Aroclor target analytes when there is a greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a "P".
- U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the reporting limit for that compound. The reporting limit can vary from sample to sample depending on dilution factors or percent moisture adjustments when indicated.

Organic Sample ID Qualifiers

The qualifiers that may be appended to the Lab Sample ID and/or the Client Sample ID for organic analyses are defined below:

- DL -- Diluted reanalysis. Indicates that the results were determined in an analysis of a secondary dilution of a sample or extract. The "DL" suffix may be followed by a digit to indicate multiple dilutions of the sample or extract. The results of more than one diluted reanalyses may be reported.
- MS -- Matrix spike (may be followed by a digit to indicate multiple matrix spikes within a sample set).
- MSD - Matrix spike duplicate (may be followed by a digit to indicate multiple matrix spikes within a sample set).
- R -- Reanalysis. The extract was reanalyzed without re-extraction. The "R" is not used if the sample was also re-extracted. May be followed by a digit to indicate multiple reanalyses of the sample at the same dilution.
- RE -- Re-extraction analysis. The sample was re-extracted and reanalyzed. May be followed by a digit to indicate multiple re-extracted analyses of the sample at the same dilution.

Sample ID Cross-reference Table

CH2M Hill Lab Sample ID	Client Sample ID	Collect Date	Sample Matrix	Additional Description
DUP = Duplicate; FB = Field Blank; FS = Field Sample; MSD = Matrix Spike Duplicate; MSI = Matrix Spike, Inorganic; MSO = Matrix Spike, Organic				
MD462001	FS MW01-002	04/21/97	Water	323-GW
MD462002	FB MW01-002B	04/21/97	Water	323-GW

The above lab sample ID's and cross reference information apply to samples as received by the laboratory. Modifiers to the lab sample ID may be added for internal tracking purposes. Any modified sample ID will be reflected in the appropriate case narrative only.

GC/MS VOLATILE ORGANICS

000001

CASE NARRATIVE
GC/MS VOLATILE ORGANICS

QAL Lab Reference No./SDG. MD462

Project: Brown and Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

- A. Sample Preparation: Not applicable.
- B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: SW-846 8260

IV. PREPARATION

Not applicable.

V. ANALYSIS

- A. Calibration: All acceptance criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Surrogates: All acceptance criteria were met.
- D. Spikes: As requested, the matrix spikes were performed using a sample from sample delivery group MD462 (MD462001MS and MD462001MSD). Please note that there were no recoveries for 2-Chloroethylvinylether in the matrix spike and the matrix spike duplicate. The LCS was also analyzed and was found to be within QC criteria. Matrix interference is suspected. Results are provided for your review.
- E. Samples: Sample analysis proceeded normally.
- F. Other: Please note that the Form 1's reflect the specified target list.

A summary of the most current applicable method detection limits (MDLs) immediately follows the case narrative.

Currently, there are not enough data points collected to produce control charts for the water surrogate recoveries for 1,2-Dichloroethane-d4. These charts are in the process of being developed.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Debra A. Wersinger DATE: 5/14/97
Herb Kelly
Resource Manager

CASE NARRATIVE
Addendum

Sample Information

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>DATE</u> <u>EXTRACTED</u>	<u>DATE</u> <u>ANALYZED</u>	<u>SAMPLE</u> <u>pH¹</u>
MD462001	MW01-002	WATER	04/21/97	N/A	04/24/97	<2
MD462001MS	MW01-002MS	WATER	04/21/97	N/A	04/24/97	<2
MD462001MSD	MW01-002MSD	WATER	04/21/97	N/A	04/24/97	<2
MD462002	MW01-002B	WATER	04/21/97	N/A	04/24/97	<2
X04247B1	VBLKJD	WATER	N/A	N/A	04/24/97	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
 Analytical Method: SW8260 Extraction Method: _____

	MDL
	<u>ug/L</u>
Acetone	1.36
Acetonitrile	7.27
Acrolein	5.11
Acrylonitrile	4.90
Benzene	0.43
Bromobenzene	0.39
Bromochloromethane	0.32
Bromodichloromethane	0.39
Bromofluorobenzene	1.43
Bromoform	0.41
Bromomethane	0.50
2-Butanone	0.77
Carbon Disulfide	0.45
Carbon Tetrachloride	0.37
Chlorobenzene	0.53
Chloroethane	0.37
2-Chloroethylvinyl ether	0.39
Chloroform	0.21
Chloromethane	0.30
Chloroprene	0.73
3-Chloropropene	0.22
2-Chlorotoluene	1.11
4-Chlorotoluene	0.50
Cis-1,2-Dichloroethene	0.28
cis-1,3-Dichloropropene	0.26
Cyclohexanone	33.46
1,2-Dibromo-3-chloropropane	1.26
Dibromochloromethane	0.29
1,2-Dibromoethane	0.39
Dibromofluoromethane	1.97
Dibromomethane	0.42
1,2-Dichlorobenzene	0.66
1,3-Dichlorobenzene	0.61
1,4-Dichlorobenzene	0.65
Dichlorodifluoromethane	0.62
1,1-Dichloroethane	0.42
1,2-Dichloroethane	0.39
1,1-Dichloroethene	0.37
1,2-Dichloroethene (total)	0.48
Dichlorofluoromethane	0.35
1,2-Dichloropropane	0.39
1,3-Dichloropropane	0.28
2,2-Dichloropropane	0.23

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
 Analytical Method: SW8260 Extraction Method: _____

	MDL
	ug/L
1,1-Dichloropropene	0.45
1,4-Dioxane	12.96
Ethyl ether	0.36
Ethyl methacrylate	0.51
Ethylbenzene	0.62
Hexachlorobutadiene	1.17
2-Hexanone	0.80
Iodomethane	1.47
Isobutyl alcohol	11.96
Isopropylbenzene	0.45
m-,p-Xylene	1.07
Methacrylonitrile	0.37
Methyl methacrylate	0.40
Methyl tert-butyl ether	0.27
4-Methyl-2-pentanone	0.39
Methylene Chloride	0.38
n-Butylbenzene	0.64
n-Propylbenzene	0.53
Naphthalene	2.30
o-Xylene	0.59
p-Isopropyltoluene	0.68
Pentachloroethane	0.31
Propionitrile	4.87
sec-Butylbenzene	0.51
Styrene	0.55
tert-Butylbenzene	0.46
1,1,1,2-Tetrachloroethane	0.33
1,1,2,2-Tetrachloroethane	0.78
Tetrachloroethene	0.46
Tetrahydrofuran	5.47
Toluene	0.45
Toluene-d8	1.26
trans-1,2-Dichloroethene	0.26
trans-1,3-Dichloropropene	0.43
trans-1,4-Dichloro-2-butene	0.58
1,1,2-Trichloro-1,2,2-trifluoroet	1.87
1,2,3-Trichlorobenzene	1.72
1,2,4-Trichlorobenzene	1.19
1,1,1-Trichloroethane	0.41
1,1,2-Trichloroethane	0.44
Trichloroethene	0.44
Trichlorofluoromethane	0.57
1,2,3-Trichloropropane	0.87

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
Analytical Method: SW8260 Extraction Method: _____

	MDL
	<u>ug/L</u>
1,2,4-Trimethylbenzene	0.44
1,3,5-Trimethylbenzene	0.65
Vinyl acetate	1.16
Vinyl Chloride	0.37
Xylene (total)	1.59

Sample data

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW01-002

Lab Name: CH2M HILL Contract: MD462

Lab Code: MGM Case No.: MD462 SAS No.: SDG No.: MD462

Matrix: (soil/water) WATER Lab Sample ID: MD462001

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 24APR0801008.D

Level: (low/med) LOW Date Received: 04/22/97

% Moisture: not dec. _____ Date Analyzed: 04/24/97

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	-----Chloromethane	10	U
75-01-4	-----Vinyl chloride	10	U
74-83-9	-----Bromomethane	10	U
75-00-3	-----Chloroethane	10	U
75-69-4	-----Trichlorofluoromethane	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-09-2	-----Methylene chloride	10	U
156-60-5	-----trans-1,2-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
67-66-3	-----Chloroform	10	U
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon tetrachloride	10	U
71-43-2	-----Benzene	10	U
107-06-2	-----1,2-Dichloroethane	10	U
79-01-6	-----Trichloroethene	10	U
78-87-5	-----1,2-Dichloropropane	10	U
75-27-4	-----Bromodichloromethane	10	U
110-75-8	-----2-Chloroethylvinyl ether	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
108-88-3	-----Toluene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
127-18-4	-----Tetrachloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	4	J
75-25-2	-----Bromoform	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW01-002B

Lab Name: CH2M HILL Contract: MD462
 Lab Code: MGM Case No.: MD462 SAS No.: SDG No.: MD462
 Matrix: (soil/water) WATER Lab Sample ID: MD462002
 Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 24APR0701007.D
 Level: (low/med) LOW Date Received: 04/22/97
 % Moisture: not dec. _____ Date Analyzed: 04/24/97
 Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	-----Chloromethane	10	U
75-01-4	-----Vinyl chloride	10	U
74-83-9	-----Bromomethane	10	U
75-00-3	-----Chloroethane	10	U
75-69-4	-----Trichlorofluoromethane	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-09-2	-----Methylene chloride	10	U
156-60-5	-----trans-1,2-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
67-66-3	-----Chloroform	10	U
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon tetrachloride	10	U
71-43-2	-----Benzene	10	U
107-06-2	-----1,2-Dichloroethane	10	U
79-01-6	-----Trichloroethene	10	U
78-87-5	-----1,2-Dichloropropane	10	U
75-27-4	-----Bromodichloromethane	10	U
110-75-8	-----2-Chloroethylvinyl ether	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
108-88-3	-----Toluene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
127-18-4	-----Tetrachloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
75-25-2	-----Bromoform	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U

QC data

1E
 VOLATILE ORGANICS ANALYSIS DATA SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKJD

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: X04247B1

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 24APR0401004.D

Level: (low/med) LOW

Date Received: 04/24/97

% Moisture: not dec. _____

Data Analyzed: 04/24/97

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
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22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

GC/MS SEMIVOLATILE ORGANICS

000097

**CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS**

QAL Lab Reference No./SDG. MD462

Project: Brown and Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

- A. Sample Preparation: All holding times were met.
- B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: SW-846 3510B
Cleanup: N/A
Analysis: SW-846 8270A

IV. PREPARATION

Please note that the base neutral fraction was extracted prior to the acid fraction as per 3510B - 7, Revision 2, September 1994.

V. ANALYSIS

- A. Calibration: All acceptance criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Surrogates: All acceptance criteria were met.
- D. Spikes: As requested, the matrix spikes were performed using a sample from sample delivery group MD462 (MD462001MS and MD462001MSD). Please note that there were several relative percent differences outside of the advisory QC criteria. The LCS was also analyzed and was found to be within the QC limits. Results are provided for your review.
- E. Samples: Sample analysis proceeded normally.
- F. Other: As requested, the Form 1's reflect the specified target compounds.

A summary of the most current applicable method detection limits (MDLs) immediately follows the case narrative.

GC/MS SEMIVOLATILE ORGANICS

Lab Reference No./SDG: MD462

Page 2

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Debra A. Kelly for DATE: 5/14/97
Herb Kelly
Resource Manager

GC/MS SEMIVOLATILE ORGANICS

Lab Reference No./SDG: MD462

Page 3

CASE NARRATIVE
Addendum

Sample Information

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>DATE</u> <u>EXTRACTED</u>	<u>DATE</u> <u>ANALYZED</u>	<u>SAMPLE</u> <u>pH¹</u>
MD462001	MW01-002	WATER	04/21/97	04/23/97	04/30/97	N/A
MD462001MS	MW01-002MS	WATER	04/21/97	04/23/97	04/30/97	N/A
MD462001MSD	MW01-002MSD	WATER	04/21/97	04/23/97	04/30/97	N/A
MD462002	MW01-002B	WATER	04/21/97	04/23/97	04/30/97	N/A
W04237B1	SBLK1L	WATER	N/A	04/23/97	04/30/97	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
 Analytical Method: SW8270 Extraction Method: SW3510

	MDL
	<u>ug/L</u>
Acenaphthene	1.24
Acenaphthylene	1.26
Acetophenone	1.39
2-Acetylaminofluorene	1.01
4-Aminobiphenyl	1.11
Aniline	1.29
Anthracene	1.00
Aramite	1.24
Aramite (DUP)	0.88
Benzidine	2.20
Benzo (a) anthracene	0.98
Benzo (a) pyrene	1.06
Benzo (b) fluoranthene	1.09
Benzo (g, h, i) perylene	0.95
Benzo (k) fluoranthene	1.72
Benzoic acid	9.07
Benzyl alcohol	1.28
bis (2-Chloroethoxy) methane	1.38
bis (2-Chloroethyl) ether	1.26
bis (2-Ethylhexyl) phthalate	1.50
4-Bromophenyl-phenylether	0.92
Butylbenzylphthalate	1.34
Carbazole	1.20
4-Chloro-3-Methylphenol	0.93
4-Chloroaniline	0.96
1-Chloronaphthalene	1.34
2-Chloronaphthalene	1.35
2-Chlorophenol	1.17
4-Chlorophenyl-phenylether	1.10
Chrysene	0.91
Di-n-butylphthalate	2.52
Di-n-octylphthalate	2.19
Dibenz (a, h) anthracene	0.71
Dibenzofuran	1.20
1,2-Dichlorobenzene	1.29
1,3-Dichlorobenzene	1.45
1,4-Dichlorobenzene	1.33
3,3'-Dichlorobenzidine	2.43
2,4-Dichlorophenol	0.86
2,6-Dichlorophenol	1.09
Diethylphthalate	1.38
7,12-Dimethylbenz (a) anthracen	1.11
3,3'-Dimethylbenzidine	4.16

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
 Analytical Method: SW8270 Extraction Method: SW3510

	MDL
	<u>ug/L</u>
2,4-Dimethylphenol	1.17
Dimethylphthalate	1.22
4,6-Dinitro-2-methylphenol	0.79
1,3-Dinitrobenzene	1.59
2,4-Dinitrophenol	2.07
2,4-Dinitrotoluene	1.08
2,6-Dinitrotoluene	1.14
1,2-Diphenylhydrazine	1.04
Ethyl methanesulfonate	1.03
Fluoranthene	1.39
Fluorene	1.20
Hexachlorobenzene	0.61
Hexachlorobutadiene	1.72
Hexachlorocyclopentadiene	3.15
Hexachloroethane	1.54
Hexachlorophene	36.10
Hexachloropropene	2.69
Indeno(1,2,3-cd)pyrene	0.71
Isophorone	1.52
Isosafrole	1.31
Methapyrilene	5.73
Methyl methanesulfonate	1.08
3-Methylcholanthrene	0.79
2-Methylnaphthalene	1.25
2-Methylphenol	1.08
3 & 4-Methylphenol	2.22
N-Nitroso-di-n-butylamine	1.28
N-Nitroso-di-n-propylamine	1.53
N-Nitrosodiethylamine	1.55
N-Nitrosodimethylamine	0.88
N-Nitrosodiphenylamine (1)	2.00
N-Nitrosomethylethylamine	1.43
N-Nitrosomorpholine	1.18
N-Nitrosopiperidine	1.33
N-Nitrosopyrrolidine	1.33
Naphthalene	1.36
1,4-Naphthoquinone	168.18
1-Naphthylamine	1.20
2-Naphthylamine	0.97
5-Nitro-o-toluidine	1.01
2-Nitroaniline	1.91
3-Nitroaniline	1.94
4-Nitroaniline	2.24

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
 Analytical Method: SW8270 Extraction Method: SW3510

	MDL
	<u>ug/L</u>
Nitrobenzene	1.64
2-Nitrophenol	0.90
4-Nitrophenol	1.03
4-Nitroquinoline-1-oxide	1.04
o-Toluidine	1.20
2,2'-Oxybis(1-chloropropane)	1.39
p-Dimethylaminoazobenzene	1.12
Pentachlorobenzene	1.19
Pentachloronitrobenzene	0.88
Pentachlorophenol	1.93
Phenacetin	1.45
Phenanthrene	0.97
Phenol	0.68
Phenyl-tert-butylamine	15.68
1,4-Phenylenediamine	2.02
2-Picoline	1.71
Pronamide	1.08
Pyrene	1.26
Pyridine	0.79
Safrole	1.17
1,2,4,5-Tetrachlorobenzene	1.33
2,3,4,6-Tetrachlorophenol	1.04
1,2,4-Trichlorobenzene	1.34
2,4,5-Trichlorophenol	0.94
2,4,6-Trichlorophenol	0.81
1,3,5-Trinitrobenzene	0.35

Sample data

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW01-002

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: MD462001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 30APR0501005.D

Level: (low/med) LOW

Date Received: 04/22/97

% Moisture: not dec. _____ dec. _____

Date Extracted: 04/23/97

Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 04/30/97

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo (a) anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	2	J
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo (b) fluoranthene	10	U
207-08-9-----	Benzo (k) fluoranthene	10	U
50-32-8-----	Benzo (a) pyrene	10	U
193-39-5-----	Indeno (1,2,3-cd) pyrene	10	U
53-70-3-----	Dibenz (a,h) anthracene	10	U
191-24-2-----	Benzo (g,h,i) perylene	10	U

(3) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW01-002

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: MD462001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 30APR0501005.D

Level: (low/med) LOW

Date Received: 04/22/97

% Moisture: not dec. _____ dec. _____

Date Extracted: 04/23/97

Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 04/30/97

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	3.816	14	NJB
2.	Unknown	6.582	6	J
3.	Unknown	7.211	27	J
4. 768-95-6	1-Adamantanol	7.361	13	NJ
5. 91-57-6	Naphthalene, 2-methyl-	7.690	14	NJ
6. 90-12-0	Naphthalene, 1-methyl-	7.862	12	NJ
7.	Unknown	8.155	27	J
8.	Unknown	8.591	9	J
9.	Unknown	8.698	8	J
10.	Unknown	9.227	8	J
11.	Unknown	9.327	10	J
12.	Unknown	9.477	17	J
13.	Unknown	10.020	14	J
14.	Unknown	10.213	6	J
15.	Unknown	10.385	10	J
16.	Unknown	11.078	7	J
17.	Unknown	11.579	12	J
18.	Unknown	11.664	9	J
19.	Unknown	14.095	6	J
20.	Unknown	14.152	12	J
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW01-002B

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: MD462002

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 30APR0601006.D

Level: (low/med) LOW

Date Received: 04/22/97

% Moisture: not dec. _____ dec. _____

Date Extracted: 04/23/97

Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 04/30/97

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-Oxybis(1-chloroprop (1)	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW01-002B

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: MD462002

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 30APR0601006.D

Level: (low/med) LOW

Date Received: 04/22/97

% Moisture: not dec. _____ dec. _____

Date Extracted: 04/23/97

Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 04/30/97

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

Number TICs found: 11

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	3.811	14	NJB
2.	Unknown	3.868	4	J
3.	Unknown	4.011	2	JB
4.	Unknown	4.046	2	JB
5. 617-94-7	Benzenemethanol, .alpha., .al	5.876	2	NJB
6.	Unknown	6.277	2	J
7.	Unknown	6.305	3	J
8. 65-85-0	Benzoic Acid	6.362	5	NJ
9.	Unknown	10.222	4	J
10.	Unknown	13.868	6	J
11.	Unknown	18.099	5	J
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QC data

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK1L

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: W04237B1

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 30APR0401004.D

Level: (low/med) LOW

Date Received: 04/23/97

% Moisture: not dec. _____ dec. _____

Date Extracted: 04/23/97

Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 04/30/97

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-Oxybis(1-chloroprop (1)	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy) methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK1L

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: W04237B1

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 30APR0401004.D

Level: (low/med) LOW

Date Received: 04/23/97

% Moisture: not dec. _____ dec. _____

Date Extracted: 04/23/97

Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 04/30/97

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	UG/L
534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo(a)anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	10	U
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo(b)fluoranthene	10	U
207-08-9-----	Benzo(k)fluoranthene	10	U
50-32-8-----	Benzo(a)pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10	U
53-70-3-----	Dibenz(a,h)anthracene	10	U
191-24-2-----	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK1L

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: W04237B1

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 30APR0401004.D

Level: (low/med) LOW

Date Received: 04/23/97

% Moisture: not dec. _____ dec. _____

Date Extracted: 04/23/97

Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 04/30/97

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	3.819	8	NJ
2.	Unknown	4.012	3	J
3.				
4.				
5.				
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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW01-002MS

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: MD462001MS

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 30APR0701007.D

Level: (low/med) LOW

Date Received: 04/22/97

% Moisture: not dec. _____ dec. _____

Date Extracted: 04/23/97

Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 04/30/97

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	76	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Ben-zidine	10	U
129-00-0-----	Pyrene	37	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo (a) anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	2	J
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo (b) fluoranthene	10	U
207-08-9-----	Benzo (k) fluoranthene	10	U
50-32-8-----	Benzo (a) pyrene	10	U
193-39-5-----	Indeno (1,2,3-cd) pyrene	10	U
53-70-3-----	Dibenz (a,h) anthracene	10	U
191-24-2-----	Benzo (g,h,i) perylene	10	U

(3) - Cannot be separated from Diphenylamine

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW01-002MS

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: MD462001MS

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 30APR0701007.D

Level: (low/med) LOW

Date Received: 04/22/97

% Moisture: not dec. _____ dec. _____

Date Extracted: 04/23/97

Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 04/30/97

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	76	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	10	U
129-00-0-----	Pyrene	37	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo(a)anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	2	J
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo(b)fluoranthene	10	U
207-08-9-----	Benzo(k)fluoranthene	10	U
50-32-8-----	Benzo(a)pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10	U
53-70-3-----	Dibenz(a,h)anthracene	10	U
191-24-2-----	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK1L

Lab Name: CH2M HILL

Contract: MD462

Lab Code: MGM

Case No.: MD462

SAS No.:

SDG No.: MD462

Matrix: (soil/water) WATER

Lab Sample ID: W04237B1

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 30APR0401004.D

Level: (low/med) LOW

Date Received: 04/23/97

% Moisture: not dec. _____ dec. _____

Date Extracted: 04/23/97

Extraction: (SepF/Cont/Sonc) SEPF

Date Analyzed: 04/30/97

GPC Cleanup: (Y/N) N

pH: 6.0

Dilution Factor: 1.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	3.819	8	NJ
2.	Unknown	4.012	3	J
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

GC PURGEABLE HALOCARBONS

000255

CASE NARRATIVE
GC PURGEABLE HALOCARBONS

QAL Lab Reference No./SDG: MD462

Project: Brown and Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A

Cleanup: N/A

Analysis: EPA 601 (Mod)

IV. PREPARATION

Not applicable.

V. ANALYSIS

A. Calibration : All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: All acceptance criteria were met.

E. Samples: Sample analyses proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____

Tammy Carey

Herb Kelly
Herb Kelly
Organic Division Manager

DATE: _____

05/15/97

GC PURGEABLE HALOCARBONS

Lab Reference No./SDG: MD462

Page 2

CASE NARRATIVE
Addendum

Sample Information

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>DATE</u> <u>EXTRACTED</u>	<u>DATE</u> <u>ANALYZED</u>	<u>SAMPLE</u> <u>pH¹</u>
MD462001	MW01-002	WATER	04/21/97	N/A	04/22/97	<2
MD462001MS	MW01-002MS	WATER	04/21/97	N/A	04/22/97	<2
MD462001MSD	MW01-002MSD	WATER	04/21/97	N/A	04/22/97	<2
MD462002	MW01-002B	WATER	04/21/97	N/A	04/22/97	<2
X04227B2	VBLK001	WATER	N/A	N/A	04/22/97	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

**CURRENT METHOD DETECTION LIMITS (MDLs)
PURGEABLE HALOCARBONS**

Date Collected: N/A	Sample Group: Lab QC
Date Extracted: N/A	Lab Sample ID: Multiple Samples
Date Analyzed: 12/20/96	Lab File 1 ID: N/A
Matrix: Water	Lab File 2 ID: N/A
Method: EPA 601 (Mod)	Dilution Factor: 1.0
% Moisture: 100	Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	0.178
75-25-2	Bromoform	1.0	0.362
74-83-9	Bromomethane	1.0	0.143
56-23-5	Carbon tetrachloride	1.0	0.191
108-90-7	Chlorobenzene	1.0	0.746
75-00-3	Chloroethane	1.0	0.085
110-75-8	2-Chloroethyl vinyl ether	1.0	0.059
67-66-3	Chloroform	1.0	0.064
74-87-3	Chloromethane	1.0	0.148
124-48-1	Dibromochloromethane	1.0	0.069
95-50-1	1,2-Dichlorobenzene	1.0	0.298
541-73-1	1,3-Dichlorobenzene	1.0	0.319
106-46-7	1,4-Dichlorobenzene	1.0	0.358
75-71-8	Dichlorodifluoromethane	1.0	0.195
75-34-3	1,1-Dichloroethane	1.0	0.128
107-06-2	1,2-Dichloroethane	1.0	0.043
75-35-4	1,1-Dichloroethene	1.0	0.125
156-59-2	cis-1,2-Dichloroethene	1.0	0.054
156-60-5	trans-1,2-Dichloroethene	1.0	0.153
78-87-5	1,2-Dichloropropane	1.0	0.155
10061-01-5	cis-1,3-Dichloropropene	1.0	0.091
10061-02-6	trans-1,3-Dichloropropene	1.0	0.038
75-09-2	Methylene chloride	5.0	0.512
79-34-5	1,1,2,2-Tetrachlorethane	1.0	0.113
127-18-4	Tetrachloroethene	1.0	0.281
71-55-6	1,1,1-Trichloroethane	1.0	0.173
79-00-5	1,1,2-Trichloroethane	1.0	0.077
79-01-6	Trichloroethene	1.0	0.147
75-69-4	Trichlorofluoromethane	1.0	0.112
75-01-4	Vinyl chloride	1.0	0.180

Sample data

**REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS**

Date Collected: 04/21/97	Sample Group: MD462
Date Extracted: N/A	Lab Sample ID: MD462001
Date Analyzed: 04/22/97	Lab File 1 ID: D22V005
Matrix: Water	Lab File 2 ID: D22W005
Method: EPA 601 (Mod)	Dilution Factor: 1.0
% Moisture: 100	Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

98 % Rec.

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date Collected: 04/21/97	Sample Group: MD462
Date Extracted: N/A	Lab Sample ID: MD462002
Date Analyzed: 04/22/97	Lab File 1 ID: D22V004
Matrix: Water	Lab File 2 ID: D22W004
Method: EPA 601 (Mod)	Dilution Factor: 1.0
% Moisture: 100	Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

110 % Rec.

QC data

000315

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date Collected: N/A	Sample Group: Lab QC
Date Extracted: N/A	Lab Sample ID: X04227B2
Date Analyzed: 04/22/97	Lab File 1 ID: D22V003
Matrix: Water	Lab File 2 ID: D22W003
Method: EPA 601 (Mod)	Dilution Factor: 1.0
% Moisture: 100	Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

94 % Rec.

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date Collected: 04/21/97	Sample Group: MD462
Date Extracted: N/A	Lab Sample ID: MD462001MS
Date Analyzed: 04/22/97	Lab File 1 ID: D22V006
Matrix: Water	Lab File 2 ID: D22W006
Method: EPA 601 (Mod)	Dilution Factor: 1.0
% Moisture: 100	Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	20
75-25-2	Bromoform	1.0	18
74-83-9	Bromomethane	1.0	20
56-23-5	Carbon tetrachloride	1.0	18
108-90-7	Chlorobenzene	1.0	20
75-00-3	Chloroethane	1.0	20
110-75-8	2-Chloroethyl vinyl ether	1.0	3.4
67-66-3	Chloroform	1.0	20
74-87-3	Chloromethane	1.0	19
124-48-1	Dibromochloromethane	1.0	19
95-50-1	1,2-Dichlorobenzene	1.0	20
541-73-1	1,3-Dichlorobenzene	1.0	20
106-46-7	1,4-Dichlorobenzene	1.0	20
75-71-8	Dichlorodifluoromethane	1.0	19
75-34-3	1,1-Dichloroethane	1.0	21
107-06-2	1,2-Dichloroethane	1.0	20
75-35-4	1,1-Dichloroethene	1.0	20
156-59-2	cis-1,2-Dichloroethene	1.0	20
156-60-5	trans-1,2-Dichloroethene	1.0	20
78-87-5	1,2-Dichloropropane	1.0	21
10061-01-5	cis-1,3-Dichloropropene	1.0	19
10061-02-6	trans-1,3-Dichloropropene	1.0	19
75-09-2	Methylene chloride	5.0	20
79-34-5	1,1,2,2-Tetrachlorethane	1.0	19
127-18-4	Tetrachloroethene	1.0	20
71-55-6	1,1,1-Trichloroethane	1.0	19
79-00-5	1,1,2-Trichloroethane	1.0	19
79-01-6	Trichloroethene	1.0	18
75-69-4	Trichlorofluoromethane	1.0	20
75-01-4	Vinyl chloride	1.0	18

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

91 % Rec.

CLIENT SAMPLE ID:

MW01-002MSD

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date Collected: 04/21/97

Date Extracted: N/A

Date Analyzed: 04/22/97

Matrix: Water

Method: EPA 601 (Mod)

% Moisture: 100

Sample Group: MD462

Lab Sample ID: MD462001MSD

Lab File 1 ID: D22V007

Lab File 2 ID: D22W007

Dilution Factor: 1.0

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	20
75-25-2	Bromoform	1.0	18
74-83-9	Bromomethane	1.0	21
56-23-5	Carbon tetrachloride	1.0	17
108-90-7	Chlorobenzene	1.0	20
75-00-3	Chloroethane	1.0	20
110-75-8	2-Chloroethyl vinyl ether	1.0	5.4
67-66-3	Chloroform	1.0	19
74-87-3	Chloromethane	1.0	19
124-48-1	Dibromochloromethane	1.0	19
95-50-1	1,2-Dichlorobenzene	1.0	20
541-73-1	1,3-Dichlorobenzene	1.0	20
106-46-7	1,4-Dichlorobenzene	1.0	20
75-71-8	Dichlorodifluoromethane	1.0	19
75-34-3	1,1-Dichloroethane	1.0	19
107-06-2	1,2-Dichloroethane	1.0	18
75-35-4	1,1-Dichloroethene	1.0	20
156-59-2	cis-1,2-Dichloroethene	1.0	19
156-60-5	trans-1,2-Dichloroethene	1.0	19
78-87-5	1,2-Dichloropropane	1.0	20
10061-01-5	cis-1,3-Dichloropropene	1.0	19
10061-02-6	trans-1,3-Dichloropropene	1.0	19
75-09-2	Methylene chloride	5.0	19
79-34-5	1,1,2,2-Tetrachlorethane	1.0	18
127-18-4	Tetrachloroethene	1.0	20
71-55-6	1,1,1-Trichloroethane	1.0	18
79-00-5	1,1,2-Trichloroethane	1.0	19
79-01-6	Trichloroethene	1.0	17
75-69-4	Trichlorofluoromethane	1.0	21
75-01-4	Vinyl chloride	1.0	19

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

94 % Rec.

GC PURGEABLE AROMATICS

000330

CASE NARRATIVE
GC PURGEABLE AROMATICS

QAL Lab Reference No./SDG: MD462

Project: Brown and Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: N/A

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A

Cleanup: N/A

Analysis: EPA 602 (Mod)

IV. PREPARATION

Not applicable.

V. ANALYSIS

A. Calibration : All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: All acceptance criteria were met.

E. Samples: Sample analysis proceeded normally. Sample MD462001 (MW01-002) contained non-target compounds.

Primary analysis was performed using a 75-meter DB-VRX analytical column. A 105-meter Rtx 502.2 analytical column was used for confirmation analysis.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____

Tammy Carey
for Herb Kelly
Organic Division Manager

DATE: 5/16/97

CASE NARRATIVE
Addendum

Sample Information

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>DATE</u> <u>EXTRACTED</u>	<u>DATE</u> <u>ANALYZED</u>	<u>SAMPLE</u> <u>pH¹</u>
MD462001	MW01-002	WATER	04/21/97	N/A	04/22/97	<2
MD462001MS	MW01-002MS	WATER	04/21/97	N/A	04/22/97	<2
MD462001MSD	MW01-002MSD	WATER	04/21/97	N/A	04/22/97	<2
MD462002	MW01-002B	WATER	04/21/97	N/A	04/22/97	<2
X04227B2	VBLK001	WATER	N/A	N/A	04/22/97	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

CURRENT METHOD DETECTION LIMITS (MDLs)
PURGEABLE AROMATICS

Date Collected: N/A	Sample Group: Lab QC
Date Extracted: N/A	Lab Sample ID: Multiple Samples
Date Analyzed: 12/20/96	Lab File 1 ID: N/A
Matrix: Water	Lab File 2 ID: N/A
Method: EPA 602 (Mod)	Dilution Factor: 1.0
% Moisture: 100	Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	0.181
100-41-4	Ethylbenzene	1.0	0.105
1634-04-4	Methyl tert-butyl ether	1.0	0.077
108-88-3	Toluene	1.0	0.070
108-38-3/106-42-3	m- and p-Xylene	2.0	0.179
95-47-6	o-Xylene	1.0	0.083

Sample data

CLIENT SAMPLE ID:

MW01-002

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date Collected: 04/21/97
Date Extracted: N/A
Date Analyzed: 04/22/97
Matrix: Water
Method: EPA 602 (Mod)
% Moisture: 100

Sample Group: MD462
Lab Sample ID: MD462001
Lab File 1 ID: D22V005
Lab File 2 ID: D22W005
Dilution Factor: 1.0
Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	2.7
1634-04-4	Methyl tert-butyl ether	1.0	U
108-88-3	Toluene	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

98 % Rec.

CLIENT SAMPLE ID:

MW01-002B

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date Collected: 04/21/97	Sample Group: MD462
Date Extracted: N/A	Lab Sample ID: MD462002
Date Analyzed: 04/22/97	Lab File 1 ID: D22V004
Matrix: Water	Lab File 2 ID: D22W004
Method: EPA 602 (Mod)	Dilution Factor: 1.0
% Moisture: 100	Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1634-04-4	Methyl tert-butyl ether	1.0	U
108-88-3	Toluene	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

110 % Rec.

QC data

000432

CLIENT SAMPLE ID:

VBLK001

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date Collected: N/A	Sample Group: Lab QC
Date Extracted: N/A	Lab Sample ID: X04227B2
Date Analyzed: 04/22/97	Lab File 1 ID: D22V003
Matrix: Water	Lab File 2 ID: D22W003
Method: EPA 602 (Mod)	Dilution Factor: 1.0
% Moisture: 100	Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1634-04-4	Methyl tert-butyl ether	1.0	U
108-88-3	Toluene	1.0	U
108-38-3/106-42-3	m- and p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

94 % Rec.

CLIENT SAMPLE ID:

MW01-002MS

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date Collected: 04/21/97	Sample Group: MD462
Date Extracted: N/A	Lab Sample ID: MD462001MS
Date Analyzed: 04/22/97	Lab File 1 ID: D22V006
Matrix: Water	Lab File 2 ID: D22W006
Method: EPA 602 (Mod)	Dilution Factor: 1.0
% Moisture: 100	Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	20
100-41-4	Ethylbenzene	1.0	23
1634-04-4	Methyl tert-butyl ether	1.0	21
108-88-3	Toluene	1.0	20
108-38-3/106-42-3	m- and p-Xylene	2.0	42
95-47-6	o-Xylene	1.0	20
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			91 % Rec.

CLIENT SAMPLE ID:

MW01-002MSD

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date Collected: 04/21/97

Date Extracted: N/A

Date Analyzed: 04/22/97

Matrix: Water

Method: EPA 602 (Mod)

% Moisture: 100

Sample Group: MD462

Lab Sample ID: MD462001MSD

Lab File 1 ID: D22V007

Lab File 2 ID: D22W007

Dilution Factor: 1.0

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	20
100-41-4	Ethylbenzene	1.0	23
1634-04-4	Methyl tert-butyl ether	1.0	20
108-88-3	Toluene	1.0	20
108-38-3/106-42-3	m- and p-Xylene	2.0	42
95-47-6	o-Xylene	1.0	21

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

94 % Rec.

GC EXTRACTABLE VOLATILE ORGANICS
(EDB)

CASE NARRATIVE
GC EXTRACTABLE VOLATILE ORGANICS (EDB)

QAL Lab Reference No./SDG. MD462

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

- A. Sample Preparation: All holding times were met.
- B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: EPA 504.1

IV. PREPARATION

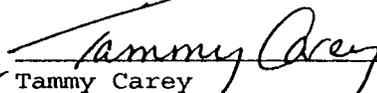
Sample preparation proceeded normally.

V. ANALYSIS

- A. Calibration: All acceptance criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Surrogates: All acceptance criteria were met.
- D. Spikes: Matrix spikes were performed using a sample from this contract. The associated blank spike (LCS) is summarized with the MS/MSD results on the Form 3 in this report.
- E. Samples: Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____


Tammy Carey
Chemist

DATE: _____

5/19/97

CASE NARRATIVE

Addendum

Sample Information

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>DATE</u> <u>EXTRACTED</u>	<u>DATE</u> <u>ANALYZED</u>	<u>SAMPLE</u> <u>pH</u> ¹
MD462001	MW01-002	WATER	04/21/97	05/15/97	05/16/97	N/A
MD462001MS	MW01-002MS	WATER	04/21/97	05/15/97	05/16/97	N/A
MD462001MSD	MW01-002MSD	WATER	04/21/97	05/15/97	05/16/97	N/A
MD462002	MW01-002B	WATER	04/21/97	05/15/97	05/16/97	N/A
W05157B1	EBLK15	WATER	N/A	05/15/97	05/16/97	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

Sample data

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 05/15/97
Lab Sample ID: MD462001 Sample Matrix: WATER Date Analyzed: 05/16/97
Client Sample ID: MW01-002 Percent Moisture: _____ Dilution Factor: 1.0

EDB

CAS Number _____ ug/L
106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 100

- U - Analyzed for but not detected.
- B - Detected in QC blank.
- J - Detected, concentration estimated.
- SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 05/15/97
Lab Sample ID: MD462002 Sample Matrix: WATER Date Analyzed: 05/16/97
Client Sample ID: MW01-002B Percent Moisture: _____ Dilution Factor: 1.0

EDB

CAS Number _____ ug/L
106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 100

- U - Analyzed for but not detected.
- B - Detected in QC blank.
- J - Detected, concentration estimated.
- SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

QC data

000473

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 05/15/97
Lab Sample ID: MD462001MS Sample Matrix: WATER Date Analyzed: 05/16/97
Client Sample ID: MW01-Q02MS Percent Moisture: _____ Dilution Factor: 1.0

EDB

CAS Number ug/L
106-93-4 1,2-Dibromoethane (EDB) . . . 0.10

1,1,2,2-Tetrachloroethane - SS 95

- U - Analyzed for but not detected.
- B - Detected in QC blank.
- J - Detected, concentration estimated.
- SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 05/15/97
Lab Sample ID: MD462001MSD Sample Matrix: WATER Date Analyzed: 05/16/97
Client Sample ID: MW01-002MSD Percent Moisture: _____ Dilution Factor: 1.0

EDB

CAS Number ug/L
106-93-4 1,2-Dibromoethane (EDB) . . . 0.09

1,1,2,2-Tetrachloroethane - SS 93

- U - Analyzed for but not detected.
- B - Detected in QC blank.
- J - Detected, concentration estimated.
- SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

GC POLYNUCLEAR AROMATIC HYDROCARBONS

000487

CASE NARRATIVE
GC POLYNUCLEAR AROMATIC HYDROCARBONS

QAL Lab Reference No./SDG. MD462

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: EPA 610

IV. PREPARATION

Entire contents of sample container was extracted per method. Actual volumes are shown on Form I's. Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

Both the initial calibration and continuing calibration summaries include data for both the primary and confirmation columns. Each compound will appear in the summary reports twice. The first time the compound will not be preceded by the "#" symbol, referring to compounds identified from the first column (RTX-5); the next time it will have the "#" symbol, referring to compounds identified from the second column (RTX-200) (for example, Naphthalene and #Naphthalene).

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: Matrix spikes were performed using a sample from this contract. The summary of the MS/MSD results has been included in this data package.

All acceptance criteria were met.

GC POLYNUCLEAR AROMATIC HYDROCARBONS

Lab Reference No./SDG: MD462

Page 2

- E. Samples: Samples MD462001, MD462001MS, and MD462001MSD were diluted to prevent target compounds from exceeding the instrument calibration range.
- F. Other: Primary and confirmation data were simultaneously acquired using two dissimilar analytical columns (RTX-5 and RTX-200) connected in parallel to one injection port and one detector.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____

Tammy Carey
Tammy Carey
Chemist

DATE: _____

05/16/97

CASE NARRATIVE

Addendum

Sample Information

<u>LAB</u>	<u>CLIENT</u>	<u>SAMPLE</u>	<u>DATE</u>	<u>DATE</u>	<u>DATE</u>	<u>SAMPLE</u>
<u>SAMPLE ID</u>	<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLED</u>	<u>EXTRACTED</u>	<u>ANALYZED</u>	<u>pH¹</u>
MD462001	MW01-002	WATER	04/21/97	04/23/97	04/24/97	N/A
MD462001MS	MW01-002MS	WATER	04/21/97	04/23/97	04/24/97	N/A
MD462001MSD	MW01-002MSD	WATER	04/21/97	04/23/97	04/24/97	N/A
MD462002	MW01-002B	WATER	04/21/97	04/23/97	04/24/97	N/A
W04237B1	NBLK01	WATER	N/A	04/23/97	04/24/97	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

PNA Water MDLs

<u>Target (RTX-5)</u>	<u>ug/L</u>
Naphthalene	0.257
2-Methylnaphthalene	0.382
1-Methylnaphthalene	0.444
Acenaphthylene	0.400
Acenaphthene	0.350
Fluorene	0.307
Phenanthrene	0.394
Anthracene	0.400
Fluoranthene	0.460
Pyrene	0.504
Benzo(a)anthracene	0.495
Chrysene	0.915
Benzo(b)fluoranthene	0.566
Benzo(k)fluoranthene	0.527
Benzo(a)pyrene	0.613
Indeno(123-cd)pyrene	0.356
Dibenzo(ah)anthracene	0.238
Benzo(ghi)perylene	0.570

<u>Target (RTX-200)</u>	<u>ug/L</u>
#Naphthalene	0.299
#2-Methylnaphthalene	0.283
#1-Methylnaphthalene	0.356
#Acenaphthene	0.394
#Acenaphthylene	0.504
#Fluorene	0.434
#Phenanthrene	0.394
#Anthracene	0.434
#Fluoranthene	0.826
#Pyrene	0.382
#Benzo(a)anthracene	0.586
#Chrysene	1.250
#Benzo(b)fluoranthene	0.475
#Benzo(k)fluoranthene	0.504
#Benzo(a)pyrene	0.400
#Dibenzo(ah)anthracene	0.625
#Indeno(123-cd)pyrene	0.975
#Benzo(ghi)perylene	0.314

Sample data

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
 Lab Sample ID: MD462001
 Client Sample ID: MW01-002

Concentration: LOW
 Sample Matrix: WATER
 Volume Extracted: 960ml

Date Extracted: 04/23/97
 Date Analyzed: 04/24/97
 Dilution Factor: 5.0

PNA COMPOUNDS

CAS Number		ug/L
91-20-3	Naphthalene	49
91-57-6	2-Methylnaphthalene . . .	16
90-12-0	1-Methylnaphthalene . . .	16
208-96-8	Acenaphthylene	10 U
83-32-9	Acenaphthene	10 U
86-73-7	Fluorene	10 U
85-01-8	Phenanthrene	10 U
120-12-7	Anthracene	10 U
206-44-0	Fluoranthene	10 U
129-00-0	Pyrene	10 U
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene . . .	10 U
207-08-9	Benzo(k)fluoranthene . . .	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene . .	10 U
53-70-3	Dibenzo(a,h)anthracene . .	10 U
191-24-2	Benzo(g,h,i)perylene . . .	10 U
Terphenyl-d14 - SS		66 %

- U - Analyzed for but not detected.
- B - Detected in QC blank.
- J - Detected, concentration estimated.
- SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
 Lab Sample ID: MD462002
 Client Sample ID: MW01-002B

Concentration: LOW
 Sample Matrix: WATER
 Volume Extracted: 965ml

Date Extracted: 04/23/97
 Date Analyzed: 04/24/97
 Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2.1	U
91-57-6	2-Methylnaphthalene	2.1	U
90-12-0	1-Methylnaphthalene	2.1	U
208-96-8	Acenaphthylene	2.1	U
83-32-9	Acenaphthene	2.1	U
86-73-7	Fluorene	2.1	U
85-01-8	Phenanthrene	2.1	U
120-12-7	Anthracene	2.1	U
206-44-0	Fluoranthene	2.1	U
129-00-0	Pyrene	2.1	U
56-55-3	Benzo (a) anthracene	2.1	U
218-01-9	Chrysene	2.1	U
205-99-2	Benzo (b) fluoranthene	2.1	U
207-08-9	Benzo (k) fluoranthene	2.1	U
50-32-8	Benzo (a) pyrene	2.1	U
193-39-5	Indeno (1, 2, 3 - cd) pyrene	2.1	U
53-70-3	Dibenzo (a, h) anthracene	2.1	U
191-24-2	Benzo (g, h, i) perylene	2.1	U
Terphenyl-d14 - SS		62	%

- U - Analyzed for but not detected.
- B - Detected in QC blank.
- J - Detected, concentration estimated.
- SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

QC data

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 04/23/97
 Lab Sample ID: W04237B1 Sample Matrix: WATER Date Analyzed: 04/24/97
 Client Sample ID: NBLK01 Volume Extracted: 1000ml Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
90-12-0	1-Methylnaphthalene	2.0	U
208-96-8	Acenaphthylene	2.0	U
83-32-9	Acenaphthene	2.0	U
86-73-7	Fluorene	2.0	U
85-01-8	Phenanthrene	2.0	U
120-12-7	Anthracene	2.0	U
206-44-0	Fluoranthene	2.0	U
129-00-0	Pyrene	2.0	U
56-55-3	Benzo(a)anthracene	2.0	U
218-01-9	Chrysene	2.0	U
205-99-2	Benzo(b)fluoranthene	2.0	U
207-08-9	Benzo(k)fluoranthene	2.0	U
50-32-8	Benzo(a)pyrene	2.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0	U
53-70-3	Dibenzo(a,h)anthracene	2.0	U
191-24-2	Benzo(g,h,i)perylene	2.0	U
	Terphenyl-d14 - SS	74	%

U - Analyzed for but not detected.
 B - Detected in QC blank.
 J - Detected, concentration estimated.
 SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
 Lab Sample ID: MD462001MS
 Client Sample ID: MW01-002MS

Concentration: LOW
 Sample Matrix: WATER
 Volume Extracted: 975ml

Date Extracted: 04/23/97
 Date Analyzed: 04/24/97
 Dilution Factor: 5.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	78	
91-57-6	2-Methylnaphthalene	8.0	
90-12-0	1-Methylnaphthalene	12	
208-96-8	Acenaphthylene	52	
83-32-9	Acenaphthene	62	
86-73-7	Fluorene	64	
85-01-8	Phenanthrene	64	
120-12-7	Anthracene	59	
206-44-0	Fluoranthene	9.1	J
129-00-0	Pyrene	8.1	J
56-55-3	Benzo (a) anthracene	10	
218-01-9	Chrysene	8.1	J
205-99-2	Benzo (b) fluoranthene	9.0	J
207-08-9	Benzo (k) fluoranthene	10	U
50-32-8	Benzo (a) pyrene	6.4	J
193-39-5	Indeno (1,2,3-cd) pyrene	10	
53-70-3	Dibenzo (a,h) anthracene	5.3	J
191-24-2	Benzo (g,h,i) perylene	8.3	J
Terphenyl-d14 - SS		62	%

- U - Analyzed for but not detected.
- B - Detected in QC blank.
- J - Detected, concentration estimated.
- SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
 Lab Sample ID: MD462001MSD
 Client Sample ID: MW01-002MSD

Concentration: LOW
 Sample Matrix: WATER
 Volume Extracted: 980ml

Date Extracted: 04/23/97
 Date Analyzed: 04/24/97
 Dilution Factor: 5.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	95	
91-57-6	2-Methylnaphthalene	13	
90-12-0	1-Methylnaphthalene	16	
208-96-8	Acenaphthylene	58	
83-32-9	Acenaphthene	69	
86-73-7	Fluorene	71	
85-01-8	Phenanthrene	70	
120-12-7	Anthracene	65	
206-44-0	Fluoranthene	9.7	J
129-00-0	Pyrene	8.4	J
56-55-3	Benzo (a) anthracene	11	
218-01-9	Chrysene	9.7	J
205-99-2	Benzo (b) fluoranthene	9.5	J
207-08-9	Benzo (k) fluoranthene	10	U
50-32-8	Benzo (a) pyrene	6.9	J
193-39-5	Indeno (1,2,3-cd) pyrene	9.1	J
53-70-3	Dibenzo (a,h) anthracene	6.6	J
191-24-2	Benzo (g,h,i) perylene	8.9	J
Terphenyl-d14 - SS		64	%

- U - Analyzed for but not detected.
- B - Detected in QC blank.
- J - Detected, concentration estimated.
- SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

Chain of custody documentation



**Brown & Root
Environmental**

455 FAIRWAY DRIVE, SUITE 200
DEERFIELD BEACH, FLORIDA 33441
(305) 570-5885 (305) 570-5974 (FAX)

SITE MANAGER: G. Goode
PROJECT NAME: SITE No. 323
BRE PROJECT NO.: 7113 CODE: _____
P.O. NO.: 2049-7113-P96249

SHIPPED TO: _____ PAGE 1 OF 1
CH2M Hill, Montgomery AL
(LABORATORY NAME, CITY)

CHAIN OF CUSTODY RECORD

LABORATORY ANALYSIS

SAMPLED BY (PRINT): M. McCoy
SAMPLER SIGNATURE: [Signature]

SAMPLE TYPE
MATRIX

PRES. TYPE
PARAMETERS
601 602 8260 610 8270 504 PA, AS, CA, ANOS 418.1 H304

STANDARD TAT RUSH
 24 HR. 48 HR. 72 HR. 7 DAYS
RESULTS DUE DATE: _____

LAB NO.	DATE	TIME	SAMPLE IDENTIFICATION	COMP.	GRAB	MATRIX
<u>01</u>	<u>4-21</u>	<u>1810</u>	<u>323-6W-MW01-002</u>		<u>X</u>	<u>GW</u>
<u>02</u>	<u>4-21</u>	<u>1910</u>	<u>323-6W-MW01-002B</u>		<u>X</u>	<u>W</u>
			<u>EXTRA Volumes for MS</u>			
			<u>AND MSP for LAB</u>			
			<u>QA/QC</u>			

NUMBER OF CONTAINERS	COMMENTS:
<u>16</u>	<u>Additional Sample</u>
<u>16</u>	<u>Volumes Collected for MS AND MSP</u>
<u>16</u>	<u>LAB QA/QC</u>
<u>16</u>	
	<u>Coolers Received Taped w/no Custody Seal</u>
	<u>2 Coolers</u>

TOTAL NUMBER OF CONTAINERS 12 12 8 4 8 4 4 64

EMPTY BOTTLES RELINQUISHED BY (SIGNATURE) <u>① [Signature]</u>	SEAL INTACT? YES NO N/A	DATE: TIME:	EMPTY BOTTLES RECEIVED BY (SIGNATURE) <u>② [Signature]</u>	SEAL INTACT? YES <u>(NO)</u> N/A	DATE: <u>4-21-97</u> TIME: <u>1200</u>
RELINQUISHED BY (SIGNATURE) <u>③ [Signature]</u>	SEAL INTACT? YES NO <u>(N/A)</u>	DATE: <u>4-22-97</u> TIME: <u>1000 CST</u>	RECEIVED BY (SIGNATURE) <u>④ Paul Gurnaulis</u>	SEAL INTACT? YES NO <u>(N/A)</u>	DATE: <u>4/22/97</u> TIME: <u>1000</u>
RELINQUISHED BY (SIGNATURE) <u>⑤</u>	SEAL INTACT? YES NO N/A	DATE: TIME:	RECEIVED BY (SIGNATURE) <u>⑥</u>	SEAL INTACT? YES NO N/A	DATE: TIME:

SPECIAL INSTRUCTIONS:

LABORATORY REMARKS: MD462

SAMPLE CONTAINERS PRECLEANED BY: <input type="checkbox"/> BRE <input type="checkbox"/> LABORATORY <input checked="" type="checkbox"/> MANUFACTURER	METHOD OF SHIPMENT: <u>Delivery by BRE</u>	BILL OF LADING NO.:
WHITE-FULLY EXECUTED COPY YELLOW-RECEIVING LABORATORY COPY PINK-SAMPLERS' COPY/QA COPY GOLDENROD-SITE MANAGERS' COPY	SAMPLING TEAM: <u>M. McCoy</u>	RECEIVED FOR LABORATORY BY (SIGNATURE): <u>Paul Gurnaulis</u> DATE: <u>4/22/97</u> TIME: <u>1000</u>
		No. <u>0075</u>

000179

Groundwater Measurement Field Forms

